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Are CEOs compensated for value destroying growth in earnings?

Sudhakar Balachandran · Partha Mohanram

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Abstract Prior research shows that firms generating earnings growth by improving profitability create shareholder value, while firms generating earnings growth through investment destroy value. This paper examines whether compensation committees consider this while determining CEO compensation. We first confirm prior results that growth from increased profitability is perceived by markets to add value while growth from investment does not. While growth from increased profitability is positively associated with compensation, so is growth from investment. The presence of institutional ownership increases the weight on growth from increased profitability, but does not reduce the weight on growth from investment. Further, value-oriented institutional ownership increases the sensitivity of compensation growth to growth from increased profitability and reduces the sensitivity to growth from investment. Contrarily, growth-oriented institutional ownership increases the sensitivity of compensation growth to growth from investment. Our results highlight the importance of understanding the nature of earnings growth in determining executive compensation.

Keywords CEO compensation · Earnings growth · Growth from investment · Growth from increased profitability · Institutional investment

JEL classifications M41 · M52 · G11 · G30 · J33

S. Balachandran
Columbia Business School, New York, NY 10027, USA
e-mail: svb34@columbia.edu

P. Mohanram (✉)
Rotman School of Management, University of Toronto, Toronto, ON M5S 3E6, Canada
e-mail: partha.mohanram@rotman.utoronto.ca

1 Introduction

In this paper, we examine whether CEOs are compensated for value destroying earnings growth. Firms can grow their earnings either by increasing the profitability of their existing assets or by increasing their investment base. Prior research (Harris and Nissim 2006; Balachandran and Mohanram 2010) has shown that growth from increased profitability is valuable, while growth from investment destroys value on average. In this paper, we seek to understand whether compensation committees distinguish between these two vastly different sources of growth to align the interests of shareholders and management.

We begin by distinguishing between these two major components of earnings growth using two approaches from prior research. First, we use a decomposition developed in Balachandran and Mohanram (2010) to partition earnings growth into growth in residual income as a proxy for growth from increased profitability and growth from investment. Second, we follow the approach in Harris and Nissim (2006) and use the change in return on invested capital to proxy for growth from increased profitability and the change in beginning invested capital to proxy for growth from investment.

Since prior research has shown that growth from increased profitability is valuable but growth from investment is not, we hypothesize that compensation committees would seek to reward managers accordingly. Consequently we hypothesize a positive association between growth in executive compensation and growth from increased profitability and no association between executive compensation and growth from investment. Our hypothesis presumes that compensation committees understand the value implications of the different sources of earnings growth and that they act in the best interests of shareholders.

However, boards may not fully understand or appreciate the different costs and benefits of different sources of earnings growth. Bebchuk and Fried (2004) have argued that executive compensation is often not determined in arm's length transactions and hence may not be efficient. Such inefficiency in the contracting process is less likely to exist in the presence of effective monitoring, such as the monitoring provided by institutional investors (Bushee 1998; Shleifer and Vishny 1986; Balachandran et al. 2009). Institutional owners might use their sophisticated understanding of financial statements to ensure that boards reward executives for value enhancing growth. Consequently, we hypothesize that the presence of institutional ownership will make it less likely that firms will reward CEOs for growth from investment and more likely to reward CEOs for growth from increased profitability.

We test our hypotheses on a sample of firms using CEO compensation data from Execucomp. We test the association between growth in CEO total compensation and growth in earnings, controlling for contemporaneous stock returns. We start with total earnings growth and then partition earnings growth into growth from increased profitability and growth from investment. We also include interactions for the level and nature of institutional ownership.

Our results support the view that top executive compensation is not determined efficiently. We find that compensation committees do indeed place a positive weight on growth from increased profitability. However, they also place a significant weight on growth from investment, even though such growth has no association with current returns and a negative association with future returns. Further, there is evidence that the weight placed on growth from investment in determining compensation is significantly greater than the weight on growth from increased profitability. These results are consistent with two explanations. First, compensation committees may not appreciate the difference between disparate sources of earnings growth. Second, agency problems may exist in organizations (Jensen and Meckling 1976), consistent with arguments by Bebchuk and Fried (2004) that compensation is determined at less than arm's length.

We find partial support for the hypothesis that inefficiencies in contracting are mitigated by institutional investors. The sensitivity of compensation growth to growth from increased profitability increases with institutional ownership. However, the presence of institutional ownership does not reduce the sensitivity of compensation growth to growth from investment. To understand this further, we analyze whether the nature of institutional ownership affects the sensitivity of compensation growth to the components of earnings growth. We hypothesize that the presence of value-oriented institutional investors is likely to increase (decrease) the weight placed on growth from increased profitability (growth from investment). Likewise, we hypothesize that the presence of growth-oriented institutional investors is likely to increase (decrease) the weight placed on growth from investment (growth from increased profitability). Consistent with our hypotheses, we find that the sensitivity of compensation to growth from investment increases with growth-oriented institutional ownership and decreases with value-oriented institutional ownership. We further find that the sensitivity of compensation to growth from increased profitability increases with value-oriented institutional ownership.

Our results contribute to the understanding of the executive compensation process and the forces that influence it. By showing that executive compensation is sensitive to growth from investment, despite such growth not creating value for shareholders, we highlight a potential inefficiency in contracting. Our results suggest that the executive compensation process may help explain why managers engage in inefficient investment activities documented in prior research (Titman et al. 2004; Rau and Vermaelen 1998; Richardson and Sloan 2003).

Our results also highlight the monitoring role that institutional investors can play in the contracting process. Our results are consistent with institutional investors influencing compensation policies to increase the weight placed on value-adding growth from increased profitability. However, we do not find in aggregate that they influence compensation policies to reduce the weight placed on value-diminishing growth from investment. This is likely to happen only when value investors have a significant stake in a firm.

The rest of the paper is organized as follows. In Sect. 2, we describe the related research on executive compensation and the valuation of earnings growth and draw on them to develop our hypotheses. In Sect. 3, we outline the research design used in our paper. In Sect. 4, we describe the data sources used and present descriptive statistics. We present our empirical results in Sect. 5 and conclusions with appropriate caveats in Sect. 6.

2 Related research and hypothesis development

2.1 Related research

2.1.1 Research related to the valuation of earning growth

Earnings growth is a fundamental determinant of equity value and stock returns (Easton and Harris 1991). Firms can show growth in earnings through different ways. They can try to grow earnings by making additional investments in projects that deliver positive earnings in the future (growth from investment). Alternately, they can also attempt to increase earnings by increasing profitability of existing operations by improving operating efficiencies, reducing costs, and using pricing power to internalize economic rents (growth from increased profitability). Earnings growth from increased profitability is inherently valuable to shareholders as it generates additional cash flows without the investment of additional capital. In contrast, it is unclear ex ante whether earnings growth from the investment of additional capital will add value.

Prior research shows that markets overvalue growth from investment and undervalue growth from increased profitability. Titman et al. (2004) document significant return reversals in periods after large capital expenditures. Rau and Vermaelen (1998) demonstrate that firms growing through large acquisitions consistently underperform in the future in terms of accounting performance and stock returns. Richardson and Sloan (2003) show that firms that raise large amounts of external financing often squander it in empire building projects. Piotroski (2000), on the other hand, shows that improvements in profitability as well as it components, asset turnover and profit margin, are positively associated with future returns.

Two recent papers examine the market's valuation of the components of earnings growth using different methodologies. Using a multi-period framework, Harris and Nissim (2006) distinguish growth derived from increases in profitability from growth arising from investment. Using a single period framework based on residual income, Balachandran and Mohanram (2010) decompose earnings growth into two primary components—growth from increase in residual income which proxies for growth from increased profitability and growth from investment. Both papers find that markets contemporaneously undervalue growth from increased profitability and overvalue growth from investment.

2.1.2 Research related to the role of earnings growth in top executive compensation

Earnings growth, along with stock returns, is an important determinant of top executive compensation. Sloan (1993) shows that the inclusion of earnings-based performance measures in executive compensation contracts helps shield executives from fluctuations that are beyond their control. Lambert and Larcker (1987) demonstrate that returns are more likely to be used in compensation for firms with high ROE variance, rapid growth, and low insider ownership. Baber et al. (1996) show that the weight on earnings growth (returns) is lower (higher) when firms have more investment opportunities. Baber et al. (1998) find that the weight on earnings growth in compensation is greater when earnings are more persistent.

2.2 Hypothesis development

2.2.1 Role of growth from increased profitability in determining compensation

Earnings growth from increased profitability is inherently valuable to shareholders. As firms are able to improve earnings by either using existing resources better (increased asset turnover) or extracting greater profits either through improved cost control or increased pricing power, such growth can be achieved without the investment of additional capital. As executive compensation is designed to provide incentives to motivate better use of existing resources, we expect a positive association between growth in compensation and growth from increased profitability. We state the hypothesis in the null form as

H1$_a$ There is no association between growth in compensation and earnings growth from increased profitability.

If we reject the null and do find a positive association, it would be consistent with compensation committees valuing growth from increased profitability as an important determinant of top management compensation.

2.2.2 Role of growth from investment in determining compensation

It is unclear whether earnings growth from investment adds value to firms. If a firm has opportunities for positive NPV projects, then incremental investments may allow it to create additional value for shareholders. However, in a competitive equilibrium, a firm may not have access to many such opportunities. Further, Jensen (1986) argues that growth from investment is often associated with the value destroying reinvestment of internally generated cash flows. Given these alternative arguments, it is unclear whether boards will view growth from investment as valuable for shareholders. It is also uncertain whether boards will reward earnings growth derived from a source with an ambiguous association with value.

Prior research (Balachandran and Mohanram 2010; Harris and Nissim 2006) has shown that earnings growth from investment is associated with strong price reversals in future periods, indicating a potential destruction of shareholder value. However, it is possible that the boards might believe that the investments their firms make will generate value and may hence desire to incentivize their CEOs to invest. Hence we view the association between earnings growth from investment and compensation as an open empirical question. We state this hypothesis in the null form as

H1$_b$ There is no association between compensation growth and earnings growth from investment.

A failure to reject the null would be consistent with board compensation committees ignoring earnings growth from investment in determining compensation. If we do find a positive association, this however would imply that boards value earnings growth from investment even though such growth could, ex post, destroy value.

