The Signaling Value of Nonrecurring Items and CEO Market-Based Compensation

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Abstract

Nonrecurring items are often characterized as transitory and are assumed to be irrelevant for firm valuation. However, I find that industry-level measures of the informativeness of special items and discontinued operations help to revise market assessments of firm value, and these signals are associated with CEO market-based compensation. The results suggest that discontinued operations provide clear signals about the business environment in the sector and reduce goodwill, while special items send noisy signals about future performance and increase goodwill. I also find a significant positive (negative) link between CEO market-based compensation and the signals sent by discontinued operations (special items).

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1. INTRODUCTION

Reports of exiting operations are often considered to be transitory and analysts have paid little attention to them. However, since managers must receive board approval to make exit decisions, it is plausible that there are future implications to such choices. The purpose of this study is to analyze the implications of exit decisions reported as transitory/nonrecurring items (hereafter nonrecurring items) on goodwill and CEO market-based compensation.

In the recent economic environment, firms use various types of internally generated intangible assets (e.g., customer information lists, efficient operating systems, high quality production capabilities, knowledge about specific foreign country operations, and specific distribution systems) along with tangible assets to provide goods and services. But, many of intangibles are unrecorded and create goodwill in capital markets. When a firm exits a line of operation, spin-off a segment, or write-down assets or inventory, book value is adjusted, which revises the magnitude of goodwill. If a firm sells previously unrecorded intangible assets, they are valued by the market at that point, and reveal previously unrecorded value of intangibles. Therefore, these adjustments probably send useful signals to markets that lead to revisions in firm value. Moreover, exiting an operation is a critical managerial decision that compensation committees probably carefully consider. For example, Shleifer and Vishny (1992) and Kruse (2002) find that managers elect to sell assets only if markets offer a reasonable price, or there is an urgent need to liquidate them. Ofek (1993) suggest that financial distress is an important reason for managers to sell assets to improve the efficiency of resource allocation. These studies suggest that managers strategically consider the strength of economy when making decisions to sell their unwanted assets. However, asset sales can be reported as special items, discontinued operations or extraordinary items.

Special items and extraordinary items contain a wide range of activities. For example, special items include restructuring charges, allowance for doubtful accounting and inventory write-downs while extraordinary items contain gains or losses from extinguishment of debt. On the other hand, discontinued operations reflect more narrowly defined exit decisions. Thus, market participants probably treat these signals differently. For example, Dechow and Ge (2006) find evidence that negative special items help to predict future firm performance although market participants do not fully understand their implications. Dechow, Huson and Sloan (1994) show that compensation committees encourage restructuring activities by intervening to shield CEO bonuses from the negative effect of the charges.

There are evidence of waves of mergers, acquisitions, takeovers and corporate diversifications (e.g., Mitchell and Mulherin 1996; Shleifer and Vishny 2003; and Doukas and Kan 2006). When these activities fail, enterprises report nonrecurring items. Although there is abundant evidence of failures in such activities (e.g., Mitchell and Mulherin 1996; Ravenscaft and Scherer 1987; and Denis, Denis and Yosk 2002), they continue. These failures indicate potential inefficiency in financial markets (Shleifer and Vishny 2003). If revisions occurr upon the announcements of nonrecurring items, reducing goodwill, this indicates that the signals provide precise information about firm value, making the book-to-market (BTM) ratio closer to one. Comment and Jarrell (1995), John and Ofek (1995) and Daley, Mehrotra and Sivakumar (1997), all find that divestitures intended to increase corporate focus improve both operating and market-based performance. However, if signals send imprecise noisy information, or increase growth expectations, they probably increase goodwill, moving the BTM ratio away from one. Therefore, an association between reports of nonrecurring items and adjustments of goodwill makes it possible to analyze the characteristics of the signals.

Moreover, economic intuition suggests that successful managerial decisions should increase firm value. Yet, the link between the market valuation and stewardship roles of earnings

has been difficult to verify.[2] Bushman and Indjejikian (1993) suggest that when managerial effort cannot be reflected in accounting information, the contracting value of security price becomes important in providing incentives to managers. If nonrecurring items can adjust goodwill, such signals are useful for compensation committees to craft appropriate pay packages to encourage objective managerial actions that reduce uncertainty about future firm value. To analyze this possibility, I examine whether nonrecurring items lead to revised equity values.

I use the residual income model developed by Ohlson (1995) and the accounting bias model proposed by Beaver and Ryan (2000) to analytically determine the relationship between terminal value adjustments and accounting bias reflected the BTM ratio. Their accounting bias proxy measures the magnitude of goodwill. I show that if information sends a clear signal to markets, the relationship between accounting bias and the adjustment is positive. I also show that information can inflate growth expectations if signals are not clear, in this case the association is negative. I refer to this type as a noisy signal.

