Connecting Book Rate of Return to Risk and Return: The Information Conveyed by Conservative Accounting

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ABSTRACT. This paper investigates how the book rate of return relates to risk and the expected return for equity investing and documents the role of conservative accounting in making the connection. In contrast to asset pricing research where the book rate of return is viewed as positively associated with risk and expected stock returns, the paper demonstrates the opposite: With the effect of conservative accounting, a lower book rate of return indicates higher risk and higher average returns. Despite the conflicting results, the paper is able to reconcile them and explain why the existing research reports a positive relationship.

Keywords: *book rate of return, conservative accounting, risk and return*

1. Introduction

This paper investigates how book rate of return under GAAP relates to risk and the required return for investing. Considerable empirical research interprets the book rate of return as an indicator of the required return for investing. A contrasting view sees the book rate of return as a measure of profitability to be compared to the required return to evaluate the success of an investment. Clearly, there is some sorting out to do. The book rate of return is an accounting measure, so the interpretation of the measure requires an understanding of how accounting impinges on the book return. The paper examines the effects of conservative accounting on the book rate of return and shows how the book return, with these effects, conveys information about risk and the equity return.

The view that a higher book return on equity (ROE) implies a higher required equity return is common in asset pricing research in finance, for example in Voulteenaho (2002), Fama and French (2006), Novy-Marx (2012), and Ball Linnainmaa, and Nikolaev (2015). Chen and Zhang (2010), Hou, Xue, and Zhang (2015), and Fama and French (2015) build asset pricing models where higher book rates of return indicate higher expected stock returns, along with other attributes. The positive relationship is consistent with economic intuition that connects return to risk: A higher book rate of return results from taking on more risk. However, after recognizing the accounting effects on ROE, this paper shows that book rate of return is indeed related to the required return, but not in the way envisioned in these papers: A low ROE, rather than a high ROE indicates risk and return. Despite the conflicting findings, the paper is able to reconcile them and explain why asset pricing research has reported a positive relationship.

The view of ROE as a profitability measure to be compared to the required return is more common in accounting research and, indeed, in practice. Much of this research recognizes that book rate of return under GAAP and IFRS suffers as a measure of "true" profitability because of accounting methods—some would call them accounting distortions. The critique points to accounting that omits assets from the balance sheet or carries them at low amounts. So, Coca-Cola Company, for example, reports an ROE typically about 25%—considered too high for an "economic rate of return"—because the brand asset is missing from the denominator of ROE. Similarly so for mature pharmaceutical firms that expense R&D investment— their ROE is typically over 20%.The practice is known as conservative accounting. A measure that is affected by investment can hardly be a measure of the profitability of investment, so Rogerson (1997; 2008), Dutta and Reichelstein (2005), Rajan and Reichelstein (2009), McNichols, Rajan, and Reichelstein (2014), and Liu, Ohlson, and Zhang (2013), among others, propose alternative accounting to rectify the problem. Practitioners also make such adjustments to calculate a corrected rate of return which, when compared to the required return, is said to render "economic value added," as in Stewart (1990). This paper shows that the GAAP book rate of return conveys information, not only about the profitability of investment, but also its risk. Attempts to remove the so-called accounting distortions from the book rate of return remove information that is useful to the investor for assessing risk and the required return.

Like these accounting studies, the paper focuses on the effects of conservative accounting. However, while the effect of conservative accounting on the denominator of ROE is involved (as with Coca Cola), so is a complimentary feature: Conservative accounting can also reduce the numerator of ROE. This numerator effect is induced by accounting principles that tie earnings recognition to uncertainty. If the uncertainty that drives the accounting is risk that is

priced in the stock market, a lower ROE, so affected, requires a higher stock return while a higher ROE requires a lower return. There is no necessity that conservative accounting be tied to priced risk, of course, but our empirical analysis suggests so.

The effects of conservative accounting on book value, earnings, and the book rate of return have been modeled for a given required return, in Feltham and Ohlson (1995), Zhang (2000), Rajan, Reichelstein, and Soliman (2007), for example. With no effect on the required return (nor on price), these papers implicitly cast conservative accounting as a pure accounting phenomenon, unrelated to the economics of the firm—noise to be accommodated in performance evaluation and valuation. Our results indicate that conservative accounting conveys information about the required return.

2. Conservative Accounting, Risk, and the Book Rate of Return

Many papers have demonstrated the effects of accounting methods on the book rate of return, notably Greenball (1969), Fisher and McGowan (1983), Livingstone and Salamon (1970), Brief and Lawson (1992), Feltham and Ohlson (1995), Zhang (2000), Beaver and Ryan (2000), Danielson and Press (2003), Monahan (2005), and Rajan, Reichelstein, and Soliman (2007). The latter three papers, along with Penman and Zhang (2002), provide empirical documentation. The main insight is that conservative accounting increases the book rate of return on average but decreases it when there is growth in investment.

Intuitively, if assets are missing from the balance sheet but earnings from the missing assets are flowing through the income statement, earnings-to-book must be high (due to a denominator effect), as with Coca Cola. But, the only way that investments can be missing from the balance sheet is by expensing them rapidly, as with the expensing of advertising and R&D or with accelerated depreciation methods. With investment growth, such expensing reduces

earnings and thus depresses the book rate of return (due to a numerator effect). A high book rate of return is realized only on the success of the investment, for then earnings are reported on a low book-value base (the denominator effect).[1]

These properties are simply by construction of the accounting, and are well known. The insight in this paper is to connect conservative accounting and its effect on the book rate of return to risk. The connection is via accounting principles that deal with uncertainty: Under uncertainty, earnings recognition is deferred until the uncertainty has been substantially resolved. In asset pricing terms, earnings are not booked until a firm has a low-beta asset, cash or a near-cash receivable.[2] This principle is applied in two ways. First, the revenue recognition principle prescribes that revenue is not recognized until it is "realized." This usually involves waiting until there is a transaction with a customer, with the receipt of cash reasonably certain. Second, if revenue from an investment is particularly uncertain, the investment is expensed immediately—as in the case of R&D and advertising—or subject to rapid amortization.[3] Both deferral of revenue recognition and the expensing in response to uncertainty yield a lower book rate of return (via the numerator effect on earnings). The effect is to push earnings recognition to the future, yielding higher expected future earnings (that are not subject to amortization of investment cost). But these earnings are at risk, subject to realization, and the low book rate of

[1]Penman (2013, Chapter 17) provides examples and the Rajan, Reichelstein, and Soliman (2007) four quadrants depicts it well.

[2] We recognize that "risk" is sometimes distinguished from "uncertainty," the term mainly used in the accounting literature. We treat them as equivalent in this paper.

[3] In justifying the immediate expensing of R&D under FASB Statement No. 2, the FASB focused on the "uncertainty of future benefits." In IAS 38, the IASB applied the criterion of "probable future economic benefits" to distinguish between "research" (which is expensed) and "development" (which is capitalized and amortized). Both the deferral of revenue recognition and the expensing of investment result in lower earnings and lower book rates of return, *ceteris paribus*.

return indicates this risk. Correspondingly, the resolution of uncertainty on the realization of successful outcomes then yields a higher book rate of return (with the numerator effect of realized earnings on a low denominator) and thus lower risk.

The FASB's *Statement of financial Accounting Concepts No. 2* (1975) defines conservative accounting as "a prudent reaction to uncertainty," and conservative accounting practices permeate accounting. The refusal to recognize sales from prospective customers, even if they are in the order book, obeys the principle of waiting until uncertainty is resolved. Recording deferred (or "unearned") revenues pushes revenues to the future, even though a customer has performed, because there is remaining uncertainty about the firm's performance. R&D investment and brand building (advertising and promotion) are the usual exhibits where investment is viewed as particularly risky and thus expensed—the investment may not produce revenue. But immediate expensing extends to investment on supply chain and distribution systems, organization costs, store opening costs, employee development, film development costs, software development, merger costs, accelerated depreciation, and impairments, to name a few.[4] The expenditure is expensed against earnings immediately, yielding a lower book rate of return but higher future earnings and higher subsequent book rates of return *if* the expenditures produce realized earnings. The *if* implies that the expected earnings are at risk.

From this perspective, a low (or negative) ROE for a start-up biotech firm with R&D expenditures but few sales is not interpreted as "low profitability." Rather it is interpreted as potentially high profitability, but expected profitability that has yet to be realized and thus at risk:

[4] Research distinguishes "conditional conservatism" from "unconditional conservatism." The former, developed in Basu (1997) and Watts (2003), is applied on receipt of negative information about future earnings outcomes. We largely have unconditional conservatism in mind, but conditional conservatism comes within the scope. Recognizing losses but not gains defers revenue recognition until realization, and a write-down of an asset is the further application of conservative accounting conditional on new information about the outcomes from the investment.

The investment in R&D has yet to pay off. In contrast, a mature pharmaceutical firm where R&D investment has paid off reports a high ROE and thus is considered to have lower risk; the uncertainty has been resolved. But, of course, firms can have low (or negative ROE) due to realizations—the risky investment did not pay off—so there is some sorting out to do.

Further case studies illustrate:

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

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

Amazon.com, Inc. reported a loss for the third quarter of 2013, as it had done for the full year, 2012. The losses continued into 2014 on rising sales. The losses were attributed to "spending on technology and content, such as video streaming and grocery delivery to mobile devices" and the firm's "willingness to win customers by losing money." Stated differently, the losses were not due to profits from current sales, but to the expensing of these investments with uncertain outcomes. While high expectations were built into the share price, the accounting conveyed uncertainty: The added revenues from these investments have yet to be realized.[5]

During the 1990s, Starbucks Corporation reported a book rate of return on its operations of less than 10 percent. However, it traded at a price-to-book ratio of about 5, a multiple that one associates with a much higher book return. Starbucks was expanding stores aggressively, expensing start-up costs, advertising, employee training, and supply chain development. This expensing depressed the book return, an indication that the growth strategy was risky. As it

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

happened, the strategy paid off, with the book rate of return rising to 20 percent by 2005 and to 42 percent by 2014. But the strategy was risky; it could have gone the other way.[6]

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

The paper shows empirically that low book rates of return exhibit the numerator effect of conservative accounting. And, in confirmation that conservative accounting relates to uncertainty, the lower book rates of return are associated with higher variance in earnings outcomes and with more extreme outcomes. Moreover, the paper provides evidence that this risk is (non-diversifiable) risk that is priced in the stock market. First, earnings outcomes associated with low book rates of return due to conservative accounting are more sensitive to market-wide beta shocks. Second, investing in those lower ROE firms yields the higher average stock returns that investors require as reward for bearing risk. Third, these returns are particularly sensitive to common risk factors that have been identified in asset pricing.

3. Connecting Conservative Accounting and the Book Rate of Return to the Expected Return

While this evidence is suggestive, the connection of conservative accounting to priced risk remains an open question. To be formal, one might model an accounting system where conservative accounting indicates a firm's systematic risk and the risk premium thus required. However, without a valid, generally accepted asset pricing model, let alone one based on accounting numbers, that is an ambitious task.[7] We do, however, gain some insights from the

[6] Penman (2012, Chapter 5) lays out this case in more detail.

[7] Ohlson (2008) constructs a hypothetical accounting where earnings growth aligns with the risk premium, one-to-one. The paper involves accounting that requires anticipation of the future such that a permanent earnings number can be calculated that is sufficient for forecasting future earnings (with a growth constant). This differs from

framework in Penman, Reggiani, Richardson, and Tuna (2015). The framework is adapted here to connect ROE under conservative accounting to the expected stock return. The analysis also guides the construction of our empirical tests.