2.2.3 Influence of institutional ownership

Compensation committees of boards might deviate from providing their CEOs optimal incentives for the following two reasons. First, they might be unable to distinguish between growth from increased profitability and growth from investment, and might overestimate the benefits and underestimate the costs from investments. Second, the board might be unable or unwilling to address potential agency problems in their firms. Bebchuk and Fried (2004) argue that executives and their boards of directors, the participants in the executive compensation market, often do not transact at arm's length. They argue that CEOs often influence the selection of directors and may have other conflicting relationships with them. This compromises the efficiency of the compensation setting process.

Prior research has shown that institutional investors can provide a monitoring role and mitigate some of the inefficiencies in the executive compensation process (Bushee 1998; Shleifer and Vishny 1986; Balachandran et al. 2009). In addition, as institutional investors are sophisticated users of financial information, they are more likely to be able to distinguish value enhancing growth in earnings from value destroying growth. We hence expect a greater weight on growth from increased profitability and a reduced weight on growth from investment with greater institutional ownership. We state the hypothesis in the null form as

H2$_a$ The association between growth in compensation and earnings growth from increased profitability is unrelated to the level of institutional ownership.

H2$_b$ The association between growth in compensation and earnings growth from investment is unrelated to the level of institutional ownership.

If we find that the presence of institutional investment is associated with a greater weight on growth from increased profitability (lesser weight on growth from investment), this would be consistent with institutional investors either influencing boards to set appropriate incentives for top executive compensation or with institutional investors choosing to invest in firms where appropriate incentives are already in place.

2.2.4 Influence of value-oriented institutional ownership

Finally, the attitude towards different sources of earnings growth could differ based on the institutional investor's investment philosophy. Value investors focus on profitability and return on investment. Piotroski (2000) implements a value investing based strategy on a sample of high book-to-market stocks to successfully distinguish winners from losers. The key signals used in his analysis are increase in profitability (return on assets) and increase in asset turnover and profit margin. Warren Buffet, the legendary value investor, explained his investment philosophy in one of the annual letters to his firm's shareholders as follows:[1]

> Most companies define "record" earnings as a new high in earnings per share. Since businesses customarily add from year to year to their equity base, we find nothing particularly noteworthy in a management performance combining, say, a 10% increase in equity capital and a 5% increase in earnings per share. After all, even a totally dormant savings account will produce steadily rising interest earnings each year because of compounding.

We hypothesize that value investors will consider growth from increased profitability to be more valuable than growth from investment. They will either influence compensation practices to reward profitability or choose to invest only in firms where they believe that incentives are appropriately aligned. We state this hypothesis in the null form as

$H3_a$ The association between growth in compensation and earnings growth from increased profitability is unrelated to the level of value-oriented institutional ownership.

$H3_b$ The association between growth in compensation and earnings growth from investment is unrelated to the level of value-oriented institutional ownership.

If we reject the null and find that the presence of value-oriented institutional ownership is associated positively with the weight on growth from increased profitability (negatively with growth from investment), this would be consistent with value investors influencing boards to emphasize profitability over investment or with value investors investing in firms where the incentives are already aligned with their preference for profitability over investment.

2.2.5 Influence of growth-oriented institutional ownership

Growth investors are likely to focus less on short term earnings and more on investment, which they may regard as necessary prerequisites for attaining future growth. Evidence for this can be seen in prospectuses outlining the investment philosophies of growth funds. An excerpt from such a prospectus is provided below:[2]

> Baron Funds is a long-term investor in businesses. It is not a short-term trader of stocks. Its focus is on the long-term fundamental prospects of the businesses in which it invests rather than on historical operating results or current earnings expectations. Baron believes that historical results and the outlook for near-term earnings are often not indicative of superior longer-term prospects

[1] Chairman's letter to investors, Berkshire Hathaway, 1977. http://www.berkshirehathaway.com/letters/1977.html.

[2] Prospectus of the Barron Growth Fund, February 2009.

> that can be identified through research efforts. Baron Funds attempts to take advantage of targeted opportunities, identified by its research, to purchase what it believes are great companies with exciting prospects at attractive prices.

We hypothesize that growth investors will consider growth from increased profitability to be less valuable than growth from investment. They will either influence compensation practices to reward growth from investment or choose to own stakes only in firms where management are incentivized to invest. We state this hypothesis in the form of the null as

$H4_a$ The association between growth in compensation and earnings growth from increased profitability is unrelated to the level of growth-oriented institutional ownership.

$H4_b$ The association between growth in compensation and earnings growth from investment is unrelated to the level of growth-oriented institutional ownership.

If we reject the null and find that the presence of growth-oriented institutional ownership is associated negatively with the weight on growth from increased profitability (positively with growth from investment), this would be consistent with growth investors either influencing boards to emphasize growth or with growth investors choosing to invest in firms where the incentives are aligned with their preference for growth over profitability.

3 Research design

3.1 Components of earnings growth

We start by decomposing earnings growth into two primary components—one representing growth from investments and the other denoting growth from increased profitability. We use two approaches to decompose earnings. The first approach, based on Balachandran and Mohanram (2010), uses the change in residual income (RI) as the proxy for growth from increased profitability. The second approach, based on Harris and Nissim (2006), uses the change in return on invested capital (ΔROIC) as a measure of increased profitability. The RI decomposition has the advantage of dividing earnings growth into additive components, allowing one to compare the relative coefficients among the different components and make assessments about differential valuation. However this decomposition is also subject to misclassification between the different categories. This problem does not affect the second approach, which does not attempt a complete decomposition. To ensure the robustness of our tests that follow, we will use both the RI decomposition and the alternative ΔROIC approach.

3.1.1 Residual income based decomposition

Residual income (RI) is a natural starting point in the attempt to disentangle these two sources of growth as it starts with operating income and takes a charge for the opportunity cost of the capital employed. Balachandran and Mohanram (2010) use RI to decompose earnings growth. We present an abbreviated version of the decomposition below.

Residual income is typically defined as net operating profit after tax [net income plus after tax interest or $NI_t + INT_t * (1 - t)$] less a charge for invested capital, calculated as weighted average cost of capital (WACC) times lagged invested capital (IC) as follows:

$$RI_t = NI_t + INT_t * (1 - t) - WACC_t * IC_{t-1} \tag{1}$$

Correspondingly residual income in the prior period is

$$RI_{t-1} = NI_{t-1} + INT_{t-1} * (1 - t) - WACC_{t-1} * IC_{t-2} \tag{2}$$

Combining (3) and (4) we can express change in RI as below, where Δ refers to changes;

$$\Delta RI_t = \Delta NI_t + \Delta INT_t * (1 - t) - WACC_t * IC_{t-1} + WACC_{t-1} * IC_{t-2} \tag{3}$$

Add and subtract $WACC_t * IC_{t-2}$ to the above expression, reorganize and solve for ΔNI_t:

$$\Delta NI_t = \Delta RI_t + \Delta IC_{t-1} * WACC_t - \Delta INT_t * (1 - t) + IC_{t-2} * \Delta WACC_t \tag{4}$$

Consider the terms in Eq. 4 in reverse order. $IC_{t-2} * \Delta WACC_t$ can be interpreted as the component of earnings growth associated with an increase in operating risk. $\Delta INT_t * (1 - t)$ represents the negative impact of increasing interest expense (due to either increased debt or cost of debt) on earnings growth. $\Delta IC_{t-1} * WACC_t$ will be associated with growth in earnings associated with new investment. Finally, ΔRI_t is change in net income that exceeds the incremental cost of capital invested. This will increase due to any factor not explicitly captured in the other terms. This includes all improvements not requiring the investment of new capital such as increases in pricing power, decreases in operating expenses and increases in asset efficiency. Balachandran and Mohanram (2010) interpret $\Delta IC_{t-1} * WACC_t$ as growth from investment and ΔRI_t as growth from increased profitability. They show that the markets undervalue growth from increased profitability and overvalue growth from investment.

3.1.2 Alternate decomposition

Harris and Nissim (2006) also analyze the dichotomy between earnings growth derived from improvements in profitability and earnings growth derived from additional investment. In their paper, they use a multi-year estimation to separate out these two components. Their returns tests do not use a formal decomposition (as the RI based model does) but instead use the change in return on invested capital ($\Delta ROIC_t$) as the proxy for growth from increased profitability and the growth in beginning invested capital (ΔIC_{t-1}) as the proxy for growth from investment.

3.2 Relationship between components of earnings growth and contemporaneous returns

We begin our analysis with the relationship between returns and the components of earnings growth. As our baseline, we start with the specification developed in Easton and Harris (1991) to understand the relationship between returns and earnings. Specifically,

$$\mathrm{RETM_t} = \alpha_0 + \beta_1 * \mathrm{NI_t} + \beta_2 * \Delta\mathrm{NI_t} + \varepsilon, \tag{5}$$

where $\mathrm{RETM_t}$ is a measure of market-adjusted returns. We substitute for the components of $\Delta\mathrm{NI_t}$ from Eq. 4 to give the following specification:

$$\begin{aligned}\mathrm{RETM_t} = {} & \alpha_0 + \gamma_1 * \mathrm{NI_t} + \gamma_2 \Delta\mathrm{RI_t} + \gamma_3(\Delta\mathrm{IC_{t-1}} * \mathrm{WACC_t}) + \gamma_4(\Delta\mathrm{INT_t} * (1 - \mathrm{t})) \\ & + \gamma_4(\mathrm{IC_{t-2}} * \Delta\mathrm{WACC_t}) + \varepsilon \end{aligned} \tag{6}$$

We interpret the coefficients from this regression as measures of the market's valuation of different earnings growth components. The coefficient γ_2 on $\Delta\mathrm{RI_t}$ represents how the market values earnings growth from increased profitability, while the coefficient γ_3 on $(\Delta\mathrm{IC_{t-1}} * \mathrm{WACC_t})$ represents how the market values growth from investment. Finally, γ_4 and γ_5 represent the valuation of changes in interest expense and risk. We will focus on γ_1 and γ_2 in our analysis.

We also use the Harris and Nissim (2006) approach, with the change in return on invested capital $(\Delta\mathrm{ROIC_t})$ as the proxy for growth from increased profitability and growth in beginning invested capital $(\Delta\mathrm{IC_{t-1}})$ as the proxy for growth from investment. We hence get

$$\mathrm{RETM_t} = \alpha_0 + \gamma'_1 * \mathrm{NI_t} + \gamma'_2 \Delta\mathrm{ROIC_t} + \gamma'_3 \Delta\mathrm{IC_{t-1}} + \varepsilon \tag{7}$$

We interpret γ'_2 as representing the valuation of growth from increased profitability and γ'_3 as representing the valuation of growth from investment as per Harris and Nissim (2006).

