Returns to Buying Earnings and Book Value: Accounting for Growth and Risk

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Abstract

This paper documents that the earnings yield and book-to-price combine to predict equity returns in a way that is consistent with the rational pricing of risk. It is well known that earnings yields predict returns in the cross-section, consistent with standard formulas that show that the earnings yield equals the required return when there is no expected earnings growth beyond that from retention. With growth, those same formulas show that the earnings yield is increasing in the required return but decreasing in the growth. So, if growth is risky and requires a higher return, the determination of the required return from a given earnings yield is problematical. The paper shows that book-to-price facilitates the determination: for a given earnings yield, book-to-price indicates additional return associated with expected growth. The finding provides a rationalization of the well-documented book-to-price effect in stock returns: book-to-price indicates the risk in buying earnings and earnings growth. However, growth identified by a high book-to-price as yielding a higher return is quite different from "growth" typically attributed to a low book-to-price as yielding a lower return. Accordingly, the notion of "growth" versus "value" is redefined.

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This paper documents that earnings-to-price (E/P) and book-to-price (B/P) jointly predict stock returns in a way that is consistent with rational pricing of risk. The documented returns, from a joint sort on E/P and B/P, have been trolled many times by "value" and "growth" investors, but a long line of papers has questioned whether the returns are simply reward for risk (Fama and French (1992); Berk, Green, and Naik (1999); Zhang (2005); and Lewellen and Nagel (2006), to mention just a few). This paper brings an accounting perspective to the issue: earnings and book values are accounting numbers so, if the two ratios indicate risk and expected return, it might have something to do with accounting principles for measuring earnings and book value.

Indeed, an accounting principle connects earnings and book value to risk: under uncertainty, accounting defers the recognition of earnings until the uncertainty has largely been resolved. The deferral of earnings to the future produces earnings growth, deemed by the accounting to be at risk. Further, the deferral also reduces short-term E/P, reduces earnings relative to book value, and yields a higher B/P for a given E/P. Accordingly, E/P and B/P jointly indicate expected earnings growth that is at risk.

The paper shows empirically that these two ratios, considered together, indeed predict earnings growth but also predict stock returns, consistent with the market pricing growth as risky; in short, the market pricing of earnings and book values aligns with the risk embedded in the accounting. In so doing, the paper provides an explanation for the well-documented "book-to-price" effect in returns. It also suggests a revision in the notions of "value" and "growth." In "value" versus "growth" investing, "growth" is

deemed to be low risk, requiring lower returns. In this paper, growth yields higher average returns, consistent with the market pricing growth as risky.

Earnings-to-Price

Considerable research shows that earnings-to-price (E/P, the earnings yield) predicts stock returns (in Basu 1977 and 1983 and Jaffe, Keim, and Westerfield 1989, for example). Whether those returns are reward for risk or the result of mispricing is the subject of perennial discussion, but the idea that earnings yields indicate the required return for risk, posited in Ball (1978), has some foundation. First, standard formulas show that the earnings yield equals the required return if there is no expected earnings growth beyond that from retention. Second, beginning with Ball and Brown (1968) and Beaver (1968), a stream of papers documents that realized stock returns are related to realized earnings, consistent with casual observation that stock prices move when earnings differ from expectation. More recently, Dubinsky and Johannes (2006) estimate that a disproportionate portion of anticipated stock price volatility is associated with uncertainty resolution around earnings announcements. It appears that expected earnings are at risk; investors "buy earnings" and the E/P ratio prices the risk in expected earnings.[1]

Earnings yields used to predict stock returns are typically short-term (usually annual) yields. However, expected short-term earnings yields are not likely to be a sufficient indictor of risk and return. Investors buy not only short-term earnings but also subsequent long-term earnings, and both are presumably at risk; investors are subject to the risk that short-term earnings realizations may be different from expected but also to

[1] Aggregate earnings yields have been used widely as predictors of market-wide equity risk premiums, in Fama and French (1988), Campbell and Shiller (1988 and 1998), and Campbell and Thompson (2008), for example.

the risk that long-term growth expectations may not be realized.[2] If so, how do the short-term earnings yield and expected earnings growth combine to indicate the required return for the risk? The issue is subtle. Under standard formulas, E/P is increasing in the required return but decreasing in expected earnings growth.[3] If growth is risky and requires a higher return, then growth has both an increasing and decreasing effect on E/P, so teasing out the required return from a given earnings yield and the expected growth it implies is problematical. Has book-to-price a role to play?

Book-to-Price

Research (in Fama and French 1992, for example) shows that book-to-price (B/P) also predicts stock returns, so consistently so that Fama and French (1993 and 1996) have built an asset pricing model based on the observation. The same discussion of rational pricing versus market inefficiency ensues but, despite extensive modeling (and numerous conjectures), the phenomenon remains a mystery. The mystery deepens when it is said that B/P is inversely related to earnings growth while positively related to returns; low B/P stocks (referred to as "growth" stocks) yield lower returns than high B/P stocks ("value" stocks). Yet investment professionals typically think of growth as risky, requiring higher returns, consistent with the risk-return notion that one cannot buy more earnings (growth) without additional risk. The predictable returns to book-to-price have

[2] Relative to R-squares observed in regressions of realized annual returns on realized annual earnings, R-squares increase significantly when earnings and returns are observed over longer periods (in Easton, Harris and Ohlson (1992) and Ohlson and Penman (1992), for example): long-horizon returns are strongly correlated with long-run earnings outcomes.

[3] The common Gordon formula, $P/E = 1/(r-g)$, where r is the required return and g is the earnings growth rate, exhibits the property, although this formula holds only for full payout. The formula also shows that, in the case of no growth, $E/P = r$. Ohlson and Juettner-Nauroth (2005) provide a formula for P/E with the same properties but which is payout insensitive. Empirical research has robustly demonstrated that P/E predicts earnings growth, in Beaver and Morse (1974), Fuller, Huberts, and Levinson (1992), Fairfield (1994), and Penman (1996), for example.

not been reconciled with those associated with earnings yields, even though earnings and book value articulate as a matter of accounting. An exception is Fama and French (1992) who claim that book-to-price "subsumes" earnings-to-price as an indicator of returns, but one typically thinks of earnings (payoffs) as being at risk rather the book values (net assets) from which earnings flow.

This paper confirms that earnings yields predict returns. However, it also shows that, given E/P, B/P identifies both subsequent expected earnings growth and returns that add to those indicated by E/P. The identification of growth by B/P follows as a matter of accounting: for a given short-term earnings yield, a higher book-to-price implies higher long-term earnings over those in the short-term, that is, higher long-term earnings growth. If expected earnings growth is at risk—as accounting principles that defer earnings under uncertainty would suggest—book-to-price adds to expected returns, as the empirical results confirm. Earnings and book value, the bottom-line numbers of the income statement and balance sheet, articulate in an accounting sense, but they also articulate to indicate growth, risk, and required return.

Accordingly, the paper explains the B/P premium in stock returns as reward to the risk of buying earnings and earnings growth. B/P is positively correlated with E/P in the cross-section so, as the earnings yield is positively related to subsequent returns, so is B/P. However, for a given earnings yield, B/P further identifies growth that the market prices to yield higher returns. In the context of value versus growth, "growth" is redefined, with growth indicated by a higher B/P (rather than a lower B/P) associated with higher returns.

We estimate expected returns from average realized returns, with the pretense that average observed returns are reward for risk. One can interpret the observed returns as reward to discovering market mispricing, as argued by Lakonishok, Shleifer, and Vishny (1994), for example. The paper in no way settles this issue. However, it does provide support for the risk-return explanation by recognizing how the accounting for earnings and book value relates to risk.

The Key Ideas

The paper embraces two ideas. The first recognizes that, for a given price, E/P and B/P are accounting phenomena so, if these ratios are to indicate risk and return, it may have something to do with the accounting. The second acknowledges the accounting principle that defers earnings recognition under uncertainty, creating expected earnings growth; earnings growth and risk connect by construction of the accounting. We move to the formal construction in short order, but some elaboration here may aid intuition.

On the first point, consider the case where B/P = 1. Here B/P cannot indicate risk; both a money market fund and a hedge fund have B/P = 1 but very different risk. For these funds, B/P =1 is a property of mark-to-market or "fair value" accounting, and the accounting removes any role for B/P to indicate risk. So, if B/P is to indicate risk, it must be that accounting principles depart from mark-to-market accounting in recognition of (or in manner that is correlated with) risk.

Such is the case where accountants carry book values lower than price, as is typical for non-investment firms that apply historical cost accounting. For a given price (that values real activity), lower book value must result in higher expected future earnings, by construction of the accounting. Earnings can be recognized in the short term

to produce an expected short-term earnings yield that indicates risk and the required return. Or earnings can be deferred further, to the long term, producing expected long-term earnings growth over the short term.

The second point – earnings deferral is a response to uncertainty – suggests that the growth created by earnings deferral aligns with risk. Earnings recognition rules under U.S. GAAP and international accounting standards focus on the resolution of uncertainty: the recognition of earnings is typically deferred until realization of cash is relatively certain. In accounting parlance, earnings are "unrealized" until certain "realization" criteria—usually a confirmed sale at market—are met, all the more so when earnings realizations are deemed particularly uncertain (as in the case of R&D activities, for example). The accounting treatment ties back to risky dividends: dividends are paid out of book value so dividends cannot be paid until earnings are recognized and added to book value.[4] This deferral accounting is sometimes referred to as "conservative accounting," suggestive of an accommodation of uncertainty. Examples include the expensing of research and development or brand-building expenditures (essential a very rapid amortization), accelerated depreciation, deferring "unearned" revenues, booking liabilities but not the value in intangible assets, excessive provisioning, and recognizing unrealized losses early but deferring unrealized gains.

