The Differential Value Implications of the Profitability and Investment Components of Earnings

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Abstract

Firms may grow earnings either by improving the profitability of existing capital or by investing additional capital. This paper shows that, in the long run, earnings growth obtained through improvements in profitability is associated with a substantially larger price change than that due to additional investments. The valuation coefficients of the profitability and investment components of earnings differ by a factor of three, and this difference is observed consistently across industries. In the short run, however, investors overreact to earnings growth resulting from incremental capital investments and underreact to earnings growth due to improved profitability.

Keywords: earnings growth, profitability, investment, capital.

Data Availability: Data are available from sources identified in the paper.

I. INTRODUCTION

Earnings growth is a primary determinant of equity value.[1] Firms may deliver earnings growth either by improving the profitability of capital (i.e., the accounting rate of return on invested capital) or by increasing the capital base on which that profitability is earned. Economic theory suggests that earnings growth achieved through incremental capital investments is less valuable to existing shareholders than growth obtained by improving profitability. Unlike improvements in profitability, increases in capital generate an incremental cost of capital. This cost reduces economic income but is not fully reflected in reported earnings.[2] Therefore, earnings growth due to increases in capital overstates economic growth. This study investigates empirically whether earnings growth obtained through increases in capital is indeed associated with a smaller price change than growth obtained through improvements in profitability.

While accountants have long recognized that reported earnings do not reflect the cost of capital (e.g., research using the residual income framework), the pricing of earnings growth is affected by two additional factors which may offset or even reverse the cost of capital effect. First, due to accounting conservatism and the realization principle, investments typically reduce reported profitability in the near term. Thus, earnings growth from new investments understates growth in pre-cost of capital economic income. Second, extant research in accounting suggests that investors "fixate" on reported earnings and do not fully consider their source (e.g., accruals

[1] Examples of valuation models which incorporate earnings growth include variants of the Gordon (1962) model which use earnings growth as a proxy for dividend growth (e.g., Campbell and Shiller 2001, Lamont 1998, Arnott and Asness 2003, Fama and French 2002), PEG-type models (e.g., Ohlson and Juettner-Nauroth 2004, Easton 2004, Bradshaw 2004, Gode and Mohanram 2003), residual income-based Price/Book and Price/Earnings models (e.g., Fairfield 1994, Penman 1996, Claus and Thomas 2001), and empirical models that use earnings growth as an explanatory variable for P/E (e.g., Beaver and Morse 1978, Zarowin 1990, Lee 1988, Dhaliwal et al. 1999). In addition, the ERC literature effectively establishes a relationship between unexpected stock returns and unexpected earnings growth, since the only difference between unexpected earnings (the explanatory variable in ERC regressions) and unexpected earnings growth is the deflator.

[2] Operating income, which is the focus of our analysis, does not reflect the cost of debt or equity capital. Net income reflects the cost of debt but not the cost of equity capital.

versus cash flow). It is possible that a similar inefficiency applies to the pricing of earnings growth. That is, investors may not be aware of the differential value implications of growth from incremental investments versus growth from improved profitability.

Our primary focus in this study is on valuation implications. Specifically, we address the following questions: (1) in the long-run, how big is the differential pricing of the two sources of earnings growth? And (2) in the short run, are market prices efficient with respect to this information? Evidence on these issues has clear implications for investors and other users of financial information who use estimates of earnings growth in making investment and other value-related decisions.

To address the first question, we examine the relationship of long horizon stock returns with two earnings components: earnings generated by incremental capital investments (the investment component of earnings) and earnings derived from existing capital (the profitability components of earnings). Specifically, we regress cumulative stock returns over three and five years horizons on the two components of earnings, controlling for various firm characteristics which reflect market expectations regarding risk, profitability and growth. Consistent with economic intuition, we find that earnings growth due to increases in invested capital is valued much less than growth resulting from improved profitability. The valuation coefficients of the investment and profitability components of earnings differ by a factor of three, and this difference is highly significant and is observed consistently across industries. We also find that the coefficient on the investment component of earnings is positively related to the profitability of capital. This latter result suggests that, when pricing the investment component of earnings, investors consider the amount of additional capital required to generate these earnings: High (low) profitability implies that the capital investment and hence the additional cost of capital required to generate the earnings are relatively small (large), which in turn implies a relatively large (small) net value effect.

We then examine the timeliness of the market pricing of the investment and profitability components of earnings. We find that investors initially overreact to earnings growth resulting from incremental capital investments and underreact to growth resulting from improved profitability. The mispricing of earnings growth due to incremental capital investments is particularly large; a zero-investment strategy based on this information (low decile minus high decile) generates abnormal stock returns in the following year of about 9%. These returns are very persistent and largely orthogonal to the accruals and cash flow anomalies.

The paper proceeds as follows. In Section II, we describe the primary research question and develop the methodology. In Section III, we discuss descriptive statistics and present the results of the various analyses. We conclude in Section IV.

II. RESEARCH QUESTION AND METHODOLOGY

Research Question

Analysts frequently discuss earnings growth and how growth is expected to impact prices, but they often pay little attention to the incremental cost of capital required to generate that growth. Neo-classical economic theory, embodied in notions of residual income valuation (Ohlson 1995), emphasizes that earnings growth contributes to intrinsic equity value only to the extent that it exceeds the cost of required capital. More recently, the effect of incremental investments on the pricing of earnings growth, as measured by Price-Earnings-Growth (PEG) ratios, has been considered in Ohlson and Juettner-Nauroth (2004) and Easton (2004). When firms borrow, issue shares or reinvest earnings, they increase the amount of invested capital and hence increase the dollar cost of capital (i.e., invested capital times the discount rate). The earnings generated by the additional capital are included in operating income, but the cost of that capital is excluded. Accordingly, growth in operating income due to incremental capital investments overstates economic performance. In contrast, growth in operating income due to improvements in the profitability of capital does not give rise to any incremental cost of capital. (Hereafter, the terms earnings and operating income are used interchangeably; other earnings constructs will be referred to explicitly.)

Another way to demonstrate the differential value implications of earnings growth due to incremental capital investments versus improvements in profitability is to consider the effect on existing stockholders. New borrowing and stock issuance dilute the share of existing stockholders by creating new claims on the firm's cash flows. Reinvestment of earnings gives rise to an incremental opportunity cost for stockholders, who forgo the opportunity to generate income on these funds, had they been distributed. In contrast, improvements in profitability (without new investment) do not dilute the claim of existing stockholders and are not associated with an incremental opportunity cost. Thus, when firms increase their earnings by investing additional capital, the price change associated with these earnings should be smaller than that of earnings generated by improving the profitability of capital. This study investigates whether investors indeed price the two elements of earnings growth differently.

A related research question pertains to the differential valuation of growth in residual operating income versus growth in "required" operating income, where residual operating income is equal to operating income minus required operating income, and required operating income is measured as the product of beginning capital and the weighted-average cost of capital. We select to focus on a different decomposition of earnings (described more precisely below) for two reasons. First, estimates of the weighted-average cost of capital involve substantial measurement error. Second, and more importantly, residual income is particularly sensitive to the distorting effects of accounting conservatism. For example, firms typically have negative residual operating income during growth years and positive residual operating income subsequently. Our approach imposes less structure and effectively allows the estimated coefficients of the earnings components to reflect both the cost of capital and accounting conservatism effects. While the offsetting impact of accounting conservatism prevents us from being able to measure the pricing of the cost of capital, we are able to identify the information content of the investment-profitability earnings decomposition and test whether this information is priced efficiently in the short-term.

General Approach

To address our research question, we need to decompose earnings into profitability and investment components. This requires that we examine intervals covering at least two accounting periods, to allow for both a change in the capital base (first period) and earnings on the incremental capital (second period). We consider longer intervals (three and five years), for three reasons. First, for short intervals the profitability component of earnings swamps the investment component, reducing the power of the tests. Second, measurement errors in aggregate earnings are likely to become relatively less important for longer periods of aggregation (Easton et al. 1992). Third, pricing errors (i.e., market inefficiencies) are similarly likely to be less important for longer periods, as prices gravitate to fundamentals. Our research design thus involves regressions of long-horizons stock returns on contemporaneous values of the two earnings components and control variables.