3.3 Relationship between components of earnings growth and future returns

We examine the relationship between components of change in net income and future returns by using 1-year-ahead market adjusted returns as the dependent variable. Our specification is thus

$$\begin{aligned}\mathrm{RETM_{t+1}} = {} & \alpha_0 + \delta_1 * \mathrm{NI_t} + \delta_2 * \Delta\mathrm{RI_t} + \delta_3 * (\Delta\mathrm{IC_{t-1}} * \mathrm{WACC_t}) + \delta_4 \\ & * (\Delta\mathrm{INT_t} * (1 - \mathrm{t})) + \delta_5 * (\mathrm{IC_{t-2}} * \Delta\mathrm{WACC_t}) + \varepsilon \end{aligned} \tag{8}$$

We interpret the coefficients from this regression as measures of how the stock market reinterprets its initial reaction to components of earnings growth. If the coefficient δ_2 on $\Delta\mathrm{RI_t}$ (δ_3 on $\Delta\mathrm{IC_{t-1}} * \mathrm{WACC_t}$) is positive, it implies that the market's initial reaction was an under-reaction, leading to a drift in the future. However, if this coefficient is negative, it implies that the market's initial reaction was an overreaction, leading to future reversals. Similarly, we also modify Eq. 9 for future returns with the Harris and Nissim (2006) approach as below:

$$\mathrm{RETM}_{t+1} = \alpha_0 + \delta'_1 * \mathrm{NI}_t + \delta'_2 * \Delta\mathrm{ROIC}_t + \delta'_3 * \Delta\mathrm{IC}_{t-1} + \varepsilon \tag{9}$$

We interpret the coefficients δ'_2 and δ'_3 as the market's correction to its initial assessment.

3.4 Relationship between components of earnings growth and growth in compensation

Our hypotheses are based on the relationship between the components of earnings growth and growth in compensation. For our empirical tests, we follow the specifications used in the extensive literature on the role of accounting information and stock market returns in determining top executive compensation. Studies focusing on the determinants of compensation typically regress change in compensation on growth in earnings and stock runs (Baber et al. 1996; Bushman et al. 2006).

While returns and earnings growth are likely to be correlated, they are both used as determinants of compensation for the following reasons. First, Sloan (1993) argues that the use of earnings in executive compensation contracts helps shield executives from fluctuations in firm value that are beyond their control. Second, Barclay et al. (2005) contend that both earnings and returns have a role in compensation because earnings represent delivered performance while returns represent expected future performance. We start with the following baseline specification for compensation growth.[3]

$$\Delta\mathrm{COMP}_t = \alpha_0 + \phi_1 * \mathrm{RET}_t + \phi_2 * \Delta\mathrm{NI}_t + \varepsilon \tag{10}$$

where $\Delta\mathrm{COMP}_t$ is the growth in compensation; RET_t is contemporaneous stock returns; and $\Delta\mathrm{NI}_t$ is growth in earnings. ϕ_1 and ϕ_2 represent the weights placed on market based measures and accounting based measures of performance respectively. To understand how compensation varies with components of earnings growth, we substitute for $\Delta\mathrm{NI}_t$ in the above equation using the two approaches discussed before. With the RI based decomposition (Eq. 4), we get

$$\Delta\mathrm{COMP}_t = \alpha_0 + \eta_1 * \mathrm{RET}_t + \eta_2 * \Delta\mathrm{RI}_t + \eta_3 * \Delta\mathrm{IC}_{t-1} * \mathrm{WACC}_t + \eta_4 * (\Delta\mathrm{INT}_t * (1 - t)) + \eta_5 * (\mathrm{IC}_{t-2} * \Delta\mathrm{WACC}_t) + \varepsilon \tag{11}$$

In this equation, η_2 and η_3 represent the sensitivity of compensation growth to growth from increased profitability and growth from investment. In addition, using the Harris and Nissim (2006) approach gives us the following equation:

$$\Delta\mathrm{COMP}_t = \alpha_0 + \eta'_1 * \mathrm{RET}_t + \eta'_2 * \Delta\mathrm{ROIC}_t + \eta'_3 * \Delta\mathrm{IC}_{t-1} + \varepsilon \tag{12}$$

[3] As in prior research, we use raw returns instead of market adjusted returns for two reasons. First, the value of stock based compensation depends on actual returns. Second, it is unclear how many firms use relative performance evaluation for compensation. In addition, Baber et al. (1999) recommend adding the level of net income in addition to the change in net income to compensation regressions. When we add the level of net income to our regressions, the coefficient on net income is insignificant and all other inferences unaltered. We therefore decide to focus on the specification with returns and changes in net income alone.

In the above equation, η'_2 and η'_3 represent the sensitivity of compensation growth to growth from increased profitability and growth from investment.

4 Data

4.1 Sample selection and sample descriptive statistics

We get our annual compensation information from the Execucomp database. We focus on CEO total compensation (Data Item TDC_1). Given that we are analyzing the change in compensation, we require that a firm have two consecutive years of compensation data. In addition, we also impose the restriction that the executive who is the CEO be the same in both years. We collect accounting information to decompose growth in earnings from COMPUSTAT. We require that firms have all necessary information, including lagged and twice-lagged invested capital (Compustat # 37). We also require that firms have information on CRSP to compute contemporaneous and 1-year-ahead returns. Finally, we obtain information on institutional ownership from the Thompson Financial Database (formerly called Spectrum) which is in turn collated from 13-F filings. We measure institutional ownership on the fiscal year end date. Consistent with prior research, we assume that institutional ownership is zero if a firm's holdings do not appear in the Thomson database. Our final sample has 16,332 observations representing 2,474 distinct firms. Panel A of Table 1 outlines the sample selection procedure.

Panel B of Table 1 presents descriptive statistics for the sample. Sample firms are large, as Execucomp covers the S&P 1500. Mean (median) sales are $4.769 billion ($1.248 billion), while mean (median) assets are higher at $12.049 billion ($1.570 billion). Mean (median) market value of equity is $6.994 billion ($1.518 billion). Firms are also profitable with mean (median) net income of $308 million ($66 million). Further, firms have positive residual income, also evidenced by mean return on invested capital (ROIC) at 10.4% exceeding mean weighted average cost of capital (WACC) of 10.1%. Mean proportion of institutional ownership is 49%. Finally, mean (median) total annual CEO compensation is approximately $4.8 million ($2.2 million).

Panel C presents the industry distribution of the sample. The representation of industries in the sample generally mirrors that of the overall Compustat population. There does not seem to be any evidence of industry clustering. Panel D presents the time distribution. While the Execucomp database starts from 1992, our analysis starts from 1993 as we need at least 2 years to compute growth in compensation. Other than 1993 and 1994 when the coverage was just starting, all other years each represent 7 to 8% of the overall sample.

4.2 Computation of analysis variables

Our measure of compensation growth, ΔCOMP, is the growth in total compensation (TDC_1 in Execucomp). This includes all cash compensation including bonus and all other incentive compensation including the value of stock options as computed by Execucomp.

For NI, we use income before extraordinary items (Compustat #18). To compute RI, we first compute net operating profit after tax (NOPAT) as NI plus INT * (1 − t),

Table 1 Sample selection and descriptive statistics

Panel A: sample selection procedure

	Firm-years	Distinct firms
Data on Execucomp for CEO total compensation (TDC_1)	24,202	2,871
LESS observations with no lagged total compensation information	3,109	177
Remaining observations	21,093	2,694
LESS firms with change in the CEO across the 2 years	2,532	21
Remaining observations	18,561	2,673
LESS observations without adequate data to calculate residual income based decomposition (lagged and twice-lagged invested capital)	1,411	96
Remaining observations	17,150	2,577
LESS observations without contemporaneous returns on CRSP	687	87
Remaining observations	16,463	2,490
LESS firms with missing 1-year-ahead returns on CRSP	131	16
Final sample	16,332	2,474

Panel B: descriptive statistics for sample firm-years ($N = 16{,}332$)

	Mean	SD	Q1	Median	Q3
Total assets	12049.2	57333.8	531.9	1570.0	5676.5
Sales	4768.8	13641.4	484.4	1248.0	3760.3
Market value of equity	6993.5	22468.9	555.0	1518.0	4642.5
Book value of equity	2219.1	6398.2	239.6	594.6	1697.0
Total debt	4006.4	28475.4	55.3	324.1	1297.8
Net income	308.2	1142.9	17.5	65.5	225.1
NOPAT	439.3	1807.4	25.6	85.5	283.8
Residual income	107.2	834.1	−16.5	15.6	88.0
ROE	10.5%	25.5%	6.2%	13.0%	19.1%
ROIC	10.4%	27.6%	6.2%	10.9%	16.7%
Cost of equity	11.0%	3.9%	7.9%	10.3%	13.0%
WACC	10.1%	3.6%	7.3%	9.3%	11.9%
% Institutional holdings	48.9%	33.6%	1.7%	56.9%	76.3%
Salary	0.658	0.353	0.419	0.600	0.839
Bonus	0.738	1.478	0.045	0.355	0.850
Total compensation	4.769	20.780	1.107	2.243	4.890

Table 1 continued

Panel C: industry distribution

SIC code	Description	Firm-years	Sample (%)	Compustat (%)
73	Business services	1,261	7.7	11.5
28	Chemicals and allied products	1,192	7.3	6.6
36	Electronic and other electric equipment	1,183	7.2	6.5
49	Electric, gas, and sanitary services	1,109	6.8	4.1
60	Depository institutions	942	5.8	9.4
35	Industrial machinery and equipment	921	5.6	5.1
38	Instruments and related products	790	4.8	5.2
63	Insurance carriers	656	4.0	2.5
13	Oil and gas extraction	506	3.1	3.1
37	Transportation equipment	491	3.0	1.8
20	Food and kindred products	434	2.7	1.9
33	Primary metal industries	358	2.2	1.2
50	Wholesale trade-durable goods	355	2.2	2.1
27	Printing and publishing	330	2.0	1.1
48	Communications	325	2.0	3.9
	All other industries	5,479	33.5	33.9
	Total	16,332	100	100