Security prices reflect timely information about managerial decisions, which makes market-based compensation an effective tool for growth firms to provide incentives to managers (Baber, Janakiraman and Kang 1996; Smith and Watts 1992). However, market-based compensation can also create undesirable incentives if compensation committees are not careful about the effect of growth expectations on security prices. For example, Greenspan (2002) expresses a concern that option contracts might produce motivations for managers to artificially inflate accounting earnings in order to keep stock prices high. Thus, when considering the design of CEO market-based pay, effective compensation committees should weigh the trade-off of the

[2] In an earlier theoretical analysis, Paul (1992) contends that there is no connection between the valuation and stewardship roles of reported earnings. He notes that although investors cannot observe the manager's effort level, they have rational expectations and understand managers' choices of effort level in equilibrium. Gjesdal (1981), suggests that information ranking can be different between valuation and compensation models, which supports Paul's argument. However, Bushman, Engel and Smith (2006) recently advance upon Paul's work. They argue that his finding is based on an implicit assumption that there is no cross-sectional variation in the variance of earnings or of market value. They find a positive relationship between the valuation and incentive coefficients on earnings.

benefits of providing incentives against the costs of noise arising from excessively optimistic expectations.

In my empirical analyses, I first estimate whether nonrecurring items have an incremental ability to explain goodwill, measured as the difference between market and book value of equity, at the industry-level.[3] I then estimate firm-specific accounting bias,[4] and test whether it is associated with the incremental value relevant component of nonrecurring items at the industry-level. Nonrecurring items might be industry-level shocks, and probably provide useful information for outsiders to assess the business environment (Harford 2005). For example, *The New York Times* reported the following two articles;

> On Friday, BlackBerry announced that it would lay off 4,500 employees, or nearly 40 percent of its already reduced work force,.., The company also said that it expected to report a quarterly loss of nearly $1 billion next week, mainly the result of a write-off of unsold BlackBerry phones, but also because of payments to stop manufacturers and suppliers from adding to the pile. And of its six phones that the company offers, two will be discontinued; (20, September 2013).

> As recently as two years ago, T-Mobile had all but been given up for dead. It was losing subscribers and struggling to upgrade its aging cellular network. Its owner, Deutsche Telekom, said it wanted out of the competitive North American market, agreed to sell T-Mobile to AT&T for $39 billion and was already describing T-Mobile as a "discontinued" operation in its financial statements. (29, November, 2013).

These articles illustrate a competitive business environment, which helps investors to reconsider their assessment of the sector and firms within the industry.

My results indicate that special items send noisy signals to investors about future growth opportunities, while discontinued operations provide clearer signals about firm value. I do not find any significant valuation role for extraordinary items. I also find that the signals sent by special items are negatively associated with the use of CEO market-based compensation, while those sent by discontinued operations are positively associated with the use of market-based pay. Together these findings suggest that signals sent by discontinued operations are valuable to

[3] This definition of *GW* is consistent with Feltham and Ohlson (1995), who describe economic goodwill arising from firms' operating activities. Intangible investments are industry-specific, and hence, I believe that industry level estimation is reasonable.

[4] Beaver and Ryan (2000) define accounting bias as a representation of the persistent firm-specific variation in the BTM.

market participants to adjust their expectations about firms' future profits, and that compensation committees use them to provide incentives to executives. However, information relayed by special items is too noisy to provide proper managerial incentives. These results are robust across two alterative industry-level measures of the incremental value relevant component of nonrecurring items.

My research contributes to the prior literature in several ways. First, prior research concerning nonrecurring items presents mixed results about their value relevance. I examine the effect of nonrecurring items on goodwill and show that discontinued operations and special items provide information that affects investors' perception about firm value. Dechow and Ge (2006) show that large negative special items reflect critical managerial decisions that affect future performance. I show that discontinued operations also reflect important managerial decisions and may be a valuable tool to evaluate CEO performance.

Second, Paul (1992) indicates that as noise increases, signals resolve more uncertainty about firm value. However, they must be less informative about managerial efforts. My results suggest that different sorts of signals may reduce or increase uncertainty. Compensation committees can distinguish the usefulness of signals sent by nonrecurring items and design compensation schemes accordingly to provide incentives to CEOs and try to reduce the effect of noise in CEO market-based compensation.

Third, the literature in finance on mergers, acquisitions and diversifications pays little attention to various types of nonrecurring items. However, these nonrecurring items are probably related to above activities. My results show that market participations reduce goodwill in response to announcements of discontinued operations, while increasing goodwill based on the announcements of special items. They ignore the reports of extraordinary items. These findings suggest a potential future area of research that links waves of mergers, acquisitions and diversification activities to reports of nonrecurring items in order to increase our understanding these type of managerial decisions.

Fourth, I extend research conducted by Beaver and Ryan (2000; 2005) concerning accounting bias created by unconditional conservatism.[5] I use their measure of accounting bias to show that special items and discontinued operations relay value relevant information about book value adjustments that is useful for compensation committees to craft CEO incentives through market-based compensation. Both Bushman, Engel and Smith (2006) and Banker, Huang and Natarajan (2009) show there is a link between CEO cash compensation and the valuation role of performance measures. No prior studies analyze this type of link via nonrecurring items.