The idea of earnings deferral aligning with risk is merely suggestive; in a market where only systematic risk is priced, it would have to be that growth created by the accounting bears on outcomes correlated with common factors such as the market portfolio in CAPM pricing. Note, however, that revenue recognition rules delay income

[4] Firms can borrow against future earnings to pay dividends, of course, but the added leverage adds to risk and the required return.

recognition until "receipt of cash is reasonably certain" and cash is a low-beta asset. Nor is there any necessity that the earnings deferral under a particular accounting system − U.S. GAAP, for instance − delivers expected growth that is indicative of risk and return: too much earnings could be deferred (for a low-B/P, R&D firm, for example) or too little (for a high B/P firm whose assets have not been written down). Whether a particular accounting system results in expected growth that is indicative of risk is an empirical matter which we investigate for U.S. GAAP.

The accounting points aside, the idea that growth is associated with risk carries a certain persuasion. If investors see expected short-term earnings at risk, they must see that subsequent earnings are also at risk; added earnings from expected growth come with added risk, consistent with a risk-return tradeoff. Investors are concerned with life-long-dividends (that buy future consumption), and dividends (and consumption) are at risk because the earnings that yield dividends are at risk. Common investment wisdom embraces the idea that growth is risky. Fundamental investors have always discounted growth, understanding that it can be competed away. Leverage adds expected earnings but also adds risk. Analysts' long-term earnings growth forecasts perform poorly against actual realizations, indicating they contain considerable uncertainty. In valuation calculations, one usually regards the "terminal value" part of a valuation as relatively uncertain, based as it is on long-term growth prospects.

Our paper is in the vein of research (in Lettau and Ludvigson 2005; Menzly, Santos and Veronesi 2004; and Santos and Veronesi 2005, for example) that sees risk associated with growth, though the growth referred to there is dividend growth rather than earnings growth. These papers see the dividend yield as increasing in risk and

decreasing in dividend growth, and we see the earnings yield in the same way (if for different reasons). But when earnings are involved, so are book values, so we also bring light to the B/P effect in stock returns. Other papers associate risk with "duration" and long-term outcomes (see Bansal and Yaron 2004; Dechow, Sloan and Soliman 2004; Bansal, Dittmar and Lundblad 2005; Croce, Lettau, and Ludvigson (2007); and Malloy, Moskowitz and Vissing-Jorgensen 2006). Our paper stands in contrast to papers (such as Cochrane 1996; Gomes, Kogan and Zhang 2003; Anderson and Garcia-Feijóo 2006; Xing 2008; Zhang and Chen 2008; and Lettau and Wachter 2007) that supply other rationalizations for the B/P effect. Some of these papers associate B/P with "growth" or "growth options," but with growth requiring lower returns. By interpreting book value for what it is, an accounting number with defined properties, we avoid attributions – "assets in place", "investment", "tangible assets", "Tobin's *q*," "distress", "growth opportunities" – by mere labeling.

Book-to-price and Earnings-to-price as Accounting Constructions

In this section, we show that B/P represents expected earnings not yet booked to book value, with those expected earnings divided between short-term earnings and long-term earnings growth.

Book value is constructed by a periodic accounting operation:

$$B_t = B_{t-1} + Earnings_t - d_t \qquad (1)$$

where B is book value, d is net dividends (dividends plus share repurchases, net of share issues), and *Earnings* are comprehensive earnings, as measured by accounting principles. This "clean-surplus" relation (that expresses the "articulation" of earnings and book value) says that earnings add to book value and dividends are paid out of book value.

Thus, expected future dividends are determined by expected future book values that in turn are determined by the future earnings to be added to current book value. Accordingly, the dividend discount model can be restated in terms of book value and expected earnings to be added to book value, as in the standard derivation of the residual earnings model. Given a constant discount rate, *r*, the price of common equity now (at time t) is

$$P_t = \sum_{\tau=1}^{\infty} \frac{d_{t+\tau}}{(1+r)^{\tau}} \tag{2}$$

where $d_{t+\tau}$ in the expected dividend to common in period $t + \tau$. (Here and throughout the paper, variables time-subscripted with $\tau > 0$ are expected values.) This model is, of course, a statement of the no-arbitrage price if *r* is the required return for risk borne. If price violates the no-arbitrage principle, *r* is simply a number that reconciles expected payoffs to price, that is, the expected return or internal rate of return to buying at the current price.[5] Substituting $d_{t+\tau} = Earnings_{t+\tau} - (B_{t+\tau} - B_{t+\tau-1})$ into equation (2) for all $\tau > 0$,

$$P_t = B_t + \sum_{\tau=1}^{\infty} \frac{Earnings_{t+\tau} - rB_{t+\tau-1}}{(1+r)^{\tau}} \ . \tag{3}$$

$Earnings_{t+\tau} - rB_{t+\tau-1}$ is expected residual earnings for year $t + \tau$. While the dividend discount model sees expected dividends at risk, one can equivalently see expected

[5] A constant discount rate is, of course, not entirely palatable. The formulation here suffices to introduce the empirical analysis which is concerned with documenting the yield (in returns) to buying stocks in the cross-section (at a point in time) based on accounting characteristics. However, the attribution of observed yields to reward for risk is made with some hesitancy; market efficiency issues aside, a constant discount rate is inconsistent with no-arbitrage if discount rates are stochastic, and observed returns include the effect of changes in discount rates with which accounting characteristics could be correlated. See Hughes, Liu and Liu (2009). Rubinstein (1976) and Breeden and Litzenberger (1978) provide dividend discount models with varying discount rates and Feltham and Ohlson (1999), Ang and Liu (2001), and Christensen and Feltham (2009) lay out residual earnings valuation models with stochastic discounts rates.

earnings at risk. Summarizing expected residual earnings for years after t+1 with a growth rate, *g*, applied to residual earnings expected in t+1 presents the model in a form that distinguishes earnings expected in the short-term (t+1) from earnings expected from subsequent growth:

$$P_t = B_t + \frac{Earnings_{t+1} - rB_t}{r - g} \quad (3a)$$

$$= B_t + \frac{(ROCE_{t+1} - r)B_t}{r - g} \quad (3b)$$

where $ROCE_{t+1} = Earnings_{t+1}/B_t$ is the one-year ahead return on common equity.

The model states that the difference between price and book value is due to expected earnings implicit in price that have not yet been booked to book value. Furthermore, the value (in price) can be divided between book value, expected short-term earnings, and long-term earnings. The allocation is a matter of how the accounting is executed. With mark-to-market accounting, $P_t = B_t$ (and all value is in book value). With price preserved, but $P_t > B_t$, the lower book value means earnings deferred to the future, but those earnings can be recognized in the short-term or the long-term (as a matter of accounting). Accordingly, for a given price and required return, both B/P and the forward E/P ($Earnings_{t+1}/P_t$) are accounting phenomena, as is the growth rate, *g*, that is determined by expected long-term earnings (to be added to book value) relative to the earnings expected to be added to book value in the short-term.[6]

Book-to-Price, Earnings-to-Price, Growth, and the Required Return

[6] This residual earnings growth rate is the earnings growth rate, adjusted for retention and capital contributions. One infers earnings growth from residual earnings growth by reverse engineering residual earnings to infer earnings. The assumption of a constant growth rate is not necessary for our purposes: let *g* represent additional value from long-term earnings (after the forward year).

Our inquiry deals with how book-to-price (B/P), earnings-to-price (E/P), and growth connect to risk and return. From equations (3a) and (3b),

$$r = \frac{Earnings_{t+1}}{P_t} + (1 - \frac{B_t}{P_t})g \tag{4a}$$

$$= \frac{B_t}{P_t} ROCE_{t+1} + (1 - \frac{B_t}{P_t})g \, . \tag{4b}$$

(The expressions require $ROCE_{t+1} > g$, a restriction that will be addressed in the empirical work[7]).Variants of equation (4a) appear in Brief and Lawson (1992), Danielson and Press (2003), and Rajan, Reichelstein, and Soliman (2007), among others. Papers that reverse engineer the cost of capital from prices implicitly utilize these formulas with various estimates of growth (see Claus and Thomas 2001; Gebhardt, Lee and Swaminathan 2001; and Easton, Taylor, Shroff and Sougiannis 2002, for example).

Equation (4b) describes r as a weighted average of $ROCE_{t+1}$ and g with weights that sum to unity supplied by B/P. It thus emphasizes that B/P is, in the first instance, an attribute (observed in the present) that combines expected short-term earnings and growth—the future payoffs that are at risk—rather than a risk attribute itself.[8] But it also emphasizes that the B/P weights involve a pricing of the risk in expected short-term

[7] From equation (3b),

$$P_t = B_t \times \frac{ROCE_{t+1} - g}{r - g}$$

from which equations (4a) and (4b) are derived. Thus a positive price requires $ROCE_{t+1} > g$ as well as the standard condition, $r > g$. Rather than starting from the residual earnings valuation, one could start from an abnormal earnings growth valuation (in Ohlson and Juettner-Nauroth 2005) where price is based on expected forward earnings capitalized at the required return plus value from abnormal earnings growth. This model is more general (and removes the restriction), but does not involve book value. See Ohlson and Gao (2006).

[8] The weighting could also represent an inefficient market's inappropriate combination of the two components, to yield expected returns different from that implied by risk.

earnings and growth. How then might the B/P weighting indicate risk in buying short-term earnings and growth? We consider three cases.

***Case 1*: $P_t = B_t$**

In this case, B/P cannot indicate the required return, as illustrated with the money market fund and the risky hedge fund example earlier. The property is by application of a particular accounting, mark-to-market accounting. From (4a) and (4b) with B/P = 1, $r = \frac{Earnings_{t+1}}{P_t} = ROCE_{t+1}$. Thus, while B/P does not indicate the required return, the forward E/P and $ROCE_{t+1}$ are sufficient.