Panel D: distribution across time

Year	Firms	Sample (%)
1993	295	1.8
1994	888	5.4
1995	1,193	7.3
1996	1,232	7.5
1997	1,192	7.3
1998	1,225	7.5
1999	1,254	7.7
2000	1,257	7.7
2001	1,286	7.9
2002	1,338	8.2
2003	1,320	8.1
2004	1,329	8.1
2005	1,293	7.9
2006	1,230	7.5

For Panel B, the following data items are from the annual Compustat file: sales (#12), assets (#6), total debt (#9 + #34), book value of equity (#60), market value of equity [shares outstanding (#25) * stock price (#199)] and net income before extraordinary items (#18). NOPAT is net income before extraordinary items plus interest expense (#15) times (1-tax rate). Residual income is NOPAT minus lagged invested capital (#37) times WACC. See footnote 5 for details on WACC estimation where INT is the interest expense (Compustat #15), and t is the tax rate.[4] RI is defined as NOPAT minus IC_{t-1} (lagged invested capital, Compustat #37) times the weighted average cost of capital (WACC).[5] Once we have extracted and computed RI, INT * (1 − t), IC_{t-1} and WACC, we compute the changes in the variables. Finally, all variables in this decomposition are scaled by beginning market value of equity [shares outstanding (#25) * stock price (#199)]. For our second approach towards decomposing income growth, return on invested capital ($ROIC_t$) is NOPAT divided by beginning invested capital (IC_{t-1}). Growth in investment (ΔIC_{t-1}) is the difference between IC_{t-1} and IC_{t-2} and is also scaled by beginning market value of equity.

Contemporaneous annual returns ($RETM_t$) for a given firm are calculated by compounding CRSP monthly returns beginning 4 months after the beginning of the fiscal year and ending 12 months thereafter. We do this to allow enough time to ensure that annual financials are available. One-year-ahead returns ($RETM_{t+1}$) are similarly calculated by starting the compounding period 4 months after the end of the fiscal year. We adjust the returns by subtracting the compounded return on the value-weighted index over the same period. Finally, all our variables except stock returns are winsorized at the 1 and 99% levels.

4.3 Descriptive statistics for analysis variables

Panel A of Table 2 presents the descriptive statistics for the variables used in our analysis. By construction, the mean change in ΔNI (0.97%) equals the change in ΔRI (0.64%) plus the investment component ($\Delta IC_{t-1} * WACC_t = 0.43\%$), minus the change in the after-tax interest component (0.17%) plus the change in risk component ($IC_{t-2} * \Delta WACC_t = 0.06\%$). Interestingly, while the mean ΔRI is positive, the mean $\Delta ROIC_t$ is −0.67%. The means of both contemporaneous and 1-year-ahead returns are significantly greater than zero (slightly over 4%) as these are equally weighted means, while the market index used is the value-weighted index. If we use the equally weighted index as the market return measure, the means are close to zero. Finally, the mean growth in compensation ΔCOMP is 38.4%.

Panel B of Table 2 presents correlations between the variables, both Pearson and Spearman rank-order. Not surprisingly, growth in net income (ΔNI) and residual income (ΔRI) is highly correlated (0.971 Pearson, 0.884 Spearman). Interestingly, the correlation between ΔNI and the investment component of the change in NI ($\Delta IC_{t-1} * WACC_t$) is negative, indicating that large changes in income are seldom associated with growth because of investment. The proxies for growth from

[4] The tax rate is the prevailing statutory tax rate for each year, set to zero if a firm has net operating loss carry-forwards (NOLs), consistent with Biddle et al. (1997).

[5] We estimate WACC by (1) estimating a CAPM cost of equity using 60 past monthly returns, (2) inferring after-tax cost of debt from interest expense, total interest bearing debt, and the tax rate, and (3) using market value of equity and book value of total debt for their relative weights. We estimate betas using at least 24 months and up to 60 months of lagged returns. Betas below 0.4 are set to 0.4, while betas above 3 are set to 3. If a beta cannot be estimated, we use the contemporaneous median beta for firms with the same 2-digit SIC code.

Table 2 Descriptive statistics for analysis variables

Panel A: univariate statistics ($N = 16,332$ observations)

	Mean (%)	SD (%)	25th percentile (%)	Median (%)	75th percentile (%)
NI_t	3.80	10.70	2.81	5.49	7.83
ΔNI_t	0.97	10.91	−0.99	0.74	2.35
ΔRI_t	0.64	11.56	−1.67	0.31	2.06
$\Delta IC_{t-1} * WACC_t$	0.43	2.34	−0.01	0.39	1.00
$\Delta INT_t * (1-t)$	0.17	1.15	−0.07	0.00	0.23
$IC_{t-2} * \Delta WACC_t$	0.06	1.63	−0.46	0.00	0.48
$\Delta ROIC_t$	−0.67	12.87	−3.65	0.03	3.10
ΔIC_{t-1}	18.00	39.54	−0.26	9.16	23.63
$RETM_t$	4.18	54.05	−23.14	−2.70	20.92
$RETM_{t+1}$	4.44	52.39	−22.66	−1.93	21.66
$\Delta COMP_t$	38.41	132.78	−19.82	8.37	47.32

Panel B: correlation matrix

	NI_t	ΔNI_t	ΔRI_t	ΔIC_{t-1} * $WACC_t$	ΔINT_t * $(1-t)$	IC_{t-2} * $\Delta WACC_t$	$\Delta ROIC_t$	ΔIC_{t-1}	$RETM_t$	$RETM_{t+1}$	$\Delta COMP_t$
NI_t		0.369	0.297	0.249	−0.061	−0.031	0.339	0.032	0.075	−0.052	0.039
ΔNI_t	0.496		0.971	−0.378	−0.087	0.150	0.633	−0.126	0.169	0.014	0.058
ΔRI_t	0.430	0.884		−0.487	−0.040	0.069	0.625	−0.203	0.160	0.027	0.052
ΔIC_{t-1} * $WACC_t$	0.103	−0.103	−0.295		0.251	−0.213	−0.225	0.567	−0.092	−0.050	0.002
ΔINT_t * $(1-t)$	−0.041	−0.100	−0.076	0.291		0.206	−0.006	0.152	−0.031	−0.015	0.007
IC_{t-2} * $\Delta WACC_t$	0.030	0.089	−0.090	−0.103	0.092		0.095	−0.121	0.075	−0.053	0.019
$\Delta ROIC_t$	0.385	0.816	0.834	−0.316	−0.066	0.136		−0.253	0.147	0.001	0.067
ΔIC_{t-1}	0.013	−0.102	−0.270	0.888	0.244	−0.132	−0.351		−0.062	−0.031	0.045
$RETM_t$	0.239	0.215	0.204	−0.042	−0.074	0.018	0.194	−0.058		−0.025	0.084
$RETM_{t+1}$	0.060	0.030	0.040	−0.023	−0.021	−0.038	0.024	−0.034	0.043		0.010
$\Delta COMP_t$	0.163	0.194	0.177	−0.005	−0.021	0.016	0.169	−0.006	0.127	0.008	

NI_t is net income before extraordinary items (#18). ΔNI_t and ΔRI_t are the change in net income and residual income respectively, where residual income is computed as described in Sect. 4.2. IC_{t-1} is lagged invested capital (#37). ΔIC_{t-1} is the lagged change in invested capital (#37). IC_{t-2} is twice-lagged invested capital (#37). $WACC_t$ is the weighted average cost of capital, computed as described in footnote 5. $\Delta INT_t * (1-t)$ is the change in after-tax interest expense (#15). $\Delta ROIC_t$ is the change in return on invested capital, defined as NOPAT scaled by lagged invested capital. All variables except ROIC are scaled by lagged market value of equity (#25*#199). $RETM_t$ and $RETM_{t+1}$ are, respectively, contemporaneous and 1-year-ahead annual buy and hold returns, adjusted by subtracting value-weighted market returns compounded over the same time period. Returns are compounded starting 4 months after the prior fiscal year end for $RETM_t$ and starting 4 months after the current fiscal year end for $RETM_{t+1}$. $\Delta COMP_t$ is the change in total CEO compensation, i.e. $(TDC_t/TDC_{t-1} - 1)$ from Execucomp. Panel A presents the univariate statistics for the variables. Panel B presents the correlation between the variables. Figures above/below the diagonal are Pearson/Spearman rank-order correlations increased profitability using the two approaches (ΔRI and ΔROIC) are strongly correlated (0.625 Pearson, 0.834 Spearman), as are the two proxies for growth from investment (ΔIC_{t-1} * $WACC_t$ and ΔIC_{t-1}, 0.567 Pearson and 0.888 Spearman).

Both ΔNI and ΔRI show strong correlation with current returns ($RETM_t$), with ΔNI showing a marginally stronger correlation. In contrast, both ΔNI and ΔRI correlate weakly with future returns ($RETM_{t+1}$), with ΔRI showing a marginally stronger correlation. Finally, growth in compensation (ΔCOMP) appears to be strongly correlated with ΔNI, ΔRI, and ΔROIC but uncorrelated with proxies for growth from investment (ΔIC_{t-1} * $WACC_t$ and ΔIC_{t-1}).

5 Results

5.1 Relationship between components of earnings growth and contemporaneous stock returns

Prior research has found that both growth from increased profitability as well as growth from investment are positively related to contemporaneous returns, with a significantly greater coefficient on growth from increased profitability (Balachandran and Mohanram 2010). We begin first by re-examining the relation between the components of earnings growth and contemporaneous stock returns in our sample.

We run regressions for a panel of firm-years with the dependent variable as market adjusted buy-and-hold contemporaneous annual returns ($RETM_t$) and the dependent variables as current income (NI_t) and either the change in income (ΔNI_t) or the components of change in net income. The regressions control for clustering along two dimensions, firm and time, using the procedure outlined in Cameron et al. (2006) and discussed in Petersen (2009).[6]

Panel A of Table 3 presents the regression for contemporaneous returns. The first specification presents the basic Easton and Harris (1991) regression. As the results indicate, the coefficient on income growth is 0.8077. In the next specification, we replace ΔNI_t with its components using the RI based decomposition. We find that the market appears to value growth from increased profitability (coefficient on ΔRI 0.6462, *t*-stat 4.04) but do not find any evidence that the markets value growth from investment (ΔIC_{t-1} * $WACC_t$). Finally, we run a regression with the alternate decomposition. Here too we find that the stock markets appear to value growth from increased profitability ($\Delta ROIC_t$) but not growth from investment (ΔIC_{t-1}). The finding that growth from increased profitability is valued positively and considered more valuable than growth from investment is consistent with prior research.[7]

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[6] We thank John McInnis of the University of Texas for providing us with the SAS code to implement the two-way clustering. The code can be obtained from https://webspace.utexas.edu/~johnmac.

