Returns to Buying Earnings and Book Value: Accounting for Growth

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Abstract

This paper investigates how earnings yields and expected earnings growth combine to indicate expected return. Under standard formulas, the earning yield is increasing in the required return and decreasing in expected earnings growth. However, if expected growth is risky and so requires a higher return, the earnings yield is at the same time increasing and decreasing in growth, making the identification of the expected return for a given earnings yield problematical. The paper shows that, for a given earnings yield, book-to-price indicates additional return associated with expected growth that is imbedded in the earnings yield. The result provides a rationalization of the well-documented book-to-price effect in stock returns: book-to-price is positively associated with earnings yields (that indicate returns) but, in addition, book-to-price indicates risky growth that adds to expected returns. However, growth identified by a high book-to-price as yielding a higher return is quite different from "growth" typically identified with a low book-to-price as yielding a lower return. Accordingly, the notions of "growth" versus "value" are redefined.

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Beginning with Ball and Brown (1968) and Beaver (1968), research has consistently documented that firm's realized stock returns are related to the earnings they report. Most 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 the risk in holding stocks is associated, at least in part, with the risk of earnings not meeting expectations; investors "buy (expected) earnings" and the outcome to their investment depends on the difference between actual and expected earnings. The idea has some persuasion when one appreciates that, under standard valuation models, price can be expressed in terms of a stream of expected earnings rather than expected dividends (that are at risk). If expected earnings are at risk, is it then the case that expected returns are related to expected earnings? This paper explores this question.

The idea is embraced in conjectures (in Ball 1978, for example) that earnings yields (earnings-to-price) are positively related to risk and expected return. Indeed, evidence (in Basu 1977 and 1983, for example) indicates that annual earnings yields predict cross-sectional differences in stock returns, and the aggregate short-term earnings yield has been used widely as a predictor of future market-wide equity risk premiums (in Fama and French 1998, Campbell and Shiller 1988, 1998, Campbell and Thompson 2007, and Maio 2007, for example). However, R-squares from contemporaneous returns-earnings regressions with annual earnings are far from perfect, indicating that the expected annual earnings yield is unlikely to be a sufficient indicator of expected return.

Investors buy short-term earnings plus subsequent growth in earnings, and one would expect both to be at risk.[1] This begs the question of whether expected earnings growth, in addition to the short-term earnings yield, indicates risk and return and, if so, how the yield and growth combine to do so.

The issue is subtle. Under standard formulas for the earnings yield (or its inverse, the P/E ratio), the earnings yield is increasing in the required return but decreasing in expected earnings growth, and empirical research has robustly demonstrated the growth aspect (in Beaver and Morse 1974, Fuller, Huberts, and Levinson 1992, Fairfield 1974, and Penman 1996). If growth requires a higher return, then growth has both an increasing and decreasing effect on the earnings yield, so teasing out the required return from an earnings yield and the expected growth it implies is problematical.

The issue of growth and expected returns cannot be engaged without considering book-to-price (B/P), for B/P is related to expected growth simply because of the way accounting works. While the returns-earnings relation is the most prominent contemporaneous correlation reported in empirical accounting research, the most prominent predictive correlation (reported in empirical finance) is the positive relation between book-to-price (B/P) and subsequent stock returns. So much so that, with the presumption that the predicted returns are reward for risk, Fama and French (1992, 1993 and 1996) and others have proceeded to develop asset pricing models that include a common risk factor to which a firm's sensitivity is indicated by its book-to-price. Why B/P plays such an important role in explaining stock returns remains a mystery (although conjectures abound), but note that it is book-to-price that predicts returns, not expected

[1] 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.

earnings that flow from the net assets that book value represents (and it is the earnings that one thinks of being at risk). Fama and French (1992) claim that book-to-price subsumes any predictable returns associated with earnings-to-price.

The mystery deepens when one recognizes 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 (referred as "value" stocks), yet investment professionals typically think of growth as risky, requiring higher returns. This paper reconciles the observation that B/P predicts stock returns with the notion that expected earnings and growth add risk, and thus provides a partial resolution of the mystery. B/P is positively correlated with the earnings yield and so, as the earnings yield is positively related to subsequent returns, so is B/P. Further, for a given earnings yield, B/P further identifies the growth that the market prices to yield higher returns. "Growth" is redefined, with growth indicated by B/P associated with higher returns.

We estimate expected returns from average realized returns, so ask how expected earnings and growth forecast returns to investing. The pretense that average observed returns are reward for risk is maintained throughout, but of course one can also interpret the results as reward to discovering market mispricing by forecasting earnings and earnings growth with an accommodation for book value.

The Key Ideas

The paper embraces two ideas. The first is the idea that growth is risky. The second is a recognition that the relation between accounting numbers (like book value and earnings) and real phenomena (like risk) depends on how the accounting is done.

The first idea is conjectural, but carries a certain persuasion. Firms' life-long dividends are at risk so, unless short-term earnings are sufficient to indicate life-long expected dividends, one would expect subsequent earnings (growth) that generates those dividends to be at risk as well. Intuition suggests that added earnings come with added risk, consistent with a risk-return tradeoff. Leverage, for example, adds earnings growth but also adds risk. Common investment wisdom embraces the idea that growth is risky; "growth" funds, for example, are deemed to yield higher expected returns than "income" funds and correspondingly are deemed to be higher risk. In valuation practice one usually regards the "terminal value" part of a valuation as relatively uncertain, based as it is on long-term growth prospects. Relative to their forecasts for the short-term, analysts' long-term growth estimates perform poorly against actual realizations, indicating they contain considerable uncertainty.

Whether growth requires a higher return is an empirical issue which we investigate. However, the investigation involves accounting issues, for expected earnings and their growth are accounting constructs. Risk presumably has to do with real activity, so the relationship between risk and expected earnings depends on how the accounting for those attributes aligns with risk. That accounting, in turn, depends on the accounting for book value, for lower book values generate higher subsequent earnings by construction of the accounting. Indeed B/P is in part an accounting phenomenon; B/P reflects how accountants measure book value. So, if B/P indicates risk and return (as extant asset pricing models maintain), it may have something to do with the accounting. And, as expected earnings are determined by the accounting for current book value, the

issue of how expected earnings and their growth relate to risk and return must inevitably involve book value.

We move to the formal construction in short order, but some elaboration here may aid intuition. To examine the conjecture that B/P indicates risk and return, consider a benchmark case where B/P = 1. In this case, B/P cannot indicate risk: both a money market fund and a hedge fund have the same B/P = 1 but very different risk. For these funds, B/P =1 is a property of the mark-to-market or fair value accounting applied (and the accounting removes any role for B/P to indicate risk). Further, an asset with B/P = 1 has no growth beyond that from retention. So, if B/P or growth are 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. Consider a case where accountants carry book values lower than price (such that B/P < 1), by applying historical cost accounting for example. For a given price (that values real activity), lower book value must result in higher expected future earnings as lower book value can only be reported by increasing earnings in the future. With this built-in mechanism, accounting could be designed to report book values at a level that produces expected earnings and growth corresponding to risk; indeed, Ohlson (2008) constructs a hypothetical accounting where growth reflects the risk premium, one-to-one.

Under U.S. GAAP, B/P ratios are typically less than 1.0 and one has the premonition that GAAP imbeds a risk assessment with the effect that, when there is more risk, more earnings are deferred to the future. Earnings recognition rules, governed by "reliability" requirements, typically deal with the resolution of uncertainty: rather than marking to fair value and recognizing all value in current book value, earnings are

deferred if realization of cash is relatively uncertain. In accounting parlance, earnings are "unrealized" (with a consequent lower book value) until certain criteria -- typically a confirmed sale in the 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 closed to book value.[2] Accounting rules also determine the division of total expected future earnings (not yet booked to book value) between the short-term and the long-term. Some rules (such as those involving earnings from existing inventory), typically result in earnings being recognized in the immediate future, and yet others (such as the expensing of anticipated near-term R&D and brand-building expenditures, and the recognition of earnings from anticipated investments not yet made) require deferral of earnings to the more distant future.