Stock returns during a period consist of expected and unexpected components. The expected component of stock returns is determined at the beginning of the period by the risk-free interest rate, the market price of risk, and investors' perceptions of the firm's risk; it is generally unrelated to realized earnings during the period. The market reaction to realized earnings is instead captured by the unexpected component of stock returns. We therefore include in the regressions controls for expected returns: size, earnings-to-price, book-to-market and leverage, all measured at the beginning of the return period (see, e.g., Fama and French 1992). We also include a fixed industry-year effect (i.e., separate dummies for each industry in each year). This control is important for two reasons. First, it captures variation in time- and industry-specific determinants of expected returns (e.g., interest rates, sensitivity to business cycles). Second, and more importantly, it mitigates biases due to unexpected changes in the return/earnings relationship, such as those due to unexpected changes in interest rates, the industry's future prospects, or other factors which affect stock returns but are not necessarily reflected in contemporaneous earnings (or vice versa).

After considering these controls, the remaining variation in the dependent variable reflects unexpected stock returns. We are interested in the relationship between this quantity and the unexpected portions of the profitability and investment components of earnings. Rather than estimate the unexpected portions of the earnings components separately, we include the earnings components in the regressions together with proxies for expected profitability and growth. These proxies effectively control for the expected portions of the earnings components, allowing the coefficients of the earnings components to measure the association between unexpected stock returns and the unexpected portions of the earnings components. The proxies for expected profitability and growth are the same firm-characteristics that we use to control for expected returns (industry-year effect, size, earnings-to-price, book-to-market and leverage) as well as profitability in the year prior to the return accumulation period.[3]

Earnings Components

If the level of capital remains constant during a period of n years, then

Total earnings (over the n years) = n × average annual profitability × beginning capital.

If the level of capital changes during the period, total earnings may be larger or smaller than this amount, depending on whether the level of capital increased or decreased during the period. Accordingly, we decompose earnings into profitability and (incremental) investment components:

Profitability component = n × average annual profitability × beginning capital (1)

Investment component = total earnings – profitability component (2)

where the investment component represents the additional earnings generated through increases in invested capital.

We measure average annual profitability as the sum of earnings over the n years divided by the sum of capital at the beginning of each of the n years. This measure of average profitability is equal to a weighted average of annual profitability over the n years, calculated with weights proportional to the level of capital at the beginning of each year. That is,

$$\text{Average annual profitability} = \frac{\sum_{i=1}^{n} \text{earnings}_i}{\sum_{i=1}^{n} \text{capital}_{i-1}} = \sum_{i=1}^{n} \frac{\text{capital}_{i-1}}{\sum_{j=1}^{n} \text{capital}_{j-1}} \times \frac{\text{earnings}_i}{\text{capital}_{i-1}} \qquad (3)$$

[3] The coefficients of the earnings components under this approach are identical to those obtained using a two-steps approach where, in the first step, the earnings components are regressed on the profitability and growth proxies and, in the second step, stock returns are regressed on the same variables and the residuals from the first-step regressions (see, e.g., Greene 1997).

Substituting equation (1) into equation (2) yields

Investment component =

total earnings – n × average annual profitability × beginning capital (4)

Substituting equation (3) into equation (4) and simplifying, we get

Investment component =

n × average annual profitability × beginning capital

× average cumulative growth in capital =

profitability component × average cumulative growth in capital (5)

where the average cumulative growth in capital is defined as:

$$\text{Average cumulative growth in capital} = \frac{1}{n}\sum_{i=1}^{n}\left(\text{capital}_{i-1} - \text{capital}_0\right) / \text{capital}_0 \quad (6)$$

Thus, while the profitability component of earnings (equation (1)) is proportional to average profitability during the n years, the investment component (equation (5)) is also affected by growth in capital during the n years. The intuition for equation (5) is that the extent to which incremental investments generate earnings growth depends not only on the magnitude of the investments but also on their profitability.

We measure earnings as operating income before special items and after tax (*OI*). Specifically, we calculate *OI* as net income (COMPUSTAT data item #172) minus extraordinary items (#48) minus after-tax special items (#17 × (1 – t)) and plus after-tax interest expense (#15 × (1 – t)), where t is the federal corporate tax rate plus two percent average state tax rate. Capital is measured as the sum of common equity (#60), preferred stock (#130), long-term debt (#34) and current debt (#9).

Specifications

The primary specification we estimate is:

$$R_{t+1,t+n} = \alpha_{industry\text{-}year} + \beta_1\, PROF_{t+1,t+n} + \beta_2\, INVEST_{t+1,t+n}$$

$$+ \gamma_1\, SIZE_t + \gamma_2\, EP_t + \gamma_3\, BP_t + \gamma_4\, LEV_t + \gamma_5\, ROIC_t + \varepsilon_{t+1,t+n} \qquad (7)$$

for n = 3 and 5 (i.e., return intervals of three and five years). The parameter $\alpha_{industry\text{-}year}$ represents industry-year fixed effect, where industry is defined at the 3-digit SIC level. The variables are defined as follows:

$R_{t+1,t+n}$	=	Cumulative stock returns from three month after the beginning of year t+1 through three month after the end of year t+n[4]
$PROF_{t+1,t+n}$	=	The profitability component of earnings during the years t+1 through t+n (see equation (1)), divided by the book value of capital at the end of year t; thus, $PROF_{t+1,t+n}$ = n × average annual profitability
$INVEST_{t+1,t+n}$	=	The investment component of earnings during the years t+1 through t+n (see equation (5)), divided by the book value of capital at the end of year t; thus, $INVEST_{t+1,t+n}$ = n × average annual profitability × average cumulative growth in capital
$SIZE_t$	=	Log of the market value of equity at the end of year t
EP_t	=	The ratio of recurring income available to common in year t to the market value of equity at the end of year t. Recurring income available to common is measured as *OI* minus the sum of after-tax interest expense and preferred dividends
BP_t	=	The book value of equity divided by its market value at the end of year t
LEV_t	=	The ratio of the book value of debt and preferred stock to the book value of capital at the end of year t
$ROIC_t$	=	The ratio of *OI* in year t to the book value of capital at the end of year t-1

[4] We measure stock returns through three months after the end of year t+n to assure that they reflect the earnings information of year t+n.

The variables of primary interest are $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$. The remaining explanatory variables are included to control for expected returns, expected profitability and expected growth.

Note that the sum of $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$ is equal to the total of operating income over the years t+1 through t+n, deflated by the book value of capital at time t. We denote this variable as $EARNINGS_{t+1,t+n}$. To provide a benchmark, we first estimate the following regression model which substitutes $EARNINGS_{t+1,t+n}$ for its components, $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$:

$$R_{t+1,t+n} = \alpha_{industry\text{-}year} + \beta_1\, EARNINGS_{t+1,t+n}$$
$$+ \gamma_1\, SIZE_t + \gamma_2\, EP_t + \gamma_3\, BP_t + \gamma_4\, LEV_t + \gamma_5\, ROIC_t + \varepsilon_{t+1,t+n} \quad (8)$$

That is, we effectively restrict the coefficients on $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$ to equal each other. We then run the unrestricted model (equation (7)) and test the significance of the difference between the coefficients of $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$.

Realized earnings during a period are associated with contemporaneous stock returns only to the extent that they have not been anticipated at the beginning of the period. For this reason, we include in equations (7) and (8) proxies for profitability and growth. However, these controls are not likely to fully capture the expected portions of the earnings components, which implies that the coefficients on $EARNINGS_{t+1,t+n}$, $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$ will be biased downward (since only a portion of these earnings triggers a market response). To mitigate this bias, we rerun the regressions deflating the earnings variables by the market value of capital at the end of year t instead of its book value. Market value is essentially a forecast of future earnings, so deflating earnings by market value is similar to subtracting a market-based measure of expected earnings from reported earnings (Ohlson 1991, Easton and Harris 1991).