***Case 2: No Growth*.**

Setting $g = 0$ in equation (3a),

$$P_t = B_t + \frac{Earnings_{t+1} - rB_t}{r}. \tag{5a}$$

But book value cancels such that

$$P_t = \frac{Earnings_{t+1}}{r} \tag{5b}$$

and $r = \frac{Earnings_{t+1}}{P_t}$. As in the case of B/P = 1, the required return is indicated by the forward E/P and, given E/P, B/P adds nothing to explain returns. Indeed, for a given E/P = r, B/P can take on any value, but cannot indicate the required return (unless correlated with E/P). Furthermore, this no-growth case challenges the standard attribution (in "value" versus "growth" investing, for example) that B/P unconditionally indicates growth. A low B/P ("growth" in the language of growth versus value) can be due to high short-term earnings relative to book value, but with no subsequent growth. A high B/P ("value") can be a firm with low earnings-to-book (with losses, for example) but with

growth expectations. In short, book-to-price can vary with no growth implied (Penman 1996 elaborates).[9]

Case 3: Growth.

Cases 1 and 2, where E/P = *r* and B/P has no incremental role, suggest that E/P is the starting point for forecasting expected returns. Accordingly, our empirical tests ask whether E/P forecasts returns and then, conditional on E/P, whether B/P adds to the explanation of returns. The discussion of the no-growth case implies that, if B/P adds to the required return over the earnings yield, it must have to do with growth. Indeed, equation (4a) shows that the difference between *r* and the earnings yield is explained by an interaction of B/P with growth. Comparative statics that might explain *r* in terms of B/P and growth are not straightforward, however, for growth can affect both B/P and E/P (and indeed the required return). The three accounting scenarios below distinguish the case where growth affects B/P from those where it does not, and also the case where growth and B/P indicate risk from those where it does not.

Accounting Scenario 1: Growth Adds to Price but not to Risk. In this scenario, growth over forward earnings represents additional earnings that are valued in price but do not add risk. In familiar terms, growth is added earnings from positive net-present-value investing (over the required return), so adds to price. The higher price has the effect of decreasing the forward earnings yield over that for the no-growth case (a denominator effect), such that E/P < *r*. And, for a given book value, the added price also reduces B/P.

Under this scenario, B/P is decreasing in growth, consistent with "growth" versus "value" attributions. As growth also depresses E/P, B/P in equation (4a) serves to adjust

[9] For an example, an R&D firm can have a low B/P (because the R&D asset is missing from the balance sheet), a high $ROCE_{t+1}$ (because of the missing book value), but no growth. Stated differently, the firm can be priced with a low B/P but a normal P/E = 1/*r*.

E/P for growth to recover the *r* that would be indicated by E/P (alone) in the no-growth case.[10] B/P cancels growth, and the higher the growth (and lower the B/P that prices growth), the higher is the weight applied to *g*. But *r* is preserved, unaffected by growth expectations.

Accounting Scenario 2: Growth Adds to Risk but not to Price. In this scenario, growth adds risk but does not add to price because price is discounted for the risk in the growth; risk and growth cancel in the price. With price and book value preserved, growth can only be added by deferring earnings from the short-term to the long-term, as with accounting that defers earnings under uncertainty. Forwards earnings and E/P are thus depressed, as in scenario 1, but (with price unchanged) the reduced E/P is due to a numerator effect.[11] Unlike Scenario 1, B/P is unaffected. Rather than B/P incorporating the pricing of growth with an increase in the denominator, growth and risk offset in price to leave B/P unchanged.[12]

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[10] In addition, in equation (4b) B/P adjusts $ROCE_{t+1}$ to recover the earnings yield.

[11] The accounting effect can be appreciated by understanding that, for given total (life-long) expected earnings, long-term earnings can only be increased by decreasing short-term earnings. That is, accounting methods shift earnings between periods, but do not affect life-time earnings (that must equal cash flows). An accounting tutorial that shows how the accounting works is available from the corresponding author.

[12]Equations (4a) and 4(b) cannot strictly be applied in the scenario where growth informs about *r*, for *g* is the residual earnings growth rate rather than the earnings grwoth rate, and the residual earnings growth rate is a function of *r* as well as growth in earnings. (The mathematical problem arises from incorporating risk in the denominator of a valuation model, like (2) and (3a), rather than through a discount via covariance terms in the numerator, but we know of no way of endogenously determining these covariances in terms of earnings growth.) However, one can show via examples that, for B/P < 1, reducing forward earnings with price held constant, *g* increases with increases in *r*. From model (3a),

$$g = r - \frac{Earnings_{t+1} - rB_t}{P_t - B_t}$$

With P_t and B_t held constant, a decrease in $Earnings_{t+1}$ and an increase in *r* implies an increase in *g*. The empirical construction in the paper finesses the issue. The formulation does serve to remind one that adding growth to a valuation like that in model (3a) – on the basis of projected sales or earnings growth, for example – may require a corresponding adjustment to the required return; that is, added growth increases *g* but also increases *r*, reducing the effect on *r* – *g*. If price reflects both growth and the risk in growth, reverse engineering the formulas (4a) and (4b) for the required return is problematic. The typical

The case of added leverage provides an illustration of the effect of growth and risk on price. Penman (2010, Chapter 13) shows via examples that added leverage adds expected earnings growth. However, if borrowing is a zero-NPV activity (as under standard Modigliani and Miller conditions), the added leverage does not add to price, despite the higher growth. The reason is that leverage also adds to risk and the required return (under the standard weighted-average cost-of-capital formula) so that growth that would otherwise add to price also reduces price for added risk; growth and risk cancel to leave price unchanged. Furthermore, for a given book value (of equity), added leverage does not change book-to-price.[13]

One can imagine that the same economics might apply to the operating part of a business: consistent with a risk-return tradeoff, one cannot buy more growth without taking on more risk. The Fed Model of stock prices (though controversial) implies that risk and growth cancel in price, and Thomas and Zhang (2009) present empirical support for the Fed Model at the aggregate level of stock prices. However, it is a question of how the accounting is done, but principles that defer earnings under uncertainty suggest that GAAP accounting produces expected growth in response to risk. Ohlson (2008) models a particular form of accounting – permanent earnings accounting – where growth equals the risk premium so growth offsets risk, one-for-one, in price.

In business operations, growth might add risk (Scenario 2) but presumably also involves positive-NPV activity that adds to price (Scenario 1), so both scenarios are

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exercise ignores the point, and reverse-engineering papers have typically been unsuccessful in identifying implied expected returns that are validated with actual realized returns, though methodological issues also are involved (see Easton and Monahan 2005 and Guay, Kothari, and Shu 2005).

[13] See Penman, Richardson, and Tuna (2007) for an examination of the relationship between book-to-price, leverage, and returns.

likely to be in play in the cross section. Two features differentiate the two scenarios. First, B/P is higher under the second scenario than in the first. This accords with the observation in Berk (1995) that risk reduces price, *ceteris paribus*, so a ratio like B/P is likely to be higher with more risk. Second, while both scenarios result in lower E/P, the lower E/P comes through the denominator (higher price) in Scenario 1 but though the numerator (lower forward earnings) in Scenario 2. As growth reduces forward earnings rather than price in Scenario 2, earnings are lower relative to book value (lower $ROCE_{t+1}$.[14] These discriminating features are the focus of our tests: For a given E/P, does lower earnings-to-book indicate higher expected returns? As, for a given E/P, lower earnings-to-book means higher book-to-price, the question is equivalent to asking whether, for a given E/P, higher B/P indicates higher expected growth and higher returns, tying B/P to growth and returns.[15] Thus, the scenario ties B/P to growth and returns, but in a quite different way to standard "growth" versus "value" scenarios.[16]

[14] The practice of expensing R&D expenditures, considered to have risky payoffs, is an example. The practice reduces book value, deferring earnings to the future. But repeated expensing with growth in R&D expenditures reduces forward earnings (for a given price and book value), deferring more earnings to the long-term. And so with LIFO accounting, brand-building expenditures, conservative revenue recognition, and accelerated depreciation policies (to mention a few).

[15] Simply, E/P = E/B ×B/P.

[16] Fama and French (2006) have the flavor of what's going on here, but their setup is quite different. In a model that involves clean surplus accounting, as in equation (3b), they express the expected return in terms of B/P, profitability (earnings relative to book value, *ROCE*), and growth in book value (which they call "investment"). They investigate the relationship between returns and each one of these, holding the other two constant. But their comparative statics do not accord with the way that accounting works: One cannot vary an accounting component of equation (3b) while holding the other components constant. To produce more growth (for a given *r* and price), for example, the accountant has to change either book value or short-term earnings or both. In contrast to our results, growth (as they define it) is negatively related to expected returns in the cross section (holding their other accounting attributes constant). These points aside, the results of our paper are indicative of the rational pricing of risk that the stream of Fama and French papers emphasize.

Accounting Scenario 3: Growth Adds Neither to Price nor Risk.

The effects in Scenario 2 are simply by construction of the accounting: conservative accounting (that defers earnings recognition) is applied in response to risk. But accounting is by fiat and can take on any form, raising the specter that the conservative accounting of GAAP, and the growth it creates, is not related to real activity, price or risk, but rather an accounting peculiarity. Indeed, there are claims that GAAP is excessively conservative.[17] Growth so induced does not affect B/P, as in Scenario 2, but offsets exactly in E/P in equation (4a) to leave both price are *r* unaffected (it's just accounting !).[18] This pure accounting treatment (unrelated to real activity) results in lower short-term earnings relative to book value (as in Scenario 2), but does not forecast added returns. If this is the case, neither E/P nor B/P may indicate returns and one must look elsewhere for an explanation of the B/P effect in stock returns.

The empirical analysis is set up to distinguish these three scenarios. Results lend support to Scenario 2.

The Empirical Construction

The empirical construction mimics the accounting construction. The analysis involves observing book value then separating earnings expectations implicit in the difference between book value and price into short-term and long-term earnings. The residual earnings (*RE*) valuation (3a) divides into three components, as follows:

[17] It is said that accountants practice conservatism as a defense against law suits, and the political process under which accounting standard setting operates forces too-conservative accounting. LIFO accounting for inventories depresses earnings and produces earnings growth (with growing inventories), but is presumably related to tax issues rather than risk.