3.1 Conservative Accounting, ROE, and the Expected Return

By the clean-surplus accounting relation (CSR), $d_1 = Earnings_1 - (B_1 - B_0)$, where d is net dividends and B is the book value of common equity. Substituting into the forward stock return,

$$\frac{E(P_1 + d_1 - P_0)}{P_0} \equiv E(R_1) = E\left[\frac{Earnings_1}{P_0} + \frac{P_1 - B_1 - (P_0 - B_0)}{P_0}\right] \quad (1)$$

$$= E\left[ROE_1 . \frac{B_0}{P_0} + \frac{P_1 - B_1 - (P_0 - B_0)}{P_0}\right] \quad (1a)$$

where $ROE_1 = \frac{Earnings_1}{B_0}$, the book return on equity. Thus the expected stock return is expressed as the forward earnings yield, $\frac{E(Earnings_1)}{P_0}$, plus the price-denominated expected change in the premium (of price over book value) during the forward year. ROE appears in equation (1a) because the earnings yield is the product of the book return and the book-to-price ratio. These equations exhibit the following properties that bear on the connection of ROE to expected returns:

P1. Dividends do not affect the premium, nor the expected change in premium:

$$E[P_1 - B_1 - (P_0 - B_0)] = E[\Delta P_1 + d_1 - (\Delta B_1 + d_1)] \text{ for all } d_1$$

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transactions-based GAAP accounting that defers earnings recognition to the future because it cannot be anticipated with any certainty.

if

(i) dividends reduce price one-for-one, and
(ii) dividends reduce book value one-for-one

Condition (i) is satisfied under Miller and Modigliani (1961) (M&M) assumptions and (ii) is applied under GAAP that reduces book value by the amount of the dividend.

P2. The expected change in premium in equation (1) is determined by the measurement of $E(Earnings_1)$. Given CSR and P1,

$$E[P_1 - B_1 - (P_0 - B_0)] = E[\Delta P_1 + d_1 - (\Delta B_1 + d_1)] = E[\Delta P_1 + d_1 - Earnings_1]$$

Thus, for a given $E(R_1)$ and thus a given $E(\Delta P_1 + d_1)$, $E(Earnings_1)$ determines the expected change in premium.

P3. The expected change in premium represents expected earnings growth. Given a constant expected return, r, CSR, and mild boundary conditions,

$$P_0^T = \frac{1}{(1+r)^T} E\left[\sum_{\tau=1}^{T} Earnings_\tau + \sum_{\tau}^{T} (1+r)^{T-\tau} d_t\right] \rightarrow P_0 \text{ as } T \rightarrow \infty,$$

where P_0 is the no-arbitrage price under the dividend discount model and the expectation in the denominator of equation (1). The valuation is insensitive to dividends under P1 (see Ohlson, 1995). Thus, for a given P_0 and thus a given expectation of total earnings for periods 1 to T, lower $E(Earnings_1)$ implies higher earnings for periods 2 to period T, that is, expected earnings growth. It follows that $E[P_1 - B_1 - (P_0 - B_0)] = 0$ implies no expected earnings growth after period 1. See also Shroff (1995).

P4. A change in premium (and expected earnings growth) is determined by the accounting for the book value for operations. By balance sheet equations at market value and book value, $P_t = P_t^{NOA} - P_t^{NFO}$ and $B_t = NOA_t - NFO_t$, all t, where P_t^{NOA} and NOA_t are enterprise market price (the price of the firm) and enterprise book value, respectively, and P_t^{NFO} and NFO_t are the price of net financial obligations (net debt) and the book value of net financial obligations, respectively. Thus,

$$E\left[P_1 - B_1 - (P_0 - B_0)\right] = E\left[\Delta P_1^{NOA} - \Delta NOA_1\right]$$

if $NFO_1 = P_1^{NFO}$. That is, the change in premium is determined by the accounting for operating activities in the balance sheet, ΔNOA_1. The $NFO_1 = P_1^{NFO}$ condition is not precisely met under GAAP, but is approximately so except when there is a significant change in interest rates or credit risk. Under P2, the change in premium is determined by the accounting for $Earnings_1$. Given clean surplus accounting for operating activities, $Earnings_1 = OI_1 - Net\ Interest_1$, = $Free\ Cash\ Flow_1 + \Delta NOA_1 - Net\ Interest_1$, where *OI* is income from operating activities. Thus, it is the accounting for the ΔNOA_1 component of earnings that determines the change in premium and excepted earnings growth.[8]

Conservative accounting impinges on the measurement of earnings and thus, by P2, induces an increase in the premium when earnings are reduced by its application. Further, in equation (1a), the accounting also reduces ROE. By P3, conservative accounting that reduces the ROE also induces expected earnings growth by deferring earnings recognition to the future. P4 identifies the accounting that produces a change in premium and expected earnings growth: the accounting for ΔNOA_1. For a given P_0, lower ΔNOA_1 (and thus lower $Earnings_1$ and ROE_1) implies higher future growth, while higher ΔNOA_1 implies lower growth.[9] Accordingly, our empirical tests focus on the amount of ΔNOA_1 added (or not added) to the balance sheet.

The ΔNOA_1 component of earnings affects the numerator of ROE but, as $ROE_1 = \frac{Earnings_1}{B_0}$, ΔNOA_1 does not affect the denominator (the beginning-of-period book value). However, the application of conservative accounting in the past does bear on the denominator; $B_0 = NOA_0 - NFO_0$ accumulates past ΔNOA, yielding a low B_0 under conservative

[8] Correspondingly, it can be shown that free cash flow does not affect premiums (nor does net interest in financing activities).

[9] NOA is operating assets minus operating liabilities, so includes the effect of conservative accounting on accrued expenses, deferred revenues, etc. that affect earnings.

accounting. If conservative accounting is applied in response to uncertainty, a low B_0 (for a given P_0) indicates expected earnings not recognized because uncertainty has not been resolved. Accordingly, the realization of earnings that resolves the uncertainty implicit in a low denominating B_0 implies lower risk. That is, a high ROE implies lower risk because unrealized earnings, deemed to be at risk, are now realized.

In sum, if conservative accounting and the expected uncertain growth it induces conveys risk, a low ROE (due to the numerator effect of conservative accounting) implies higher risk while a high ROE (due to a numerator and denominator effect) implies lower risk. If this risk impinges on the expected stock return, ROE is negatively related to expected returns. That is the prediction that is the subject of our tests. Of course, both the numerator effect and the denominator effect can be operating such that a given ROE may be affected by both. Thus, for example, a low ROE with no numerator effect is to be distinguished from one with a depressed numerator. Our empirical analysis does so.

3.2 Priced Risk?

While conservative accounting connects to risk and the resolution of risk under accounting principles, there is no imperative that the risk is priced in the market. As tautologies, equations (1) and (1a) hold for any accounting with no necessary effect on the expected return: Conservative accounting may merely shift earnings from period 1 to subsequent periods with no implication for the left-hand side of these equations. The expected return changes in response to the risk conveyed by the accounting only if higher expected earnings growth induced by lower $Earnings_1$ is priced as risky and thus is discounted with a lower P_0 in the denominator of equation (1) to yield the higher expected return. That discount might be established with an asset

pricing model that explicitly connects accounting to risk premiums, but that we do not have. Accordingly, the issue is an empirical question which is the focus of the rest of the paper.

However, the no-arbitrage assumption that is the foundation of asset pricing theory suggests that the realization principle ties to priced risk. In holding stocks rather than cash, investors bear the risk that the expected return may not be realized, so they require a return premium commensurate with the risk. But, when they sell stocks and invest the cash proceeds in the risk-free asset—they realize the return—the risk is reduced, and so is the expected return (now equal to the risk-free rate). A stock is a claim on the expected earnings of a firm, so when the firm realizes those expected earnings into cash or a near-cash asset on shareholders' behalf, the investors' risk and expected return are correspondingly reduced. On a consolidated basis, the firm's accounts are part of the shareholders' accounts, so it makes no difference if the shareholder "realizes" or the firm "realizes" on the shareholder's behalf— the shareholders (the 100 percent owners) have the claim to the same cash. A no-arbitrage condition so dictates (frictions aside): *Ceteris paribus*, paying cash out to shareholders (in dividends) has no effect on the cum-dividend value of the shareholders' claim under M&M assumptions; cash in the firm is valued the same as cash in the shareholder's cash account.[10]

Reference to a simple valuation model yields conditions under which the accounting connects to priced risk, and those conditions can be tested empirically. In the no-growth case where conservative accounting has no numerator effect, $P_0 = \frac{E(Earning_1)}{r}$; that is, P_0 is

[10] Realization typically results in a receivable rather than cash, but receivables are discounted to a cash equivalent value for the risk of not receiving the cash, at least in principle.

expected earnings discounted for risk in the required return. Adding growth (with positive expected earnings),

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

and

$$\frac{E(Earnings_1)}{P_0} = r - g \,. \qquad (2)$$

For a constant expected return, *r*, this is a no-arbitrage valuation equivalent to the Gordon constant-growth dividend model with full payout of earnings. Payout policies other than full payout are of course observed. However, retention adds to earnings growth, *g*, but does not add value under M&M conditions—nor does it affect the premium of price over book value by Property 1. Thus this valuation isolates the growth that potentially affects price and at the same time is M&M consistent.

The earnings yield in equation (2) is, of course, the first term in equation (1) such that $E(R_1) \equiv r = \frac{E(Earnings_1)}{P_0}$ with no growth (no change in premium). Introducing growth, equation (2) shows that, for a given *r*, E/P is decreasing in expected earnings growth, *g*—a common view of the E/P ratio. In this case, the expected growth has no bearing on the expected return in equation (1): higher expected growth is incorporated in P_0, the denominator on the right-hand side, with no effect on the left-hand side. This case, where conservative accounting merely shifts earnings to the future without any effect on *r*, stands as the null hypothesis. However, *r* is also involved in the valuation and *r* may be related to expected earnings growth: it is $r - g$ that determines E/P, and a higher *r* may require a higher *g*. Thus, a given E/P, the first

term in equation (1), could be one with a high *r* and high *g* or one with a low *r* and low *g* (but the same $r - g$). Additional information is necessary to distinguish the two. That information would imply a discount to P_0 in equation (1) to yield a higher *r* on the left-hand side for a higher *g* because the higher expected growth is deemed to be risky. The foregoing analysis demonstrates that ROE under conservative accounting has the potential to convey that information.

Our empirical tests thus proceed in two stages. First, we ask whether conservative accounting and its effect on ROE is associated with higher *r*. As is standard in asset pricing research, expected returns are implied from average realized returns with the assumption that the market is pricing risk efficiently.[11] Those tests are in section 5. However, second, we also ask: for a given $E/P = r - g$, the first term on the right-hand side of equation (1), does ROE distinguish whether the market is pricing the E/P as one with high *g* and a correspondingly high *r* or one with low *g* and low *r*? For rational pricing, two conditions must be satisfied: For a given $E/P = r - g$,

(i) higher *r* must be associated with higher expected earnings growth, and

(ii) the higher growth expectation must be associated with higher risk that the growth will not be realized.

These conditions are not sufficient to demonstrate priced risk, of course, but they are necessary conditions and conditions that can be tested. Those tests are in section 6. Nevertheless, as in all

[11] Research has reported that R&D investment is associated with higher stock returns, in Lev and Sougiannis (1996), Lev, Sarath, and Sougiannis (2005), and Eberhart, Maxwell, and Siddique (2004), for example. There are differing interpretations of the result, with Chambers, Jennings, and Thompson (2002) attributing the returns to risk and Chan, Lakonishok, and Sougiannis (2001) attributing them to investor misunderstanding of the accounting. Donelson and Resutek (2012) see the returns as part of the value-growth spread phenomenon.

empirical asset pricing, the identification of priced risk remains inconclusive without a valid asset pricing model to establish sufficient conditions.

4. Data, Variable Calculation, and Summary Statistics

Our sample covers all U.S. firms available on Compustat files for any of the years, 1963-2012, and which have stock price and returns for the corresponding years on CRSP files. Financial firms (in SIC codes 6000-6999) are excluded because they practice fair value accounting where the deferral principle is not operative. Utilities are also excluded because the book rate of return is subject to regulation.[12] Firm-years are deleted for any year in which Compustat reports a missing number for book value of common equity, income before extraordinary items, total assets, or long term debt. Firm-years with negative book value are also eliminated. Market prices are observed on CRSP three months after each fiscal year, by which time the annual accounting numbers for the fiscal year should have been reported (as required by regulation). Stock returns, also observed on CRSP, are annual returns after this date, calculated as buy-and-hold compounded monthly returns.