We deflate the earnings variables by capital rather than equity because we focus on operations and use operating income to measure earnings. However, the dependent variable (stock return) measures the return to equity holders. To allow for economic interpretation of the earnings coefficients, we also run the regressions deflating the earnings variables by the market value of equity instead of capital. When using this deflator, the earnings variables are expressed relative to the same basis used in measuring stock returns (market value of equity at the beginning of the period), and thus the earnings coefficients can be interpreted as measuring the price change associated with a dollar of unexpected operating income.[5]

An important assumption in regression analysis is that the coefficients are the same for all observations. This assumption is not likely to hold if we use all available firm-year observations to estimate Equations (7) and (8). Prior research establishes that the relationship between unexpected stock returns and unexpected earnings is non-linear, as firms with extreme values of profitability tend to have low earnings persistence and therefore small valuation coefficients. This is especially true for low values of profitability, which are often due to negative transitory earnings (e.g., Freeman and Tse 1992, Hayn 1995, Burgstahler et al. 2002).[6] While the impact of transitory earnings items is likely to be relatively small when earnings are measured over long horizons, it still should not be ignored. We therefore estimate Equations (7) and (8) for portfolios sorted by average annual profitability, measured as depicted in Equation (3).

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[5] Another advantage of deflating by the market value of equity is that it is consistent with most prior research (e.g., Easton et al. 1992), making the results comparable to prior findings.

[6] Negative transitory earnings are likely to be more frequent and larger in magnitude than positive items, because: (1) real options, such as the option to abandon unsuccessful operations, allow firms to "cut their losses," (2) negative transitory items are often due to "big bath" charges, which reduce current profitability but subsequently reverse, and (3) under conservative accounting, profits are recognized gradually as earned while losses are recognized fully when anticipated.

These regressions are important also because they provide additional evidence on whether investors consider the incremental cost of capital associated with the investment component of earnings when pricing earnings growth. Equation (5) shows that the incremental capital required to generate a given level of the investment component of earnings is decreasing in average profitability. Thus, high average profitability implies a small incremental cost of capital and therefore a large valuation coefficient for the investment component of earnings. We test this hypothesis by comparing the coefficient of the investment component of earnings estimated for high profitability firms with that estimated for low profitability firm.

III. RESULTS

Sample and Descriptive Statistics

Our initial sample consists of all firm-year observations included in the COMPUSTAT files for the period 1978-2002.[7] We measure the variables as defined in the previous section, and delete observations with missing values for any of the control variables (measured at time t), or for stock returns, earnings or capital in any of the years t+1 through t+n (n = 3 or 5). We also delete observations with non-positive book value of capital at the end of year t. Since we run all analyses for two alternative horizons (three and five years), we effectively create two samples where all observations in the n = 3 sample are included in the n = 5 sample, but not vice versa. Finally, to reduce the effect of influential observations, for each sample we delete observations that lie outside the 1% to 99% range of the distribution for any of the regression variables.[8]

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[7] We start the sample in 1978 to mitigate survivorship bias (see Kothari et al 1995) and to increase sample homogeneity (GAAP and firm characteristics have changed considerably over time; see, e.g., Collins et al. 1997).

[8] As discussed above, we rerun all analyses (including the outlier filter) using two additional deflators: market value of capital and market value of equity.

Panel A of Table 1 presents descriptive statistics for the distribution of the variables used in the five-year horizon analysis. As shown, the average cumulative stock return is 82.8%, which implies an annual return of 12.8%. Earnings are on average 47.8% of the book value of capital at the beginning of the five years period, with most of these earnings due to the profitability component (31.2%). The investment component of earnings is small on average (16.6%), but its standard deviation is relatively large (42.3% compared to 57.1% for the profitability component). Thus, each of the earnings components contributes significantly to the variation in total earnings.

As shown above (equation (5)), the investment component of earnings is equal to the product of the profitability component and the cumulative growth in capital (the variable G in Table 1). The statistics in Table 1 indicate that both determinants of the investment component are important: the mean value and standard deviation of the cumulative growth in capital are similar to those of the profitability component.

Panel B of Table 1 provides the Pearson (lower triangle) and Spearman (upper triangle) correlation coefficients. Coefficients above 0.01 in absolute value are significant at the 1% level. The Pearson (Spearman) correlation between earnings and returns is 0.35 (0.49), considerably larger than typical annual correlations (see Easton et al. 1992). However, while stock returns are strongly related to the profitability component of earnings (Pearson = 0.36, Spearman = 0.53), their association with the investment component is substantially weaker (Pearson = 0.21, Spearman = 0.25). These statistics provide support for the hypothesis that investors assign lower valuations to earnings growth resulting from incremental investments compared to growth due to improved profitability. We next turn to the regression analysis which allows us to evaluate the differential valuation of the two earnings components simultaneously and with controls for confounding effects.

Primary Analysis

We start by estimating equation (8), which substitutes total earnings for the profitability and investments components. Panel A (Panel B) of Table 2 presents the regression statistics when earnings are deflated by the book (market) value of capital, and Panel C gives the estimates when earnings are deflated by the market value of equity. In each panel, we report estimates for six regressions: two horizons—three and five years, and three profitability subsamples for each horizon—low, intermediate and high. The earnings coefficient is positive and highly significant in each of the 18 regressions, but it exhibits substantial variation as it ranges from a minimum of 0.134 to a maximum of 2.597.[9] Within each of the six deflator/horizon sets of regressions, the earnings coefficient increases monotonically with profitability, demonstrating the importance of estimating the regressions separately for each profitability group.

In 9 out of the 18 regressions, the earnings coefficient is less than one, suggesting that a dollar of earnings is associated with less than a dollar change in market value.[10] Given that earnings are on average quite persistent, one may expect the earnings coefficient to be substantially greater than one. The small magnitude of the earnings coefficient could be due to one or more of the following explanations. First, it could be that our controls for expected earnings are not sufficient, which results in a downward bias in the earnings coefficient since expected earnings are not associated with stock returns. Second, earnings are indirectly subject to personal taxes (when dividends are paid or shares are sold), so the valuation coefficient may

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[9] The *t*-statistics are calculated using the Newey and West (1987) algorithm with n lags, and are therefore robust to heteroscedasticity as well as to autocorrelation resulting from overlap in stock returns.

[10] To the extent that the controls reflect variation in expected returns, we expect a negative coefficient for *SIZE* and *ROIC* (large, profitable firms are less risky), and positive coefficient for *EP*, *BP* and *LEV* (value proxies and financial leverage risk). Note, however, that the controls capture variation in expected earnings in addition to variation in expected returns, which makes it difficult to interpret their coefficients. In any case, our focus is on earnings, not the controls.

reflect a discount for personal taxes. Third, earnings measure the return on capital before subtracting its cost. Thus, to the extent that unexpected earnings are associated with unexpected capital investments, the market valuation of earnings is reduced by the cost of incremental capital.

We next estimate Equation (7), which allows us to examine the validity of the third explanation. Equation (7) decomposes earnings into profitability and investment components, where the profitability component measures the portion of earnings due to profitability (holding investment constant), while the investment component captures earnings due to additional investments. Unexpected earnings due to improved profitability have no incremental cost of capital associated with them, while unexpected earnings due to investments imply additional cost of capital. Thus, the coefficient on the investment component of earnings should be smaller than that of the profitability component, to reflect the incremental cost of capital associated with these earnings.

The estimates in Table 3 show that the coefficient on the profitability component of earnings is substantially larger than the corresponding coefficient on the investment component in each of the 18 regressions (3 deflators × 2 horizons × 3 profitability groups). Moreover, in each of the regressions, the *t*-statistic of the difference between the earnings component coefficients as well as the increase in R^2 obtained by decomposing earnings is highly significant (one is implied by the other). The mean value of the profitability (investment) component across the 18 regressions is 2.07 (0.46). That is, the profitability coefficient is on average more than four times larger than the investment coefficient. The profitability component is also substantially larger than the coefficient on total earnings (mean of 1.16 across the 18 regressions), confirming that the relatively small magnitude of the earnings coefficients in Table

2 is due in part to the implicit cost associated with earnings growth achieved through incremental capital investments.[11]

Examining the patterns in the earnings component coefficients across the profitability portfolios, we observe that both coefficients are positively related to profitability. However, while the increase in the coefficient of the profitability component occurs primarily when moving from low to intermediate profitability, that of the investment component occurs between the intermediate and high profitability portfolios.[12] These patterns are expected. Low levels of profitability are particularly transitory (e.g., Fama and French 2000), hence explaining the low coefficient of the profitability component for the low profitability subsample. Earnings growth due to incremental capital investments contributes to value only to the extent that the investments earn returns larger than the cost of capital, which occurs primarily for the high profitability subsample, thus explaining the low coefficients on the investment component for low and intermediate profitability firms (average annual profitability for the low, intermediate and high profitability subsamples are -8.0%, 7.4% and 16.3% respectively for the three years horizon analysis, and -4.3%, 7.7% and 15.7% respectively for the five years horizon).