In applying these principles, U.S. GAAP accounting is particularly conservative.[3] The conservative accounting features that defer income to the future and lower the book value are modeled in Feltham and Ohlson (1995) and Zhang (2000).[4] Ceteris paribus (holding real activity constant), conservative accounting reports lower book value − and

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

[3] For example, research and development and brand-building expenditures are expensed immediately rather than capitalized in book value and amortized against income in the future. Liabilities tend to be booked while (intangible) assets are omitted from the balance sheet. The practice of "recognizing losses early" while deferring gains (in the application of the lower-of-cost-or-market rule, for example) is a hallmark of conservative accounting.

[4] The accounting effects are demonstrated with examples in Penman (2007, Chapter 16). Empirical documentation of the effects of conservative accounting under U.S. GAAP can be found in Cheng (2005), Beaver and Ryan (2005), Monahan (2005), and Penman and Zhang (2002).

so increases expected short-term earnings relative to current book value − but continued application of conservative accounting shifts earnings from the short-term earnings to the long-term. The effects are simply by construction of the accounting. However, these papers are modeled with a fixed discount rate, unrelated to the accounting, so do not deal with the issue of how conservative accounting, and the B/P and growth it generates, relate to risk and return.

Of course, 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 that revenue recognition rules delay income 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 should be impaired but have not). Whether a particular accounting system does so is an empirical matter which we investigate for U.S. GAAP.

The inverse complementarity of B/P and future earnings is a fixed feature of accounting design; it has to be. However, if the expectation of higher future earnings means more risk, B/P would then be negatively related to risk and return. Research documents a positive relation between B/P and returns, yet the notion that accountants carry book values higher when future earnings are at risk goes against the grain of accounting principles.[5] Thus the mystery of B/P predicting returns (and "growth" stocks

[5] U.S. GAAP requires impairment of book values when their carrying values are higher than warranted by expectations of the future. More generally, the notion of "recognizing losses early" while deferring gains

yielding lower returns). The presumption that growth adds risk could, of course be incorrect, but that also goes against the grain of accounting principles. Lower book values create both short-term earnings and long-term growth so, to reconcile the observation that B/P predicts returns with the idea that growth is risky, it has to be that B/P bears on the identifying long-term growth (over short term earnings) that indicates risk and return. Our empirical results suggest so. We find that short-term earnings yields are related to subsequent returns (as in previous papers). But, for a given earnings yield, subsequent expected growth adds to returns and B/P indentifies that portion of growth that is priced to yield those returns. So, as the earnings yield is based on that same growth, B/P identifies returns associated with the risky growth that is incorporated in the yield.

Our paper is in the vein of recent research (in Lettau and Ludvigson 2005 and 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. Our ideas are closest to those of Menzly, Santos and Veronesi (2005). They see the dividend yield as increasing is risk and decreasing in dividend growth, and we see the earnings yield is 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 the long-term (Bansal and Yaron 2004, Dechow, Sloan and Soliman 2004, Bansal, Dittmar and Lundblad 2005, Croce, Lettau and Ludvigson 2006, and Malloy, Moskowitz and Vissing-Jorgensen 2006). On the other hand, with an appeal to Merton (1973), some papers (such as Zhang 2005, Anderson and Garcia-Feijóo 2006, Xing 2006, and Zhang and Chen 2007) view "growth

(in the application of the lower-of-cost-or-market rule, for example) is a hallmark of conservative accounting as practiced.

(opportunities)" as a hedge against economy-wide shocks to investment opportunities so that "growth" requires a lower return.

We do not claim to provide a complete explanation for the B/P effect in stock returns. B/P may indicate risk and expected return simply because it is correlated in the cross section with some risk characteristic (distress risk or liquidity risk, for example) or because of the variety of explanations offered in Cochrane (1996), Berk, Green and Naik (1999), Gomes, Kogan and Zhang (2003), Cooper (2006) , and Lettau and Wachter (2007), for example. We do not examine these alternative explanations. Nor do we provide any insight as to whether B/P indicates expected return for risk born or a mispricing of that risk. But we do bring an accounting interpretation to the B/P effect and demonstrate empirically that expected short-term earnings and subsequent earnings growth differentiates returns to investing, with B/P playing a role. The result accords with the common intuition that growth is risky and adds to expected returns but also provides an explanation of why B/P predicts stock returns.

The Construction of Book-to-Price

In accounting, book value is constructed by a periodic operation (clean-surplus accounting):

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

where B is book value, d is net dividends (dividends plus share repurchases, net of share issues), and *Earnings* are comprehensive (clean-surplus) earnings. The clean-surplus operation states that, given net dividends, book value is created by earnings. If price is set on the basis of expected future earnings, the difference between price and book value

represents expected future earnings anticipated by the market but not yet booked to book value, along with a discount in the price for risk.[6] The lower the earnings booked to book value, the higher must be expected future earnings, and vice versa for more earnings booked to book value. And future earnings represent earnings growth.

The residual earnings valuation model states this property more formally. The model is by now well known, but bears restatement to demonstrate the accounting issues when one considers the relationship between book value and price. With consumption is mind, investors are of course concerned with dividends (cash), not earnings, and the dividend-discount model expresses price in terms of expected dividends. 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 also, of course, a statement of the no-arbitrage price if *r* is the required return for risk borne. If prices violate 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.[7] Substituting $d_{t+\tau} = Earnings_{t+\tau} - (B_{t+\tau} - B_{t+\tau-1})$ into equation (2) for all $\tau > 0$,

[6] Net dividends do not affect the difference between book value and price if they reduce price one-for-one, as they do book value, so our focus is on earnings and book value. While net dividends may not affect the difference between price and book value, they will affect their ratio, B/P, via a leverage effect and thus also expected returns associated with B/P, as shown in Penman, Richardson and Tuna 2007.

[7] 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

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

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

$Earnings_{t+1} - rB_t$ is expected residual earnings for year t+1, $ROCE_{t+1} = Earnings_{t+1}/B_t$ is the one-year ahead expected return on common equity, and g represents expected residual earnings after date t+1 expressed as a growth rate applied to expected t+1 residual earnings.

This constant growth model presents the model in its simplest, reduced form; more generally, price can be expressed in terms of expected residual earnings up to any forecast horizon, t+T, with added growth after time T. However, the one-period version adequately serves our purpose of highlighting accounting effects. First, it legitimizes the idea that price can be thought of in terms of expected earnings, equivalently to expected dividends. Second, it crystallizes the idea that the difference between price and book value is due to expected earnings implicit in the price that have not yet been booked to book value; for a given price, a lower book value creates higher future earnings. Third, it expresses the idea that one can think of valuation as a forecast of earnings for the short term, t+1, with an added forecast of growth over the long term, represented by a growth rate, g, in the formula, and our empirical work revolves around the distinction between

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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 (2008). Rubinstein (1976) and Breeden and Litzenberger (1978) provide dividend discount models with varying discount rates and Feltham and Ohlson (1999) and Ang and Liu (2001) lay out residual earnings valuation models with stochastic discounts rates.

short-term earnings and long-term growth [8] Finally, the model demonstrates that the value (in price) can be divided between book value, short-term earnings, and growth and that allocation is a matter of how the accounting is done; for a given price, a lower book value creates higher future earnings, but those earnings can be realized in the short-term or the long-term. Note that growth in this model refers to residual earnings growth, but residual earnings growth can be restated as earnings growth.[9]

The Required Return, Book-to-Price, Short-term Earnings, and Growth

The residual earnings model is often reverse engineered to infer the expected return. From equations (3a) and (3b),

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

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

(The expressions require $ROCE_{t+1} > g$, an issue that will be addressed in the empirical work[10]).Variants of equation (4a) appear in Brief and Lawson (1992), Danielson and

[8] In the parlance of finance, short-term earnings are earnings from current investments and long-term earnings come from growth opportunities. This is taking license, however, for assets in place can also add growth.

[9] One infers earnings growth from residual earnings growth by reverse engineering residual earnings to infer earnings. Residual earnings growth adjusts for earnings growth that arises from net assets that earn at the required return (so does not add to price).

[10] 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).