Conservative accounting impinges on the measurement of net operating assets (*NOA*), and, as laid out in section 3, it is the accounting for *NOA* that ties conservative accounting to the expected return. To capture the effect on *NOA*, we expand upon the procedures in Penman and Zhang (2002). Deferred earnings that result from reducing income and booking lower *NOA* to the balance sheet effectively creates off-balance sheet (hidden) reserves that are later released into earnings if realized. The amount of reserves at any point in time is the amount by which balance sheet *NOA* has been reduced by the application of conservative accounting. Thus, we

[12] Firms classified as Membership Organization or Unknown SIC are also excluded from our analysis.

calculate a C-Score as the amount by which the balance sheet would have been higher without conservative accounting, relative to net operating assets (NOA) actually booked to the balance sheet:

$$C_{it} = \frac{ER_{it}}{NOA_{it}},$$

where ER is the estimated reserve created by conservative accounting and *i* indicates firms and *t* indicates balance sheet dates.[13]

The Penman and Zhang (2002) C-score was estimated from the accounting effects of R&D expensing, advertising expensing, and LIFO accounting for inventories. We expand that score to include the effects of conservative accounting applied to bad-debt allowances, depreciation allowances, deferred revenue, and accrued expense:

$$C_{it} = (RD_{it}^{res} + ADV_{it}^{res} + INV_{it}^{res} + BD_{it}^{res} + DEP_{it}^{res} + DEF.REV_{it}^{res} + ACC.EXP_{it}^{res})/NOA_{it}.$$

The calculation for the C-score components is as follows:

- R&D reserve $\left(RD_{it}^{res}\right)$ is calculated as the estimated amortized R&D asset that would have been on the balance sheet if R&D had not been expensed. We capitalize R&D expenditures (Compustat item XRD), then amortize them using the industry coefficients estimated by Lev and Sougiannis (1996). In a sensitivity analysis, we also amortize using the sum-of-the-years-digits method over five years.

- Advertising reserve $\left(ADV_{it}^{res}\right)$ is the estimated brand asset created by advertising expenditures. We capitalize advertising expenses (Compustat item XAD) and then amortize them using a sum-of-the-year's digits method over two years. Bublitz and Ettredge (1989) and Hall (1993) indicate that advertising has a short useful life, typically one to two years.

[13] This C-score captures the effect on unconditional conservatism on the balance sheet, in contrast to that in Khan and Watts (2009) that is designed to capture unconditional conservatism.

- Inventory reserve $\left(\text{INV}_{\text{it}}^{\text{res}}\right)$ equals the LIFO reserve (Compustat item LIFR) reported in the financial statement footnotes.

- Bad-debt reserve $\left(BD_{it}^{res}\right)$ equals the excess amount of allowance for bad-debt expenses, estimated by multiplying the gross amount of receivables (Compustat item RECT + RECD) by the difference of the allowance-to-gross-receivable ratio Compustat items RECD/(RECT+RECD) and the median allowance-to-gross-receivable ratio of all firms within the same revenue decile as well as the same revenue growth decile in the same industry (2-digit SIC).

- Depreciation reserve $\left(DEP_{it}^{res}\right)$ equals the excess amount of accumulated depreciation, estimated by multiplying the gross amount of PP&E (Compustat item PPEGT) by the difference of the accumulated-depreciation-to-gross-PP&E ratio (Compustat items (PPEGT-PPENT)/PPEGT) and the median accumulated-depreciation-to-gross-PP&E ratio of all firms within the same revenue decile as well as the same revenue growth decile in the same industry (2-digit SIC).

- Deferred revenue reserve $\left(DEF.REV_{it}^{res}\right)$ equals the excess amount of deferred revenue (Compustat items DRC and DRLT), estimated by multiplying NOA by the difference of the deferred-revnue-to-NOA ratio and the median deferred-revenue-to-NOA ratio of all firms within the same revenue decile as well as the same revenue growth decile in the same industry (2-digit SIC).

- Accrued expense reserve $\left(ACC.EXP_{it}^{res}\right)$ equals the excess amount of accrued expenses (Compustat item XACC), estimated by multiplying the gross amount of NOA by the difference of the accrued-expense-to-NOA ratio and the median accrued-expense-to-NOA ratio of all firms within the same revenue decile as well as the same revenue growth decile in the same industry (2-digit SIC).

Establishing the benchmark of the carrying value without conservative accounting is difficult. So the measures are presumably noisy and bias our empirical analysis against a result.[14] For R&D and advertising, the score is calculated against a benchmark with an assumed amortization rate. For LIFO, the score is available from the reported LIFO reserve. However, the other measures are calculated against industry medians (with a matching also on revenue and

[14] McNichols, Rajan, and Reichelstein (2014) calculate a measure to correct for conservative accounting, but that measure aims to correct the book value to replacement cost as prescribed by Tobin's *q*.

revenue growth). This is appropriate if industry medians differ across industries for "real" as opposed to accounting reasons (as they presumably do). However an industry benchmark is problematic if the application of conservative accounting varies across industries (as well it might). Further, bad debt allowances, depreciation, deferred revenue, and accrued expenses may differ within industry for "real" reasons, or be affected by income shifting due to inter-period earnings management rather than the application of conservative accounting. Thus, we conduct the test using the full measure here and with just the R&D, advertising, and inventory component. Results are reported for the full measure, but results are qualitatively similar under the narrower measure.

The C-score captures the cumulative balance sheet effect of conservative accounting and thus the denominator effect on ROE. Correspondingly, the change in C-score captures the current period effect of conservative accounting on earnings (and ΔNOA), and thus the numerator effect on ROE:

$$\Delta C_{it} = \frac{ER_{it}}{NOA_{it}} - \frac{ER_{it-1}}{NOA_{it-1}}$$

That is, ΔC captures the change in the estimated reserve (relative to the recorded ΔNOA) from conservative accounting. A special case occurs when earnings and ΔNOA are unaffected by conservative accounting such that there is no effect on earnings or the premium in equation (1). That is the case where the cancelling error property of accounting applies: Even though conservative accounting induces a denominator effect and thus a difference between price and book value, earnings (and ER) are not affected by conservative accounting in steady state. The standard example is with R&D: R&D expense and earnings are the same irrespective of whether R&D is expensed immediately or capitalized and amortized if there is no growth in R&D

expenditures; it is growth in R&D investment that reduces earnings, increases the premium, and increases expected earnings growth. And so with deferred revenues, etc.: ΔNOA and earnings (and thus premiums) are unaffected if there is no change in deferred revenues. Increased R&D investment or growing deferred revenues reduce earnings under conservative accounting and add to the C-score, while a decline in R&D investment or deferred revenues increases earnings and reduces the C-score.[15]

Table 1 reports summary statistics for the variables used in the analysis. The notes to the table define the variables and the Appendix details how each was calculated. ROE includes the effect of leverage that is related to risk and the expected return but is not affected by conservative accounting. So, we also examine the (unlevered) return on net operating assets (RNOA), calculated as operating income relative to net operating assets. RNOA is in Table 1, along with leverage, NFO/P, that explains the difference between ROE and RNOA

The median ROE and RNOA, about 9.5%, are roughly equal to what one typical views as a normal return to equity investing: about 10%. It is often claimed that conservative accounting typically yields a book rate of return that is "too high" relative to the required return due to the denominator effect, but that that does not appear to be the case on average. The numerator effect also operates to reduce the reduce ROE and RNOA such that these numbers typically approximate the required return. (Mean ROE and RNOA in the table are affected by left skewness from loss firms.) The positive mean and median C-scores indicate that conservative accounting is typically operating. Median ΔC is close to zero, indicating that releases of earnings

[15] Johansson and Östman (1995, pp. 118-120) lay out the effects of conservative accounting on earnings and book values and demonstrate the special case of cancelling errors.

from conservative accounting reserves (that increase the book rates of return) are offset by increases in those reserves in the cross-section (that reduce the book rates of return).

Table 2 reports correlations between variables, with Pearson correlations above the diagonal and Spearman rank correlations below. The correlation coefficients are means over time of estimates from the cross-section for each year. E/P is positively correlated with returns, as equation (1) indicates. ROE and RNOA are strongly correlated and we obtain similar results (below) with both. Both the C-score and ΔC are negatively correlated with ROE and RNOA: The application of conservative accounting is stronger in firms with low book rates of return. The C-score and ΔC are positively correlated: Firms with high estimated reserves tend to grow those reserves with more investment. The negative correlation of leverage (NFO/P) with the book rates of return and with both conservative accounting measures is to be noted: Inferences from observed correlations between one of these variables and returns must consider leverage as explanation.

5. Empirical Analysis: Book Rate of Return, Conservative Accounting, and Stock Returns

The empirical analysis documents the relationship between book rate of return and stock returns and assesses how conservative accounting bears on the issue. The analysis proceeds in three stages. First, we investigate whether book rate of return is positively correlated with average stock returns unconditionally. This answers the question of whether book returns, like stock returns, reflect reward for risk (on average), consistent with the standard risk-return tradeoff. The answer is no: There is little correlation between book return and average stock return. Second, we examine whether the book return is related to stock returns conditional upon the effect of conservative accounting. The answer is yes: A low book rate of return depressed by conservative

accounting with growing investment is associated with higher returns, consistent with conservative accounting conveying information about risk. In contrast, a high book return that reflects realizations of earnings from investing is associated with lower returns, consistent with earnings being recognized when uncertainty has been resolved. Finally, we conduct tests within the framework of section 3: For a given E/P (that indicates the expected return without growth), does the addition of ROE add to the expected return, and is that added return associated with the effect of conservative accounting? The answer is yes.

5.1 Unconditional Correlation of Book Rate of Return with Stock Returns

Table 2 indicates that the cross-sectional correlation between ROE and subsequent stock returns is low, though positive, and so for RNOA. Table 3 investigates further. Panel A reports returns and other metrics for 10 portfolios formed from ranking firms each year on their ROE. Panel B does the same for a ranking on RNOA. There is little variation in returns over the book return portfolios, and the differences between the returns for the high and low portfolios are not significantly different from zero. ROE is negatively correlated with beta in Penman (1991) and in Table 2, but is actually U-shaped over the portfolios here. There is little here to indicate that average book rates of return in the cross-section are related to risk and expected return. ROE is increasing in leverage, so one might expect ROE to have a positive relationship with returns because of a leverage effect, but that is not the case. The reason is that leverage (NFO/P) is negatively correlated with RNOA, the unlevered component of ROE, as Panel B demonstrates: Higher RNOA firms have lower leverage, as documented in Nissim and Penman (2003). Indeed, the correlation between ROE and leverage in Panel A is negative.

As in Table 2, the C-score is negatively correlated with both ROE and RNOA in Table 3, which may be surprising as conservative accounting is presumed to result in high book rates of return on average. The relationship in Table 3 is actually U-shaped over the portfolios, with both low and high ROE and RNOA associated with higher C-scores. The scores for the high portfolios coincide with the standard presumption. The high C-scores for the low ROE and RNOA portfolios have a corresponding ΔC that indicates earnings depressed by conservative accounting, from the expensing of R&D and advertising (for example) that has not yet paid off—as is typical of early-stage firms.

That ΔC numerator effect is decreasing in the book rate of return: Lower ROE and RNOA, associated with positive ΔC, are those where the accounting depresses numerator earnings, while the negative ΔC for high ROE and RNOA are indicative of increasing earnings from decreasing investment. Despite these patterns, forward stock returns are not related to the book rate of return. However, a given book return is not only affected by the conservative treatment of investment, but also by the realizations of earnings from past investments.

We proceed to Table 4 to sort this out. We report results for RNOA, but results are similar for ROE, as the high correlation between ROE and RNOA in Table 2 suggests.

5.2 Returns Associated with Conservative Accounting

Table 4 reports returns associated with conservative accounting and its effect on the book rate of return. In Panel A, firms are formed onto 10 portfolios each year from a ranking on ΔC, the measure of how conservative accounting affects the numerator of the book return. It is clear that the ranking on ΔC also ranks returns, and the difference between the high and low portfolio returns is statistically significant at the 1% level: The numerator effect on earnings of

conservative accounting and investment growth is associated with higher average returns, with lower earnings indicating higher risk and return.