As is always the case with regression analysis, our estimates can only indicate association, not causation. Thus, for example, one should not interpret the coefficient on the investment component of earnings (β_2) as suggesting that firms may increase their value by \$$\beta_2$ by making additional investments that increase earnings by \$1. Moreover, even if the estimates measure the impact of the earnings components on firm value (i.e., if they measure causal

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[11] The profitability (investment) component coefficient in Table 3 is larger than the corresponding earnings coefficient in Table 2 in 17 (0) out of the 18 deflator/horizon/profitability combinations.

[12] The average profitability component coefficient across the 6 deflator/horizon combinations for the low, intermediate and high profitability portfolios are 0.55, 2.45 and 3.22, respectively. The average investment component coefficient across the 6 deflator/horizon combinations for the low, intermediate and high profitability portfolios are -0.03, 0.33 and 1.06, respectively.

effects), because capital investments are likely to affect both the profitability and investment components of earnings, one would have to quantify the change in each of the earnings components in order to measure the net effect on firm value. In particular, due to conservative accounting practices, investments are typically associated with near-term declines in profitability. Thus, capital investments are likely to result in a decrease in the profitability component of earnings which will offset at least part of the increase in the investment component. Our estimates suggest that earnings growth due to additional investments has a small effect on firm value, even when ignoring the negative effect on profitability.

Analysis by Industry

Extant research in accounting demonstrates that the price-earnings relationship varies substantially in the cross-section. To account for such heterogeneity, in the primary analysis we include industry-year dummies, control for various firm characteristics, and estimate the equations for subsamples of firms with similar profitability. To further control for across-industry heterogeneity, we next rerun Equation (7) separately for each industry/profitability group, where industry classification is based on 3-digit SIC.[13] We use the five-year horizon and, to allow for economic interpretation of the coefficient (see discussion in Section II), focus on deflation by market value of equity.[14] We present the estimated earnings component coefficients in Figure 1. To increase power, we focus on industries with at least 100 observations, which yields 127 industry groups.

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[13] Industry membership is relevant because risk and accounting conservatism, which vary by industry, affect expected book profitability. For example, companies that invest heavily in intangible assets are expected to earn high book profitability, both because their book value is understated (Zhang 2000) and their risk is relatively high (Chan et al. 2001).

[14] We obtain similar results when using each of the other 5 deflator/horizon combinations.

Each point in Figure 1 corresponds to a different industry/profitability group. The y-axis displays the coefficient on the profitability component of earnings while the x-axis measures the coefficient on the investment component. Thus, points above the main diagonal represent industries where investors value earnings that result from profitability more than those due to investments. Only 19 points are below the diagonal. That is, for 108 out of the 127 industries (85.0%), the coefficient on the profitability component of earnings is larger than that on the investment component. The mean value of the investment (profitability) coefficient across the 127 observations is 0.636 (1.835), and the difference between the two means is highly significant (*t*-statistic of 9.0). These results demonstrate the robustness of our findings and inference—over long horizons, investors value earnings growth more when it results from improved profitability, as compared to growth from new investments.

Alternative Explanations

The results in Table 3 and Figure 1 indicate that the valuation coefficient of the profitability component of earnings is substantially larger than that of the investment component. We attribute this difference to the omitted incremental cost of capital associated with the investment component of earnings. However, there are at least two alternative explanations for the difference in coefficients. First, if the investment component of earnings is more predictable than the profitability component, its coefficient will be smaller than that of the profitability component since stock returns are unrelated to expected earnings. To examine this possibility, we regress the profitability and investment components (*PROF* and *INVEST* respectively) on the proxies for expected profitability and growth discussed in Section II: industry-year effect, *SIZE*, *EP*, *BP*, *LEV* and *ROIC*. If the investment component is more predictable than the profitability component, R^2s from the *INEST* regressions should generally be larger than those from the *PROF* regressions.

Table 4 presents R^2 measures from the *INVEST* and *PROF* regressions, estimated for each of the three profitability portfolios. As before, we run the models using three alternative deflators (book and market value of capital, and market value of equity), and for two horizons (three and five years). We focus on an R^2 measure which excludes the explanatory power of the industry-year effects since these variables capture primarily unexpected shocks (results are qualitatively similar when we use the overall R^2). In most cases, R^2 from the *PROF* regression is substantially larger than R^2 from the corresponding *INVEST* regression. Thus, the small valuation coefficients of *INVEST*, compared to the *PROF* coefficients, are not due to the predictability of *INVEST*. If anything, Table 4's results suggest that *INVEST* is less predictable than *PROF* and should therefore trigger a larger market reaction.

Another possible explanation is that *INVEST* and *PROF* are equally predictable, but the proxies used in this study perform better in controlling for the expected part of *PROF*. If this explanation holds, the *INVEST* coefficient should be similar to the PROF coefficient when the proxies for profitability and growth are excluded from the stock return regressions, since then the downward bias in the valuation coefficients due to expected earnings should be similar for the two earnings components. To examine this possibility, we rerun model (7) without the control variables. We find that the difference between the profitability and investment coefficients becomes larger rather than smaller. In particular, the average *PROF* coefficient across the 18 regressions is 1.90 compared to a 0.37 average for *INVEST*. We therefore conclude that the difference in the *PROF* and *INVEST* valuation coefficients is not due to differences in the predictability of these earnings components or ability to control for this predictability.

Market Efficiency

The findings of the previous sections indicate that over long periods of time (three or five years), investors value earnings growth resulting from incremental capital investments substantially less than growth due to improved profitability. These analyses, however, do not inform on the timeliness of the differential market pricing of the two earnings components. Extant research in accounting suggests that investors often "fixate" on reported earnings and react to information in earning components with a delay (e.g., Sloan 1996). We next examine whether a similar inefficiency applies to the profitability/investment decomposition of earnings.

Given the level of profitability in year t-1 ($ROIC_{t-1} = OI_{t-1} / Capital_{t-2}$), earnings growth in year t is either due to improved profitability in year t ($\Delta ROIC_t = ROIC_t - ROIC_{t-1}$) or to growth in capital in year t-1 ($GROWTH_{t-1} = [Capital_{t-1} - Capital_{t-2}] / Capital_{t-2}$).[15] To the extent that investors do not recognize in a timely fashion that earnings growth resulting from new capital investments is less valuable, $GROWTH_{t-1}$ should be negatively related to stock returns in year t+1, as stock prices gradually reflect the lower value of earnings growth from incremental capital investments. We examine this possibility by running cross sectional regressions of the following model:

$$R_{t+1} = \alpha + \beta_1\, \Delta ROIC_t + \beta_2\, GROWTH_{t-1} + \gamma_1\, ROIC_{t-1} + \gamma_2\, SIZE_t + \gamma_3\, EP_t + \gamma_4\, BP_t + \gamma_5\, LEV_t + \gamma_6\, CFO_t + \gamma_7\, ACC_t + \varepsilon_{t+1} \quad (9)$$

Where R_{t+1} is the one-year buy-and-hold stock return, measured from four months after the end of fiscal year t. *CFO* is cash from operations (COMPUSTAT #308) divided by the market value

[15] Earnings growth in year t is related to the change in capital in year t-1 because profitability is measured relative to beginning of year capital. Thus, an increase in capital in year t-1 implies that a larger amount of invested capital is available to generate earnings in year t compared to year t-1.

of equity at the end of the year, and *ACC* is total accruals (*OI* – *CFO*) divided by average total assets during the year. We control for accruals and cash flow to assure that any correlation between *GROWTH* and future stock returns is not due to *GROWTH* proxying for the accruals or cash flow anomalies (Sloan 1996, Desai et al. 2004). The other variables—defined in Section II—are included to control for expected returns.