Press (2003), Ohlson (2005), and Rajan, Reichelstein, and Soliman (2007), among others.[11] Empirical papers that infer the expected return or the "cost of capital" implicit in prices utilize variations of these formulas with various estimates of growth (Claus and Thomas 2001, Gebhardt, Lee and Swaminathan 2001, and Easton, Taylor, Shroff and Sougiannis 2002, for example).

Equations (4a) and (4b) are the point of departure for our analysis. We ask how the forward earnings yield, $\frac{Earnings_{t+1}}{P_t}$, book to price, and growth jointly inform about the required return. The point of departure is the case where book value and growth are pure accounting phenomena that have no implication for the required return.

Book Value and Growth as Pure Accounting Phenomena

In the just-mentioned papers, B/P and the earnings growth it creates are regarded as pure accounting phenomena unrelated to risk and return. Price is based on expected dividends, as in equation (1), and the accounting does not modify that expectation. Risk arises from real activity, price incorporates a discount for risk, but the accounting is not related to the discount rate. The accounting can be anything and the equations merely serve to recover *r* from a particular accounting: Given price, the expected return can be expressed as a configuration of book value, expected short-term earnings and long-term growth, and this configuration will change with alternative accounting methods but with price and *r* preserved. (It's just accounting!)

Equation (4a) expresses the expected return in terms of the forward earnings yield, adjusted for long-term growth, with the B/P ratio giving the weight to the

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[11] Mingcherng Deng pointed out that, as $ROCE_{t+1} = Earnings_{t+1} / B_t$ equation (4a) can be expressed in the form of (4b).

adjustment. With no growth, the forward earnings yield indicates r (and the forward P/E = 1/r, as in the standard theory of the P/E ratio). But the forward earnings yield reflects growth as well as risk, so the forward earnings yield is adjusted by applying B/P to the expected growth to recover the r that would be inferred if there were no growth. This makes (accounting) sense because, for a given forward earnings yield, growth is created by decreasing book value, so B/P cancels growth that is not related to risk (but which depresses the earnings yield).

Equation (4b) describes r as a weighted average of $ROCE_{t+1}$ and g with weights (summing to unity) supplied by B/P. It thus emphasizes that B/P is, in the first instance, an attribute that combines short-term earnings and growth – the payoffs that are at risk – rather than a risk attribute itself. (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.) In the case of mark-to-market accounting referred to in the introduction, B/P = 1, $r = ROCE_{t+1}$ and $g = 0$ (mark-to-market accounting can have no growth because expected residual earnings is zero). In this case B/P cannot indicate risk (as in the comparison of the money market funds and hedge fund earlier). Under accounting that moves away from mark-to-market, resulting in B/P ≠ 1 but with no growth ($g = 0$), $r = \frac{B_t}{P_t} ROCE_{t+1}$ and expected $ROCE_{t+1}$ no longer equals the required return. $ROCE_{t+1} > r$ is due to book value (in the denominator) carried below market value, with earnings correspondingly deferred to the short-term future. So B/P again provides the correction to recover r; B/P serves as an accounting adjustment with no necessary relation to r; rather, the forward E/P ratio in 4(a) indicates the expected return.

In the case of growth, B/P again serves to adjust for growth in recovering *r* from the forward earnings yield.

Book Value and Growth Indicating Risk

In the pure accounting scenario, there is no role for B/P or growth to indicate the expected return; B/P serves to cancel the accounting growth that decreases B/P but which has no relation risk or the expected return. However, if growth indicates risk, higher growth for a given book value would not translate directly into a lower B/P ratio, for price that anticipates the growth would also be discounted for risk; risk and return would be at work in the price. Rather than B/P offsetting growth, as in the pure accounting scenario, growth and risk would offset in price; B/P ratio would be higher for given growth and so would the forward earnings yield, *ceteris paribus*.[12]

The case of added leverage provides an illustration. While we know of no formal derivation, Penman (2007, Chapter 13) shows via examples that added leverage adds expected earnings growth. However, as a zero-NPV activity, the added leverage does not add to price, despite the higher growth. The reason is that leverage also adds to risk and expected 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.

Business operations, unlike leverage, presumably involve non-zero-NPV activity. Accordingly, expected earnings growth can indicate both required earnings for risk born

[12] Clearly equations (4a) and (4b) do not work for imputing the required return in this case. Note that papers that have applied equations similar to (4a) and (4b) to estimate the required return have been unsuccessful in identifying implied expected returns that are validated with actual realized returns (see Easton and Monahan 2005 and Guay, Kothari, and Shu 2005), though methodological issues also are involved. Of course, equations (4a) and (4b) hold if *r* is known, but that is the object of the exercise.

and earnings in excess of that requirement. (The earnings growth could indicate positive NPV investing or accounting that is too conservative by deferring too much earnings to the future.) The forward earnings yield will then reflect both, increasing in the growth that requires return for risk and decreasing in excess growth over that required to compensate for risk. Presumably both are at work, but again it depends on the accounting; Ohlson (2008) presents a model where a permanent earnings accounting generates only the first such that growth cancels risk in the price and the earnings yield, one-for-one, such that the forward earnings yield is approximately equal to the risk-free rate.[13]

We deal with the case of U.S. GAAP. We investigate how earnings yields and B/P combine to indicate expected returns in the cross section. We observe the result in previous papers showing that earnings yields are positively related to subsequent returns. This provides a partial explanation of why B/P is positively associated with returns, for B/P is positively related to earnings yields in the cross section. With the two accounting scenarios in mind, we then investigate how B/P adds to returns for a given earnings yield. To do so, we turn to the empirical construction that identifies growth that varies with B/P (for a given earnings yield) and potentially indicates risk and return over that indicated by a given earnings yield.

[13] 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 (3ab) or (4ab) 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 other accounting attributes constant). These points aside, the analysis here, supported by the empirical results, is indicative of the rational pricing of risk which the stream of Fama and French papers emphasize.

The Empirical Construction

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

$$P_t = B_t + \frac{RE_{t+1}}{r} + RE_{t+1}\left[\frac{1}{r-g} - \frac{1}{r}\right] \qquad (5)$$

(1) (2) (3)

The investor is viewed as buying (1) book value, (2) short-term earnings for the forward year with no subsequent growth, and (3) long-term earnings with added anticipated growth. Under this construction, value versus growth is not simply identified by high verses low P/B, for a high P/B can apply to a firm with no growth but with low book value and a significant short-term earnings component; that is, a firm can have a high P/B even though component (3) of the valuation is zero. This point is made, with empirical support, in Penman (1996).

Earnings with no growth imply a normal P/E ratio (where earnings are simply capitalized with the required return). So the first two components of this valuation amount to forecasting a normal forward P/E ratio. Formally, valuation (5) without the growth component can be restated as capitalized forward earnings:

$$P_{t+1} = B_{t+1} + \frac{RE_{t+1}}{r}$$

$$= \frac{Earnings_{t+1}}{r} \qquad (6)$$

Thus $Earnings_{t+1}/P_t = r$, corresponding to equation (4a) with no growth.[14]

With *r* specified, component 3 of equation (5) is growth in excess of that required for the risk born. But *r* is not known and indeed is the object of the endeavor. 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 (5) as

$$P_t = B_0 + \frac{RE_{t+1}}{r_f} \tag{7}$$

(1) (2)

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

$$\frac{B_t}{P_t} + \frac{STE}{P_t} + \frac{LTE}{P_t} = 1 \tag{8}$$

where $\frac{STE}{P_t}$ is the short-term component (2) relative to price and $\frac{LTE}{P_t}$ identifies that portion of price associated with long-term earnings expectations. The summation to 1.0 honors the accounting conservation notion that all value implicit in price must be allocated to book value, short-term earnings and long-term earnings, and also divides a dollar of price over the three components: the investor is seen as spending a dollar on buying book value, earnings expected to be added to book value in the short term, and earnings expected to be added to book value in the long term, and the issue is how the

[14] For a positive price, equation (6) holds only for positive earnings. This point is recognized in the empirical work.

expected return is related to that allocation. We will refer to short-term earnings and long-term earnings expectations as *STE* and *LTE*, with the reminder that they are price denominated.