Panel B of Table 4 reports returns associated with conservative accounting for a given level of RNOA. The same RNOA portfolios in Table 3 are spilt into three according to how they are affected by ΔC. Note, first, that for a given ΔC, there is little variation in returns over RNOA portfolios (along rows in the table), expect for portfolio1 (with extreme negative RNOA). However, the partitioning on ΔC within RNOA portfolios orders returns. For high RNOA, for example, returns are lower when the book return reflects earnings realizations on a low denominator and with a low ΔC effect on the numerator, but are higher when ΔC depresses the numerator. In contrast with papers that associate high book rates of return with risk and return, high returns are associated with high RNOA only if the RNOA is affected in the numerator by conservative accounting. The same applies to low RNOA portfolios but more so, and it is these portfolios where ΔC is relatively high in Table 3: These are portfolios where RNOA is particularly depressed by conservative accounting.

Panel B also brings the denominator effect to the fore. Low ΔC are cases where the RNOA is less affected by conservative accounting, so reflect realizations of earnings from investment rather than the depressing effect on earnings of investment. Under GAAP, earnings realizations are the resolution of uncertainty which (presumably) lowers risk and the required return. The lower returns for RNOA associated with low ΔC suggest so.

Conservative accounting affects RNOA in both the numerator and the denominator, with ΔC being the measure of the numerator effect and the C-score the measure of the denominator effect. So, one might ask whether it is ΔC or the C-score that is associated with returns. Indeed,

in unreported tests we found that the C-score also ranked returns. However, the two are positively correlated—the average rank correlation is 0.316 in Table 2. Thus Panel C of Table 4 forms portfolios first on the C-score and then on ΔC within each C-score portfolio. The difference in returns between high and low ΔC for a given C-score is positive and significant, except for low C-score portfolios where conservative accounting has little impact.[16]

As ΔC is negatively correlated with leverage in Table 2, the sort on ΔC is unlikely to pick up leverage (which is presumably positively related to returns). To check, we repeated the analysis in Panel B of Table 4, replacing ΔC with the leverage variable, NFO/P. The returns associated with ΔC cannot be explained by leverage.

5.3 Returns Conditional upon Earnings-to-Price

Equation (1) expresses the expected return in terms of the expected earnings yield and subsequent expected earnings growth. In the analysis in section 3, a variable indicates the expected return, *r*, if, for a given E/P = *r* – *g*, it distinguishes firms with a high *r* and *g* from those with low *r* and *g* (but with the same *r* – *g*). That requires that the variable (i) forecast higher earnings growth, *g*, associated with a higher *r*, and (ii) that expected growth is at risk of not being realized. In this section, we ask whether, for a given E/P, book rate of return is negatively related to the average returns (that are indicative of *r*). Then, in the next section, we test for the two conditions.

In Table 5 portfolios are formed by ranking firms each year on E/P. Then, within a given E/P portfolio, portfolios are formed by ranking on ROE. The ranking on E/P is for positive E/P

[16] In this test, the results were stronger with the less-noisy C-score and ΔC involving just R&D, advertising, and inventory. Differences in returns between the high and low ΔC portfolios were significant at the 5% level for C-score portfolios 4-10.

firms only, with loss firms assigned to their own portfolio. Again, reported returns and mean returns from forming portfolios each year. The analysis is with levered numbers, E/P and ROE, but the results are similar with unlevered earnings-to-price and RNOA.[17]

Panel A shows that, with the exception of the negative E/P portfolio, returns are positively related to E/P (across the top row), as might be expected given that E/P is the first component on equation (1). The second ranking on ROE (down columns) indicates that, for a given positive E/P, ROE is negatively related to returns.[18] Significantly, although E/P and ROE are positively correlated in Table 3 (with a mean rank correlation of 0.620 in Table 2), E/P ranks returns unconditionally here, while ROE (in Table 3) does not. Rather, ROE serves to supplement E/P as an indicator of the expected return.

Panel B of the table, which reports the mean ΔC for each portfolio, provides an explanation: Lower ROE firms have a higher ΔC. That is, these are firms where earnings in the E/P ratio are depressed by conservative accounting and deferred to the future. In contrast, high ROE are associated with negative ΔC which indicates the release of reserves into earnings; these are firms with earnings realizations on a low denominator that imply lower risk and return. Results for the ΔC portfolios in Panel B (not tabulated) show that returns are strongly related to ΔC.[19]

[17] In equation (1), the E/P ratio is the forward (expected) E/P. Here we use the trailing earnings (before extraordinary and special items) as a forecast of the forward earnings. The earnings accordingly are the same as in the book rate of return. The mean Spearmen correlation between the trailing earnings-to-price and subsequent realized forward earnings-to-price is 0.64, and the mean Spearman correlation between successive ROE is 0.71. We do not use analysts' forecasts for forward earnings because our interest is in the information in reported accounting numbers. Further, analysts' forecasts introduce behavioral issues that presumably have nothing to do with the accounting.

[18] Further analysis shows that the ranking on ROE within E/P portfolios is not just a further ranking on E/P.

[19] The High-Low returns for the ΔC ranking were (in percent) 6.55, 6.39, 7.04, 8.28, and 7.61 for the positive E/P portfolios 1 – 5, respectively, and 8.95% for the negative E/P portfolio. All were significant at the 1% level.

As further demonstration that the returns to ROE in Panel A are associated with conservative accounting, Panel C forms portfolios in the same way as in Panel A, except that the lowest ROE portfolios, 1 and 2, retain only firms with the highest 40 percent of ΔC from a ranking on ΔC within the E/P portfolio, while the highest ROE portfolios, 4 and 5, retain only the lowest 40 percent of ΔC from that ranking. The differences in returns between the high and low ROE portfolios (in the last row of the panel) are significantly enhanced over those in Panel A. Regressions of returns on both ROE and ΔC within each E/P portfolio (not reported) find that there is still some explanatory power in ROE after controlling for ΔC. However, our ΔC measure may not capture all the effects of conservative accounting on ROE. Indeed, many contend that a good deal of S, G & A expense is expensed investment—on employee training, software, start-up costs, customer development, distribution and supply chain development, for example—and this we have not captured.

These observations apply to firms with positive E/P. For loss firms (with negative E/P) in Table 5, mean returns are positively correlated with these negative ROE portfolios. This is despite the fact that Panel B shows that the ROE ranking is also a ranking on ΔC, as in the positive E/P portfolios. Indeed, the unreported results from ranking on ΔC for these loss firms produced significant return spread, just as in the positive E/P portfolios. We have no clear interpretation of the Panel A results for loss firms, but make two observations. First, in contrast to the positive E/P portfolios where we observed that E/P is fairly constant over ROE within a given E/P portfolio, E/P is strongly positively correlated with ROE for the negative E/P portfolio, and expected returns are positively correlated with E/P in equation (1): E/P for the low ROE portfolio is -0.36, compared with -0.02 for the high ROE portfolio. Second, unlike positive E/P, current E/P is not a good forecast of the forward E/P in equation (1) for loss firms. This will

particularly be the case if the losses are due to excessive write-downs that reverse into earnings in the next period. To check, we grouped all negative E/P on their forward E/P as indicated by analysts' consensus earnings forecasts and then, within each group, formed portfolios based on ROE. In four out of the five E/P portfolios, ROE showed a negative correlation with future returns, just like the positive E/P portfolios. In the remaining forward E/P portfolio, the correlation was positive, but not statistically significant.

With ROE negatively correlated with leverage in Table 2, the returns associated with ROE here could represent return premiums for leverage. To investigate, we repeated the analysis in Table 5 but now forming portfolios within each E/P portfolio by ranking on NFO/P rather than on ROE. We observed no significant difference in returns across the NFO/P portfolios. This is possibly because E/P (on which stocks are first ranked) reflects leverage already.

A further test strengthens the inferences. It effectively administers a placebo by repeating the test with pseudo ROEs calculated by capitalizing the conservative accounting reserve indicated by the C-score. This effectively reverses the effect of conservative accounting by reconstructing what the balance sheet would have looked like without conservative accounting. As we are unlikely to have captured all the conservative accounting effects in the C-score, the reconstruction is probably not perfect. So we see this as a weak check. Indeed, in repeating the analysis with the pseudo ROEs, there were still differences in returns across ROE portfolios, but they are reduced. The calculation of a second pseudo ROE provided a stronger comparison. When ROE was calculated with mark-to-market accounting (for both the numerator and denominator), there were no significant differences in returns across ROE portfolios. Mark-to-market accounting removes all the effects of conservative accounting, of course.

6. Empirical Analysis: Book Rate of Return, Conservative Accounting, and Uncertainty about Earnings

Section 3 establishes two conditions for the returns documented in Table 5 to indicate priced risk. For a given E/P = $r - g$,

(i) higher r must be associated with higher expected earnings growth, and

(ii) the higher growth expectation must be associated with higher risk that the growth will be realized.

This section tests if these conditions are satisfied.[20]

As the ROE portfolios in Table 5 are constructed for a given expected E/P, we first investigate whether ROE indicates the risk of expected earnings in the forward year of not being realized. That would be so if, for the given E/P = $r - g$, ROE indicates a higher r. Table 6 constructs the same portfolios as in Table 5, but now reporting the mean standard deviation (Panel A) and interdecile range (Panel B) of *realized* earnings one-year ahead (relative to current price). The mean values are means over years of the within portfolio measures for each year. The interdecile range (IDR) emphasizes tail risk about which investors are particularly concerned, the size of extreme negative outcomes relative to extreme positive outcomes. There is some positive correlation between E/P and these volatility measures over the positive E/P portfolios, corresponding to the increasing returns over these E/P portfolios in Table 5. But, to the issue, both measures are decreasing in ROE for a given E/P: The mean returns (down columns) in

[20] We note that there is already some evidence in the literature. Kothari, Laguerre, and Leone (2002) and Amir, Guan, and Livne (2007) find that the variance of earnings from R&D investment is higher than that from other capital expenditure. In what has become known as the Bowman paradox, the strategy literature has found a negative relationship between book rate of return and the variance of book rate of return, although the finding has been called into question. See Bowman (1980) and Brick, Palmon, and Venezia (2015).

Table 5 are associated with uncertainty about year-ahead earnings outcomes, the first component of the expected return in equation (1).

Table 7 tests the two conditions for ROE to indicate priced risk. It reports mean growth rates and the variation in growth rates for the same portfolios in Tables 5 and 6. The mean growth rates in Panel A are those two years ahead, that is, for the year after the forward year. The reported growth rates are the mean over years of portfolio median growth rates each year. The growth measure, described in the heading to the table, ranges between -2.0 and +2.0. It approximates the standard growth rate measure for a wide range of firms, but also accommodates cases with negative or small denominators.[21]

The E/P ratio (or rather its inverse, the P/E) is typically viewed as indicating expected earnings growth, and growth rates are decreasing in the E/P ratio (along rows) in Panel A. Equation (3) describes the expected return in terms of the forward earnings yield and subsequent expected earnings growth and the panel also reports that, for a given positive E/P, the decreasing returns over ROE portfolios align with average ex post earnings growth: Low ROE are associated with higher average earnings growth as well as higher average returns. Condition (i) is satisfied in the data.

The variation in earnings growth rates in Panels B and C of Table 7 are decreasing in ROE and align with both the mean growth rates in Panel A and the mean returns in Table 5. Thus, the higher mean returns for low ROE portfolios are not only associated with expected earnings growth but also with growth around which there is considerable uncertainty. Condition

[21] Because added investment in the first year ahead adds to earnings growth two years ahead, we also calculated the residual earnings growth rate two years ahead to subtract for the added investment. Residual earnings was calculated as $Earnings_{t+2} - (r_f \times Book\ Value_{t+1})$, where r_f is the yield on the U.S. 10-year Treasury note for the year. Results were similar.