Table 5 reports summary statistics from cross sectional regressions of equation (9) for the period 1988-2002 (15 years).[16] For each coefficient, we report the time series mean, the associated *t*-statistic (i.e., the ratio of the time-series mean to its standard error), and the percentage of regressions with positive coefficient. To evaluate robustness, we report OLS regressions (Panel A) as well as regressions where the explanatory variables are measured using decile ranks (Panel B). We find that $GROWTH_{t-1}$ is negatively and significantly related to R_{t+1} in both panels and in most of the cross-sectional regressions (12 out of 15 in Panel A, 15 out of 15 in Panel B). These estimates suggest that investors initially overreact to earnings growth resulting from incremental capital investments but subsequently correct this mispricing. In contrast, the coefficient of $\Delta ROIC_t$ is positive, suggesting that investors underreact to earnings growth due to improved profitability.

The estimates in Panel B suggest that a zero investment portfolio which is long in the stock of firms from the lowest *GROWTH* decile and short in firms from the highest *GROWTH* decile earns average annual abnormal stock returns of 7.1% (-0.0079 × -9, where -9 is the difference between the ranks of the low and high deciles). These returns are earned after controlling for proxies for expected returns (e.g., size, book-to-market) as well as the accruals

[16] We follow the COMPUSTAT convention of assigning firms with fiscal year end in January through May to the previous year. Because return data are available from CRSP through December 2003, stock returns for the 2002 sample (i.e., stock returns for the twelve month that start four month after the end of fiscal year 2002) are measured over less than a full year for most firms. Results are not sensitive to the deletion of these observations.

and cash flow anomalies. The annual abnormal stock returns associated with $\Delta ROIC_t$ are substantially smaller (2.5% = 0.0028 × 9), suggesting that the mispricing of the profitability/investment decomposition is due primarily to the initial overreaction of investors to the investment component of earnings. This overreaction is subsequently corrected, as reflected in the correlation between *GROWTH* and future stock returns.

The negative correlation between growth in capital and subsequent stock returns has been documented by prior research (e.g., Fairfield et al. 2003, Richardson and Sloan 2003).[17] However, previous studies generally attribute this relation to the negative association between growth in capital and subsequent changes in profitability. According to these studies, growth in capital is often due to market timing by companies (e.g., Loughran and Ritter 1995), overinvestment (e.g., Titman et al. 2003) or aggressive accounting (e.g., Sloan 1996). Each of these causes of growth in capital predicts a decline in profitability. Indeed, Fairfield et al. (2003) show that one-year-ahead ROA is negatively associated with growth in net operating assets after controlling for current ROA.[18] They suggest that "this is because both conservative accounting principles and diminishing marginal returns to increased investment tend to reduce profitability for growing firms. … investors appear to overweight the valuation implications of … growth … for one-year-ahead ROA." Richardson and Sloan (2003) conclude that "the relation between external financing transactions and future stock returns is most likely attributable to a combination of over-investment and aggressive accounting that is not anticipated in stock prices."

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[17] Some of these studies focus on net operating assets (i.e., operating assets minus operating liabilities) rather than capital. However, since capital is equal to total assets minus operating liabilities, net operating assets is equal to capital minus financial assets, which for most firms are relatively small.

[18] Penman and Zhang (2004) document similar results using RNOA instead of ROA.

We suggest an additional explanation. If, in the short run, investors "fixate" on earnings growth without fully considering the additional cost of capital required to generate that growth, the mispricing of stocks should be related to the growth in capital. This follows because the incremental cost of capital associated with earnings growth is proportional to the growth in capital. The analysis in Table 5 allows us to distinguish this explanation from the hypothesis that the relationship between growth in capital and subsequent stock returns is due to investors failing to understand that growth in capital predicts a subsequent decline in profitability. Unlike prior studies, we use the growth in capital in year t-1 to explain stock returns in year t+1. Thus, profitability in the year subsequent to the growth in capital (i.e., $ROIC_t$) is disclosed before the start of the return accumulation period. Moreover, regression model (9) includes as explanatory variables both the growth in capital in year t-1 ($GROWTH_{t-1}$) and the change in profitability in the following year ($\Delta ROIC_t$). Thus, even if investors fail to promptly price current changes in profitability, this mispricing should be captured by the $\Delta ROIC_t$ coefficient rather than by the $GROWTH_{t-1}$ coefficient.

Our research design thus allows us to focus on the hypothesis that investors fail to differentiate between earnings growth resulting from incremental investments versus improved profitability. However, our analysis cannot rule out the possibility that the negative relationship between growth in capital and subsequent stock returns is due in part to the negative association between the former and subsequent profitability (e.g., Fairfield et al. 2003). Moreover, there is an important interaction between these two hypotheses. To the extent that growth in capital predicts a negative change in profitability, firms with high (low) growth in capital are likely to have a relatively large (small) investment component of earnings and small (large) profitability component. Accordingly, univariate partitions based on growth in capital in year t-1 should predict stock returns in year t+1 reasonably well. We next test this conjecture by examining the abnormal stock returns earned on univariate investment strategies (i.e., without controlling for other variables).

Table 6 reports the time-series means and *t*-statistics of abnormal stock returns over the period 1988-2002 for selected portfolios. Abnormal return is measured as the difference between the firm's annual return starting four months after the end of fiscal year t and the contemporaneous return on a matched portfolio based on size (five quintiles) and book-to-market (five quintiles for each size quintile).[19] The portfolios are: (1) "low" – consisting of equal-size positions taken each year in the ten percent of firms with the lowest values for the partitioning variable ($\Delta ROIC_t$, $GROWTH_{t-1}$, CFO_t, or ACC_t); (2) "high" – ten percent of firms with the highest values; and (3) "zero investment" – long in "high" and short in "low" each year for $\Delta ROIC_t$ and CFO_t, and long in "low" and short in "high" for $GROWTH_{t-1}$ and ACC_t.

The estimates in Table 6 indicate that the simple strategy of buying the stock of firms with low values for $GROWTH_{t-1}$ and selling firms with high values yields substantial and highly significant abnormal returns (mean of 9.14%, *t*-statistic of 6.0). The returns are similar to those earned on the accruals (mean of 8.44%, *t*-statistic of 4.3) and cash flow (mean of 8.64%, *t*-statistic of 2.9) strategies, but their statistical significance is higher. In contrast, trading on $\Delta ROIC_t$ yields small and marginally significant returns (mean of 2.95%, *t*-statistic of 1.8). The large magnitude of abnormal returns on the growth strategy is consistent with the conjecture that the negative correlation between $GROWTH_{t-1}$ and $\Delta ROIC_t$ enables the former to predict the

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[19] Results are similar to those reported below when we use size-adjusted returns, or residual returns from a cross-sectional regression of the annual stock return on beta, size, book-to-market and the prior year return (to capture momentum), instead of size and book-to-market adjusted returns. We also obtain similar results when we use 100 benchmark size and book-to-market portfolios (ten book-to-market portfolios for each size decile) instead of twenty-five portfolios.

relative magnitudes of both the investment and profitability components of earnings in year t, which are mispriced by investors. The poor performance of the profitability strategy suggests that the mispricing is largely related to the growth component of earnings.[20]

IV. CONCLUSION

Firms may grow earnings either by improving the profitability of capital or by investing additional capital. In this paper we show that earnings growth obtained through improvements in profitability is associated with a substantially larger price change than growth due to additional investments. The difference in the valuation coefficients of the two earnings components is large, highly significant, and observed consistently across industries. These results indicate that, in the long run, investors recognize that earnings growth due to incremental capital investments is associated with incremental cost of capital while earnings growth due to improved profitability is not. Moreover, we demonstrate that when valuing the investment component of earnings, investors consider the size of the incremental cost of capital required to generate these earnings. In particular, we show that the valuation coefficient of the investment component of earnings is positively related to average profitability, which in turn is negatively related to the cost of incremental capital per dollar of earnings growth.