[7] Prior literature, unlike this paper, does find a positive association between investment and current returns. One potential reason for this difference is that our sample consists of larger firms that face more scrutiny, making it less likely that investors will reward value diminishing investments.

Table 3 Regression of returns on earnings and earnings growth components

Panel A: dependent variable contemporaneous market-adjusted returns ($RETM_t$)

Variable	Interpretation	Expected sign	Baseline Easton and Harris	RI based breakdown	Profitability breakdown
Intercept		?	0.0311	0.0328	0.0467
			(0.78)	(0.82)	(1.07)
NI_t	Income	+	0.0772	0.1869	0.1670
			(0.27)	(0.71)	(0.59)
ΔNI_t	Income growth	+	0.8077		
			(4.32)		
ΔRI_t	Growth from increased profitability	+		0.6462	
				(4.04)	
$\Delta IC_{t-1} * WACC_t$	Growth from investment	?		−0.2288	
				(−0.43)	
$\Delta INT_t * (1 - t)$	Change in interest	−		−1.6556	
				(−1.12)	
$IC_{t-2} * \Delta WACC_t$	Change in risk	+		2.3734	
				(1.94)	
$\Delta ROIC_t$	Profitability growth	+			0.5373
					(4.12)
ΔIC_{t-1}	Investment growth	?			−0.0421
					(−1.52)
N			16,332	16,332	16,332
Adj. R^2 (%)			2.86	3.23	2.32

Panel B: dependent variable 1-year-ahead market-adjusted returns ($RETM_{t+1}$)

Variable	Interpretation	Expected sign	Baseline Easton and Harris	RI based breakdown	Profitability breakdown
Intercept		?	0.0549	0.0578	0.0613
			(1.41)	(1.52)	(1.57)
NI_t	Income	?	−0.3250	−0.2583	−0.2729
			(−1.15)	(−0.92)	(−1.12)
ΔNI_t	Income growth	?	0.1871		
			(1.04)		
ΔRI_t	Growth from increased profitability	?		0.1310	
				(0.73)	
$\Delta IC_{t-1} * WACC_t$	Growth from investment	?		−0.8521	
				(−1.99)	
$\Delta INT_t * (1 - t)$	Change in interest	?		0.2825	
				(0.18)	
$IC_{t-2} * \Delta WACC_t$	Change in risk	?		−2.1041	
				(−1.91)	
$\Delta ROIC_t$	Profitability growth	?			0.0550
					(0.56)
ΔIC_{t-1}	Investment growth	?			−0.0344
					(−2.57)
N			16,332	16,332	16,332
Adj. R^2 (%)			0.40	0.88	0.37

Table 3 continued

Table presents coefficients and *t*-statistics (in parentheses) from pooled regressions. *t*-statistics control for two-way clustering by firm and time using the Cameron et al. (2006) methodology. $RETM_t$ and $RETM_{t+1}$ are, respectively, contemporaneous and 1-year-ahead annual buy and hold returns, adjusted by subtracting value-weighted market returns compounded over the same time period. Returns are compounded starting 4 months after the prior fiscal year end for $RETM_t$ and starting 4 months after the current fiscal year end for $RETM_{t+1}$. NI_t is net income before extraordinary items (#18). ΔNI_t and ΔRI_t are the change in net income and residual income respectively, where residual income is computed as described in Sect. 4.2. IC_{t-1} is lagged invested capital (#37). ΔIC_{t-1} is the lagged change in invested capital (#37). IC_{t-2} is twice-lagged invested capital (#37). $WACC_t$ is the weighted average cost of capital, computed as described in footnote 5. $\Delta INT_t * (1 - t)$ is the change in after-tax interest expense (#15). $\Delta ROIC_t$ is the change in return on invested capital, defined as NOPAT scaled by lagged invested capital. All variables except ROIC are scaled by lagged market value of equity (#25*#199)

5.2 Relationship between components of earnings growth and future stock returns

We next examine the relationship between earnings growth and future returns. The results are presented in Panel B of Table 3. The first regression indicates that there is no evidence of any earnings related drift, as the coefficient on ΔNI_t is an insignificant 0.1871. When we replace ΔNI_t with the RI based decomposition, we find evidence of a reversal with respect to growth from investment. The coefficient on $\Delta IC_{t-1} * WACC_t$ is a significantly negative −0.8521 (*t*-stat −1.99). Similarly, when we use the alternate decomposition, we find a significant negative coefficient on growth in investment (coefficient −0.0344, *t*-stat −2.57). The reversal with respect to investment is consistent with prior research (Titman et al. 2004; Balachandran and Mohanram 2010; Harris and Nissim 2006).

Summarizing the results from the analysis of contemporaneous returns and future returns, growth from increased profitability is viewed as valuable while growth from investment is viewed as value destroying. The markets appreciate growth from increased profitability contemporaneously. The markets ignore growth from investment contemporaneously but react negatively in the future. In the next section, we examine whether compensation committees are aware of the differential valuation implications of these two sources of growth.

5.3 Relationship between growth in compensation and components of earnings growth

We next regress the growth in compensation on both returns as well as growth in earnings. Our measure of compensation growth $\Delta COMP_t$ is the growth in total annual compensation (TDC_1 in Execucomp). The regressions are presented in Panel A of Table 4.

The first regression runs the baseline specification as in Bushman et al. (2006). We find that growth in total compensation is strongly associated with both stock returns (RET_t) as well as growth in income (ΔNI_t). The second regression replaces income growth with its components using the RI based decomposition. While growth in compensation is strongly associated with growth from increased profitability rejecting the null for $H1_a$ (coefficient on ΔRI_t 0.6828, *t*-stat 4.97), it is also positively associated with earnings growth from investment (coefficient on

$\Delta IC_{t-1} * WACC_t$ 2.3927, *t*-stat 4.02), rejecting the null for $H1_b$. In fact, the coefficient on growth from investment is significantly higher (difference 1.7099, *t*-stat 2.80). When we use the alternate decomposition, we find similar results. The growth in compensation is strongly associated with growth in profitability (coefficient on $\Delta ROIC_t$ 0.7475, *t*-stat 4.62) but also strongly associated with growth in investment (coefficient on ΔIC_{t-1} 0.2312, *t*-stat 4.49).[8] The implication of

Table 4 Regression of compensation growth on returns and earnings growth components

Panel A: regression for growth in total compensation ($\Delta COMP_t$)

Variable	Interpretation	Expected sign	Baseline Bushman et al.	RI based breakdown	Profitability breakdown
Intercept		?	0.3498	0.3404	0.3180
			(12.50)	(12.39)	(13.07)
RET_t	Contemporaneous stock returns	+	0.1760	0.1761	0.1791
			(4.04)	(4.25)	(4.25)
ΔNI_t	Income growth	+	0.5479		
			(3.36)		
ΔRI_t	Growth from increased profitability	+		0.6828	
				(4.97)	
$\Delta IC_{t-1} * WACC_t$	Growth from investment	?		2.3927	
				(4.02)	
$\Delta INT_t * (1 - t)$	Change in interest	?		−0.4165	
				(−0.48)	
$IC_{t-2} * \Delta WACC_t$	Change in risk	?		1.3173	
				(1.40)	
$\Delta ROIC_t$	Profitability growth	+			0.7475
					(4.62)
ΔIC_{t-1}	Investment growth	?			0.2312
					(4.49)
N			16,332	16,332	16,332
Adj. R^2 (%)			0.86	0.95	1.40

Panel B: mean compensation, earnings growth, and returns partitioned by investment

	$\Delta IC_{t-1} \geq 0$ (*N* = 12,153) (%)	$\Delta IC_{t-1} < 0$ (*N* = 4,179) (%)	Difference (%)	*t*-stat
$RETM_t$	2.6	8.7	−6.1	−5.42
$RETM_{t+1}$	3.2	8.2	−5.0	−4.84
ΔNI_t	−0.1	4.1	−4.2	−15.33
ΔRI_t	−0.9	5.2	−6.1	−20.99
$\Delta IC_{t-1} * WACC_t$	1.1	−1.6	2.8	55.96
$\Delta INT_t * (1 - t)$	0.3	−0.1	0.3	14.72
$IC_{t-2} * \Delta WACC_t$	0.0	0.4	−0.4	−11.06
$\Delta COMP_t$	38.4	38.6	−0.2	−0.09

[8] We cannot compare coefficients on $\Delta ROIC_t$ and ΔIC_{t-1} as the former is a ratio and the latter represents (deflated) dollars invested. This is unlike the RI based decomposition where we break ΔNI_t into distinct components that add up to the total.