(ii) is satisfied. The results for the interdecile range in Panel C are quite telling: ROE conveys information that the investor is exposed to tail risk such that there is a higher probability of very good earnings growth if the investment is successful, but that is offset by a higher probability of an extreme negative outcome. That is the risk indicated by the low ROEs for Facebook and Amazon in the earlier case studies.[22]

Asset pricing theory views priced risk as exposure to factors common to all assets, that is, risk that cannot be diversified away in a portfolio. Accordingly, Table 8 reports on how realized earnings for each portfolio are subject to market-wide shocks to earnings. It reports betas (slope coefficients) estimated from the following time-series regression for each portfolio:

$$\text{Portfolio}\frac{Earnings_1}{P_0}(t) = \alpha + \beta \cdot \text{Market}\frac{Earnings_1}{P_0}(t) + \varepsilon_t$$

The earnings realizations are for the forward year, that is, the same year during which portfolio returns are observed in Table 5, so the betas are those actually experienced during the holding period, not historical betas. To align realizations in calendar time, the regression is estimated for firms with December 31 fiscal-years only. The portfolio earnings yield is the average earnings yield for the portfolio and the market-wide earnings yield is the aggregate earnings for stocks in the sample for the relevant year relative to aggregate price.[23] The average R-square for the regressions is quite high—an average of 54.4 percent for the unconditional betas in Panel

[22] We note that, for the negative E/P portfolios, expected growth rates in Panel A of Table 7 and the dispersion of growth rate outcomes in Panels B and C align with the returns in Panel A of Table 5 in a way that satisfies the two conditions. However, ROE is positively related to these features (in the sense that a less negative ROE is a higher ROE).

[23] Results are similar when market earnings are calculated as the average earnings yield for all stocks in the relevant year.

A—indicating that market-wide earnings explain a significant part of portfolio earnings realizations.

The earnings betas in Panel A of Table 8 are increasing with E/P over the positive E/P portfolios and have the same rank order over E/P portfolios as the mean returns in Table 5. Further, the betas are decreasing in ROE for a given E/P portfolio. They, too, align with the returns in Table 5: Low ROE stocks exhibit higher sensitivity to market-wide shocks. Separating years in which the market-wide earnings yield was up from the previous year (up-markets) from years when it was down (down-markets), the conditional betas in Panels B and C indicate that lower ROE have higher up-market betas, delivering higher earnings in good times, but also have higher down-market betas.[24] Upside potential is matched with downside risk. Correspondingly, high ROE portfolios have considerably lower betas in down-markets, but their upside beta is also lower. In sum, the variation in earnings outcomes across ROE portfolios in Tables 6 and 7 is due, in part, to sensitivity to systematic shocks.[25] Condition (ii) is, again, supported.

The analysis in this section was repeated for the portfolios formed solely of the basis of ΔC—the portfolios in Panel A of Table 4. The results were not as strong, though significant differences were observed between extremes. While ΔC captures the numerator effect of conservative accounting on ROE, it does not capture the denominator effect that yields a high ROE when earnings are realized. Further, our ΔC measure does not capture all aspects of

[24] Results were similar when up-markets and down-markets were identified as years in which the stock market return, in excess of the risk-free rate, was positive or negative.

[25] The analysis in this section involves only firms that survived up to the period investigated. There are differences in the frequency of bankruptcy between high and low ROE portfolios. For positive E/P portfolios, there is a significantly higher frequency of bankruptcy in low ROE portfolios (relative to high ROE) within one year for two of the five E/P portfolios. For bankruptcy within five years, the differences are significantly different for three of the five E/P portfolios. There is a significant difference in O-scores (that indicate the probability of bankruptcy) between low and high ROE portfolios for positive E/P portfolios 1 – 3. The direction of these differences indicates that conservative accounting and ROE indicate the risk of bankruptcy.

conservative accounting—expensing of software development, training costs, and distribution and supply chain development, for example—which are picked up in ROE. And a high ΔC can be associated with a relatively high ROE, somewhat negating its effect, as can a low ΔC with a low ROE. When the analysis was repeated for the portfolios in Panel C of Table 5 (where ΔC and ROE are interacted), the association with risky outcomes was similar to that reported here.

7. Connection to Asset Pricing

While the sensitivities to market-wide earnings shocks in Table 8 suggest that the risk conveyed by the ROE is priced risk, there is no necessity, of course. The joint hypothesis problem, stated by Fama (1970), recognizes that such an attribution can only be made against the benchmark of a valid, generally accepted asset pricing model, and that we do not have. However, the results do connect to popular asset pricing models. We explore the connection here.

7.1 Connection to Asset Pricing Models with B/P

As E/P = ROE × B/P (approximately), the ranking on B/P for a given E/P in Table 5 is (approximately) an inverse ranking on B/P, and B/P appears prominently in asset pricing models.[26] One might suggest that we have therefore just documented the widely-recognized Fama and French (1992, 1993) book-to-price effect in stock returns, but that is not the case. First, the analysis here also involves E/P, as directed by equation (1), and thus incorporates a feature not in the Fama and French model: The ranking of returns on B/P in Table 5 is for a given E/P. Second, the returns in Panel C of Table 5 are not just from a ranking on ROE (or a reverse

[26] The "approximate" qualification is because ROE is calculated on beginning book value while B/P involves end-of-period book value. A ranking on B/P within each of the E/P portfolios in Table 5 produced a similar spread of returns (inversely) to those in Panel A of Table 5.

ranking on B/P) but also involve an interaction of ROE with ΔC, and that produces enhanced returns over those from on ranking on ROE (or B/P) alone.

In fact, our analysis provides some insight into the B/P effect in stock returns. While a robust empirical regularity, the B/P effect in stock returns is not well understood, although there are many conjectures.[27] The analysis here provides a rationale: For a given E/P, the investor buying a high B/P stock is, on average, buying a stock with a low ROE, and conservative accounting conveys the information that the low ROE stock is a risky stock. In short, B/P risk is conveyed by financial statements. It follows that, if the returns to B/P represent priced risk (as many maintain), so do those related to ROE.

If so, our ROE portfolios should exhibit different sensitivities to Fama and French book-to-price (HML) factor returns. Table 9 investigates. In Panel A, all stocks in a given quintile ROE portfolio within the positive E/P portfolios in Panel A of Table 5 are grouped into one portfolio. So, for example, the low ROE portfolio in Table 9 consists of all stocks indicated as low ROE in the positive E/P portfolios in Table 5. Panel B quintile portfolios group the portfolios in Panel C of Table 5 in the same way: firms in ROE quintiles 1 and 2 (the low ROE) are restricted to those with ΔC in the highest 40 percent of ΔC from a ranking on ΔC within the E/P portfolio, while quintiles 4 and 5 (high ROE) consist only of firms with the lowest 40 percent of ΔC from that ranking. The table reports calendar-time, time-series regressions of monthly excess returns for the five portfolios on excess returns for the Fama and French factors, the market (MKT), book-to-price (HML), size (SMB), plus a momentum factor (UMD) which is commonly used in a four-factor extension of the model.

[27] Conjectures include distress risk, the risk of assets in place, the risk in growth options, "value" versus "growth" risk, to name a few.

The factor betas in Table 9 indicate that ROE portfolio returns are sensitive to all four factors. However, the lower ROE portfolios, to which we attribute higher risk, are more sensitive to the book-to-price (HML) factor; β_{HML} declines monotonically as ROE increases. Further, lower ROE portfolios are more sensitive to the size factor (SMB). This accords with the notion that conservative accounting and the associated risky growth expectations are more prevalent in small firms while large firms are those where growth expectations have been realized. Indeed, the mean Spearman correlation between size and ROE is 0.418. The sensitivities to these factors not only decline as ROE increases, but the high ROE portfolios report a negative coefficient, indicating they provide a hedge against these factors.

The regression intercepts (alphas) are also decreasing in ROE, almost monotonically from the low ROE portfolio to the high ROE portfolio. The spread increases when ROE is interacted with ΔC in Panel B. Even though the returns for the low ROE portfolio are more sensitive to the B/P and size factors, they still yield the highest intercept returns. The final column in each panel reports the alpha return for a portfolio that goes long on the high ROE portfolio and short on the low ROE portfolio (a "hedge" portfolio with zero net investment). The alpha return is highly significant; even though the returns for the low ROE portfolio are more sensitive to the B/P and size factors, they still yield the highest intercept returns. It is clear that the analysis has captured returns not explained by the four-factor model.[28] Whether these returns represent required return for risk that is not identified by the factor model or abnormal returns remains an open question—as, in fact, are the returns to the Fama and French factors under the Daniel and Titman (1997) critique. However, given rational pricing (the assumption underlying

[28] We also estimated intercepts (alphas) for each of the ROE portfolios in Panel A of Table 5 (with positive E/P) and for the five High-Low "hedge" portfolios in the bottom row of the Panel A. The alphas for the five hedge portfolios, 1 to 5, were -0.245, -0.463, -0.432, -0.164, and -0.502, respectively. With the exception of portfolio 4, these intercepts were significant different from zero.

inferences in most empirical asset pricing research) our portfolio formation scheme involving both E/P and ROE, prompted by the analysis in section 3, has identified risk and return not explained by the Fama and French model.

7.2 Connection to Asset Pricing Regressions with B/P and ROE

Considerable empirical research documents a positive relationship between returns and ROE (and its variants), in sharp contrast to our findings. See Voulteenaho (2002), Fama and French (2006), Novy-Marx (2012), and Ball, Linnainmaa, and Nikolaev (2015), for example. These observations have led to the addition of an ROE factor to the original Fama and French factors, as in Fama and French (2015). Lyle and Wang (2015) and Chattopadyhay, Lyle, and Wang (2015) also report a positive relationship between ROE and returns. Our analysis provides some commentary and an explanation for these findings.

Equation (1) instructs that, given no expected change in premium (and thus no expected earnings growth), it is the expected earnings yield that equates to the expected return, not ROE_1: $E(R_1) = \frac{E(Earnings_1)}{P_0}$. However, as $\frac{Earnings_1}{P_0} = ROE_1 \times \frac{B_0}{P_0}$ in equation (1a), ROE_1 indicates the expected return in the cross-section, conditional upon B/P. In the afore-mentioned papers, B/P appears in regression models along with ROE. It is not ROE or B/P that indicate the expected return as separate inputs, but rather the earnings yield that B/P and ROE jointly convey; ROE adjusts B/P in these regressions to recover the earnings yield (albeit not multiplicatively). In short, these papers are consistent with our analysis if zero earnings growth is typical in the cross-section. If growth is involved, our analysis predicts that ROE should predict returns negatively conditional upon E/P.

To investigate, Table 10 reports on regressions of returns on ROE, B/P, and E/P in alternative combinations. In both the decile rank regressions (Panel A) and standard OLS regressions (Panel B), ROE by itself is either not significantly associated with returns or negatively so, consistent with findings in Table 3. When adding B/P (or log B/P, as in many of the papers), ROE becomes significant with a positive association with returns (as does B/P), consistent with the two recovering E/P. However, dropping B/P and adding E/P, the mean coefficient on ROE is now negative, consistent with our analysis. With both E/P and B/P in the regression, ROE no longer has explanatory power, but E/P and B/P do. Of course, these regressions do not incorporate modified book return metrics that have been in investigated (in Novy-Marx, 2012, Ball, Linnainmaa, and Nikolaev, 2015, and Ball, Gerakos, Linnainmaa, and Nikolaev, 2015). It remains an intriguing question whether these metrics (which exclude R&D and other accruals) enhance the return prediction because that indicate growth.

Fama and French (2006 and 2015) motivate the addition of ROE as a risk characteristic by appealing to an equation that applies the clean-surplus relation (CSR) to substitute earnings and book values for dividends in the dividend discount model:

$$\frac{P_0}{B_0} = \frac{\sum_{\tau=1}^{\infty} E(Earnings_\tau - (B_\tau - B_{\tau-1})/(1+r)^\tau}{B_0},$$

where *r* is the expected return, a constant. They refer to the term, $\frac{\sum_{\tau=1}^{\infty} E(Earnings_\tau)}{B_0}$, as profitability (the book rate of return), with current ROE the indicator, and the change in book value, $\frac{B_\tau - B_{\tau-1}}{B_0}$, as growth in investment. Reverse-engineering the expression, they conclude,

among other things, that *r* is increasing in the expected book rate of return holding B/P and expected investment growth constant, and decreasing in expected investment growth holding B/P and expected book rate of return constant. These comparative statics motivate the five-factor model in Fama and French (2015).