Similar to Sloan (1996) and other market inefficiency studies, we find that in the short run investors "fixate" on reported earnings and do not fully utilize the information in earnings components. Specifically, we find that investors overreact to earnings growth resulting from

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[20] $GROWTH_{t-1}$ is strongly related to the investment component of earnings (positive relation) and weakly related to the profitability component (negative relation). In contrast, $\Delta ROIC_t$ is strongly related to the profitability component of earnings (positive relation) and weakly related to the investment component (negative relation). Thus, the fact that the growth strategy performs substantially better than the profitability strategy suggests that the mispricing of the profitability/investment decomposition is due primarily to the initial overreaction of investors to the investment component of earnings.

incremental capital investments and underreact to growth resulting from improved profitability. The mispricing of the investment component of earnings is particularly large and significant. A zero investment strategy based on this information earns abnormal stock returns which are similar in magnitude but largely orthogonal to the returns earned on the accruals and cash flow strategies.

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TABLE 1
Summary Statistics

Panel A: Distribution statistics (56,635 observations)

	Mean	StD	P5	Q1	Median	Q3	P95
$R_{t+1,t+5}$	0.828	1.612	-0.812	-0.255	0.433	1.367	3.910
$EARNINGS_{t+1,t+5}$	0.478	0.846	-0.732	0.181	0.475	0.824	1.731
$PROF_{t+1,t+5}$	0.312	0.571	-0.681	0.160	0.386	0.592	1.026
$INVEST_{t+1,t+5}$	0.166	0.423	-0.107	0.005	0.076	0.237	0.852
$G_{t+1,t+5}$	0.375	0.636	-0.221	0.025	0.206	0.509	1.552
$SIZE_t$	4.736	1.980	1.672	3.252	4.605	6.132	8.211
EP_t	0.042	0.112	-0.142	0.024	0.060	0.093	0.165
BP_t	0.718	0.484	0.154	0.369	0.612	0.943	1.660
LEV_t	0.338	0.252	0.000	0.110	0.321	0.530	0.777
$ROIC_t$	0.088	0.155	-0.142	0.045	0.093	0.151	0.293

Panel B: Correlation coefficients (Pearson/Spearman below/above the main diagonal)

	R	*EAR*	*PRO*	*INV*	*G*	*SIZE*	*EP*	*BP*	*LEV*	*ROIC*
$R_{t+1,t+5}$		0.49	0.53	0.25	0.15	0.11	0.26	0.24	0.09	0.03
$EARNINGS_{t+1,t+5}$	0.35		0.94	0.74	0.52	0.26	0.27	-0.22	-0.10	0.52
$PROF_{t+1,t+5}$	0.36	0.89		0.54	0.31	0.28	0.30	-0.17	-0.09	0.50
$INVEST_{t+1,t+5}$	0.21	0.79	0.43		0.63	0.12	0.12	-0.24	-0.15	0.37
$G_{t+1,t+5}$	0.09	0.30	0.13	0.42		0.07	0.07	-0.31	-0.11	0.30
$SIZE_t$	0.01	0.20	0.26	0.06	-0.02		0.16	-0.25	0.09	0.27
EP_t	0.10	0.27	0.32	0.10	0.03	0.22		0.32	0.09	0.53
BP_t	0.20	-0.11	-0.05	-0.14	-0.25	-0.29	0.03		0.12	-0.35
LEV_t	0.06	-0.05	0.00	-0.11	-0.08	0.09	-0.03	0.08		-0.23
$ROIC_t$	0.03	0.51	0.52	0.31	0.11	0.22	0.53	-0.14	-0.13	

The variables are defined as follows:

$R_{t+1,t+n}$ = Cumulative stock returns from three month after the beginning of year t+1 through three month after the end of year t+5

$EARNINGS_{t+1,t+n}$ = Earnings during the years t+1 through t+5, divided by the book value of capital at the end of year t

$PROF_{t+1,t+n}$ = The profitability component of earnings during the years t+1 through t+n (see equation (1)), divided by the book value of capital at the end of year t; thus, $PROF_{t+1,t+n}$ = n × average profitability

$INVEST_{t+1,t+n}$ = The investment component of earnings during the years t+1 through t+n (see equation (5)), divided by the book value of capital at the end of year t; thus, $INVEST_{t+1,t+n}$ = n × average annual profitability × average cumulative growth in capital

$G_{t+1,t+n}$ = Average cumulative growth in capital during the years t+1 through t+5 (see equation (6)); $G_{t+1,t+n} = INVEST_{t+1,t+n} / PROF_{t+1,t+n}$

$SIZE_t$ = Log of the market value of equity at the end of year t

EP_t	=	The ratio of core income available to common in year t to the market value of equity at the end of year t
BP_t	=	The book value of equity divided by its market value at the end of year t
LEV_t	=	The ratio of the book value of debt and preferred stock to the book value of capital at the end of year t
$ROIC_t$	=	The ratio of operating income in year t to the book value of capital at the end of year t-1

TABLE 2
The Value Implications of Earnings

$$R_{t+1,t+n} = \alpha_{industry\text{-}year} + \beta_1\, EARNINGS_{t+1,t+n} + \gamma_1\, SIZE_t + \gamma_2\, EP_t + \gamma_3\, BP_t + \gamma_4\, LEV_t + \gamma_5\, ROIC_t + \varepsilon_{t+1,t+n}$$

Panel A: Earnings deflated by beginning book value of capital

Horizon	Profitability	β_1	γ_1	γ_2	γ_3	γ_4	γ_5	R^2	Obs.
n = 3	Low	0.201	0.008	-0.260	0.224	-0.055	-0.367	0.041	25,501
		11.1	1.9	-5.0	16.3	-2.0	-9.8		
n = 3	Intermediate	1.309	0.019	-0.449	0.671	0.444	-1.177	0.157	25,501
		18.5	5.7	-4.5	33.8	15.0	-11.5		
n = 3	High	1.395	-0.004	0.121	1.220	0.727	-1.334	0.206	25,501
		39.7	-0.9	0.8	34.3	18.3	-13.5		
n = 5	Low	0.134	0.014	-0.374	0.350	0.027	-0.476	0.042	18,878
		6.7	1.8	-3.5	14.5	0.6	-6.6		
n = 5	Intermediate	0.737	0.033	-0.264	1.063	0.733	-1.304	0.168	18,879
		15.6	5.1	-1.7	29.7	13.3	-8.8		
n = 5	High	1.151	0.029	0.806	2.002	1.258	-2.318	0.241	18,878
		35.7	3.0	3.2	29.8	15.1	-12.5		

Panel B: Earnings deflated by beginning market value of capital

Horizon	Profitability	β_1	γ_1	γ_2	γ_3	γ_4	γ_5	R^2	Obs.
n = 3	Low	0.742	0.000	-0.505	0.267	-0.093	-0.283	0.060	25,205
		19.8	0.0	-9.5	20.3	-3.4	-8.3		
n = 3	Intermediate	1.873	0.023	-0.666	0.424	0.384	-0.970	0.164	25,206
		21.5	6.5	-6.6	20.5	13.1	-9.9		
n = 3	High	3.112	0.017	-1.289	0.199	0.291	-0.365	0.190	25,205
		37.6	3.7	-7.8	4.9	7.4	-4.2		
n = 5	Low	0.633	0.004	-0.575	0.377	-0.022	-0.419	0.063	18,679
		13.9	0.6	-5.3	16.1	-0.5	-6.2		
n = 5	Intermediate	1.094	0.035	-0.479	0.755	0.642	-1.122	0.170	18,679
		15.9	5.4	-3.0	20.3	11.8	-8.2		
n = 5	High	2.597	0.059	-1.443	0.394	0.596	-0.673	0.226	18,679
		34.8	6.1	-5.1	5.4	7.1	-4.1		

Panel C: Earnings deflated by beginning market value of equity

Horizon	Profitability	β_1	γ_1	γ_2	γ_3	γ_4	γ_5	R^2	Obs.
n = 3	Low	0.563	-0.003	-0.645	0.270	-0.095	-0.228	0.076	25,280
		25.8	-0.8	-12.0	20.7	-3.5	-6.8		
n = 3	Intermediate	0.726	0.021	-0.412	0.345	-0.107	-1.197	0.156	25,281
		16.6	6.2	-4.2	14.5	-3.0	-12.1		
n = 3	High	1.877	0.009	-0.321	-0.129	-0.604	-0.814	0.188	25,281
		34.8	1.9	-2.0	-3.0	-13.1	-9.3		
n = 5	Low	0.518	-0.002	-0.807	0.339	-0.139	-0.369	0.085	18,728
		19.0	-0.2	-7.2	14.8	-3.0	-5.3		
n = 5	Intermediate	0.592	0.034	-0.235	0.580	-0.058	-1.367	0.175	18,729
		14.8	5.3	-1.4	13.5	-0.9	-9.4		
n = 5	High	1.597	0.050	-0.063	-0.084	-0.947	-1.452	0.227	18,728
		31.0	4.9	-0.2	-1.1	-10.0	-8.5		

The first row of each pair provides the estimated coefficients while the second reports the Newey and West (1987) *t*-statistics with n lags. The regressions include fixed effect for industry-year, where industry membership is determined at the 3 digit SIC code level. The variables are defined in Table 1. Average profitability (the partitioning variable) is measured as the ratio of total earnings over the n years to the sum of capital at the beginning of each of these years. In Panel B (Panel C), $EARNINGS_{t+1,t+n}$ is deflated by the market value of capital (equity) instead of the book value of capital.