Applying the algebra in (6) to (7),

$$\text{B/P} + STE = \frac{Earnings_{t+1}}{r_f P_t}, \tag{9}$$

that is, the first two components equal the forward earnings yield relative to the risk free rate, effectively the earnings yield spread. Our first test examines whether earnings yields (relative to the risk free rate) indicate differences in returns in excess of the risk-free rate. From equation (9), the growth component,

$$LTE = 1 - \frac{Earnings_{t+1}}{r_f P_t} \tag{10}$$

This expresses the notion that higher growth is associated with a lower earnings yield (a higher P/E ratio). From equation (9),

$$\text{B/P} = \frac{Earnings_{t+1}}{r_f P_t} - STE \tag{11}$$

Equation (11) suggest why B/P might indicate additional expected returns 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. Thus, if B/P is to indicate risk and return over the earnings yield, it may 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*. As the earnings yield mirrors *LTE*, by equation (10), it must then have to do with *LTE* relative to *STE*, that is, the amount of earnings expected to be added to book value in the long-term relative to that in

the short term. That accords with the notion that accounting defers more earnings to the long-term, relative to the short-term, when outcomes are risky.

Data Description

The analysis covers U.S. listed firms over the period 1963-2006 whose book value of common equity for that fiscal year is available as data item 60 on Compustat and whose stock prices and returns are on CRSP. 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. Price per share is observed at three months after fiscal-year end at which time financial statement data for the prior year are assumed to be reported. Book value per share is that at fiscal-year end, adjusted for stock splits and stock dividends over the three months after fiscal year end, with the book-to-price ratio calculated at this point. Monthly returns are observed for the 12 months following this point.

In addition to firms with missing book value of common equity (data item 60) on Compustat, firms with negative book value or price less than 20 cents are excluded from the analysis. Firms are also excluded if shares outstanding (item 25) and income before extraordinary items (item 18) are missing. Other missing Compustat data items were 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. 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 bias in analysts' forecasts evidenced in Hughes, Liu, and Su (2008), among others. 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 (and added to book value).

There are 153,858 firm-years in the investigation over the 44 years, 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 note to the table explains the trimming of variables. The table reports that the distributions of returns, B/P, and the earnings yield 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) future residual earnings. The observation accords with the notion that accounting defers earnings relative to a mark-to-market accounting. B/P values less than the median indicate relatively more earnings expected in the future, and those greater than the median indicate relatively lower anticipated earnings to be added to book value. 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 to continue as a perpetuity (without growth). However, there is considerable variation around this median. Median *LTE,* identified with growth beyond the short term, is 19.0%, that is, 19.0% of price is explained by expectations of long-run residual earnings over that for the short term without growth. Again, there is considerable variation around this median but note that about 40% of firms have negative *LTE.*

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 correlations involving these two variables should be scrutinized against the Spearman (rank) correlations. 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* - *STE* (not reported in the table) is only -0.093, indicating that, while B/P is often identified as having a negative relationship with "growth" – with a low B/P being a "growth" stock – it actually has low correlation

with long-term earnings relative to earnings added to book value in the short term. This reflects an accounting whereby lower book value produces not only higher long-term earnings growth but also higher short-term earnings relative to book value, as in the construction in equation (5). B/P is positively correlated with the earnings yield, suggesting that, if yields are related to expected returns, so might B/P. Indeed, the table reports that both earnings yields and B/P are positively related to subsequent stock returns.

Earnings yields are perfectly correlated with *LTE* in Table 2, by the construction of equation (10). This of course is the manifestation of the property that earnings yields reflect subsequent earnings growth. Accordingly, while earnings yields are positively related to returns, *LTE* is negatively related to returns. However, while *LTE* is positively related to beta in Table 2, the earnings yield (over the risk-free rate) is negatively related to beta. If growth is risky (and has a higher beta) it should yield higher returns, but this higher risk should also be reflected in the earnings yield (that incorporates both risk and growth) such that earning yields yield higher returns for the beta associated with growth. This tension cues our tests. Note, in addition, that *LTE* is negatively correlated with size – small firms have more expected long-term growth – and small firms are identified with higher risk in the asset pricing models.

The Empirical Analysis

Methodology

Each year, at three months after prior fiscal-year end, firms are ranked on the B/P, *STE* or *LTE* component of equation (8) and assigned to 5 portfolios, low to high. Cut-off

points for the portfolio allocation are determined from the ranking for the prior year to avoid look-ahead bias. Within each portfolio, firms are then ranked on another component of equation (8). We report average buy-and-hold annual returns over the ensuing 12 months for each portfolio from the full set of replications every year.[15] Intercepts ("alphas") estimated from Fama and French time-series factor regressions are also reported for each portfolio to ascertain whether portfolio returns differ from those predicted given realizations of common factor returns identified by those models (which include a B/P factor of course).

Results

In interpreting the results, we maintain the assumption 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.

Our core result is in Table 3. Panel A of that table reports mean buy-and-hold returns over 12 months subsequent to portfolio formation date for five portfolios formed from a ranking each year on *LTE* (along rows) and, within each *LTE* portfolio, five portfolios formed from a ranking on B/P. There is an average of 139.9 stocks per portfolio per year, though that drops for years with fewer stocks of course. 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 8), the amounts in Panels B, C, and D for a given portfolio

[15] 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 CRSP's delisting return and then reinvesting any remaining proceeds in a size matched portfolio (where size is measured as market capitalization at the start of the return accumulation period). 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.

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 the first ranking in Panel A of Table 3 (across the top of the panel) are negatively related to the amount of *LTE* in the portfolio. The t-statistic of -2.27 on the mean difference in return, -9.60%, 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-statistics in this an later tables). As *LTE* is an inverse ranking on the short-term earnings yield, by equation (10), the result also informs that returns are positively correlated with E/P ratios (relative to the risk-free rate), as documented in previous studies: with the presumption that the observed returns are reward for risk, earnings yields indicate risk and return. Estimated portfolio betas in Panel E are positively related to *LTE*, indicating that long-term earnings add (systematic) risk. Beta is thus negatively related to earnings yields, yet earnings yields are positively related to returns. This observation sharpens the tension referred to earlier: earnings yields (in theory) are increasing in risk and expected return while decreasing in growth, but here they are decreasing in growth that is related to beta risk (that requires a higher return under the CAPM). Panel F also indicates that earnings yields are increasing in size which is negatively related to growth but which is presumed in asset pricing models to require a lower return. For a given earnings yield observed in the cross section, one requires an understanding of whether the yield is higher because of risk associated with growth or lower because of anticipated growth unrelated to risk and return.

The ranking second in Table 3, on B/P, provides insights. Clearly, 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: 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 (8), as the comparative values of *STE* and *LTE* over portfolios in Panels C and B 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 in the short-term – long-term growth over the short term – and this growth also ranks returns.[16] *LTE* can be generated by lower book value, as a pure accounting phenomenon, but that lower book values can also generate higher *STE* (as a pure accounting phenomenon). But when *LTE* is generated with lower *STE,* growth that yields higher returns is implied. Accordingly, sorting on B/P (for a given earnings yield) discriminates on expected growth that is priced as risk in the earnings yield and adds to expected return. The results accords with the construction of B/P in equation (11): B/P is the earnings yields adjusted for the amount of earnings added to book value in the short term (*STE*) so, for a given earnings yield (based on *LTE* as well as risk), the lower the *STE* (and higher the B/P), the higher the return. In short, Panel A shows that earnings yields rank returns unconditionally, but B/P further identifies growth risk and return associated with a given yield.

Panel H of Table 3 reports intercepts ("alphas") from time-series regressions of monthly portfolio returns (in excess of the ten-year risk-free rate) on returns for portfolios

[16] The earning yield is unrelated (structurally) to the *STE* component in equation (9), for it depends on the book value. *STE* is the amount of earnings added in the short-term relative to book value, and accordingly *STE* is the earnings yield adjusted for B/P, from equation (11).

mimicking the market, size, B/P and momentum factors (and results from a three-factor model excluding momentum are similar). The t-statistics indicate that the returns associated with joint values of the earnings yield and B/P cannot be explained by factors 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.