However, the comparative statics are inconsistent with how accounting works. Our discussion of the no-growth case above demonstrates that, for a given firm, one cannot vary the book rate of return holding B/P constant; given earnings, the two are the mirror image of each that reflects the accounting for book value. Thus, for a given price and given expected earnings, book rate of return and B/P vary inversely; high book rate of return means low B/P, *ceteris paribus*, by construction of the accounting. And earnings are held constant in the comparative statics: it is $\frac{B_\tau - B_{\tau-1}}{B_0}$ that is held constant, but $B_\tau - B_{\tau\text{-}1} = Earnings_\tau + d_\tau$ by the assumed CSR so, and dividends are not relevant to price under P1, growth in book value is determined by earnings. The analysis does introduce growth, in the form of "investment growth" said to be $\frac{B_\tau - B_{\tau-1}}{B_0}$, but there is a mislabeling that voids the interpretation: Again, growth in book value in the formula is cum-dividend earnings, not investment. Thus, profitability based on these earnings cannot be held constant while looking at the effect of growth in book value on *r*. If investment is to be introduced, our analysis shows that the accounting for investment and thus ΔNOA is important in relating ROE to expected returns.

The Fama and French comparative statics appear to support the view, standard in asset pricing, that expected returns are negatively related to growth. The definition of "growth" may vary, but our analysis suggests that the expected return may be positively related to expected

earnings growth. The Fama and French formulation, with book rate of return defined as $\frac{\sum_{\tau=1}^{\infty} E(Earnings_{\tau})}{B_0}$, does not admit period-to-period growth; the earnings expectation relative to current book value is for life-long earnings, with no allocation to periods. In contrast, our analysis focuses on the allocation of earnings to the short-term versus the long-term under accounting that introduces expected earnings growth.

8. Conclusion

Investment is risky. Conservative accounting recognizes the risk, deferring earnings recognition until the uncertainty has been resolved and expensing investment when it is particularly risky. The effect is to produce lower earnings and a lower book rate of return with growing investment, but a higher book return when earnings from risky investment are realized. Accordingly, book rate of return conveys information about risk. The empirical analysis documents that this is the case; lower book rates of return affected by conservative accounting are associated with more uncertain earnings outcomes and earnings that are more sensitive to shocks to aggregate (market-wide) earnings. They are also associated with higher average stock returns, so the risk appears to be priced risk. And these are returns that are not captured by standard asset pricing models.

The findings provide no support for the conjecture, typical in asset pricing research, that book rates of return are positively related to risk and return. The paper does, however, provide an explanation of the positive association between book return and stock returns in many asset pricing papers. Those papers also include book-to-price (B/P) as a predictor and, conditional on B/P, the book rate of return captures the earnings yield that indicates risk and the expected return, and precisely so when there is no expected earnings growth. However, the recognition of

growth connected to conservative accounting introduces information about risk that predicts that ROE, rather than positively related to risk and return, is negatively related. The empirical analysis confirms.

The paper also has implications for those who would correct the book rate of return for the effects of conservative accounting to obtain a superior measure of profitability. Those corrections are based on the presumption that conservative accounting is noise to be removed in evaluating profitability. That might be warranted when one is attempting to assess the profitability of a past investment ex post, but investors buy going concerns where firms continually invest to generate earnings. So, the primary concern is with the risk of investments currently being made, going forward. This paper indicates that conservative accounting supplies information to this investor: Beware of a low book rate of return, for that may convey risk; that return may indicate that the firm is potentially very profitable, but that is uncertain. Adjustments to book rate of return for performance evaluation ignore the fact that managers make on-going investments that impose risk on the shareholder.

There is a final qualification. The returns documented in the paper have been interpreted as compensation for risk, a standard presumption in asset pricing research. There is no necessity, of course, for the returns could also be abnormal returns due to mispricing of the information in book rate of return. Indeed, the perceptive reader will recognize that an earlier paper of ours, Penman and Zhang (2002), also documented returns associated with conservative accounting and there we chose, perhaps cavalierly, to attribute the returns to investors not understanding the effects of conservative accounting. In the absence of a generally accepted asset pricing model to benchmark required returns, the attribution to efficient markets versus inefficient markets cannot be sorted out. However, the association of conservative accounting with risk via an accounting

principle for recognizing earnings under uncertainty gives credence to interpreting the returns as connected to risk. The empirical association of conservative accounting with risky earning outcomes in this paper lends further support. However, the aim of the paper is not to sort out rational versus rational pricing but to raise the prospect that conservative accounting ties to risk and, if so, that bears on the interpretation of the book rate of return. The results are consistent with this view of accounting.

APPENDIX
Calculation of Variables

Dependent Variable	
Return	One-year, buy-and-hold return calculated from CRSP monthly returns, starting at the beginning of the fourth month after the current fiscal year end. For firms that are delisted during the 12 months, the return for the remaining months is calculated 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. Results are qualitatively similar if we make no such adjustment. Final accounting data for a fiscal year are presumed to have been published during the three months after fiscal-year end (and before the beginning of the return period).
Earnings	Earnings before extraordinary items (Compustat item IB) and special items (item SPI), minus preferred dividends (item DVP), with a tax allocation to special items at the prevailing federal statutory corporate income tax rate for the year.
B	Book value of common equity at the end of the fiscal-year. Book value is Compustat common equity (item CEQ) plus any preferred treasury stock (item TSTKP) less any preferred dividends in arrears (item DVPA).
P	Market value of equity three months after fiscal-year end. It is calculated as the number of shares outstanding at the end of the fiscal year from Compustat multiplied by the price per share from CRSP at three months after fiscal-year end, adjusted for any intervening stock splits and stock dividends. This excludes any change in the market price from net share issues over the three months. Market price can also be calculated as per-share price at three months after fiscal-year end, adjusted for stock splits and stock dividends over the three months. E/P is based on this price. For this calculation, earnings are on a per-share basis.
Beta	Estimated from monthly returns up to 60 months up to the third month after fiscal-year end by regressing returns on the value-weighted CRSP market index.
OI	Operating income before extraordinary items (Compustat item IB) and special items (item SPI), with a tax allocation to special items at the prevailing federal statutory corporate income tax rate for the year. Calculated as Earnings + NFE. OI is the numerator of RNOA.
NFE	Net financial expense for the fiscal-year, calculated as after-tax interest expense (XINT × (1- marginal tax rate)) plus preferred dividends (item DVP) and minus after-tax interest income (item IDIT × (1- marginal tax rate)).
NFO	Net financial obligations at the end of the fiscal year, the difference between financial obligations and financial assets, as in Nissim and Penman (2001)
NOA	Net operating assets at the end of the fiscal year, measured as net financial obligations plus book value of common equity plus minority interest (item MI).
C-score	Estimated reserves from conservative accounting at the end of the fiscal year, as described in the text.
ΔC	The change in estimated reserves during the fiscal year.

REFERENCES

Amir, E., Y. Guan, and G. Livne. 2007. The relative association of R&D and capital expenditures with subsequent earnings variability. *Journal of Business Finance and Accounting* 34, 222-246.

Ball, R., J. Gerakos, J. Linnainmaa, and V. Nikolaev. 2015. Accruals, cash flows, and operating profitability in the cross section of stock returns. The University of Chicago Booth School of Business, Working Paper No. 15-12.

Ball, R., J. Linnainmaa, and V. Nikolaev. 2015. Deflating Profitability. *Journal of Financial Economics* 117, 225-248.

Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24, 3-37.

Beaver, W. and S. Ryan. 2000. Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research* 38, 127-148.

Bowman, E. 1980. A risk/return paradox for strategic management. *Sloan Management Review* 21, 17-31.

Brick, I., O. Palmon, and I. Venezia. 2015. On the relationship between accounting risk and return: Is there a (Bowman) paradox? *European Management Review* 12, 99-111.

Brief, R. and R. Lawson. 1992. The role of the accounting rate of return in financial statement analysis. *The Accounting Review* 67, 411-426.

Bublitz, B. and M. Ettredge. 1989. The information in discretionary outlays: Advertising, research, and development. *The Accounting Review* 64, 108-124.

Chambers, D., R. Jennings, R.B. Thompson II. 2002. Excess returns to R&D-intensive firms. *Review of Accounting Studies* 7, 133-158.

Chan, L.K.C., J. Lakonishok, and T. Sougiannis. 2001. The stock market valuation of research and development expenditures. *Journal of Finance* 56, 2431-2457.

Chattopadyhay, A., M. Lyle, and C. Wang. 2015. Accounting Data, Market Values, and the Cross Section of Expected Returns Worldwide. Unpublished paper, Harvard University and Northwestern University.

Chen, L., and L. Zhang. 2010. A better three-factor model that explains more anomalies. *Journal of Finance* 65, 563-594.

Daniel, K., and S. Titman. 1997. Evidence on the characteristics of cross sectional variation in stock returns. *Journal of Finance* 52, 1-33.

Danielson, M. and E. Press. 2003. Accounting returns revisited: evidence of their usefulness in estimating economic returns. *Review of Accounting Studies* 8, 493-530.

Donelson, D. and R. Resutek. 2012. The effect of R&D on future returns and earnings forecasts. *Review of Accounting Studies* 17, 848-876.

Dutta, S. and S. Reichelstein. 2005. Accrual accounting for performance evaluation. *Review of Accounting Studies* 10, 527-552.

Eberhart, A.C., W.F. Maxwell, A.R. Siddique. 2004. An examination of long-term excess stock returns and operating performance following R&D increases. *Journal of Finance* 59, 623-651.

Fama, E. 1970. Efficient capital markets: A review of theory and empirical work. *Journal of Finance* 25, 383-417.

Fama, E., and K. French. 1992. The cross-section of expected stock returns. *Journal of Finance* 47, 427-465.

Fama, E., and K. French. 1993. Common risk factors in the returns of stocks and bonds. *Journal of Financial Economics* 33, 3-56.

Fama, E. and K. French. 2006. Profitability, investment and average returns. *Journal of Financial Economics* 82, 491-518.

Fama, E., and K. French. 2015. A Five-Factor Asset Pricing Model. *Journal of Financial Economics* 116, 1-22.

Feltham, G. and J. Ohlson. 1995. Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research* 11, 689-731.
Financial Accounting Standards Board (FASB). 1975. *Statement of Concepts No.2: Qualitative Characteristics of Accounting Information.* Stamford, CT: FASB.

Fisher, F. and J. McGowan. 1983. On the misuse of accounting rates of return to infer monopoly profits. *American Economic Review* 73, 82-97.

Greenball, M. 1969. Appraising alternative methods of accounting for accelerated tax depreciation: a relative-accuracy approach. *Journal of Accounting Research* 7, 262-289.

Hall, B. 1993. Industrial research during the 1980s: Did the rate of return fall? *Brookings Papers on Economic Activity, Microeconomics*, 289-344.

Hou, K., C. Xue, and L. Zhang. 2015. Digesting anomalies: An investment approach. *Review of Financial Studies*, 28, 650-705.

Johansson, S., and L. Östman.1995. *Accounting Theory: Integrating Behavior and Measurement*. London: Pitman Publishing.

Khan, M., and R. Watts. 2009. Estimation and empirical properties of a firm-year measure of accounting conservatism. *Journal of Accounting and Economics* 48, 132-150.

Kothari, S., T. Laguerre, and A. Leone. 2002. Capitalizing versus expensing: Evidence on the uncertainty of future earnings from capital expenditures versus R&D outlays. *Review of Accounting Studies* 7, 355-382.

Lev, B., and T. Sougiannis. 1996. The capitalization, amortization and value-relevance of R&D. *Journal of Accounting and Economics* 21, 107-138.

Lev, B., B. Sarath, and T. Sougiannis. 2005. R&D reporting biases and their consequences. *Contemporary Accounting Research* 22, 977-1026.

Liu, J., J. Ohlson, and W. Zhang. 2013. A comparison of Chinese and US firms' profitability. Unpublished paper, Cheung Kong Graduate School of Business and New York University.

Livingstone, J. and G. Salamon. 1970. Relationship between the accounting and the internal rate of return measures: a synthesis and an analysis. *Journal of Accounting Research* 2, 199-216.

Lyle, M. and C. Wang. 2015. The Cross Section of Expected Holding Period Returns and their Dynamics: A Present Value Approach. *Journal of Financial Economics* 116, 505-525.

McNichols, M., Rajan, M., and S. Reichelstein. 2014. Conservatism correction for the market-to-book ratio and Tobin's *q*. *Review of Accounting Studies* 19, 1393-1435.