Table 4 continued

Panel C: regression for growth in total compensation ($\Delta COMP_t$) interacted with positive investment (POSINV)

Variable	Interpretation	Expected sign	Baseline Bushman et al.	RI based breakdown	Profitability breakdown
Intercept		?	0.3462	0.3651	0.3487
			(11.26)	(12.6)	(10.31)
POSINV		?	0.0066	−0.0272	−0.0567
			(0.22)	(−0.87)	(−1.74)
RET_t	Contemporaneous stock returns	+	0.1156	0.1183	0.1110
			(2.60)	(2.84)	(2.61)
RET_t * POSINV		?	0.0940	0.0906	0.1112
			(3.03)	(2.95)	(4.05)
ΔNI_t	Income growth	+	0.3888		
			(2.19)		
ΔNI_t * POSINV		+	0.5643		
			(2.17)		
ΔRI_t	Growth from increased profitability	+		0.5476	
				(3.17)	
ΔRI_t * POSINV		+		0.3840	
				(1.45)	
ΔIC_{t-1} * $WACC_t$	Growth from investment	?		2.2710	
				(2.42)	
ΔIC_{t-1} * $WACC_t$ * POSINV		?		−0.1551	
				(−0.12)	
ΔINT_t * (1 − t)	Change in interest	?		−0.3451	
				(−0.39)	
IC_{t-2} * $\Delta WACC_t$	Change in risk	?		1.4271	
				(1.53)	
$\Delta ROIC_t$	Profitability growth	+			0.7757
					(4.55)
$\Delta ROIC_t$ * POSINV		+			−0.0844
					(−0.24)
ΔIC_{t-1}	Investment growth	?			0.1161
					(0.65)
ΔIC_{t-1} * POSINV		?			0.1427
					(0.73)
Adj. R^2 (%)			0.95	1.01	1.47

For the regressions in Panels A and C, the dependent variable $\Delta COMP_t$ is growth in total compensation, i.e. (TDC_t/TDC_{t-1} − 1) from Execucomp. RET_t is raw annual buy-and-hold returns. NI_t is net income before extraordinary items (#18). ΔNI_t and ΔRI_t are the change in net income and residual income respectively, where residual income is computed as described in Sect. 4.2. IC_{t-1} is lagged invested capital (#37). ΔIC_{t-1} is the lagged change in invested capital (#37). IC_{t-2} is twice-lagged invested capital (#37). $WACC_t$ is the weighted average cost of capital, computed as described in footnote 5. ΔINT_t * (1 − t) is the change in after-tax interest expense (#15). $\Delta ROIC_t$ is the change in return on invested capital, defined as NOPAT scaled by lagged invested capital. The components of income growth using the RI breakdown are scaled by lagged market value of equity (#25*#199). Panels A and C present coefficients and *t*-statistics (in parentheses) from pooled regressions. Panel B presents descriptive statistics for the sample partitioned on the basis of the dummy variable POSINV which equals one if lagged invested capital (ΔIC_{t-1}) > 0 and 0 otherwise. Panel C modifies the regression in Panel A by including interactions with POSINV. *t*-statistics for the regressions control for two-way clustering by firm and time using the Cameron et al. (2006) methodology these results is that compensation committees do not appear to understand that growth from investment is less valuable. In fact, the RI based decomposition seems to indicate that the weight on growth from investment is significantly higher. This provides a contracting based explanation for the consistent prior evidence that firms make bad investments.[9]

To better understand the role of growth from investment in compensation, we partition our sample into two groups based on whether investments are positive ($\Delta IC_{t-1} > 0$). Panel B of Table 4 presents the means for the components of earning growth, stock returns and compensation growth partitioned on the basis of growth in investment. Firms with positive investment underperform on the basis of stock returns, both contemporaneous and 1-year-ahead. Further, firms with positive investment have lower growth in net income as well as residual income. Interestingly, while firms with increasing investments appear to underperform, the growth in compensation is almost identical for both partitions (approximately 38.5%). In other words, even though their stock returns and earnings growth are inferior, firms with increasing investments reward CEOs, potentially because investments are viewed ex ante as valuable.

To better understand why CEOs of firms with increasing investment benefit from similar growth in compensation, we rerun our regressions with an interaction for positive investment. We define POSINV to equal 1 if there is a positive investment ($\Delta IC_{t-1} > 0$) and zero otherwise. The results are presented in Panel C of Table 4. We focus on the interactions between POSINV and the components of earnings growth. For the RI based decomposition, the interaction of POSINV with both growth from increased profitability (ΔRI_t) as well as growth from investment ($\Delta IC_{t-1} * WACC_t$) are insignificant. Further, the coefficient on ($\Delta IC_{t-1} * WACC_t$), which represents its effect for the group with negative investment is significantly positive – in other words managers of firms that are divesting are getting paid less on the margin. Such CEOs do potentially get increases in compensation for their improved financial performance (increase in residual income, better stock returns), but the net effect is that their mean growth in compensation is the same as that for investing CEOs. Thus, the results are consistent with boards incentivizing CEOs to make investments, even though ex post these investments destroy value on average.

5.4 Earnings persistence and the relationship between compensation and earnings growth

Baber et al. (1998) show that earnings growth is weighted more in executive compensation when earnings are more persistent. Our results show that CEOs are rewarded for earnings growth stemming from increases in investment that may not

[9] As a sensitivity analysis, we repeat the above analysis with two alternative proxies for compensation growth-the growth in the bonus component of total earnings and the growth in the number of options granted. The results are broadly similar for both measures of compensation growth using both the RI based decomposition as well as the profitability decomposition. Compensation growth shows a much stronger correlation with growth from investment, especially for stock option grants. While this seems reasonable given that option grants are supposed to be forward looking long term incentives, it must be noted that they are correlated strongly with value diminishing growth.

result in future benefits– that is earnings growth that may not persist. How does one reconcile these results? To attempt to do this, we extend their analysis to the components of earnings growth. Baber et al. (1998) use earnings to price (E/P) to estimate earnings persistence, arguing that firms with less persistent earnings are more likely to have either negative or extreme E/P ratios. They classify firms with intermediate values of E/P as having higher persistence and classify firms with extreme (including negative) E/P as having lower persistence. Following their approach, we partition our sample into 10 groups for each year. Group 1 consists of firms with negative E/P, while all other groups are classified based on E/P into nine equal sized groups. We define PERSIST as a dummy that equals 0 for groups 1, 2, 9, and 10 (low persistence) and 1 for all other groups.

Panel A of Table 5 presents means for the components of earning growth, stock returns and compensation growth partitioned on PERSIST. Firms with high earnings persistence earned higher contemporaneous returns (REM_t) but earn lower future returns (REM_{t+1}). Firms with higher persistence appear to have higher growth in earnings, but this growth in earnings is driven both by higher growth from increased profitability (ΔRI_t) as well as higher growth from investment ($\Delta IC_{t-1} * WACC_t$). These data may provide a hint as to why boards reward growth from investment. Boards of firms with high persistence in earnings and strong returns might rationally conclude that the current investments will also be profitable. However, ex post, these investments do not generate value, leading to weak future performance.

Panel B of Table 5 presents the regressions for compensation growth with interactions for persistence. The first regression corroborates Baber et al. (1998), as the interaction of PERSIST with earnings growth (ΔNI_t) is significantly positive. In the next regression with the RI decomposition, the interaction of PERSIST with growth from increased profitability (ΔRI_t) is significantly positive. However the interaction of PERSIST with growth from investment ($\Delta IC_{t-1} * WACC_t$) is also significantly positive.[10] Hence, while boards do place a greater weight on persistent earnings, they do not differentiate between different components of earnings growth.

Table 5 Impact of earnings persistence on the determinants of compensation growth

Panel A: mean compensation, earnings growth, and returns partitioned by persistence

	PERSIST = 0 (N = 6,961) (%)	PERSIST = 1 (N = 9,371) (%)	Difference (%)	t-stat
$RETM_t$	2.0	5.8	3.7	4.11
$RETM_{t+1}$	6.3	3.1	−3.2	−3.62
ΔNI_t	0.3	1.5	1.1	5.87
ΔRI_t	0.1	1.0	0.9	4.25
$\Delta IC_{t-1} * WACC_t$	0.3	0.5	0.2	5.65
$\Delta INT_t * (1 - t)$	0.2	0.1	−0.1	−5.86
$IC_{t-2} * \Delta WACC_t$	0.1	0.0	−0.1	−3.35
$\Delta COMP_t$	38.6	38.2	−0.4	−0.18

[10] The results using the ROIC framework are slightly different as the interaction of PERSIST with investment growth (ΔIC_{t-1}) is insignificant.

Table 5 continued

Panel B: regression for growth in total compensation ($\Delta COMP_t$) interacted with persistence (PERSIST)

Variable	Interpretation	Expected sign	Baseline Bushman et al.	RI based breakdown	Profitability breakdown
Intercept		?	0.3629	0.3579	0.3284
			(9.92)	(10.03)	(12.16)
PERSIST		?	−0.0388	−0.0530	−0.0325
			(−1.52)	(−2.22)	(−2.06)
RET_t	Contemporaneous stock returns	+	0.1593	0.1580	0.1673
			(3.12)	(3.24)	(3.36)
RET_t * PERSIST		?	0.0362	0.0374	0.0340
			(0.68)	(0.71)	(0.64)
ΔNI_t	Income growth	+	0.3884		
			(2.53)		
ΔNI_t * PERSIST		+	1.1569		
			(4.94)		
ΔRI_t	Growth from increased profitability	+		0.4931	
				(3.81)	
ΔRI_t * PERSIST		+		1.3127	
				(5.04)	
ΔIC_{t-1} * $WACC_t$	Growth from investment	?		1.9583	
				(2.31)	
ΔIC_{t-1} * $WACC_t$ * PERSIST		?		2.6266	
				(1.73)	
ΔINT_t * (1 − t)	Change in interest	?		−0.8191	
				(−0.99)	
IC_{t-2} * $\Delta WACC_t$	Change in risk	?		1.5716	
				(1.60)	
$\Delta ROIC_t$	Profitability growth	+			0.5460
					(2.61)
$\Delta ROIC_t$ * PERSIST		+			0.8078
					(3.15)
ΔIC_{t-1}	Investment growth	?			0.2551
					(2.61)
ΔIC_{t-1} * PERSIST		?			−0.0153
					(−0.13)
N			16,332	16,332	16,332
Adj. R^2 (%)			0.98	1.09	1.51

The sample is partitioned into 10 groups for each year based on E/P, which is defined as earnings before extraordinary items (Compustat #18) divided by market capitalization [shares outstanding (Compustat #25) times stock price (Compustat #199)]. Group 1 consists of firms with negative E/P, while all other groups are classified based on E/P into nine other groups. PERSIST is a dummy that equals 0 for firms in groups 1, 2, 9, and 10 (low persistence) and 1 for all other firms. Panel A partitions the sample on the basis of PERSIST and presents descriptive statistics for returns, components of earnings growth, and compensation growth. Panel B presents coefficients and *t*-statistics (in parentheses) from pooled regressions with the dependent variable being growth in total compensation ($\Delta COMP_t$). RET_t is raw annual buy-and-hold returns. NI_t is net income before extraordinary items (#18). ΔNI_t and ΔRI_t are the change in net income and residual income respectively, where residual income is computed as described in Sect. 4.2. IC_{t-1} is lagged invested capital (#37). ΔIC_{t-1} is the lagged change in invested capital (#37). IC_{t-2} is twice-lagged invested capital (#37). $WACC_t$ is the weighted average cost of capital, computed as described in footnote 5. ΔINT_t * (1 − t) is the change in after-tax interest expense (#15). $\Delta ROIC_t$ is the change in return on invested capital, defined as NOPAT scaled by lagged invested capital. The components of income growth using the RI breakdown are scaled by lagged market value of equity (#25*#199). *t*-statistics control for two-way clustering by firm and time using the Cameron et al. (2006) methodology

5.5 Compensation growth and institutional ownership

One can interpret the result that compensation committees reward managers for earnings growth from investment that do not add value in two ways. First, the compensation committees may be subject to the same growth illusion as management, in believing that the investments made will generate benefits in the future. Second, compensation committees may be unable or unwilling to step in and address agency problems or worse, they may abet these problems by incentivizing managers to take suboptimal actions. We next test our hypotheses related to the potential mitigating role of institutional investors in monitoring boards to ensure that incentives provided to management are appropriate.