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 that has been well-trolled in developing trading strategies. However the analysis employs a construction that acknowledges the accounting for earnings and book value in the presence of risk: book-to-price involves earnings deferral but relatively more earnings are deferred to the long term under risk. A key point needs to be underscored: a low B/P firm can simply be one with high earnings relative to book value in the short term (*STE*), but little additional addition to book value expected in the long term (*LTE*), as indicated by equation (5). The notion of "growth" typically associated with low B/P is thus revised: growth is expected long-term earnings over 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. Accordingly, a joint sort on E/P and B/P may identify a trading strategy with enhanced returns, but those returns can be attributed to additional risk associated with growth.

One cannot rule out other explanations, of course. The highest *LTE* portfolio in Table 3 is also the lowest earnings yield portfolio and Panel G indicates that these are loss firms, on average, perhaps associated with distress. These firms might also be associated with higher transactions costs, lower liquidity and lower prices, and Panel F indicates that they are somewhat smaller firms. However, many loss firms have high

long-term growth prospects but with further losses expected in the short term. And the B/P effect in returns is evident in Table 3 across the whole range of earnings yields.

Three features in Table 3 do give pause. First, while B/P ranks returns for a given earnings yield, betas (in Panel E) are negatively associated with both B/P and returns, even though B/P also ranks the long-term growth relative to the short term. Risk associated with growth that B/P identifies could, of course, pertain to extra-market factors (and the benchmark factor model includes the market factor). Second, with the exception of the highest *LTE* portfolio, the B/P effect in largely in the extremes, and more so in the high B/P portfolio: across a wide range of B/P (for a given earnings yield), returns are little different from those implied by the earnings yield. Central values are typically less discriminating than the extremes, of course. 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. Of course, the sample period might be one where growth risk paid off handsomely (and likely so).

If *LTE* relative to *STE* predicts returns for a given earnings yield (as in Table 3), the question arises as to whether *LTE* relative to *STE* does so unconditionally. One presumes that some (or even much) of *LTE* represents growth over that required for risk; rather it represents expected earnings from positive NPV investing and earnings deferred by accounting that is too conservative for the risk involved. Table 4 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 returns associated with each are given in

Panel A of the table, with the other panels reporting the same portfolio characteristics as the corresponding panels in Table 3.

The portfolio returns from ranking on *STE* alone, across the top of Panel A, show that *STE* does not order portfolio returns in any significant way; the t-statistic on the mean difference in returns, 3.4%, between the high and low *STE* portfolio is only 1.00.[17] Note, however that the low *STE* portfolio (containing firms with negative *STE*) has a relatively higher mean return, out of pattern; the difference in returns between portfolios 5 and 2 is 6.9%. We investigate the case of $STE < 0$ later.

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. These results are pertinent to the two scenarios earlier: growth as a pure accounting phenomenon or growth as risk. As $STE = 1 - (B/P + LTE)$ by equation (8), the ranking on *STE* (across rows) is an inverse ranking on B/P + *LTE* so, given B/P + *LTE*, a ranking on *LTE* (down columns) is an inverse ranking on B/P, as Panel B confirms. So the ranking on *LTE* for a given B/P + *LTE* examines whether there are higher returns associated with the division in the accounting between B/P and *LTE*. If growth is a pure accounting phenomenon – for given short-term earnings, lower B/P creates long-term growth that is not related to risk and return – one would expect the returns to ranking on *LTE* (and reverse ranking on B/P) here to be zero. And, given the spread of B/P ratios and *LTE* in Table 1, one might expect the variation in B/P and *LTE* due to the accounting to overwhelm variation in B/P and LTE due to risk. The canceling does occur in Table 4, but more so: returns to increasing *LTE* (and reverse ranking on B/P) are negative.

[17] Note also that $ROCE_{t+1}$ does not rank portfolio returns significantly either.

These negative returns to *LTE* could be due to too much earnings deferred to the long-term when firms are less risky; accounting is too conservative, and perversely so. Or, it could be that B/P identifies risk exposures that the accounting for income recognition does not incorporate; explanations other than those to do with the accounting are in play. A third explanation recognizes the earnings yield as the anchor to the expected return in equation (4a) before introducing growth. Table 3 anchored on the earnings yield and observed the associated returns (in the first ranking), but in Table 4 those returns are spread across portfolios by the construction that introduces growth: Panel G of Table 4 shows that earnings yields are positively related to *STE* (across rows), but negatively related to *LTE* (down columns), and *STE* ranks returns positively (somewhat) while *LTE* ranks returns negatively. As *LTE* is the negative of the earnings yield, the ranking on *LTE* is an inverse ranking on the yield. So that ranking is a recovery of the earnings yield that indicates return. For a given *STE*, the ranking on the earnings yield is also a one-for-one ranking on B/P, by equation (11), underlying the observation that B/P and the earnings yield are positively correlated. The ranking on B/P yields significant alphas from Fama and French time-series regressions in Panel H, even though the benchmark factor model includes a B/P factor, because B/P (for a given *STE*) is in fact an identification of the earnings yield (that is not in the factor model).

Table 5 gives a final set of portfolio returns. Firms are first ranked on B/P (across rows) then within each B/P portfolio on *LTE*. 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 15.4% between high and low B/P portfolios. The differences in returns across B/P portfolios can be attributed to B/P being positively correlated with earnings yields (that indicate risk and

return). However, the return spread is considerably higher than that for earnings yields in Table 3. Equation (11) suggests the reason: B/P is the earnings yield (with the risk implied), adjusted for earnings expected to be added to book value in the short term relative to the long-term (with the risk implied). Accordingly B/P indicates enhanced returns over those indicated by the earnings yield. There is a certain imperative to this interpretation: if the B/P effect in stock returns is to have an accounting interpretation, it must be because it captures not only the earnings yield, but also *STE* relative to the earnings yield, and that is a simply a property of the accounting, by equation (11).

A ranking on B/P is an inverse ranking on *STE* + *LTE*, that is, total earnings deferred from book value to the future. The second ranking in Table 5 is on *LTE*, so returns down columns are returns to increasing *LTE* and decreasing *STE* for a given *STE* + *LTE* (and Panels C and D indeed show that *STE* and *LTE* change in this manner). The ranking on *LTE* is an inverse ranking on the earnings yield, as Panel G indicates, so the investigation in the second ranking is a test of whether B/P "subsumes" the returns associated with earnings yields. Table 3 might suggest so: B/P is positively correlated with earnings yields but adds to returns for a given earnings yield. So one might conjecture that B/P predicts returns because it in positively correlated with the earnings yield, the anchor to the expected return in equations (4a) and (4b), but also because it identifies growth for a given yield that adds to expected return. The evidence in Table 5 is mixed: the reported t-statistics indicate significant return differences across earnings yield (*LTE*) portfolios only in the lower B/P portfolios. But it is the case that when a given B/P is identified with different levels of earnings yield, one observes (in Panel H) positive alphas from the four-factor model (that does not include an earnings yield

factor). Further, tests including only firms with positive earnings yields (below) report significant return difference across earnings yields portfolios for all levels of B/P.

Results for Subsamples

To discover how pervasive these findings are, we repeated the tests for varying conditions within the sample. This section reports on these robustness tests.

Firms with Positive Earnings Yields

Although the division of earnings between the short-term and long-term can be made with negative earnings, equation (6) holds only for positive earnings (if price must be positive). Panel A of Table 6 thus reports on the core test in Table 3 for firms with positive earnings yields. As in Table 3, the ranking on *LTE* is a reverse ranking on the earnings yield, and earnings/price ratios (not reported in the table) range from an average of 2.8% for the high *LTE* portfolio to 14.8% for the low *LTE* portfolio. Corresponding average betas range from 1.27 down to 0.99. Portfolio B/P ranges from 0.56 for the high *LTE* (low earnings yield) portfolio to 1.08 for the low *LTE* (high earnings yield) portfolio, a wider spread than the corresponding 0.82 to 1.05 for all stocks in Table 3.

Panel A of Table 6 indicates that *LTE* (and the earnings yield) for these positive earnings stocks ranks returns in a similar way to Panel A in Table 3. Further, as in Table 3, B/P ranks returns for a given *LTE* and that ranking is effectively a ranking on *LTE* relative to *STE*. In short, the results for all firms hold for those with positive earnings yields. Results corresponding to those in Table 4 are similar, while the ranking on *LTE* (and earnings yield) for a given B/P produced stronger results than those for all firms in Table 5: positive earnings yields add to returns explained by B/P.