[18] Feltham and Ohlson (1995) and Zhang (2000) model conservative accounting with a fixed price and a fixed discount rate.

$$P_t = B_t + \frac{RE_{t+1}}{r} + RE_{t+1}\left[\frac{1}{r-g} - \frac{1}{r}\right] \qquad (6)$$

(1) (2) (3)

where (to be reminded), $RE_{t+1} = Earnings_{t+1} - rB_t$, that is, the amount of earnings expected to be added to book value in the short term, relative to that book value. The investor buys three components in the price, (1) book value, (2) value from earnings expected to be added to book value in the short term, without growth, and (3) value from long-term growth. As in the no-growth equation (5b), components (1) and (2) amount to

$$P_t = \frac{Earnings_{t+1}}{r} \qquad (7)$$

and $Earnings_{t+1}/P_t = r$. Component (3) amounts to a price multiplier over the no-growth case, but note that, to the extent that higher growth involves higher risk, such that r increases with higher growth, the multiplier does not increase (and B/P is higher than otherwise).

This formulation involves the required return, r, such that component (3) prices growth in excess of that required for the risk born. But r is not known – indeed it is the object of the endeavor – and may be related to growth in the third component. The required return is that in excess of the risk-free rate, and the risk-free rate is known, so the endeavor amounts to evaluating the return premium over the risk-free rate. Thus we measure the first two components in equation (6) as

$$P_t = B_0 + \frac{RE_{t+1}}{r_f} \qquad (8)$$

(1) (2)

where r_f in the risk-free rate, given by the 10-year Treasury yield for the relevant year, and residual earnings is earnings in excess of r_f applied to book value. Dividing by price,

$$\frac{B_t}{P_t} + \frac{STE}{P_t} + \frac{LTE}{P_t} = 1 \tag{9}$$

where $\frac{STE}{P_t} = \frac{Earnings_{t+1} - r_f B_t}{P}$ is the short-term component (2) relative to price and $\frac{LTE}{P_t}$, the portion of price associated with long-term earnings expectations, is the remainder. We will refer to short-term earnings and long-term earnings components as *STE* and *LTE*, with the reminder that they are price denominated.

Applying the algebra that equates the first two components of equation (6) with equation (7),

$$\text{B/P} + STE = \frac{Earnings_{t+1}}{r_f P_t}, \tag{10}$$

that is, the first two components in equation (9) equal the forward earnings yield relative to the risk free rate, effectively the earnings yield spread.[19] From equations (9) and (10), the long-term component is

$$LTE = 1 - \frac{Earnings_{t+1}}{r_f P_t} \tag{11}$$

Thus *LTE* is the complement of the earnings yield, the residual in price after that explained by the earnings yield. It expresses the notion that higher long-term earnings expectations are associated with a lower earnings yield (a higher P/E ratio). From equation (10),

[19] The risk free rate, a constant in the cross section, merely scales E/P and book value in the calculation of *STE*, so is not particularly important. With this scaling, *LTE* = 0 if E/P = r_f, by equation (11).

$$\text{B/P} = \frac{Earnings_{t+1}}{r_f P_t} - STE \qquad (12)$$

This equation shows why B/P might indicate additional required return for a given earnings yield: B/P is the earnings yield adjusted for the amount of earnings added to book value in the short term (relative to book value). Thus, if B/P is to indicate risk and return over the earnings yield, it must have to do with the earnings yield relative to the amount of earnings expected to be added to book value in the short term, *STE*. But the earnings yield mirrors *LTE*, by equation (11) so, for a given E/P (and, correspondingly, a given *LTE*), a higher B/P implies lower *STE* relative to LTE (as in equation (9)). That, of course is growth from deferring earnings from the short-term to the long-term. The accounting principle that defers earnings to the long term when outcomes are risky suggests the growth so created may be related to the required return. Whether growth is so priced is an empirical matter, however.

Data Description

The analysis covers U.S. listed firms over the period 1963-2006 whose book value of common equity and earnings before extraordinary items are available on Compustat for any fiscal year within the period and whose stock prices and returns are on CRSP. Price per share is observed three months after fiscal-year end at which time financial statement data for the fiscal year are assumed to have been reported. Monthly returns are observed for the 12 months following this point. The book-to-price ratio and earnings yield are calculated at this same point, with book value per share at fiscal-year end adjusted for stock splits and stock dividends over the three months after fiscal year end. To ensure that book value refers to the common shares, book value is Compustat's common equity plus any preferred treasury stock, less any preferred dividends in arrears.

In addition to firms with missing book value of common equity (data item 60) and earnings before extraordinary items (item 18) on Compustat, firms with negative book value or price less than 20 cents are excluded from the analysis. (We repeat the analysis with exclusion at higher prices.) Firms are also excluded if shares outstanding (item 25) is missing. Other missing Compustat data items are set equal to zero.

In order to carry out the investigation over an extended period and to incorporate the full range of B/P ratios, forward earnings (for year t+1) is initially estimated as reported earnings for year t before extraordinary and special items, with a tax adjustment to special items at prevailing tax rates for the year. Other forecasts based on trailing earnings are also applied. However, we also run the analysis with analysts' consensus forecasts of forward earnings from IBES files for the period, 1977-2006. Using an estimate of forward earnings based on current (recurring) earnings not only enhances the coverage, but also avoids the problems of (behavioral) biases and noise in analysts' forecasts evidenced in Hughes, Liu, and Su (2008), Gode and Mohanram (2008), and Wahlen and Wieland (2011), to mention just a few papers. However, analysts' forecasts presumably incorporate other information. Using current earnings for the yield effectively expresses growth against a base of earnings currently reported by the accounting.

There are 153,858 firm-years over the 44 years in the investigation, with an average of 3,497 firms per year and a range of 375 in 1963 to 6,025 in 1996. Table 1 gives the distribution of monthly returns from the 12 months over which they are observed and also distributions of the estimated forward earnings yield (E/P), return on common equity ($ROCE_{t+1}$), and STE and LTE . The table reports that the distributions of

returns, B/P, and E/P in the sample are quite similar to those for all firms on CRSP and Compustat.

The median B/P for the sample in Table 1 is 0.606 (with a mean of 0.744), indicating that less than half of the value in price is represented by (discounted) expected future earnings. The observation accords with the notion that accounting, on average, defers earnings relative to a mark-to-market accounting. The distributions of *STE* and *LTE* (deflated by price) indicate how total expected residual earnings implicit in the price are typically broken down into earnings in the short term versus the long term. From the distribution of *STE,* one infers that, at the median, 21.9% of price is accounted for by forward residual earnings if those residual earnings were assessed relative the risk-free rate and were to continue as a perpetuity (without growth). However, there is considerable variation around this median. Mean and median *LTE* are positive, indicating additional earnings are expected in the term, on average. Again, there is considerable variation around the median.[20]

Basic Correlations

Table 2 reports mean Pearson and Spearman correlations coefficients between variables, with the means referring to average coefficients calculated each year. For the Pearson correlations, the top and bottom percentiles of variables (other than stock returns, betas and size) were rejected each year. However, Table 1 indicates that *STE* and *LTE* involve some extreme numbers even after this treatment, so the product-moment Pearson

[20] As *LTE* is the complement of the earnings yield relative to the risk-free rate (equation (11)), it is also scaled by the risk-free rate. The scaling leads to higher *LTE* for firms with low E/P and lower *LTE* for firms with high E/P. As the risk-free rate is a constant in the cross section at a point in time, the relative ranking of *LTE* across firms at a point in time is preserved however.

correlations involving these two variables should be scrutinized against the Spearman (rank) correlations. (Our tests are based on ranks.)

While B/P is perfectly negatively correlated with total earnings deferred to the future (per dollar of price), by construction of the accounting, Table 2 indicates that B/P is also negatively correlated with both *STE* and *LTE*: lower B/P means higher short-term earnings relative to book value but lower B/P also means higher subsequent earnings. But the correlations are not high, indicating that there is considerable variation in the mix of *STE* and *LTE* for a given B/P in the cross section. The mean Spearman correlation between B/P and *LTE* minus *STE* (not reported in the table) is only -0.093. This indicates that, while B/P is often identified as having a negative relationship with "growth," it actually has low correlation with long-term earnings relative to earnings in the short term, pertinent to the discussion of B/P and growth around equation (5a) earlier. The well-known positive correlation between B/P and subsequent returns, is evident in the table, but note that the average rank correlation between B/P and E/P is 0.312 and E/P is positively associated with returns.

The relationship between E/P and other variables is highlighted in Table 3 where characteristics of 10 portfolios formed from ranking firms on E/P are reported. As in Basu (1977 and 1983), among others, E/P is positively correlated with returns over the subsequent 12 months, suggesting that short-term earnings are at risk and require a higher return. The return relationship is not quite monotonic, with the lowest E/P portfolio, comprised of firms with particularly high negative earnings, earning particularly high returns. B/P is positively correlated with E/P (here and in Table 2), indicating that the positive correlation between B/P and returns is in part attributable to B/P identifying

short-term earnings at risk. But again, the relationship is not monotonic, with high B/P associated with both high E/P and low E/P. The higher returns associated with high B/P in portfolio 10 are associated with a correspondingly high E/P. Those associated with relative high B/P but low E/P in portfolio 1 bear on what is to come: these firms have particularly high *LTE* relative to *STE*, that is, earnings expected in the long-term relative to those expected to be added to book value in the short term.