TABLE 3
The Value Implications of Decomposed Earnings

$$R_{t+1,t+n} = \alpha_{industry\text{-}year} + \beta_1\, PROF_{t+1,t+n} + \beta_2\, INVEST_{t+1,t+n} + \gamma_1\, SIZE_t + \gamma_2\, EP_t + \gamma_3\, BP_t + \gamma_4\, LEV_t + \gamma_5\, ROIC_t + \varepsilon_{t+1,t+n}$$

Panel A: Earnings components deflated by beginning book value of capital

Horizon	Profitability	β_1	β_2	γ_1	γ_2	γ_3	γ_4	γ_5	R^2	Obs.
n = 3	Low	0.301	−0.144	0.005	−0.314	0.221	−0.084	-0.410	0.051	25,501
		14.9	-3.9	1.3	-6.1	16.2	-3.0	-10.9		
n = 3	Intermediate	3.555	0.181	0.013	-0.521	0.669	0.472	-1.152	0.182	25,501
		30.7	2.0	3.8	-5.2	34.3	16.0	-11.4		
n = 3	High	2.307	0.511	-0.013	0.164	1.230	0.774	-1.424	0.230	25,501
		39.3	9.1	-2.8	1.1	34.8	19.3	-14.5		
n = 5	Low	0.307	-0.130	0.010	-0.444	0.335	-0.025	-0.582	0.056	18,878
		12.4	-4.0	1.3	-4.2	14.0	-0.5	-7.9		
n = 5	Intermediate	3.149	0.414	0.022	-0.340	1.060	0.801	-1.290	0.193	18,879
		23.9	7.9	3.5	-2.1	29.9	14.6	-8.7		
n = 5	High	2.599	0.626	0.008	1.053	2.055	1.401	-2.593	0.282	18,878
		34.0	16.0	0.8	4.2	31.0	16.9	-14.1		

Panel B: Earnings components deflated by beginning market value of capital

Horizon	Profitability	β_1	β_2	γ_1	γ_2	γ_3	γ_4	γ_5	R^2	Obs.
n = 3	Low	0.746	0.016	0.000	-0.542	0.278	-0.099	-0.271	0.063	25,205
		20.1	0.1	0.0	-10.3	20.9	-3.7	-8.0		
n = 3	Intermediate	3.429	0.225	0.019	-0.776	0.246	0.359	-0.833	0.180	25,206
		26.6	1.7	5.6	-7.7	10.6	12.2	-8.6		
n = 3	High	4.692	1.339	0.014	-1.475	-0.188	0.181	-0.256	0.209	25,205
		37.5	10.1	3.1	-8.9	-3.9	4.5	-3.0		
n = 5	Low	0.787	-0.146	0.002	-0.671	0.397	-0.046	-0.390	0.072	18,679
		17.8	-1.4	0.3	-6.2	17.1	-1.0	-5.8		
n = 5	Intermediate	2.730	0.601	0.030	-0.675	0.419	0.603	-0.914	0.184	18,679
		18.0	7.2	4.6	-4.2	8.9	10.9	-6.7		
n = 5	High	4.952	1.620	0.052	-1.893	-0.545	0.328	-0.391	0.256	18,679
		31.1	17.5	5.4	-6.5	-5.7	3.9	-2.3		

Panel C: Earnings components deflated by beginning market value of equity

Horizon	Profitability	β_1	β_2	γ_1	γ_2	γ_3	γ_4	γ_5	R^2	Obs.
n = 3	Low	0.557	0.147	-0.002	-0.678	0.281	-0.092	-0.216	0.078	25,280
		25.5	1.9	-0.6	-12.6	21.3	-3.4	-6.5		
n = 3	Intermediate	0.946	0.216	0.020	-0.333	0.261	-0.223	-1.232	0.160	25,281
		17.4	3.0	5.8	-3.4	9.8	-5.8	-12.4		
n = 3	High	2.360	1.131	0.006	-0.214	-0.369	-0.810	-0.857	0.195	25,281
		30.2	12.5	1.3	-1.4	-7.1	-16.1	-9.8		
n = 5	Low	0.597	0.100	-0.003	-0.877	0.354	-0.147	-0.348	0.093	18,728
		22.5	1.6	-0.4	-7.9	15.6	-3.2	-5.1		
n = 5	Intermediate	0.902	0.371	0.032	-0.106	0.379	-0.336	-1.442	0.181	18,729
		15.1	7.0	4.9	-0.6	7.4	-4.6	-9.8		
n = 5	High	2.418	1.129	0.044	0.336	-0.786	-1.614	-1.661	0.241	18,728
		26.0	17.2	4.3	1.2	-7.7	-15.5	-9.6		

The first row of each pair provides the estimated coefficients while the second reports the Newey and West (1987) *t*-statistics with n lags. The regressions include fixed effect for industry-year, where industry membership is determined at the 3 digit SIC code level. The variables are defined in Table 1. Average profitability (the partitioning variable) is measured as the ratio of total earnings over the n years to the sum of capital at the beginning of each of these years. In Panel B (Panel C), $PROF_{t+1,t+n}$ and $INVEST_{t+1,t+n}$ are deflated by the market value of capital (equity) instead of the book value of capital.

TABLE 4
R^2 Measures from Regressions Predicting the Profitability and Investment Components of Earnings

		Earnings components deflated by beginning book value of capital		Earnings components deflated by beginning market value of capital		Earnings components deflated by beginning market value of equity	
Horizon	Profitability	*PROF*	*INVEST*	*PROF*	*INVEST*	*PROF*	*INVEST*
n = 3	Low	0.426	0.051	0.270	0.055	0.282	0.077
n = 3	Intermediate	0.119	0.133	0.609	0.090	0.741	0.109
n = 3	High	0.267	0.206	0.652	0.127	0.746	0.138
n = 5	Low	0.407	0.086	0.274	0.088	0.322	0.140
n = 5	Intermediate	0.107	0.177	0.686	0.134	0.773	0.173
n = 5	High	0.259	0.244	0.678	0.163	0.769	0.182

The table presents R^2 measures of regressions of the profitability ($PROF_{t+1,t+n}$) and investment ($INVEST_{t+1,t+n}$) components of earnings on an industry-year fixed effect and the following variables: log of the market value of equity at the end of year t ($SIZE_t$), the ratio of core income available to common in year t to the market value of equity at the end of year t (EP_t), the book value of equity divided by its market value at the end of year t (BP_t), the ratio of the book value of debt and preferred stock to the book value of capital at the end of year t (LEV_t), the ratio of operating income in year t to the book value of capital at the end of year t-1 ($ROIC_t$).