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. And 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 investigate the case where $ROCE_{t+1} < r_f$, that is, $STE < 0$. The mean portfolio B/P for these firms is on average higher (1.04 compared with 0.66 for firms with $STE > 0$) so we are investigating firms where a higher B/P is associated with low short-term profitability. Firms with negative earnings also fall in this group.

The return results for $STE < 0$ in Panel B of Table 6 are quite similar to those for all firms in Table 3. *LTE* again ranks returns negatively (and correspondingly the earnings yield ranks returns positively). For all *LTE* portfolios, B/P significantly adds to returns. This makes sense: if a firm is currently reporting low profitability, higher long-term expected earnings looks riskier, requiring a higher return. Results corresponding to Table 4 and 5 are similar to those for all firms, except that higher returns are associated with lowest *STE* portfolio from ranking first on *STE*. These extreme negative *STE* stocks also have higher B/P (a mean of 1.34) and particularly low (and negative) earnings yields.[18]

[18] In the Table 3 analysis for STE > 0, LTE ranks returns on the first sort, as in Table 3, and B/P ranks returns for low and mid-range LTE on the second sort, but not high LTE. The high LTE firms have particularly low B/P, suggesting they involve considerable earnings deferral. Further, the spread of STE for these high LTE firms was considerably less than for low LTE firms (and thus also the spread of LTE relative to STE). These tend to be firms where much of B/P is explained by LTE (rather than STE) so B/P does not produce much of a spread on *LTE* relative to *STE*.

Using Consensus Analysts' Forecasts of Forward Earnings

Estimating forward earnings from the most recently reported actual earnings refers to the actual accounting earnings currently being added to the book value in the B/P ratio, couching the issue in terms of growth over reported earnings and the risk implied. However, while papers such as Hughes, Liu and Su (2008) are skeptical, analysts' forecasts presumably contain further information about forward earnings that is incorporated in the price in the B/P ratio. Conditional upon analysts' forecasts approximating market expectations, using analysts' consensus forecasts of forward earnings essentially takes one year of expected growth from the long-term earnings into the short-term, that is, it evaluates growth after recognizing one year of growth that analysts anticipate. The issue, then, is whether this expectation takes away the ability of B/P to indicate return beyond the correlation of B/P with earnings yield.

The returns from using analysts' forecasts are in Panel C of Table 6, 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. We found that the distribution of B/P ratios for this sample is similar to those for all firms on COMPUSTAT during the same period but there are fewer small firms. With fewer losses, median *STE* of 45.1% in higher than the 21.9% in Table 1 and median *LTE* was 5.0% compared with the 19.0% in Table 1.

The results in Table 6 are not as strong as those in Table 3. Earnings yields still rank returns, though the return spread is not as wide as that in Table 3. For a given earnings yield (and *LTE*), B/P does rank returns, but the differences are not as large. Portfolio B/P (not reported) is again positively correlated with portfolio earnings yield

but, in the same tests as in Table 5, B/P ranks returns (unconditionally) on the first ranking but *LTE* (earnings yield) does not produce any significant return differences on the second ranking for a given B/P. The different results cannot be attributed to the different time period, for the results using reported earnings for 1977-2006 were similar to those for 1963-2006. And results using only forecast of positive earnings were also similar. Noise in the analysts' speculative forecasts could be the reason why the forward earnings yields do not discriminate as effectively on risk and return. Or analysts' forecasts of forward earnings over current earnings may identify one-year growth that is at risk (and rewarded with returns) in the earlier analysis (with the effect compounded if one-year growth in analysts' forecasts is correlated with subsequent growth). If so, B/P would have less of a role in identifying the risk associated with growth for a given forward earnings yield.

Firms with B/P greater than 1

Firms with $STE < 0$ have a preponderance of high B/P firms. However, as the B/P effect in stock returns is often attributed to high B/P firms, we specifically look at the results for $B/P > 1$. Panel D of Table 6 reports returns from first ranking on *LTE* and then on B/P, but now for only three portfolios because of the smaller number of firms with these B/P ratios. Average earnings yields (not reported in the table) are 15. 5% and 6.8% for *LTE* portfolios 1 and 2, respectively, 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 for *LTE* portfolios 1 and 2 but not significantly so for the highest *LTE* portfolio (with negative average earnings yields) where, despite the return differences, these is considerable variation in portfolio returns relative to the means.

When ranking on B/P first with these high B/P firms (in the tests following those in Table 5), B/P ranks returns. *LTE* (and the earnings yield) on the second ranking orders returns negatively but not such as to produce significant return differences.

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 calculated at fiscal-year end based on Compustat prices and book value. 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.

Conclusion

The paper confirms results in earlier studies that earnings yields predict stock returns. The result is consistent with the notion that earnings are at risk and higher expected earnings require a higher return in accordance with a risk-return tradeoff. However, investors not only buy short-term earnings but also subsequent earnings (growth), and both are presumably at risk. Identifying the expected return for a given earnings yield is

problematical, however: earnings yields are increasing in the required return and decreasing in expected earnings growth, but are also increasing in growth if growth requires a higher return.

The paper shows that book-to-price teases out returns associated with growth: for a given earnings yield, book-to-price indicates additional returns, on average, and those additional returns can be explained by book-to-price identifying risky growth that is incorporated in the earnings yield. Accordingly, the so-called book-to-price effect in stock returns is depicted as rational pricing, but in a way that differs from the typical characterization of low book-to-price indicting "growth" and 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.

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

Some qualifications apply. First the analysis does not have the security of a supporting asset pricing model that predicts that growth indicates priced risk. Like the extensively documented book-to-price effect in stock returns, we just report empirical correlations. However, the recognition that book value and growth are accounting phenomena adds credibility to the interpretation of the results: accounting principles defer earnings to the future when outcomes are risky and our empirical tests explicitly

incorporate the accounting construction that determines the relationship between earnings yields and book-to-price. Second, we do not claim to have explained the book-to-price effect entirely; others factors associated with high book-to-price that have been conjectured in the literature (like distress risk) may also come into play. Again, however, the recognition that book-to-price depends on how the accounting is done gives a certain persuasion to the idea that, if book-to-price is to indicate risk and return, it might have something to do with the accounting. Third, the metric for identifying expected returns is average ex post returns and average returns are sample-specific, with variance around them that is large relative to expected returns. We do, however, cover an extended period and most U.S. listed stocks. Fifth, the results are not as strong when analysts' consensus forecasts are employed rather than reported accounting numbers. The reason is open to conjecture but does not take away from the observation that reported earnings yields and associated B/P predict stock returns. Fifth, the documented returns may not indicate payoff for risk at all, but rather the mispricing of that risk. If so, the paper merely documents enhanced abnormal returns from identifying growth over those from earnings yields or book-to-price alone. However, the paper then suggests the distinction between "value" and "growth" in discovering alpha needs rethinking.