We modify the regressions for growth in total compensation ($\Delta COMP_t$) by introducing interactions of the level of institutional ownership (INSTPER) with current stock returns (RET_t) and ΔNI_t or the components of ΔNI_t that we focus on–growth from increased profitability (ΔRI_t) and growth from investment (IC_{t-1} * $WACC_t$).[11] The results are presented in Table 6. Our first regression uses returns (RET_t) and growth in income (ΔNI_t) along with interactions with INSTPER. The interaction of ΔNI_t with INSTPER has a significant positive coefficient, indicating that the growth in compensation is much more sensitive to income growth in the presence of institutional ownership. The interaction of RET_t with INSTPER is negative but insignificant. The greater sensitivity of compensation growth to earnings growth is consistent with institutional investors having a preference for delivered performance that earnings represent as opposed to expected performance that returns reflect (Barclay et al. 2005).

The next regression decomposes earnings growth using the RI framework. The interaction of ΔRI_t with INSTPER is significantly positive (0.9444, *t*-stat 2.78), indicating that compensation growth is more sensitive to growth from increased profitability in the presence of institutional ownership. This is consistent with our $H2_a$. However, we fail to find a reduced sensitivity of compensation growth to growth from investment in the presence of institutional ownership as the interaction of INSTPER with ΔIC_{t-1} * $WACC_t$ is insignificant (0.5036, *t*-stat 0.38). The final regression using the alternative framework finds similar results. The interaction of INSTPER with $\Delta ROIC_t$ is significantly positive (0.6374, *t*-stat 2.08), but the interaction of ΔIC_{t-1} with INSTPER is actually significant in the opposite direction (0.1180, *t*-stat 1.82).

These results imply that compensation growth does appear to be more sensitive to earnings growth from increased profitability in the presence of institutional ownership. This is consistent either with institutions using their clout to influence contracting or with institutions investing only in firms where appropriate incentives are in place. It is interesting to note that this applies only towards growth from increased profitability. Institutional investors, on average, appear to value growth

[11] We also examine the impact of institutional ownership on the relationship between earnings growth and stock returns by interacting NI_t, ΔNI_t, and components of ΔNI_t with INSTPER. When we decompose ΔNI_t into its components, we find that the interactions of both ΔRI_t as well as ΔIC_{t-1}* $WACC_t$ with INSTPER are significantly positive. The latter indicates that investments are less likely to be perceived as value destroying when made by firms with significant institutional ownership. This provides evidence that institutional ownership makes it less likely that the investments that firms make destroy value.

Table 6 Regression of compensation growth on returns and earnings growth components interacted with institutional ownership

Dependent variable growth in total compensation ($\Delta COMP_t$)

Variable	Interpretation	Expected sign	Baseline Bushman et al.	RI based breakdown	Profitability breakdown
Intercept		?	0.3275	0.3206	0.3056
			(8.91)	(8.58)	(8.50)
INSTPER		?	0.0453	0.0423	0.0241
			(0.93)	(0.78)	(0.44)
RET_t	Contemporaneous stock returns	+	0.2381	0.2356	0.236
			(3.29)	(3.35)	(3.25)
RET_t * INSTPER		?	−0.1364	−0.1298	−0.1209
			(−1.39)	(−1.33)	(−1.27)
ΔNI_t	Income growth	+	0.1075		
			(0.73)		
ΔNI_t * INSTPER		?	1.0984		
			(3.57)		
ΔRI_t	Growth from increased profitability	+		0.2970	
				(1.72)	
ΔRI_t * INSTPER		+		0.9444	
				(2.78)	
ΔIC_{t-1} * $WACC_t$	Growth from investment	?		2.0891	
				(2.22)	
ΔIC_{t-1} * $WACC_t$ * INSTPER		−		0.5036	
				(0.38)	
ΔINT_t * (1 − t)	Change in interest	?		−0.4274	
				(−0.50)	
IC_{t-2} * $\Delta WACC_t$	Change in risk	?		1.2415	
				(1.32)	
$\Delta ROIC_t$	Profitability growth	+			0.4538
					(2.11)
$\Delta ROIC_t$ * INSTPER		+			0.6374
					(2.08)
ΔIC_{t-1}	Investment Growth	?			0.1756
					(2.44)
ΔIC_{t-1} * INSTPER		−			0.1189
					(1.82)
N			16,332	16,332	16,332
Adj. R^2 (%)			0.96	1.03	1.46

Table presents coefficients and *t*-statistics (in parentheses) from pooled regressions with the dependent variable being growth in total compensation ($\Delta COMP_t$). RET_t is raw annual buy-and-hold returns. NI_t is net income before extraordinary items (#18). ΔNI_t and ΔRI_t are the change in net income and residual income respectively, where residual income is computed as described in Sect. 4.2. IC_{t-1} is lagged invested capital (#37). ΔIC_{t-1} is the lagged change in invested capital (#37). IC_{t-2} is twice-lagged invested capital (#37). $WACC_t$ is the weighted average cost of capital, computed as described in footnote 5. ΔINT_t * (1 − t) is the change in after-tax interest expense (#15). $\Delta ROIC_t$ is the change in return on invested capital, defined as NOPAT scaled by lagged invested capital. The components of income growth using the RI breakdown are scaled by lagged market value of equity (#25*#199). INSTPER is the percentage of shares outstanding held by institutional investors. *t*-statistics control for two-way clustering by firm and time using the Cameron et al. (2006) methodology from investment. In the next section, we test whether different kinds of institutions view the components of earnings growth differently.

5.6 Compensation growth and nature of institutional ownership

We next test our hypotheses related to the impact of the nature of institutional ownership on the relationship between compensation growth and the components of earnings growth. We hypothesize that value investors will value growth from increased profitability more and growth from investment less. We hypothesize the reverse for growth investors.

Using the classification in Abarbanell et al. (2003), we identify the proportion of shares outstanding held by value investors (VAL_INST) and the proportion of shares outstanding held by growth investors (GRO_INST).[12] We then add interactions of VAL_INST and GRO_INST with current stock returns (RET_t) and ΔNI_t or the components of ΔNI_t for the regressions for compensation growth. The results are presented in Table 7. The base specification uses returns (RET_t) and income growth (ΔNI_t) along with interactions. The coefficient on VAL_INST (GRO_INST) is significantly negative consistent with a lower (higher) growth rate of compensation in the presence of value (growth) investors. The interaction of RET_t with VAL_INST is significantly negative while the interaction of ΔNI_t with VAL_INST is significantly positive, consistent with value investors caring more about financial performance than stock returns.

The next specification uses returns (RET_t) along with the RI based decomposition of ΔNIt and the interactions. The interaction of VAL_INST with ΔRI_t (growth from increased profitability) is significantly positive (2.6946, *t*-stat 1.89), indicating a higher sensitivity of compensation growth towards growth from increased profitability in the presence of value investors (supporting $H3_a$). Further, the interaction of VAL_INST with $\Delta IC_{t-1} * WACC_t$ is significantly negative (−12.07, *t*-stat 2.79), indicating a lower sensitivity of compensation growth towards growth from investment in the presence of value investors (supporting $H3_b$). As mentioned earlier, this is consistent either with value investors investing in firms where growth from increased profitability is rewarded and growth from investment is curtailed or with value investors influencing contracting to ensure their preferred incentives are in place.

Regarding growth investors, we find that the interaction of GRO_INST with $\Delta IC_{t-1} * WACC_t$ is significantly positive (12.11, *t*-stat 2.19). This indicates that growth in compensation is much more sensitive to growth from investment in the presence of growth-oriented institutional investors (supporting $H4_b$). We however find no evidence that the presence of growth investors reduces the sensitivity of compensation to growth from increased profitability (hypothesis $H4_a$) as the coefficient on the interaction of ΔRI_t and GRO_INST while negative is insignificant. The final regression uses the alternate breakdown and finds similar results. The interaction of VAL_INST with $\Delta ROIC_t$ is significantly positive (2.2148, *t*-stat

[12] The mean values for GRO_INST and VAL_INST were 15 and 18.4% respectively. Their total represents almost 70% of total institutional ownership of 48.9%.