Miller, M., and F. Modigilani. 1961. Dividend policy, growth and the valuation of shares. *Journal of Business*, 34 (October), 411-433.

Modigliani F., and M. Miller. 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review* 48, 261-297.

Monahan, S. 2005. Conservatism, growth, and the role of accounting numbers in the fundamental analysis process. *Review of Accounting Studies* 10, 227-260.

Nissim, D. and S. Penman. 2001. Ratio analysis and equity valuation: from research to practice. *Review of Accounting Studies* 6, 109-154.

Nissim, D., and S. Penman. 2003. Financial statement analysis of leverage and how it informs about profitability and price-to-book ratios. *Review of Accounting Studies* 8, 531-560.

Novy-Marx, R. 2012. The other side of value: The gross profitability premium. *Journal of Financial Economics* 108, 1-28.

Ohlson, J. 2008. Risk, growth, and permanent earnings. Unpublished paper, New York University, Stern School of Business.

Penman, S. 1991. An evaluation of accounting rate-of-return. *Journal of Accounting, Auditing and Finance* (Spring), 233-255.

Penman, S. 2012. *Accounting for Value*. New York: Columbia University Press.

Penman, S. 2013. *Financial Statement Analysis and Security Valuation*, 5th ed. New York: McGraw-Hill/Irwin.

Penman, S, F. Reggiani, S. Richardson, and İ. Tuna. 2015. An accounting-based characteristic model for asset pricing. Unpublished paper, Columbia University, Bocconi University, and London Business School.

Penman, S. and X. Zhang. 2002. Accounting conservatism, the quality of earnings, and stock returns. *The Accounting Review* 77, 237-264.

Rajan, M. and S. Reichelstein. 2009. Depreciation rules and the relation between marginal and historical cost. *Journal of Accounting Research* 47, 823-865.

Rajan, M., S. Reichelstein, and M. Soliman. 2007. Conservatism, growth, and return on investment. *Review of Accounting Studies* 12, 325-370.

Rogerson, W. 1997. Intertemporal cost allocation and managerial investment incentives: a theory explaining the use of economic value added as a performance measure. *Journal of Political Economy* 105, 770-795.

Rogerson, W. 2008. Intertemporal cost allocation and investment decisions. *Journal of Political Economy* 116, 931-950.

Shroff, P. 1995. Determinants of the returns-earnings correlation. *Contemporary Accounting Research* 12, 41-55.

Shumway, T. 1997. The delisting bias in CRSP data. *Journal of Finance* 52, 327-340.

Stewart, G. 1990. *The quest for Value: A Guide for Senior Managers*. New York: HarperCollins Publishers.

Vuolteenaho, T. 2002. What drives firm-level stock returns? *Journal of Finance* 57, 233-264.

Watts, R. 2003. Conservatism in accounting, Part I: explanations and implications. *Accounting Horizons* 17, 207-221.

Zhang, X. 2000. Conservative accounting and equity valuation. *Journal of Accounting and Economics* 29, 125-149.

Table 1

Distribution of Variables

This table summarizes the average of annual cross-sectional distributions from 1963 to 2012. For the calculation of means and standard deviations, all variables are trimmed at the top and bottom two percent, each year, except for returns. There is a maximum of 156,646 firm-years observations, though less for some variables.

Variable	*Mean*	*Median*	*St. Dev.*	*Q1*	*Q3*
Return	0.176	0.073	0.653	-0.184	0.373
Beta	1.220	1.151	0.619	0.763	1.629
E/P	0.009	0.056	0.163	-0.011	0.091
ROE	0.046	0.097	0.245	-0.020	0.179
RNOA	0.034	0.094	0.362	0.004	0.172
NFO/P	0.347	0.132	0.719	-0.070	0.546
C-score	0.279	0.082	0.615	-0.006	0.328
ΔC-score	0.017	0.004	0.239	-0.068	0.086

Accounting data are from Compustat and returns and price data are from CRSP. Financial and utility firms are excluded. The appendix describes the calculation of the variables.

Return is the one-year, buy-and-hold return from the beginning of the fourth month after the current fiscal year end.

Beta is estimated from monthly returns over a 60-month period up to the third month after the end of the current fiscal year.

E/P is the (levered) earnings-to-price ratio reported for the fiscal year, calculated as earnings divided by the market price at the end of the third month after the fiscal year end.

ROE is the (levered) book rate of return, earnings divided by book value of common equity at the beginning of the fiscal-year.

RNOA is unlevered (enterprise) book rate of return, calculated as enterprise earnings (OI) divided by net operating assets (NOA) at the beginning of the fiscal year.

NFO/P is market leverage at the end of fiscal-year *t*, with the market value of net financial obligations approximated by its book value, NFO.

C-score is the estimated amount of reserve due to conservative accounting relative to net operating assets; ΔC is the change in C-score during the fiscal year.

Table 2

Average Pearson and Spearman Correlations Between Variables

This table reports averages of annual correlation coefficients across the sample years, 1963-2012. Pearson correlations are presented in the upper off-diagonal and Spearman correlations in the lower off-diagonal. For the Pearson correlations, all variables are trimmed at the top and bottom two percent, except for returns. Variables are defined in the notes to Table 1.

	Return	***Beta***	***E/P***	***ROE***	***RNOA***	***NFO/P***	***C-score***	***ΔC***
Return		-0.033	0.031	0.036	0.031	0.013	0.016	0.022
Beta	-0.059		-0.105	-0.056	-0.066	-0.020	0.068	0.019
E/P	0.135	-0.141		0.558	0.398	-0.101	-0.107	-0.088
ROE	0.083	-0.040	0.620		0.730	-0.159	-0.125	-0.088
RNOA	0.074	-0.045	0.577	0.910		-0.154	-0.159	-0.092
NFO/P	0.000	-0.034	0.043	-0.139	-0.294		-0.222	-0.028
C-score	0.022	0.063	-0.096	-0.052	0.005	-0.339		0.332
ΔC	0.024	0.014	-0.077	-0.085	-0.104	-0.040	0.316	

Table 3

Characteristics of Portfolios Formed by Ranking on ROE and RNOA

This table reports characteristics of portfolios formed by ranking on ROE and RNOA. Values reported are the average of the portfolio medians, over the sample years, 1963-2012, except for return which is the mean of the portfolio mean returns. With the exception of the ranking variable, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively from a comparison of means with their standard error estimated from the time series on means. Variables are defined in the note to Table 1.

Panel A: Portfolios Formed by Ranking on ROE

Portfolios	*Return*	*ROE*	*RNOA*	*Beta*	*NFO/P*	*E/P*	*C-score*	*ΔC-score*
LOW	0.151	-0.436	-0.367	1.393	0.306	-0.170	0.305	0.044
2	0.203	-0.129	-0.120	1.328	0.254	-0.099	0.162	0.028
3	0.197	-0.012	-0.002	1.248	0.236	-0.003	0.089	0.011
4	0.197	0.045	0.052	1.166	0.225	0.045	0.066	0.005
5	0.191	0.081	0.082	1.155	0.192	0.067	0.061	0.004
6	0.173	0.112	0.107	1.127	0.160	0.078	0.064	0.003
7	0.167	0.141	0.131	1.131	0.130	0.080	0.066	0.002
8	0.175	0.175	0.162	1.152	0.089	0.079	0.070	-0.000
9	0.166	0.222	0.206	1.198	0.057	0.075	0.084	-0.001
HIGH	0.168	0.329	0.283	1.274	0.028	0.071	0.105	-0.004
HIGH-LOW	0.017	0.765***	0.650***	-0.119**	-0.278***	0.242***	-0.200***	-0.048***

Panel B: Portfolios Formed by Ranking on RNOA

Portfolios	*Return*	*ROE*	*RNOA*	*Beta*	*NFO/P*	*E/P*	*C-score*	*ΔC-score*
LOW	0.174	-0.296	-0.539	1.414	0.224	-0.131	0.556	0.070
2	0.183	-0.114	-0.097	1.319	0.368	-0.082	0.143	0.035
3	0.191	-0.005	0.011	1.213	0.423	0.001	0.054	0.010
4	0.200	0.052	0.055	1.154	0.414	0.049	0.039	0.007
5	0.183	0.088	0.082	1.133	0.373	0.071	0.037	0.004
6	0.184	0.119	0.105	1.128	0.283	0.079	0.045	0.003
7	0.173	0.148	0.132	1.139	0.177	0.082	0.060	0.002
8	0.179	0.176	0.167	1.145	0.078	0.079	0.078	0.001
9	0.152	0.210	0.226	1.191	0.000	0.074	0.104	-0.003
HIGH	0.164	0.262	0.388	1.277	-0.073	0.065	0.205	-0.015
HIGH-LOW	-0.011	0.558***	0.927***	-0.138***	-0.296***	0.198***	-0.351***	-0.085***

Table 4

Mean Returns for Portfolios Formed by Ranking on ΔC

Panel A reports mean returns earned on portfolios formed by ranking on ΔC each year, 1963-2012. Panel B reports mean return for portfolios formed by ranking on ΔC each year within each RNOA decile portfolio. Panel C reports mean return for portfolios formed by ranking on ΔC each year within C-score decile portfolios. The flags, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, based on t-statistics calculated as the mean return divided by a standard error estimated from the time series of means.

Panel A: Returns for Portfolios Formed by Ranking on ΔC-score, in Percent

	ΔC Decile Portfolios										
	LOW	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*HIGH*	*HIGH-LOW*
Return	14.21	15.87	15.40	16.98	15.34	16.97	17.96	18.51	20.48	22.27	8.06***

Panel B: Returns for Portfolios Formed by Ranking on ΔC-score within each RNOA Decile, in Percent

		RNOA Decile Portfolios									
		LOW	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*HIGH*
ΔC Portfolios	LOW	11.10	14.11	17.17	19.54	15.61	17.16	16.81	16.65	12.07	14.63
	MEDIUM	8.93	16.96	18.39	17.81	17.61	17.58	16.18	17.55	15.75	15.05
	HIGH	22.57	22.80	21.38	23.13	21.53	20.26	19.18	18.95	18.38	17.57
	HIGH-LOW	11.47***	8.70***	4.21***	3.60**	5.91***	3.12**	2.36*	2.30	6.31***	2.94**

Panel C: Returns for Portfolios Formed by Ranking on ΔC-score within C-score Decile Portfolio, in Percent

			C-score Decile Portfolios									
		ALL	*LOW*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*HIGH*
ΔC Portfolios	LOW	15.87	12.14	15.51	16.65	15.36	15.12	15.84	15.61	16.27	16.89	19.67
	MEDIUM	17.52	13.78	14.13	14.36	15.20	17.14	16.68	18.47	19.51	20.83	23.72
	HIGH	18.92	14.62	16.17	16.98	15.54	18.10	18.16	19.52	20.22	21.51	25.04
	HIGH-LOW	3.05***	2.48	0.66	0.32	0.18	2.97**	2.32*	3.91**	3.95***	4.62***	5.37***

Table 5

Mean Returns and ΔC for Portfolios Formed by Ranking on ROE within E/P Portfolios

Panel A reports mean returns for portfolios formed each year, 1963-2012, by ranking on ROE within E/P portfolios. E/P quintile portfolios are formed from firms with positive earnings, with firms with negative earnings assigned to their own portfolio. Panel B reports mean ΔC for each portfolio. In Panel C, ROE portfolios are formed in the same way as in Panel A, but ROE portfolios 1 and 2 within each E/P portfolio consist only of those with ΔC in the highest 40 percent of ΔC from a ranking on ΔC within the E/P portfolio, while portfolios 4 and 5 consist only of firms with the lowest 40 percent of ΔC from that ranking. The flags, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, based on t-statistics calculated as the mean divided by a standard error estimated from the time series of means.