While E/P is positively related to returns in Table 3, it is negatively correlated with historical beta.[21] *LTE* is positively correlated with beta (and negatively related to returns, as it must be by the constructed negative correlation between E/P and *LTE*). If long-term earnings are risky, with higher beta, they should yield higher returns, but this higher risk should also be reflected in the earnings yield (that incorporates both risk and growth) such that E/P yields higher returns for the beta associated with growth. This is not the case, unconditionally, and this tension cues our tests. Note, in addition, that *LTE* is negatively correlated with size in Table 3 – small firms have more expected long-term earnings – and small firms are identified with higher risk in the asset pricing models.

Empirical Results

Investors are seen as buying the three components in equation (9) and the tests compare returns to portfolios formed with varying amounts of these components. We maintain the pretense that average ex post returns identify return for risk born. There is no necessity that pricing be so rational, of course, so the alternative market inefficiency interpretation in also on the table.

[21] Portfolio betas do not average to 1.0 here and in later tables because they are arithmetic means of security betas in each portfolio, with the security betas estimated using a value-weighted market index.

Returns to a Joint Sort on E/P and B/P

Our core result is in Table 4. Each year from 1963-2006, at three months after prior fiscal-year end, firms are ranked on *LTE* and assigned to 5 portfolios, low to high. As *LTE* mirrors E/P, by equation (11), the ranking is also a reverse ranking on E/P (as Panel G of the table demonstrates), so one can view the *LTE* portfolios as E/P portfolios. Then, within each *LTE* (E/P) portfolio, firms are ranked on B/P to form a total of 25 portfolios. Cut-off points for the portfolio allocations are determined from the ranking for the prior year to avoid look-ahead bias. Panel A reports mean buy-and-hold annual returns over the ensuing 12 months for each portfolio from the full set of replications every year (with *LTE* returns along rows and B/P returns down columns).[22] There is an average of 139.9 stocks per portfolio per year, though a smaller number in earlier years. Panel B gives the average B/P for each portfolio and Panels C and D the average *STE* and *LTE*. As B/P + *STE* + *LTE* = 1 (equation (9)), the amounts in Panels B, C, and D for a given portfolio sum to 1.0, and the issue is how the weighting of the components within a portfolio is related to portfolio returns.

The portfolio returns from ranking on *LTE* in Panel A of Table 4 (across the top of the panel) are negatively related to the amount of *LTE* in the portfolio. The t-statistic of -2.47 on the mean difference in return, -9.7%, between the highest and lowest *LTE* portfolio is calculated as the mean of return differences over years relative to the standard error of the mean calculated from the time series of return differences (as are other t-

[22] Buy-and-hold returns are calculated from CRSP monthly returns. For firms that are delisted during the 12 months, 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 with potential survivorship biases. Firms that are delisted for poor performance (delisting codes 500 and 520-584) frequently have missing delisting returns (see Shumway 1997). We control for this potential bias by applying delisting returns of –100% in such cases. Our results are qualitatively similar if we make no such adjustment.

statistics in this and later tables). As the *LTE* ranking is an inverse ranking on the earnings yield, the result also informs that returns are positively correlated with E/P ratios (relative to the risk-free rate). Indeed, the portfolios here are just the 10 E/P portfolios in Table 5 reduced to five. As in Table 3, estimated portfolio (historical) betas in Panel E are positively related to *LTE*, indicating that long-term earnings are associated with higher systematic risk but negatively associated with E/P that yields higher returns.

The second ranking in Table 4, on B/P, provides insights into resolving this tension. B/P ranks returns for a given *LTE* (and a given earnings yield), and Panel G of the table indicates that this is not just a further ranking on the yield: the earnings yield is held constant over the B/P portfolios, except in the highest *LTE* (lowest earnings yield) portfolio where the yield is actually decreasing in B/P. A ranking on B/P for a given *LTE* is an inverse ranking on *STE*, by equation (9), as the values of *STE* and *LTE* over portfolios in Panels C and D attest. Thus, B/P ranks *LTE* relative to *STE*, that is, earnings expected to be added to book value in the long term relative to earnings added to book value in the short-term. That growth yields higher returns. The results thus support accounting scenario 2: for a given E/P, growth that is priced as risk yields a higher B/P than growth that adds to price such that, for a given E/P, higher B/P indicates risk that is rewarded with higher average returns.

Panel H of Table 4 reports intercepts ("alpha" excess returns) from time-series regressions over the sample period of monthly portfolio returns (in excess of the one-month risk-free return) on excess returns for portfolios mimicking the market, size, B/P and momentum factors. Results from a three-factor model excluding momentum are similar. For this analysis, returns for firms in a particular portfolio are aligned in calendar

time with the month for which factor returns and the risk-free return are observed. The t-statistics on the estimated intercepts indicate that the excess returns associated with joint values of the earnings yield and B/P cannot be explained by sensitivity to factors returns in these models (that include a B/P factor). Nor can they be explained by correlations with size that are evident in Panel F, for the factor model also includes a size factor. To qualify, the reported alphas are unconditional alphas that assume that portfolio sensitivities to the common factors are constant through time.

At one level, the results just report that a joint sort on E/P and B/P yields higher returns than a sort on E/P alone, an investigation visited many times in developing trading strategies. However, the analysis employs a construction that acknowledges the accounting for earnings and book value in the presence of risk. The notion of "growth" typically associated with low B/P in these value versus growth strategies is revised: growth is expected long-term earnings over earnings relative to book value in the short term (*LTE* relative to *STE*). The joint sort on E/P and B/P identifies this growth and, as it turns out, that identification is associated with returns. A joint sort on E/P and B/P may identify a trading strategy that enhances returns, but those returns can be attributed to additional risk associated with growth.[23]

Three features in Table 4 do give pause.

First, with the exception of the lowest E/P portfolio 5 and somewhat the highest E/P portfolio 1, differential returns to B/P within E/P portfolios are largely associated

[23] One cannot rule out other explanations, of course. The highest *LTE* portfolio in Table 4 is also the lowest earnings yield portfolio and Panel G indicates that these are loss firms, on average. High B/P for these firms might indicate distress, higher transactions costs, or lower liquidity that warrants higher returns. However, many loss firms have high long-term growth prospects (a technology firm expensing R&D in excess of short-term revenues being an example), and these growth prospects are often viewed as risky (as are payoffs to R&D). And the B/P effect in returns is evident in Table 4 across the whole range of earnings yields.

with high B/P: over a wide range of B/P (for a given earnings yield), returns are little different from those implied by the earnings yield.[24] Central values are typically less discriminating than the extremes, of course, but the observation is noteworthy because, unconditionally, B/P ranks returns over the whole range of B/P (see Table 7). B/P is positively correlated with E/P, so the result informs that E/P indicates returns that might otherwise be indicated by B/P. Central E/P values (portfolios 2-4) are cases where E/P ratios (in Panel G) are affected less by potential growth (and *LTE* in Panel D is less extreme). Thus E/P is more aligned with the required return in these portfolios, with less additional risk and return to be explained. As indicated by equations (5a) and (5b) in the no-growth case where E/P indicates the required return, B/P can vary widely yet will not indicate growth or additional expected return over that indicated by E/P.

Second, while B/P ranks growth and returns for a given earnings yield, estimated historical betas (in Panel E) are negatively associated with B/P. The negative correlation between B/P and beta is well known. The results might just speak to the inadequacy of the unconditional CAPM; changes in economic conditions affect earnings and book values but may not be reflected in the historical betas reported here.[25] Cohen, Polk, and Vuolteenaho (2009) indicate that both "cash flow betas" (estimated with accounting variables, indeed earnings and book values) and CAPM betas estimated subsequent to the formation of book-to-price portfolios are more in line with the returns on those portfolios.

[24] There is more spread in return when an 8 × 8 matrix is constructed.

[25] Several papers posit that time-varying betas help explain B/P effects in stock returns. See Lettau and Ludvigson (2001), Zhang (2005), and Petkova and Zhang (2005), for example. Lewellen and Nagel (2006) find that a conditional CAPM cannot explain the B/P effect fully.

Indeed those betas are increasing in the time from portfolio formation, the time over which one would expect long-term growth expectations to be resolved.[26]

Third, the spread of average returns from the 4.3% for the low E/P, low B/P portfolio to the 30.0% for the high E/P, high B/P portfolio is large, suggesting market inefficiency rather than reward for risk. On the other hand, the sample period is one where growth risk probably paid off handsomely.

Table 5 validates that the sorts in Table 4 do indeed sort expected growth rates. Panel A reports mean actual two-year-ahead earnings growth rates for each portfolio (growth after the forward year), and Panel D reports mean two-year-ahead growth rates for residual earnings (with the risk-free rate as the required return). Like the mean returns in Table 4, the numbers are means of growth rates for each year in the sample. The growth rates are increasing in *LTE* (and thus decreasing in E/P), as one would expect. But they are also increasing in B/P for a given *LTE*: the combination of E/P and B/P forecasts ex post growth. Further, Panels B and C report that the standard deviation and interdecile range of earnings growth rates over years is also related to the sorts: not only does E/P and B/P indicate different growth rates, but also the differential risk (by these measures) that expectations may not be realized. Thus the returns in Table 4 not only align with earnings growth but also the risk in growth.[27]

[26] The finding corresponds to the observation that earnings realizations explain much of long-run returns. See footnote 2.

[27] Of course, the returns in Table 4 could also be due to market mispricing of expected earnings as the market adjusts to realized earnings growth (that it failed to predict). The ex post growth rates are calculated only for firms that survived two years ahead. While survivorship rates differ somewhat over *LTE* portfolios (83.8 percent for the low *LTE* portfolios versus 71.7 percent for the high *LTE* portfolios), the rate varied little over B/P portfolios, except for the high *LTE* portfolio where the survivorship rate for the low B/P group was 75.7 percent versus 70.4 percent for the high B/P group.

Returns to a Joint Sort on STE and LTE

If *LTE* relative to *STE* predicts returns for a given earnings yield, the question arises as to whether *LTE* relative to *STE* does so unconditionally. One expects that some (or even most) of *LTE* represents growth that adds to price under accounting Scenario1 or pure accounting growth under Scenario 3 (rather than growth that reflects risk under Scenario 2). If so, *LTE* added to *STE* might not add significantly to returns.