Table 7 Regression of compensation growth on returns and earnings growth components interacted with categories of institutional ownership

Dependent variable growth in total compensation ($\Delta COMP_t$)

Variable	Interpretation	Expected sign	Baseline Bushman et al.	RI based breakdown	Profitability breakdown
Intercept		?	0.3593	0.3505	0.3251
			(9.81)	(9.72)	(9.86)
VAL_INST		?	−0.6074	−0.5248	−0.3901
			(−4.91)	(−4.16)	(−3.64)
GRO_INST		?	0.6965	0.6100	0.4766
			(7.19)	(6.54)	(4.01)
RET_t	Contemporaneous stock Returns	+	0.2439	0.2440	0.2454
			(3.36)	(3.44)	(3.44)
RET_t * VAL_INST		?	−0.3694	−0.3819	−0.3122
			(−1.90)	(−1.89)	(−1.67)
RET_t * GRO_INST		?	−0.1115	−0.0978	−0.1474
			(−0.51)	(−0.44)	(−0.72)
ΔNI_t	Income growth	+	0.2115		
			(1.37)		
ΔNI_t * VAL_INST		?	3.5042		
			(2.20)		
ΔNI_t * GRO_INST		?	−1.5052		
			(−1.00)		
ΔRI_t	Growth from increased profitability	+		0.3750	
				(2.16)	
ΔRI_t * VAL_INST		+		2.6946	
				(1.89)	
ΔRI_t * GRO_INST		−		−0.7942	
				(−0.48)	
ΔIC_{t-1} * $WACC_t$	Growth from investment	?		2.2998	
				(2.61)	
ΔIC_{t-1} * $WACC_t$ * VAL_INST		−		−12.0670	
				(−2.79)	
ΔIC_{t-1} * $WACC_t$ * GRO_INST		+		12.1110	
				(2.59)	
ΔINT_t * (1 − t)	Change in interest	?		−0.6589	
				(−0.78)	
IC_{t-2} * $\Delta WACC_t$	Change in risk	?		1.2297	
				(1.29)	
$\Delta ROIC_t$	Profitability growth	+			0.4503
					(2.43)
$\Delta ROIC_t$ * VAL_INST		+			2.2148
					(1.71)
$\Delta ROIC_t$ * GRO_INST		−			−0.3910
					(−0.30)
ΔIC_{t-1}	Investment growth	?			0.2052
					(3.46)
ΔIC_{t-1} * VAL_INST		−			−0.5790
					(−1.75)
ΔIC_{t-1} * GRO_INST		+			0.5798
					(1.68)
N			16,332	16,332	16,332
Adj. R^2 (%)			1.31	1.46	1.86

Table 7 continued

Table presents coefficients and *t*-statistics (in parentheses) from pooled regressions with the dependent variable being growth in total compensation ($\Delta COMP_t$). RET_t is raw annual buy-and-hold returns. NI_t is net income before extraordinary items (#18). ΔNI_t and ΔRI_t are the change in net income and residual income respectively, where residual income is computed as described in Sect. 4.2. IC_{t-1} is lagged invested capital (#37). ΔIC_{t-1} is the lagged change in invested capital (#37). IC_{t-2} is twice-lagged invested capital (#37). $WACC_t$ is the weighted average cost of capital, computed as described in footnote 5. $\Delta INT_t * (1 - t)$ is the change in after-tax interest expense (#15). $\Delta ROIC_t$ is the change in return on invested capital, defined as NOPAT scaled by lagged invested capital. The components of income growth using the RI breakdown are scaled by lagged market value of equity (#25*#199). VAL_INST (GRO_INST) is the percentage of shares outstanding held by value-oriented (growth-oriented) institutional investors. *t*-statistics control for two-way clustering by firm and time using the Cameron et al. (2006) methodology

1.71), while the interaction of VAL_INST with ΔIC_{t-1} is significantly negative (−0.5790, *t*-stat 1.75). Further, the interaction of GRO_INST with ΔIC_{t-1} is significantly positive (−0.5798, *t*-stat 1.68).

5.7 Additional analysis

5.7.1 Separating out the impact of investments in mergers and acquisitions

The literature examining the ex post value destruction associated with growth from investment has focused on mergers and acquisitions (M&A). We test to see whether the sensitivity of compensation to investment varies based on whether the investment is in mergers or other investments. Using data from the SDC M&A database, we break up the lagged change in invested capital into the change associated with M&A and other investments. We then use the decomposed measures of invested growth in our regressions.

We find that growth associated with M&A does show a stronger association with compensation growth. Recall from Table 4 Panel A, the coefficient on $\Delta IC_{t-1} * WACC_t$ is 2.39. When we decompose this further, the coefficient on the M&A component is 2.59, while the coefficient on the non-M&A component is 2.29. The difference is however insignificant.

5.7.2 Do better boards monitor management more effectively?

The fact that boards compensate CEOs for growth that does not add value implies that boards either do not understand the dichotomy between value-adding and value-destroying growth themselves or that boards exacerbate agency problems because they are ineffective or under the influence of management. To test between these two explanations, we test whether more effective boards are better able to distinguish between the two sources of earnings growth. The literature on corporate governance has shown that boards are more effective when the proportion of independent directors is high; when the governance index based on Gompers et al. (2003) is low; when board size is small; and when the CEO is not also the chairman.

We include each of these characteristics independently in the compensation regression to see whether the weight on growth from increased profitability increases and weight on growth from investment decreases with improved governance. None of the interactions are significant. This indicates that board quality does not play a role in distinguishing between different sources of growth.

Hence, boards are not necessarily intentionally facilitating suboptimal investment but rather are potentially unaware of the implications of different sources of growth. This further highlights the importance of the external monitoring provided by institutional investors.

5.8 Sensitivity analysis

5.8.1 Alternate specifications for residual income

In the default specification, we use a CAPM based approach to estimate WACC to calculate residual income. We consider the following alternate specifications to estimate WACC: (1) a constant flat rate of 10% for all firm-years, (2) a cross-sectionally constant but time-varying WACC set to risk-free rate (yield on 10-year Treasury) plus 6%, iii) a WACC based on a 3-factor model based cost of equity.[13] The results are almost identical for all the analyses conducted.

5.8.2 Alternate regression specifications

We rerun all regressions with industry (2-digit SIC code) and time (year) fixed effects. The adjusted R^2 of the regression increases considerably, but the basic results are unchanged. We also run cross-sectional annual regressions and compute average coefficients and *t*-statistics using the Fama and MacBeth (1973) method, controlling for auto-correlation among coefficients using the methodology outlined in Bernard (1995). The results are largely similar with higher adjusted R^2, coefficients of similar magnitude and largely unchanged significance levels.

We include controls for the annual rate of inflation in the compensation regressions. Results are almost identical, as the time period analyzed had generally low and steady rates of inflation ranging between 1 and 3.5%. In addition, we also included controls for sales growth in the compensation growth regression. Sales growth is strongly correlated with growth from investment and loads significantly; however the strong positive relationship between compensation growth and growth from investment persists after controlling for sales growth.

5.8.3 Dropping utilities and financials

We eliminate financial services firms (2-digit SIC between 60 and 69) as the notion of invested capital is very different for such firms. We also eliminate utilities (2-digit SIC code 49) because firms in regulated industries are likely to have guaranteed rates of return on invested capital. The number of observations drops by 20% from 16,332 to 13,028. Despite this, the results are unaffected; in fact the results are marginally stronger in some specifications.

[13] βs are estimated with respect to $R_m - R_f$, SMB and HML using at least 24 and up to 60 months of monthly data. We assume risk premiums of 6, 2, and 4% for $R_m - R_f$, SMB, and HML respectively. If cost of equity cannot be computed, it is set to the median for firms in the same industry based on 2-digit SIC code.

6 Conclusions

Earnings growth is a fundamental determinant in both equity valuation and executive compensation. Prior research has shown that firms that grow earning by improving the profitability of their operations create shareholder value, while firms that grow earnings through new investments destroy value on average. This paper examines whether CEOs are provided the correct incentives to ensure that they attain growth while maximizing shareholder value.

We used two alternative approaches developed in prior research (Balachandran and Mohanram 2010; Harris and Nissim 2006) to separate out earnings growth from increased profitability from growth from investment. We first analyze the relationship between the components of earnings growth and stock returns to confirm the results from prior research. We then analyze the relationship between compensation growth and the components of earnings growth to see whether CEOs are being provided incentives to grow their firms efficiently.

We find that growth from increased profitability is valuable to shareholders as it is strongly associated with contemporaneous returns. We also find that growth from increased profitability is associated with growth in total executive compensation suggesting an alignment between measures used to reward shareholders and management.

However, when we examine growth from investment, we find evidence of potential misalignment in compensation. Specifically we find that growth from investment is not associated with contemporaneous returns and negatively associated with future returns. However, growth from investment is strongly associated with growth in total CEO compensation. This is consistent with two potential explanations. First, board compensation committees may be unaware of the dichotomy between growth from increased profitability and growth from investment. Second, there could be inefficiency in the contracting process (Bebchuk and Fried 2004) and the presence of agency problems (Jensen and Meckling 1976).

We next examine whether the presence of institutional investors mitigates any misalignment in contracting. Institutional investors are presumed to be sophisticated users of financial statements who might potentially understand the difference between valuable growth from increased profitability and potentially value diminishing growth from investment. They might also monitor boards to ensure that appropriate incentives are provided to top executives. We find that, as the proportion of institutional ownership increases, there is an increase in the sensitivity of compensation to growth from increased profitability. However, the positive association between growth from investment and compensation continues to persist even with institutional ownership.

To understand the role of institutional investors further, we consider whether institutional investors differ in their preference for the two sources of growth based on their investment strategy. We find that the sensitivity of compensation to growth from investment is explained by growth-oriented institutional investors. In contrast, holdings by value investors are incrementally associated with greater sensitivity to earnings growth from increased profitability and decreased sensitivity to earnings growth from investment. This suggests that value investors are able to correctly identify that growth from increased profitability adds value while growth from investment diminishes value. Growth-oriented institutions on the other hand seem to value growth from investments, even though such growth ultimately does not deliver value.

These results can be interpreted in two ways. First, institutions can use their size and clout to influence the contracting process. Second, they might choose to invest only in firms where the contracting reflects their preference. Our results cannot distinguish between these two explanations but do suggest why the association between growth from investment and compensation persists despite the presence of institutional investors.

It is important to consider a number of caveats to our results. First, the greater weight for growth from investment may serve to incentivize risk-averse managers to make risky investments. However, the negative relationship between growth from investment and future returns weakens a risk-driven story. Second, the horizon being analyzed could be inadequate as investments need more time to bear fruit. Finally, the greater compensation provided for growth from investment may be related to external labor market factors, as managers who are adept at managing investment may command higher compensation (Dittmann et al. 2009).

Our results contribute to the understanding of the forces that influence top executive compensation. The finding that CEO compensation is sensitive to growth from investment that ultimately does not create value might provide a contracting explanation for why managers engage in inefficient investments (Titman et al. 2004; Rau and Vermaelen 1998; Richardson and Sloan 2003). This has a potential implication for the value-growth effect demonstrated in prior research (Fama and French 1992; Lakonishok et al. 1994). One reason why low book-to-market (growth) firms might underperform is that the CEOs at these firms are strongly incentivized to deliver growth in earnings even if that growth ultimately reduces value for shareholders. The presence of growth-oriented institutional investors exacerbates this problem with an increased weight on growth from investment.

Our results also justify recent moves by the SEC to mandate greater financial literacy for board members. A financially literate board is more likely to differentiate between growth from increased profitability and growth from investment and incentivize management appropriately.

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