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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 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 values are presumed to have been reported. STE and LTE are short-term earnings and long-term earnings expected to be added to book value (and both are divided by price). Short-term earnings expectations are estimated by earnings before extraordinary items (Compustat item 18) less special items (Compustat item 17) (adjusted for taxes) in the prior year, and the earnings yield (E/P) and the forward return on common equity (ROCE) are based on this estimate. STE is the forward 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 rate, as indicated by component 2 of equation (7) in the text. It is then divided by price. The risk-free rate is the 10-year Treasury yield for the relevant year. Long-term earnings (relative to price), LTE/P = 1 – (B/P + STE/P). (STE and LTE are price-denominated in the table.) 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). The table indicates the number of firms 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					
After trimming		158,065	153,866	145,218					

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

Mean Annual Returns and Other Characteristic 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). 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 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 ten-year risk-free rate) 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 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**

							H-L	t-statistic
Ranking on LTE alone		23.5%	18.2%	14.9%	12.4%	13.9%	-9.6%	-2.47
				LTE				
		Low	***2***	***3***	***4***	***High***		
B/P	***Low***	19.7%	17.1%	14.2%	10.9%	4.3%	-15.5%	-3.90
	2	22.1%	16.0%	13.0%	9.1%	8.8%	-13.3%	-2.58
	3	21.6%	17.0%	12.1%	8.5%	14.4%	-7.2%	-1.58
	4	24.3%	18.0%	14.7%	13.4%	15.5%	-8.7%	-2.17
	High	30.0%	22.6%	20.2%	20.1%	26.4%	-3.6%	-0.96
	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**

				LTE			
		Low	***2***	***3***	***4***	***High***	***H-L***
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**

B/P \ LTE	*Low*	*2*	*3*	*4*	*High*	*H-L*
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**

B/P \ LTE	*Low*	*2*	*3*	*4*	*High*	*H-L*
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**

B/P \ LTE	*Low*	*2*	*3*	*4*	*High*	*H-L*
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**

B/P \ LTE	*Low*	*2*	*3*	*4*	*High*	*H-L*
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**

		LTE					
		Low	***2***	***3***	***4***	***High***	***H-L***
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 from Four-factor Model Time-Series Regressions**

		LTE					
		Low	***2***	***3***	***4***	***High***	***H-L***
B/P	***Low***	0.08%	0.65%	0.67%	0.19%	-0.20%	-0.27%
		0.748	*2.410*	*2.365*	*0.516*	*-0.506*	
	2	0.84%	0.70%	0.54%	0.14%	0.26%	-0.58%
		3.548	*3.021*	*2.002*	*0.433*	*0.654*	
	3	0.89%	0.77%	0.50%	0.21%	0.75%	-0.14%
		3.845	*3.634*	*1.966*	*0.689*	*2.040*	
	4	1.04%	0.75%	0.56%	0.48%	0.67%	-0.37%
		3.992	*3.587*	*2.359*	*1.784*	*1.880*	
	High	1.22%	0.98%	0.88%	0.81%	1.27%	0.05%
		4.852	*4.102*	*3.480*	*3.048*	*3.378*	
	H-L	1.14%	0.33%	0.21%	0.63%	1.47%	

Table 4

Mean Annual Returns and Other Characteristic 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 3 except firms are first ranked on expected short-term earnings added to book value (STE) and then, within STE portfolios, on long-term earnings expectations (LTE). All other aspects of the table are constructed in the same way as Table 3. See the notes to Table 3.

Panel A **Mean Annual Returns**

							H-L	t-statistic
Ranking on STE alone		17.1%	13.6%	14.7%	16.0%	20.5%	3.4%	1.00
				STE				
		Low	***2***	***3***	***4***	***High***		
LTE	***Low***	22.5%	24.0%	23.9%	20.5%	26.5%	4.0%	1.20
	2	15.8%	17.4%	14.7%	17.4%	22.7%	7.0%	1.99
	3	12.8%	11.4%	12.8%	15.4%	20.0%	7.2%	1.96
	4	15.3%	9.7%	12.2%	13.1%	16.9%	1.6%	0.33
	High	19.0%	5.7%	9.7%	13.6%	16.3%	-2.7%	-0.47
	H-L	-3.5%	-18.2%	-14.1%	-6.9%	-10.2%		
	t-stat	-0.89	-5.31	-3.8	-2.92	-3.32		

Panel B **Average B/P**

				STE			
		Low	***2***	***3***	***4***	***High***	***H-L***
LTE	***Low***	1.65	1.45	1.20	1.13	1.15	-0.50
	2	1.05	0.94	0.79	0.75	0.86	-0.20
	3	0.91	0.68	0.57	0.57	0.70	-0.21
	4	0.89	0.46	0.38	0.42	0.56	-0.33
	High	1.20	0.27	0.22	0.26	0.36	-0.84
	H-L	-0.44	-1.18	-0.99	-0.87	-0.78	

Panel C **Average STE**

				STE			
		Low	***2***	***3***	***4***	***High***	***H-L***
LTE	***Low***	-1.26	-0.11	0.33	0.64	1.62	2.88
	2	-1.56	-0.13	0.33	0.63	1.18	2.74
	3	-2.30	-0.17	0.33	0.62	1.04	3.34
	4	-3.85	-0.25	0.31	0.60	0.94	4.79
	High	-10.27	-0.46	0.25	0.56	0.87	11.13
	H-L	-9.01	-0.35	-0.08	-0.08	-0.76	

Panel D **Average LTE**

LTE \ STE	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	0.61	-0.34	-0.54	-0.76	-1.77	-2.38
2	1.51	0.19	-0.12	-0.37	-1.04	-2.55
3	2.39	0.49	0.10	-0.19	-0.74	-3.13
4	3.96	0.78	0.30	-0.02	-0.51	-4.47
High	10.06	1.20	0.53	0.18	-0.23	-10.29
H-L	9.45	1.53	1.07	0.94	1.54	

Panel E **Average Beta**

LTE \ STE	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	1.11	0.96	0.93	0.89	1.06	-0.05
2	1.26	1.07	0.99	0.95	0.97	-0.29
3	1.34	1.23	1.13	1.03	1.03	-0.31
4	1.38	1.31	1.22	1.12	1.04	-0.33
High	1.39	1.40	1.35	1.20	1.14	-0.25
H-L	0.27	0.44	0.42	0.32	0.07	

Panel F **Average Size**

Rank 2 \ STE	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	3.32	3.65	4.07	4.27	3.98	0.66
2	3.42	4.27	4.70	4.85	4.47	1.05
3	3.32	4.51	5.10	5.17	4.65	1.33
4	3.04	4.61	5.23	5.37	4.92	1.89
High	2.35	4.49	5.23	5.47	5.18	2.83
H-L	-0.97	0.84	1.16	1.20	1.20	

Panel G **Average E/P**

LTE \ STE	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	3.9%	9.9%	11.1%	12.5%	19.0%	15.1%
2	-2.3%	6.1%	8.0%	9.6%	14.0%	16.3%
3	-8.0%	3.9%	6.3%	8.2%	11.9%	19.8%
4	-18.0%	1.7%	4.8%	6.9%	10.2%	28.3%
High	-58.0%	-1.2%	3.1%	5.4%	8.2%	66.2%
H-L	-61.9%	-11.1%	-8.0%	-7.0%	-10.7%	

Panel H **Intercepts from Four-factor Model Time-Series Regressions**

		STE					
		Low	***2***	***3***	***4***	***High***	***H-L***
LTE	***Low***	0.61%	0.99%	0.97%	0.77%	0.93%	0.32%
		4.360	*4.135*	*4.424*	*3.549*	*3.441*	
	2	0.54%	0.69%	0.68%	0.66%	0.92%	0.39%
		1.555	*2.751*	*2.958*	*3.021*	*2.782*	
	3	0.64%	0.34%	0.48%	0.68%	0.83%	0.18%
		1.692	*1.134*	*1.909*	*2.875*	*3.410*	
	4	0.52%	0.27%	0.31%	0.51%	0.68%	0.16%
		1.332	*0.837*	*1.088*	*1.994*	*2.785*	
	High	0.95%	-0.10%	0.25%	0.71%	0.64%	-0.31%
		2.145	*-0.276*	*0.783*	*2.482*	*2.442*	
	H-L	0.35%	-1.08%	-0.71%	-0.06%	-0.29%	

Table 5

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

Portfolios are formed as in Tables 3 and 4 except firms are first ranked on book-to-price (B/P) and then, within B/P portfolios, on long-term earnings expectations (LTE). All other aspects of the table are constructed in the same way as Tables 3 and 4. See the notes to Table 3.