Table 6 investigates. Firms are formed into five portfolios from a ranking on *STE* (across rows) and then, within each *STE* portfolio, into a further five portfolios from a ranking on *LTE* (down columns). So portfolios vary on *LTE* relative to *STE*. The portfolio returns from ranking on *STE* alone, across the top of Table 6, show that *STE* does not order portfolio returns in any significant way. On the second ranking on *LTE*, down columns, *LTE* predicts returns for a given *STE*, but in a direction different from what one expects if *LTE* relative to *STE* indicates risk and return. As *STE* = 1- (B/P + *LTE*) by equation (9), a ranking on *LTE* (down columns) for a given *STE* examines whether higher returns are associated with the division between B/P and *LTE*. The ranking thus examines returns under Scenario 1 where B/P cancels growth that depresses E/P but it not related to risk or return. The results indicate that the canceling is operative, but more so: for a given *STE*, the ranking on *LTE* (and the negative ranking on B/P) actually ranks returns negatively.

These negative returns to *LTE* (for a given *STE*) could be due to too much earnings deferred to the long-term when firms are less risky; accounting is too conservative, and perversely so: the results are explained by Scenario 3. Or, it could be that B/P identifies risk exposures other than those to do with the accounting. A third

explanation recognizes the earnings yield as the anchor for the required return, as in equation (5a). As the ranking on *LTE* is an inverse ranking on E/P, the second sort recovers of the earnings yield that indicates return.

Returns to a Joint Sort on B/P and E/P

Table 7 reports a final set of portfolio returns. Firms are ranked first on B/P (across rows) then, within each B/P portfolio, on *LTE*, reversing the order of the rankings in Table 4. Again, the ranking on *LTE* is a reverse ranking on E/P. The "B/P effect in stock returns" is clearly evident from the first ranking, with a t-statistic of 5.57 on the mean difference of 15.0% between high and low B/P portfolios. The differences in returns across B/P portfolios can be partly attributed to B/P being positively correlated with earnings yields (that predict returns).[28] However, the return spread is considerably higher than that for earnings yields in Table 4. Equation (12) suggests a reason: B/P picks up two sources of risk. B/P is the earnings yield (with the risk and return implied), adjusted for earnings expected to be added to book value in the short term relative to the long-term (with additional risk and return implied).

Is it thus the case that B/P "subsumes" returns to E/P as Fama and French (1992) maintain? The second ranking in Table 7 addresses the question. The ranking is on *LTE*, but is also an inverse ranking on the earnings yield, so the investigation tests whether E/P adds to returns for a given B/P. The evidence in the table is mixed. The reported t-statistics indicate significant return differences across earnings yield (*LTE*) portfolios in the lower B/P portfolios, but not the higher B/P portfolios, and in Table 4 it is the higher B/P ratios that add to returns for a given E/P. When a given B/P is identified with

[28] The mean rank correlation between B/P and E/P in Table 2 is 0.312 and is 0.477 for firms with positive E/P.

different levels of earnings yield, one observes non-zero alphas from the four-factor model (not tabulated). Note that for positive earnings yields—where B/P and E/P are more strongly correlated—E/P adds to return for all levels of B/P (again not tabulated).[29]

The combination of the findings here and in Table 4 prompt an interpretation for the B/P effect in stock returns: B/P indicates risk in earnings and earnings growth. B/P is positively correlated with short-term earnings yields and thus indicates the risk and return associated with earnings yields. But, in addition, B/P indicates growth over the short term that also is at risk and requires additional return. The additional return to B/P is most striking in the low E/P portfolios where a good deal of risk is attributable to growth. However it is evident across the whole range of E/P where higher B/P ratios indicate considerable long-term earnings expected over the short term. Overall, the results endorse the notion that it is earnings and earnings growth that are at risk and B/P aids in the identification of that risk. The interpretation accords with the insights from equations (5a) and (5b): In the no-growth case, B/P can vary widely but have no relation to growth, and add nothing to the earnings yield in indicating the required return. Only when B/P indicates growth over the short-term can B/P indicate risk and return and then only if the growth indicated is growth that requires a higher return.

[29] Piotroski (2000) observes that high B/P firms with high return on book value (of assets), among other accounting characteristics, earn higher returns than those with low return on book value. Monhanram (2005) observes a similar result for low B/P firms. The authors bring a market inefficiency interpretation to their findings. However, a high return on book value for a given B/P implies a high E/P, so the results are consistent with returns to a joint sort on B/P and E/P, and thus may indicate earnings at risk. Piotroski adds changes in profit margins and asset turnovers to the predictors of returns, measures which may indicate persistent earnings and growth that are at risk.

Results for Subsamples

To discover how pervasive these findings are, we repeated the tests for varying conditions within the sample. Full details of this additional analysis are available on request.

Firms with Positive Earnings Yields. The results for all firms in Table 4 hold for those with positive earnings yields. The ranking on *LTE* (and earnings yield) for a given B/P in Table 7 produced stronger results than those for all firms in that table: positive earnings yields add to returns explained by B/P for all B/P portfolios.

Firms with Negative STE. When forward $ROCE_{t+1}$ is less than the risk-free rate, forward residual earnings is negative under our construction and the negative amount is capitalized as a perpetuity. Equations (4a) and (4b) hold only for $ROCE_{t+1} > g$. This may not be an issue; the resulting *LTE* is still a determination of long-run earnings expected (in the price) over the short term. However, we investigated the case where $ROCE_{t+1} < r_f$, that is, $STE < 0$. The results are quite similar to those for all firms in Table 4.

Using Consensus Analysts' Forecasts of Forward Earnings. The analysis in Tables 4 - 7 estimated forward earnings as equal to prior-year (trailing) earnings before extraordinary and special items.[30] Though many papers are skeptical (as referenced earlier), analysts' forecasts presumably contain further information about forward earnings that is incorporated in the price in the B/P ratio. We repeated the analysis for the period 1977-2006 for which the forecasts are available on IBES files. The sample covers fewer years, but is also limited to firms which analysts and IBES cover (there are fewer small firms).

[30] Such a construction formulates the issue in terms of growth in the long term over the level of trailing earnings. Trailing earnings may forecast forward E/P with error but, as E/P is applied to assign stocks to portfolios in the tests, error is introduced only to the extent that firms are miss-assigned to portfolios.

Results with analysts' forecasts are similar, though not as strong as those in Table 4. Earnings yields still rank returns, though the return spread is not as wide as that in Table 4. For a given earnings yield (and *LTE*), B/P does rank returns, but the differences are not as large, significant in three of the five portfolios. (Curiously) we also found that the spread of returns when ranking unconditionally on B/P was considerable less than that in Table 7 for the larger set of firms.

Alternative Forecast of Forward Earnings. We applied an alternative forecast: $Earnings_{t+1} = ROCE_t \times B_t$. This forecast accommodates expected earnings increases due to growth in book value in the prior year. Results are similar.

Firms with B/P greater than 1. As the B/P effect in stock returns is often attributed to high B/P firms, we specifically look at the results for B/P > 1. Due to fewer firms, the analysis corresponding to Table 4 was for three *LTE* portfolios and three B/P portfolios within each *LTE* portfolio. Average earnings yields are 15. 5% and 6.8% for two lowest *LTE* portfolios and negative for the highest *LTE* portfolio, but this spread on the earnings yield (and *LTE*) does not produce much of a return spread on the first ranking. B/P orders returns positively for all *LTE* portfolios.

Firms Size. The full analysis was repeated for small, medium, and large firms by market capitalization of their equity. Cut-offs to partition the size ranking were determined from the ranking for the previous year. In the joint *LTE,* B/P ranking (as in Panel A in Table 4) for large firms, *LTE* (and thus E/P) ranked returns significantly, but not B/P on the second ranking. Correspondingly, results were stronger for the second ranking in Table 4 in small and mid-cap firms. These firms are more likely to have growth at risk that differentiates them from the risk in the market as a whole. For the tests in Table 7, the

results from ranking first on B/P were stronger for small-cap and mid-cap, but those on the second ranking (effectively a ranking on E/P) were stronger for large-cap.

Low Prices. The sample excludes firms with per-share prices less than 20 cents that may be infrequently traded. Results were similar when the cut-off was changed to $1, $2, and $5.

Other Robustness Checks. Other tests were performed with little difference in results. The analysis was run on firms with December 31 fiscal-year ends only, with cutoffs points for the portfolio allocation made with reference to the distribution for the current year rather than the prior year (and still retaining no look-ahead bias). In this replication, firms enter portfolios at the same calendar time and the risk-free rate used to capitalize forward residual earnings (and which varies month-to-month) is the same for each firm. We repeated the analysis (on all firms) with B/P and E/P calculated with prices (from Compustat) at fiscal year end rather than three months after fiscal-year end. In additional tests, we began the return period four months after fiscal-year. We carried out the analysis excluding firms in the financial service industries (SIC codes 6000-6999). We also validated the robustness of the findings over time by looking at years 1963-1984 and 1985-2006 separately. Results were somewhat stronger in the earlier period. Results were also similar working with 8 × 8 portfolio sorts (with fewer firms in portfolios) and with independent two-way sorts rather than nested sorts, providing a wider range in the second sort.

Conclusion

The paper confirms results in earlier studies that earnings yields (earnings-to-price) predict stock returns. The result is consistent with the notion that earnings are at risk and

price discounts for that risk. However, investors not only buy short-term earnings but also subsequent earnings (growth), and both are presumably at risk. The paper shows that book-to-price indicates expected returns associated with expected earnings growth: for a given earnings yield, book-to-price indicates additional expected returns, and those additional returns can be explained by book-to-price indicating risky growth. Accordingly, the so-called book-to-price effect in stock returns is explained as rational pricing, but in a way that differs from the typical characterization in "value" versus "growth" investing where low book-to-price indicates "growth" and that growth is associated with lower returns. Rather, high book-to-price indicates growth and yields higher returns (for a given earnings yield), consistent with the notion that growth is risky and is priced as such.