Panel A: Returns for Portfolios Formed by Ranking on ROE within each E/P Portfolio, in Percent

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		18.47	13.74	14.72	16.64	19.29	23.81	10.06***
ROE Quintile	LOW	10.08	19.48	20.73	22.05	23.31	25.73	
	2	17.40	16.19	15.00	15.80	18.88	24.89	
	3	20.27	13.65	12.19	15.08	18.36	23.20	
	4	24.42	9.31	12.15	15.25	17.16	23.42	
	HIGH	18.80	10.14	13.73	15.18	18.76	21.81	
HIGH-LOW		8.72**	-9.34***	-7.01***	-6.87***	-4.54**	-3.93**	

Panel B: ΔC for Portfolios Formed by Ranking on ROE within each E/P Portfolio

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		2.23	0.13	0.32	0.10	0.13	-0.10	-0.23**
ROE Quintile	LOW	4.71	0.33	0.44	0.31	0.48	0.24	
	2	5.89	0.22	0.84	0.35	0.11	-0.12	
	3	2.64	0.36	0.62	0.06	0.32	-0.04	
	4	1.95	0.05	0.34	0.05	-0.35	-0.09	
	HIGH	1.14	-0.62	-0.68	-0.41	-0.26	-0.88	
HIGH-LOW		-3.57***	-0.95**	-1.12***	-0.73***	-0.74***	-1.11***	

Panel C: Returns for Portfolios Formed by Ranking on ROE and ΔC within each E/P Portfolio, in Percent

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		18.47	13.74	14.72	16.64	19.29	23.81	10.06***
ROE Quintile	LOW	11.65	20.74	23.04	23.54	26.26	28.67	
	2	17.53	19.25	18.19	17.08	20.28	26.02	
	3	20.27	13.65	12.19	15.08	18.36	23.20	
	4	17.36	7.63	11.95	12.99	14.73	23.62	
	HIGH	17.32	6.50	12.63	13.16	16.26	18.50	
HIGH-LOW		5.67	-14.24***	-10.41***	-10.37***	-10.00***	-10.17***	

Table 6

Average Standard Deviation and Interdecile Range (IDR) of Realized Earnings-to-Price One Year Ahead for Portfolios formed by Ranking on ROE within Each E/P Portfolio

The reported numbers are means over years of within portfolio measures each year. The flags, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, based on t-statistics calculated as the mean divided by a standard error estimated from the time series of means.

Panel A: Mean Standard Deviation of $Earnings_1/P_0$ for Portfolios Formed by Ranking on ROE within each E/P Portfolio

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.16	0.08	0.07	0.06	0.07	0.09	0.01***
ROE Quintile	LOW	0.17	0.12	0.11	0.09	0.10	0.12	
	2	0.18	0.09	0.07	0.06	0.06	0.09	
	3	0.18	0.07	0.05	0.04	0.05	0.08	
	4	0.16	0.05	0.04	0.03	0.04	0.08	
	HIGH	0.15	0.04	0.04	0.04	0.05	0.08	
HIGH-LOW		-0.02***	-0.09***	-0.07***	-0.05***	-0.05***	-0.04***	

Panel B: Mean Interdecile Range (IDR) of Earnings$_1$/P$_0$ for Portfolios Formed by Ranking on ROE within each E/P Portfolio

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.40	0.14	0.10	0.09	0.11	0.18	0.04***
ROE Quintile	LOW	0.41	0.27	0.22	0.19	0.19	0.27	
	2	0.44	0.19	0.11	0.10	0.11	0.17	
	3	0.44	0.13	0.07	0.07	0.09	0.15	
	4	0.37	0.08	0.05	0.06	0.08	0.15	
	HIGH	0.33	0.06	0.06	0.07	0.09	0.17	
HIGH-LOW		-0.08***	-0.21***	-0.17***	-0.12***	-0.10***	-0.10***	

Table 7

Average Earnings Growth Rates Two Years Ahead and Variation in Growth Rates for Portfolios Formed By Ranking Firms on ROE within Each E/P Portfolio

Mean growth rates in Panel A are the mean over years of the median portfolio growth rate each year. The volatility measures in Panels B and C are the mean over years of the within-portfolio numbers each year. Earnings growth rates are calculated as $\frac{Earnings_{t+2} - Earnings_{t+1}}{(|Earnings_{t+2}| + |Earnings_{t+1}|)/2}$. This measure accommodates small and negative denominators, and ranges between 2 and -2. The flags, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, based on t-statistics calculated as the mean divided by a standard error estimated from the time series of means.

Panel A: Mean Earnings Growth Rates Two Years Ahead

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.20	0.19	0.14	0.11	0.09	0.06	-0.13***
ROE Quintile	LOW	0.17	0.27	0.20	0.17	0.14	0.10	
	2	0.25	0.29	0.17	0.13	0.09	0.08	
	3	0.19	0.21	0.14	0.10	0.09	0.06	
	4	0.24	0.17	0.13	0.10	0.08	0.04	
	HIGH	0.27	0.17	0.12	0.09	0.08	0.03	
HIGH-LOW		0.10**	-0.10***	-0.08***	-0.08***	-0.06***	-0.07***	

Panel B: Mean Standard Deviation of Earnings Growth Rates Two Years Ahead

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.86	0.70	0.54	0.50	0.51	0.58	-0.11***
ROE Quintile	LOW	0.78	0.87	0.69	0.66	0.63	0.67	
	2	0.82	0.77	0.60	0.53	0.52	0.57	
	3	0.86	0.69	0.50	0.42	0.47	0.52	
	4	0.90	0.62	0.42	0.41	0.43	0.55	
	HIGH	0.94	0.51	0.45	0.44	0.48	0.56	
HIGH-LOW		0.16***	-0.36***	-0.25***	-0.22***	-0.15***	-0.11***	

Panel C: Mean Interdecile Range of Earnings Growth Rates Two Years Ahead

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		2.29	1.78	1.19	1.07	1.12	1.33	-0.44***
ROE Quintile	LOW	1.96	2.27	1.79	1.59	1.56	1.67	
	2	2.13	2.03	1.41	1.17	1.21	1.30	
	3	2.26	1.76	1.10	0.88	1.02	1.21	
	4	2.32	1.50	0.85	0.82	0.91	1.21	
	HIGH	2.41	1.16	0.93	0.94	1.06	1.31	
HIGH-LOW		0.45***	-1.11***	-0.86***	-0.65***	-0.50***	-0.36***	

Table 8

Earnings Betas and Up-market and Down-market Earnings Betas for Portfolios formed by Ranking on ROE within Each E/P Portfolio

The earnings betas are slope coefficients from estimating the following time-series regression of portfolio earnings on market-wide earnings:

$$\text{Portfolio}\frac{Earnings_1}{P_0}(t) = \alpha + \beta \cdot \text{Market}\frac{Earnings_1}{P_0}(t) + \varepsilon_t$$

Portfolio earnings yield is the mean for the portfolio. The market earnings yield is aggregate earnings for stocks in the sample for the relevant year relative to aggregate price. Only firms with fiscal years ending December 31 are included. The flags, ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, based on a t-statistic on differences in β coefficients from regressions for high and low portfolios estimated in time series as a simultaneous system. Up-market years are those when market earnings were higher than the previous year and down-market years are those when market earnings are less than the prior year.

Panel A: Unconditional Earnings Betas

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.41	0.62	0.63	0.92	1.07	1.17	0.55***
ROE Quintile	LOW	0.78	0.83	1.07	1.08	1.29	1.39	
	2	1.06	0.81	0.64	0.98	1.19	1.16	
	3	0.37	0.64	0.60	0.92	1.15	0.94	
	4	0.42	0.45	0.56	0.78	0.91	1.20	
	HIGH	0.15	0.51	0.63	0.78	0.93	1.32	
HIGH-LOW		-0.63**	-0.32**	-0.43***	-0.29**	-0.36***	-0.07	

Panel B: Up-market Earnings Betas

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.48	0.63	0.59	0.89	1.11	1.09	0.46***
ROE Quintile	LOW	0.91	0.86	1.10	1.08	1.21	1.19	
	2	1.15	0.81	0.51	0.97	1.11	1.15	
	3	0.48	0.67	0.55	0.86	1.20	0.88	
	4	0.43	0.45	0.52	0.67	0.97	1.00	
	HIGH	0.31	0.48	0.63	0.74	0.95	1.25	
HIGH-LOW		-0.60**	-0.38**	-0.47***	-0.34**	-0.26**	0.06	

Panel C: Down-market Earnings Betas

		Negative E/P	*Positive E/P Quintile*					
			LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
		0.30	0.60	0.69	0.97	0.99	1.29	0.69***
ROE Quintile	LOW	0.56	0.77	1.00	1.06	1.43	1.77	
	2	0.92	0.81	0.85	0.99	1.32	1.17	
	3	0.21	0.57	0.68	1.01	1.07	1.02	
	4	0.40	0.46	0.61	0.98	0.77	1.54	
	HIGH	-0.11	0.58	0.64	0.86	0.88	1.43	
HIGH-LOW		-0.67**	-0.19*	-0.36**	-0.21	-0.55**	-0.34*	

Table 9

Regressions of Monthly Portfolio Excess Returns for ROE Quintile Portfolios on Contemporaneous Fama-French and Momentum Factor Returns

In Panel A, ROE portfolios are formed each year by grouping all stocks in a given ROE quintile (with positive E/P) in Panel A of Table 5 into one portfolio, yielding five ROE portfolios. In Panel B, ROE portfolios 1 and 2 within each E/P portfolio consist only of those with ΔC in the highest 40 percent of ΔC from a ranking on ΔC within the E/P portfolio, while portfolios 4 and 5 consist only of firms with the lowest 40 percent of ΔC from that ranking. To align returns in calendar time, only firm with December fiscal-year ends are included. α, and β_{MKT} , β_{HML} , β_{SMB} , β_{UMD} are the estimated intercept and slope coefficients from time-series regressions of portfolio excess returns on the market premium, book-to-market, size, and momentum factor returns. The flags, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Returns for so-called MKT, HML, SMB, and UMD factors are from Kenneth French's web site at the Tuck School at Dartmouth.

Panel A: Results for ROE Quintile Portfolios Formed by Ranking on ROE within Each E/P Portfolio

	ROE Quintiles					
	LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
α (%)	0.350***	0.126	0.062	0.069	-0.011	-0.361***
β_{MKT}	1.016***	0.968***	0.994***	0.994***	1.063***	0.048**
β_{HML}	0.318***	0.178***	-0.002	-0.111***	-0.223***	-0.541***
β_{SMB}	0.070**	-0.038	-0.159***	-0.215***	-0.205***	-0.275***
β_{UMD}	-0.019	0.043***	0.046***	0.045***	0.038**	0.058***
N	597	597	597	597	597	597
Adj. R^2	0.943	0.926	0.918	0.915	0.915	0.395

Panel B: Results for Portfolios Formed by Ranking on ROE and ΔC within Each E/P Portfolio

	ROE Quintiles					
	LOW	*2*	*3*	*4*	*HIGH*	*HIGH-LOW*
α (%)	0.473***	0.221**	0.062	0.065	-0.176*	-0.641***
β_{MKT}	1.018***	0.948***	0.994***	1.007***	1.062***	0.043*
β_{HML}	0.350***	0.169***	-0.002	-0.087***	-0.245***	-0.597***
β_{SMB}	0.074**	0.014	-0.159***	-0.163***	-0.186***	-0.259***
β_{UMD}	0.009	0.061***	0.046***	0.034*	0.019	0.010
N	597	597	597	597	597	597
Adj. R^2	0.901	0.881	0.918	0.893	0.881	0.274

Table 10

Mean Coefficients from Regressions of Forward Annual Stock Returns on ROE, B/P, and E/P

This table reports the average of regression coefficients estimated each year, 1963-2012. The flags, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, based on t-statistics calculated as the mean coefficient divided by the standard error estimated from the time series of coefficients. Panel A reports results from decile rank regressions, Panels B with independent variables are trimmed at the top and bottom 2%.

Panel A: Decile Rank Regressions

	Dependent Variable: R_{t+1}			
Intercept	0.21***	0.06	0.13***	0.09**
ROE	-0.01**	0.01**	-0.01***	-0.01*
B/P		0.02***		0.01**
E/P			0.02***	0.01***

Panel B: Trimmed Data

	Dependent Variable: R_{t+1}			
Intercept	0.18***	0.17***	0.13***	0.14***
ROE	-0.01	0.20**	-0.20***	0.07
LnB/P		0.07***		0.04**
E/P			0.95***	0.49***