TABLE 5
Cross-sectional Regressions of One-Year-Ahead Stock Return on the Change in Profitability, Growth in Capital, and Control Variables

$$R_{t+1} = \alpha + \beta_1\, \Delta ROIC_t + \beta_2\, GROWTH_{t-1} + \gamma_1\, ROIC_{t-1} + \gamma_2\, SIZE_t + \gamma_3\, EP_t + \gamma_4\, BP_t + \gamma_5\, LEV_t + \gamma_6\, CFO_t + \gamma_7\, ACC_t + \varepsilon_{t+1}$$

Panel A: OLS regressions

	β_1	β_2	γ_1	γ_2	γ_3	γ_4	γ_5	γ_6	γ_7	R^2	Obs.
Mean	0.0831	-0.0228	0.0756	-0.0026	0.0582	0.0434	-0.0354	0.0786	-0.2525	0.0397	4,472
t-statistic	2.1	-5.4	1.6	-0.5	1.8	2.6	-0.9	2.8	-4.3		
% positive	80%	20%	67%	40%	73%	67%	47%	80%	7%		

Panel B: Explanatory variables measured in decile rank

	β_1	β_2	γ_1	γ_2	γ_3	γ_4	γ_5	γ_6	γ_7	R^2	Obs.
Mean	0.0028	-0.0079	0.0054	-0.0021	0.0030	0.0079	-0.0050	0.0090	-0.0050	0.0439	4,472
t-statistic	2.0	-6.4	1.8	-0.6	1.1	2.2	-1.4	3.4	-3.1		
% positive	73%	0%	73%	47%	60%	60%	40%	87%	13%		

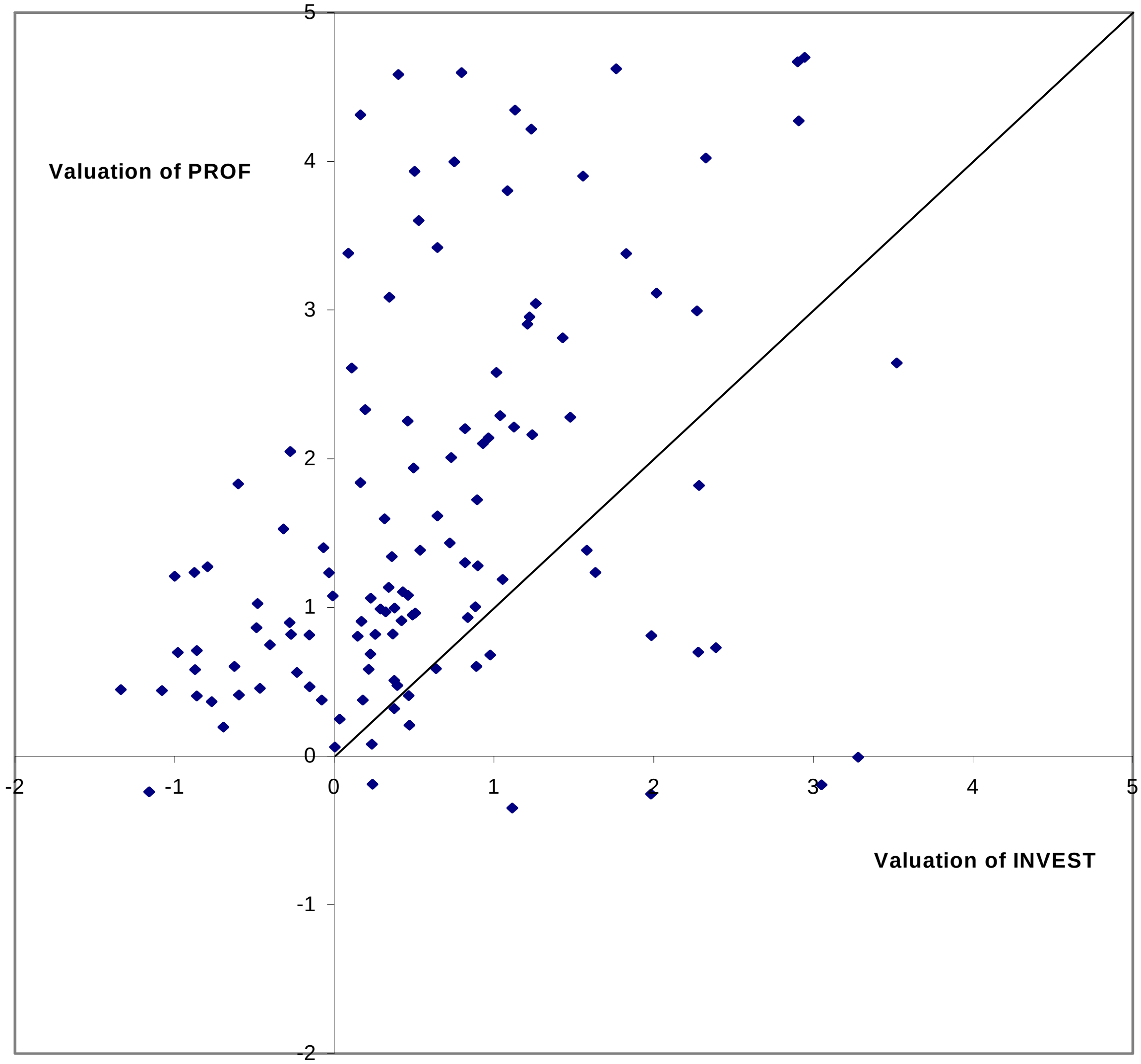
Sample period is 1988-2002 (15 years). In each panel, the first row reports the time series means of the corresponding statistics (coefficient, R^2, or number of observations), the second row reports the *t*-statistics of the coefficients (the ratio of the time-series mean of each coefficient to its standard error), and the third row reports the percentage of regressions with positive coefficients. R_{t+1} is the one-year buy-and-hold stock return, measured from four months after the end of fiscal year t. $\Delta ROIC_t = ROIC_t - ROIC_{t-1}$ where $ROIC_t = Operating\ Income_t\ /\ Capital_{t-1}$. $GROWTH_{t-1} = [Capital_{t-1} - Capital_{t-2}]\ /\ Capital_{t-2}$. $SIZE_t$ is the log of the market value of equity at the end of year t. EP_t is the ratio of core income available to common in year t to the market value of equity at the end of year t. BP_t is the book value of equity divided its market value at the end of year t. LEV_t is the ratio of the book value of debt and preferred stock to the book value of capital at the end of year t. *CFO* is cash from operations divided by the market value of equity at the end of the year. *ACC* is total accruals (*Operating Income – CFO*) divided by average total assets during the year.

TABLE 6
Abnormal Returns to Investment Strategies

	$\Delta ROIC_t$	$GROWTH_{t-1}$	CFO_t	ACC_t
Low	-0.0354	0.0251	-0.0378	0.0193
	-1.7	1.7	-1.7	1.2
High	-0.0059	-0.0663	0.0486	-0.0651
	-0.3	-5.0	4.3	-6.9
Zero investment	0.0295	0.0914	0.0864	0.0844
	1.8	6.0	2.9	4.3

Sample period is 1988-2002 (15 years). The first row reports the time-series means of the portfolio abnormal returns, while the second row reports the associated *t*-statistics. Abnormal return is measured as the difference between the firm's return and the contemporaneous return on a matched portfolio based on size (five quintiles) and book-to-market (five quintiles for each size quintile). Returns are measured over a twelve months period starting four months after the end of fiscal year t. The low (high) portfolio consists of equal-size positions in the ten percent of firms with the lowest (highest) value of the variable indicated at the heading of the column. For $\Delta ROIC_t$ and CFO_t, the zero investment portfolios consist of long position in "high" and short position in "low." For $GROWTH_{t-1}$ and ACC_t, the zero investment portfolios consist of long position in "low" and short position in "high." $\Delta ROIC_t = ROIC_t - ROIC_{t-1}$ where $ROIC_t = Operating\ Income_t / Capital_{t-1}$. $GROWTH_{t-1} = [Capital_{t-1} - Capital_{t-2}] / Capital_{t-2}$. *CFO* is cash from operations divided by the market value of equity at the end of the year. *ACC* is total accruals (*Operating Income – CFO*) divided by average total assets during the year.

FIGURE 1
The Value Implications of the Profitability and Investment Components of Earnings by Industry/Profitability Groups



The figure presents the coefficients on the profitability (*PROF*) and investment (*INVEST*) components of earnings from equation (7), estimated for each industry/profitability group separately using the five year horizon and deflation by market value of equity. Each point in the figure corresponds to a different industry/profitability group, where industry classification is based on 3-digit SIC and profitability groups are constructed within each industry (three groups). Industry/profitability groups with less than 100 observations are excluded.