Thus, while research has shown that both book-to-price and earnings-to-price predict stock returns, the results here suggest that expected returns are best explained by book-to-price and earnings-to-price jointly, for then the expected returns associated with growth are identified. Book-to-price predicts returns unconditionally, but this is explained by the positive correlation between book-to-price and earnings-to-price in the cross section plus book-to-price identifying risky growth for a given earnings-to-price.

The documented returns could, of course, represent (abnormal) returns to the market's inefficient pricing of earnings and book values, and the paper in no way resolves this issue. However, the attribution of the documented average returns to the rational pricing of risk gains currency from a consideration of the accounting principles that determine earnings and book values. Accounting defers earnings recognition to the future under uncertainty, and defers relatively more earnings to the long-term future

when outcomes are particularly risky. So earnings deferred to the long run, relative to earnings added to book value in the short run, is indicative of the risk a firm faces. For a given earnings yield, book-to-price captures this feature, simply by the way that earnings-to-price and book-to-price articulate. There is no imperative that accounting reflects priced risk, but our results suggest so.

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Table 1

Cross-sectional Distribution of Variables in the Analysis

This table reports descriptive statistics from the period 1963-2006 for variables used in the empirical analysis, along with comparative statistics for selected variables for all stocks on the CRSP and Compustat databases. Returns are average monthly returns over the 12 months beginning three months after firms' fiscal-year end. B/P is calculated as the ratio of the per-share book value of common equity (B) to the per-share price of common equity. B is common equity (Compustat data item 60) plus any preferred treasury stock (item 227) less any preferred dividends in arrears (item 242), and is measured on a per-share basis at the end of each fiscal year, adjusted for stock splits and stock dividends over the three months following fiscal-year end. Price per share is the CRSP price at three months after fiscal-year end at which point book value and earnings for that year are presumed to have been reported. Short-term earnings (forward) expectations are estimated by earnings before extraordinary items (Compustat item 18) in the prior year less special items (Compustat item 17) adjusted for taxes, and the earnings yield (E/P) and the forward return on common equity (ROCE) are based on this estimate. The earnings yield is the earnings on a per-share basis, adjusted for stock splits and stock dividends over the three months following fiscal-year end, divided by price per share three months after fiscal-year end. STE is short-term residual earnings, with the required return set equal to the risk-free rate and that forward residual earnings then converted to a no-growth residual earnings forecast by capitalizing one-year ahead residual earnings at the risk-free rate, as indicated by component 2 of equation (8) in the text. It is then divided by price. The risk-free rate is the 10-year Treasury yield at three months after fiscal-year end, obtained from the Federal Reserve website. Long-term earnings (relative to price), LTE = 1 – (B/P + STE), with the understanding that both STE and LTE are price-denominated. The distributions are from data pooled over firms and years. For the calculation of means and standard deviations (but not the percentiles), the top and bottom percentiles of observations of the accounting variables each year are eliminated (but not for the stock returns). There are 145,218 firms-years after this trimming.

	All CRSP Stocks	All Compustat Stocks		Stocks in the Sample					
	Monthly Return (%)	B/P	E/P	Monthly Return (%)	B/P	E/P	ROCE	STE	LTE
Mean	1.18	0.759	0.020	1.29	0.744	0.028	0.030	-0.422	0.678
Std. Dev.	18.26	0.594	0.188	17.06	0.555	0.155	0.295	2.788	2.710
Percentiles:									
5	-22.22	0.113	-0.327	-21.28	0.123	-0.276	-0.606	-5.318	-1.391
10	-15.42	0.180	-0.133	-14.79	0.187	-0.115	-0.240	-2.593	-0.935
20	-8.85	0.291	-0.015	-8.49	0.295	-0.009	-0.017	-0.919	-0.496
30	-5.00	0.392	0.022	-4.76	0.395	0.024	0.043	-0.296	-0.222
40	-2.10	0.497	0.04	-1.99	0.497	0.041	0.076	0.020	-0.007
50	0.00	0.609	0.053	0.00	0.606	0.055	0.101	0.219	0.190
60	2.28	0.737	0.066	2.51	0.731	0.067	0.121	0.381	0.395
70	5.29	0.901	0.082	5.47	0.890	0.082	0.142	0.544	0.646
80	9.59	1.139	0.104	9.63	1.118	0.104	0.166	0.739	1.136
90	17.61	1.573	0.146	17.31	1.518	0.143	0.211	1.058	2.738
95	27.15	2.057	0.187	26.32	1.948	0.181	0.262	1.390	5.270
No. of firm/years	216,121	166,416	162,131	153,858					

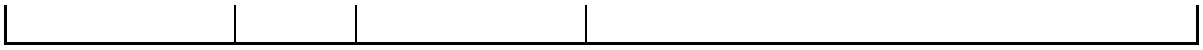

Table 2

Mean Cross-sectional Correlations Between Variables in the Analysis, with Pearson Correlations on the Upper Diagonal and Spearman Correlations on the Lower Diagonal

This table reports mean cross-sectional correlations over the period 1963-2006. Reported correlations are the average correlation of coefficients calculated each year.

Returns are mean monthly returns over the 12 months beginning three months after firms' fiscal-year end. Betas, estimated from a maximum of 60 months and a minimum of 24 months prior to this date, are from market model regressions using CRSP value-weighted market return inclusive of all distributions. Size is the natural log of the market capitalization of equity (in millions of dollars). All other variables are defined in the notes to Table 1. Spearman correlation coefficients, estimated each year, utilize a total of 153,858 firm-year observations and Pearson correlation coefficients are estimated from the truncated sample of 145,218 firm-year observations after deleting the extreme percentiles for variables other than returns, beta, and size.

	Return	Beta	B/P	STE	LTE	E/P	ROCE	Size
Return		-0.029	0.083	0.021	-0.057	0.061	0.046	-0.040
Beta	-0.064		-0.130	-0.100	0.151	-0.152	-0.101	-0.015
B/P	0.120	-0.156		-0.311	-0.072	0.075	-0.183	-0.315
STE	0.107	-0.120	-0.155		-0.900	0.896	0.717	0.311
LTE	-0.163	0.197	-0.309	-0.815		-0.997	-0.620	-0.204
E/P	0.168	-0.197	0.312	0.808	-0.996		0.620	0.205
ROCE	0.094	-0.076	-0.377	0.852	-0.566	0.566		0.317
Size	0.030	0.013	-0.297	0.307	-0.161	0.162	0.402	

Table 3

Characteristics of Earnings Yield Portfolios

Ten portfolios are formed each year in the period, 1963-2006, by ranking firms three months after fiscal year end on their annual earnings yield (E/P). Cut-off points for the allocation of stocks to the portfolios are those for the prior year data, to avoid look-ahead bias. Numbers reported are means over years of portfolio means for each year. Variables on column headings, except returns, are defined in the notes to Tables 1and 2. Annual returns are buy-and-hold returns observed over the 12 months following the portfolio formation date.

E/P Portfolio	E/P (%)	B/P	STE	LTE	Beta	Size	Annual Returns (%)
1 (Low)	-32.5	0.98	-6.15	6.16	1.38	2.87	16.0
2	-3.3	0.61	-1.21	1.60	1.32	4.03	10.3
3	2.0	0.59	-0.35	0.75	1.28	4.43	11.4
4	4.5	0.61	0.02	0.37	1.22	4.70	12.8
5	6.1	0.64	0.22	0,14	1.14	4.93	14.8
6	7.4	0.70	0.35	-0.05	1.06	4.92	15.2
7	8.6	0.77	0.46	-0.23	1.01	4,82	17.9
8	10.0	0.84	0.58	-0.42	0.97	4.69	18.1
9	11.8	0.93	0.75	-0.68	0.96	4.49	20.8
10 (High)	16.3	1.16	1.19	-1.35	0.99	4.11	25.3

Table 4

Mean Annual Returns and Other Characteristics for Portfolios Formed from Long-term Earnings Expectations (*LTE*) and Book-to-Price

Five portfolios are formed each year in the period, 1963-2006, by ranking observations three months after fiscal year end on the long-term earnings component of price, *LTE* (that is price-deflated). *LTE* = 1- E/P.r_f, so *LTE* is also a negative ranking in E/P. Then, within each *LTE* portfolio, five portfolios are formed by ranking on book-to-price (B/P). Cut-off points for the allocation of stocks to the portfolios are those for the prior year data, to avoid look-ahead bias. Buy-and-hold returns are then observed over the 12 months following the portfolio formation date. Portfolio returns reported in Panel A are mean returns from forming portfolios each year. The reported t-statistics are the mean return differences between returns for the high and low portfolios indicated relative to the standard error of that mean estimated from the time series of return differences.

Panels B - G report means of portfolio characteristics. Most characteristics are defined in the notes to Table 1. Betas, estimated from a maximum of 60 months and a minimum of 24 months prior to this date, are from market model regressions using CRSP value-weighted market return inclusive of all distributions. Size is the natural log of the market capitalization of equity (in millions of dollars).

Panel H reports intercepts (with t-statistics in parenthesis) from regressing portfolio monthly excess returns (over the return on the U.S. one-month Treasury bill) in the time-series regressions on excess returns associated with market (MKT), size (SMB), book-to-price (HML), and momentum (UMD) factors. The factor returns for MKT, SMB, HML and UMD factors and the one-month Treasury return were obtained from Kenneth French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html.