Panel A **Mean Annual Returns**

							H-L	t-statistic
Ranking on B/P alone		9.7%	12.9%	15.8%	19.1%	25.0%	15.4%	5.57
				B/P				
		Low	***2***	***3***	***4***	***High***		
LTE	***Low***	17.0%	17.6%	20.8%	22.4%	29.6%	12.6%	4.16
	2	11.6%	14.2%	16.7%	18.9%	25.2%	13.6%	4.97
	3	9.5%	12.5%	14.2%	19.4%	23.4%	13.9%	4.06
	4	4.6%	10.7%	13.5%	18.3%	22.8%	18.2%	5.91
	High	5.6%	9.6%	13.7%	16.9%	24.2%	18.5%	5.36
	H-L	-11.3%	-7.9%	-7.1%	-5.5%	-5.4%		
	t-stat	-2.74	-2.22	-1.82	-1.43	-1.26		

Panel B **Average B/P**

				B/P			
		Low	***2***	***3***	***4***	***High***	***H-L***
LTE	***Low***	0.27	0.48	0.69	0.96	1.61	1.35
	2	0.25	0.46	0.68	0.94	1.49	1.24
	3	0.22	0.45	0.67	0.93	1.53	1.31
	4	0.19	0.45	0.67	0.93	1.62	1.43
	High	0.19	0.45	0.67	0.94	1.84	1.65
	H-L	-0.08	-0.03	-0.02	-0.02	0.22	

Panel C **Average STE**

				B/P			
		Low	***2***	***3***	***4***	***High***	***H-L***
LTE	***Low***	0.89	1.10	1.21	1.23	0.94	0.05
	2	0.48	0.67	0.72	0.67	0.11	-0.37
	3	0.26	0.47	0.50	0.36	-0.57	-0.84
	4	-0.16	0.16	0.17	-0.08	-1.90	-1.74
	High	-2.51	-2.11	-2.17	-3.01	-8.04	-5.53
	H-L	-3.40	-3.21	-3.38	-4.24	-8.98	

Panel D **Average LTE**

LTE \ B/P	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	-0.16	-0.57	-0.90	-1.19	-1.55	-1.39
2	0.27	-0.13	-0.40	-0.61	-0.60	-0.87
3	0.52	0.08	-0.16	-0.30	0.04	-0.48
4	0.97	0.40	0.16	0.15	1.29	0.31
High	3.32	2.67	2.50	3.06	7.20	3.88
H-L	3.48	3.24	3.40	4.25	8.76	

Panel E **Average Beta**

LTE \ B/P	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	1.17	1.12	1.03	0.96	0.97	-0.20
2	1.25	1.09	0.97	0.90	0.93	-0.32
3	1.35	1.15	1.00	0.94	0.97	-0.38
4	1.42	1.26	1.14	1.06	1.07	-0.35
High	1.46	1.40	1.35	1.31	1.23	-0.23
H-L	0.29	0.28	0.32	0.34	0.26	

Panel F **Average Size**

LTE \ B/P	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	5.28	4.81	4.66	4.38	3.62	-1.66
2	5.63	5.34	4.98	4.56	3.66	-1.98
3	5.39	5.25	4.95	4.47	3.49	-1.90
4	4.81	4.94	4.81	4.27	3.15	-1.66
High	3.67	3.74	3.68	3.36	2.46	-1.21
H-L	-1.61	-1.07	-0.98	-1.02	-1.16	

Panel G **Average E/P**

LTE \ B/P	*Low*	*2*	*3*	*4*	*High*	*H-L*
Low	7.8%	10.7%	13.0%	15.2%	17.8%	10.1%
2	5.0%	7.8%	9.7%	11.3%	11.4%	6.5%
3	3.3%	6.4%	8.2%	9.3%	7.2%	4.0%
4	0.3%	4.3%	6.0%	6.3%	-0.6%	-0.9%
High	-15.0%	-10.3%	-9.2%	-12.4%	-38.8%	-23.8%
H-L	-22.7%	-21.1%	-22.2%	-27.6%	-56.6%	

Panel H **Intercepts from Four-factor Model Time-Series Regressions**

		B/P					
		Low	***2***	***3***	***4***	***High***	***H-L***
LTE	***Low***	0.28%	0.54%	0.79%	0.90%	1.19%	0.91%
		2.648	*1.992*	*3.170*	*3.646*	*4.118*	
	2	0.48%	0.52%	0.75%	0.79%	1.13%	0.65%
		1.670	*2.041*	*3.368*	*3.705*	*4.876*	
	3	0.30%	0.60%	0.67%	0.77%	1.03%	0.73%
		0.913	*2.253*	*2.912*	*3.589*	*4.121*	
	4	-0.18%	0.27%	0.53%	0.75%	0.96%	1.15%
		-0.499	*0.942*	*2.169*	*3.047*	*3.312*	
	High	-0.15%	0.26%	0.66%	0.73%	1.22%	1.37%
		-0.361	*0.663*	*1.953*	*2.176*	*3.141*	
	H-L	-0.42%	-0.28%	-0.12%	-0.16%	0.04%	

Table 6

Mean Annual Returns in Subsamples for Portfolios Formed from Long-term Expectations (LTE) and Book-to-Price

This table presents mean annual buy-and-hold portfolio returns for portfolios formed in the same way as those in Table 3 but under conditions indicated at the head of each panel. To form portfolios, stocks are first ranked on the long-term earnings component of price (LTE) then, within each LTE portfolio, by ranking on book-to-price. See notes to Table 3.

Panel A **Firms with Positive Earnings**

							H-L	t-stat
Ranking on LTE		24.0%	19.0%	16.2%	13.9%	12.2%	-11.8%	-4.33
				LTE				
		Low	***2***	***3***	***4***	***High***		
B/P	***Low***	19.5%	18.1%	14.9%	13.3%	9.7%	-9.8%	-2.60
	2	23.1%	17.3%	14.6%	11.9%	8.0%	-15.0%	-4.37
	3	22.4%	18.4%	13.7%	12.1%	9.6%	-12.9%	-4.64
	4	23.6%	18.5%	15.4%	13.7%	13.6%	-10.0%	-3.33
	High	31.3%	22.7%	22.6%	18.7%	20.0%	-11.3%	-4.30
	H-L	11.7%	4.6%	7.7%	5.4%	10.3%		
	t-stat	4.09	2.32	3.56	2.23	2.72		

Panel B **Firms with $STE < 0$ ($ROCE_{t+1} < r_f$)**

							H-L	t-stat
Ranking on LTE		24.5%	18.2%	12.0%	15.8%	17.8%	-6.7%	-1.80
				LTE				
		Low	***2***	***3***	***4***	***High***		
B/P	***Low***	18.9%	9.8%	5.6%	2.8%	11.5%	-7.4%	-1.39
	2	27.3%	16.1%	7.8%	6.4%	13.5%	-13.8%	-2.88
	3	23.9%	21.2%	7.6%	13.0%	14.5%	-9.4%	-1.51
	4	25.7%	20.6%	16.9%	36.0%	21.8%	-3.9%	-0.93
	High	26.5%	23.7%	22.0%	21.7%	27.9%	1.4%	0.50
	H-L	7.5%	13.9%	16.4%	19.0%	16.3%		
	t-stat	2.36	3.30	5.29	6.10	2.60		

Panel C **Using Analysts' Consensus Forecasts of Forward Earnings; 1977-2006**

							H-L	t-stat
Ranking on LTE		22.8%	22.8%	17.8%	15.2%	17.1%	-5.7%	-0.89
				LTE				
		Low	***2***	***3***	***4***	***High***		
B/P	***Low***	18.1%	21.7%	15.1%	14.9%	14.9%	-3.2%	-0.58
	2	20.5%	20.2%	18.8%	12.5%	12.3%	-8.2%	-1.51
	3	25.4%	21.6%	16.1%	14.8%	16.4%	-9.0%	-1.47
	4	22.4%	24.4%	18.2%	14.8%	18.2%	-4.2%	-0.59
	High	27.4%	26.2%	21.0%	19.0%	23.6%	-3.8%	-0.69
	H-L	9.3%	4.5%	5.9%	4.1%	8.7%		
	t-stat	2.57	1.34	2.20	1.18	1.95		

Panel D **B/P > 1**

					H-L	t-stat
Ranking on LTE		26.9%	23.2%	23.5%	-3.4%	-1.33
			LTE			
		Low	***2***	***High***		
BP	***Low***	22.5%	20.9%	20.1%	-2.4%	-0.48
	2	26.5%	22.5%	24.0%	-2.6%	-0.56
	High	31.8%	26.3%	26.6%	-5.2%	-1.47
	H-L	9.4%	5.3%	6.5%		
	t-stat	3.47	3.01	1.63		