Panel A **Mean Annual Returns (%)**

		Low	*2*	*3*	*4*	*High*	*H-L*	t-stat
Ranking on LTE alone (A reverse ranking on E/P)		23.2	18.1	14.9	12.1	13.5	-9.7	-2.47
				LTE				
B/P	***Low***	19.7	17.1	14.2	10.9	4.3	-15.5	
	2	22.1	16.0	13.0	9.1	8.8	-13.3	
	3	21.6	17.0	12.1	8.5	14.4	-7.2	
	4	24.3	18.0	14.7	13.4	15.5	-8.7	
	High	30.0	22.6	20.2	20.1	26.4	-3.6	
	H-L	10.3	5.5	6.1	9.2	22.2		
	t-stat	3.92	2.92	2.78	2.62	5.67		

Panel B **Average B/P**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE alone		1.05	0.80	0.67	0.60	0.80	-0.25
				LTE			
B/P	***Low***	0.55	0.40	0.28	0.17	0.14	-0.41
	2	0.79	0.59	0.42	0.30	0.32	-0.47
	3	0.96	0.73	0.55	0.45	0.60	-0.37
	4	1.18	0.90	0.74	0.68	1.04	-0.14
	High	1.77	1.39	1.29	1.33	1.99	0.22
	H-L	1.23	0.99	1.01	1.16	1.85	

Panel C **Average STE**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE alone		0.99	0.52	0.28	-0.17	-3.75	-4.73
				LTE			
B/P	***Low***	1.33	0.89	0.64	0.22	-2.00	-3.33
	2	1.13	0.72	0.53	0.14	-2.48	-3.61
	3	1.01	0.60	0.42	0.01	-3.19	-4.20
	4	0.90	0.44	0.23	-0.23	-4.30	-5.20
	High	0.56	-0.05	-0.33	-0.92	-6.84	-7.40
	H-L	-0.77	-0.94	-0.97	-1.13	-4.84	

Panel D **Average LTE**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE alone		-1.04	-0.32	0.05	0.57	3.94	4.98
				LTE			
B/P	***Low***	-0.88	-0.29	0.08	0.61	2.86	3.74
	2	-0.92	-0.31	0.05	0.56	3.16	4.08
	3	-0.97	-0.33	0.03	0.55	3.60	4.57
	4	-1.08	-0.34	0.03	0.55	4.27	5.35
	High	-1.33	-0.34	0.04	0.58	5.85	7.18
	H-L	-0.45	-0.04	-0.04	-0.03	2.99	

Panel E **Average Beta**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE alone		0.98	0.99	1.10	1.25	1.35	0.38
				LTE			
B/P	***Low***	1.10	1.13	1.20	1.39	1.44	0.35
	2	1.00	1.03	1.17	1.35	1.42	0.42
	3	0.93	0.96	1.11	1.27	1.40	0.47
	4	0.94	0.92	1.06	1.21	1.31	0.37
	High	0.94	0.94	1.01	1.09	1.17	0.23
	H-L	-0.15	-0.19	-0.19	-0.30	-0.27	

Panel F **Average Size**

		Low	2	3	4	High	H-L
Ranking on LTE alone		4.28	4.76	4.93	4.56	3.44	-0.84
				LTE			
B/P	Low	4.56	5.15	5.47	5.13	4.17	-0.39
	2	4.65	5.12	5.44	5.05	3.88	-0.77
	3	4.46	4.97	5.16	4.80	3.50	-0.96
	4	4.10	4.64	4.74	4.38	3.08	-1.02
	High	3.43	3.77	3.75	3.46	2.45	-0.98
	H-L	-1.13	-1.38	-1.72	-1.67	-1.72	

Panel G **Average E/P (%)**

		Low	2	3	4	High	H-L
Ranking on LTE alone		14.1	9.3	6.7	3.2	-18.4	-32.5
				LTE			
B/P	Low	12.9	9.0	6.4	2.8	-11.4	-24.3
	2	13.2	9.1	6.7	3.2	-13.3	-26.5
	3	13.7	9.3	6.8	3.4	-16.1	-29.8
	4	14.4	9.5	6.9	3.4	-20.6	-35.0
	High	16.2	9.5	6.8	3.1	-30.7	-46.9
	H-L	3.4	0.5	0.5	0.3	-19.3	

Panel H **Intercepts (% Returns) and *t-statistics* from Four-factor Model Time-series Regressions**

		LTE					
		Low	2	3	4	High	H-L
B/P	Low	0.26	0.23	0.28	0.08	-0.42	-0.68
		2.48	*2.21*	*2.85*	*0.64*	*-2.06*	
	2	0.42	0.11	0.16	0.00	-0.02	-0.43
		4.06	*1.21*	*1.67*	*0.00*	*-0.07*	
	3	0.40	0.24	0.07	0.01	0.41	0.01
		3.87	*3.27*	*0.91*	*0.08*	*2.02*	
	4	0.52	0.25	0.15	0.17	0.30	-0.21
		3.68	*3.23*	*1.93*	*1.75*	*1.59*	
	High	0.73	0.52	0.42	0.40	0.98	0.24
		7.14	*5.08*	*4.12*	*3.50*	*4.74*	
	H-L	0.48	0.29	0.13	0.31	1.40	

Table 5

Annual Earnings Growth Rates Two Years Ahead of Portfolio Formation, for Portfolios Formed from Long-term Earnings Expectations (*LTE*) and Book-to-Price

Portfolios are the same as those in Table 4. To accommodate negative denominators, growth rates are calculated as $\frac{\Delta X_{t+2}}{(|X_{t+2}| + |X_{t+1}|)/2}$, where X is earnings (in Panel A) or residual earnings (in Panel D). Residual earnings are calculated with the required return set to the risk-free rate.

Panel A **Mean Earnings Growth Rates Two years Ahead (%)**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE		-5.5	-0.4	0.0	4.2	26.1	31.6
				LTE			
B/P	***Low***	-11.5	-5.9	-4.6	-4.8	15.2	26.7
	2	-5.6	-1.6	-3.2	-1.6	19.6	25.2
	3	-5.9	-0.1	-3.6	3.3	25.8	31.7
	4	-3.1	0.6	0.6	5.8	30.1	33.2
	High	-2.0	3.6	10.7	18.7	38.0	40.0
	H-L	9.5	9.5	15.3	23.5	22.8	

Panel B **Std Dev of Earnings Growth Rates (%)**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE		12.0	9.5	10.7	17.3	19.7	7.7
				LTE			
B/P	***Low***	15.2	13.2	10.4	16.1	18.9	3.7
	2	13.3	11.3	11.3	18.5	19.7	6.4
	3	14.7	11.4	12.0	19.4	21.0	6.2
	4	14.3	10.2	13.3	21.7	26.2	11.9
	High	19.3	17.5	19.8	25.7	28.1	8.8
	H-L	4.1	4.3	9.3	9.5	9.2	

Panel C **Interdecile Range of Earnings Growth Rates (%)**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE		30.9	25.7	29.2	37.8	44.9	14.0
				LTE			
B/P	***Low***	37.8	27.6	29.1	36.6	41.9	4.1
	2	29.2	27.6	27.1	40.3	40.7	11.5
	3	28.7	28.0	30.2	43.1	51.7	23.0
	4	37.2	27.0	37.0	49.3	65.2	28.0
	High	50.3	39.0	46.0	60.0	69.8	19.4
	H-L	12.5	11.5	16.8	23.3	27.9	

Panel D **Mean Residual Earnings Growth Rates (%)**

		Low	*2*	*3*	*4*	*High*	*H-L*
Ranking on LTE		-9.5	-2.8	-2.5	4.2	26.9	36.4
				LTE			
B/P	***Low***	-22.1	-15.0	-14.6	-15.2	8.6	30.7
	2	10.9	-8.7	-11.0	-7.9	17.9	28.8
	3	11.5	-3.8	-9.5	2.1	26.4	37.9
	4	-5.3	1.8	2.5	11.4	34.9	40.2
	High	4.9	12.0	23.8	30.8	44.1	39.2
	H-L	27.0	26.9	38.4	46.0	35.5	

Table 6

Mean Annual Returns for Portfolios Formed from Expected Short-term Earnings Added to Book Value (*STE*) and Long-term Earnings Expectations (*LTE*)

Portfolios are formed as in Table 4 except firms are first ranked on expected short-term earnings relative to book value (*STE*) and then, within *STE* portfolios, on long-term earnings expectations (*LTE*).

		Low	*2*	*3*	*4*	*High*	*H-L*	t-stat
Ranking on STE alone		17.0	13.0	14.3	16.1	20.5	3.5	1.00
				STE				
LTE	***Low***	22.5	24.0	23.9	20.5	26.5	4.0	
	2	15.8	17.4	14.7	17.4	22.7	7.0	
	3	12.8	11.4	12.8	15.4	20.0	7.2	
	4	15.3	9.7	12.2	13.1	16.9	1.6	
	High	19.0	5.7	9.7	13.6	16.3	-2.7	
	H-L	-3.5	-18.2	-14.1	-6.9	-10.2		
	t-stat	-0.89	-5.31	-3.80	-2.92	-3.32		

Table 7

Mean Annual Returns and for Portfolios Formed from Book-to-price and Long-term Earnings Expectations (*LTE*)

Portfolios are formed as in Table 4 except firms are first ranked on book-to-price (B/P) and then, within B/P portfolios, on long-term earnings expectations (*LTE*).

Panel A **Mean Annual Returns (%)**

		Low	*2*	*3*	*4*	*High*	*H-L*	t-stat
Ranking on B/P alone		9.3	12.6	15.4	18.4	24.3	15.1	5.57
				B/P				
LTE	***Low***	17.0	17.6	20.8	22.4	29.6	12.6	
	2	11.6	14.2	16.7	18.9	25.2	13.6	
	3	9.5	12.5	14.2	19.4	23.4	13.9	
	4	4.6	10.7	13.5	18.3	22.8	18.2	
	High	5.6	9.6	13.7	16.9	24.2	18.5	
	H-L	-11.3	-7.9	-7.1	-5.5	-5.4		
	t-stat	-2.74	-2.22	-1.82	-1.43	-1.26		