The remainder of the paper is organized into four sections. In section 2, I present the theory development and hypotheses. In section 3, I provide a description of the sample and variables. In section 4, I describe the empirical models and results. The final section is a summary of the results and discussion of the limitations of my analysis.

2. THEORY DEVELOPMENT AND RESEARCH DESIGN

The fundamental theory of production economics is based on the notion that a firm uses resources (e.g., assets and labors) to manufacture products. The financial reporting system capitalizes the long-lived assets on the balance sheet and ideally traces profit generating activities through the depreciation process. This system attempts to match the current and future streams of earnings to reflect the process of capital use in the production activities. At the end of the depreciable life or when assets are sold, a firm adjusts book value to current market price.[6]

However, a conservative accounting approach distorts reported asset values by disallowing capitalization of intangibles. For intangible knowledge-based assets, Lev and Zarowin (1999; p. 354) argue, "the fundamental accounting measurement process of periodically

[5] Beaver and Ryan (2005) decompose accounting conservatism into two components, unconditional conservatism and conditional conservatism. Unconditional conservatism is related to accounting treatments that persistently understate book values whereas conditional conservatism is related to asymmetric recognition of losses or gains that are often time and news-dependent.

[6] For example, Solow (1957) describes depreciation as the difference between gross output and the net productivity of capital. Zero net marginal productivity of capital means that "when adding some capital adds only enough product to make good the depreciation on the increment of capital itself."

matching costs with revenue is seriously distorted, adversely affecting the informativeness of financial information." Internally generated assets (e.g., reputation for quality goods and services, an efficient internal operating system, or an internally developed distribution system) produce value for firms, and are likely reflected in security prices. The value of such assets is difficult to quantify but creates goodwill. When a firm disposes of a line of business, engages in restructuring operations or incurs inventory write-downs, book value is adjusted toward market value. These activities recalibrate historically valued assets to current value and price previously unrecorded intangibles at current value. Thus, nonrecurring items can reveal the previously hidden value when managers decide to adjust book value.

2.1 Theory Development

In a theoretical analysis, future adjustments of book value are often assumed to be zero because of the assumption of an infinite time horizon. However, I focus on a finite time period in analyzing nonrecurring items, and this adjustment is important in my study.

Beaver and Ryan (2000, 2005) discuss bias contained in the BTM ratio. They propose an empirical measure of accounting bias that reflects the persistent firm- specific values of unrecorded intangibles to assess unconditional conservatism. I use this measure, which is explained below, to develop hypotheses about the informativeness of nonrecurring items.

Ohlson (1995) defines an abnormal/residual income model based on a clean surplus relationship, which can be explained by the following relationship; current period dividends (DV_t; wealth distribution) are equal to the sum of prior period owners' equity (BV_{t-1}; book value) plus earnings generated in the current period (COE_t; wealth creation) minus current period owners' equity (BV_t), which is written,

$$DV_t = BV_{t-1} + COE_t - BV_t \qquad (1)$$

where the subscript *t* indicates time. Assuming that security prices (P_t) are based on the expected future dividends discounted over an infinite time horizon, using equation 1, security prices can be defined as,

$$P_t = \sum_{k=1}^{\infty} R^{-k} E_t[BV_{t+k-1} + COE_{t+\tau} - BV_{t+k}]. \quad (2)$$

where R^{-k} is one plus the cost of equity capital (r), and k is a counter of future years beyond the current year. Now expanding the right-hand side of the equation, security prices are presented as the sum of three factors: the current book value, future abnormal earnings, and a terminal value adjustment to book value respectively as follows,

$$= E_t\left[\frac{BV_t + rBV_t - rBV_t + COE_t}{(1+r)} + \frac{(1+r)(-BV_{t+1}) + BV_{t+1} + COE_{t+1}}{(1+r)^2} + \frac{(1+r)(-BV_{t+2}) + BV_{t+2} + COE_{t+2}}{(1+r)^3} + \ldots + \frac{(1+r)(-BV_{t+\infty})}{(1+r)^{\infty}}\right]$$

$$= E_t\left[\frac{BV_t + rBV_t}{(1+r)} + \frac{COE_{t+1} - rBV_t}{(1+r)} + \frac{COE_{t+2} - rBV_{t+1}}{(1+r)^2} + \ldots - \frac{BV_{t+\infty}}{(1+r)^{\infty}}\right]$$

$$= BV_t + \sum_{k=1}^{\infty} R^{-k} E_t[COE_{t+k} - rBV_{t+k-1}] - E_t\left[\frac{BV_{t+\infty}}{(1+r)^{\infty}}\right]. \quad (3)$$

In the above model, security price reflects the future value of abnormal earnings, $[COE_{t+k} - rBV_{t+k-1}]$ and a terminal value adjustment $\left[\frac{BV_{t+\infty}}{(1+r)^{\infty}}\right]$. To simplify, I rewrite the above equation as follows,

$$P_t = BV_t + \sum_{k=1}^{\infty} R^{-k} E_t[COE^a_{t+k}] - \theta \quad (4)$$

where abnormal earnings is COE^a_{t+k} for k = 1 ,..., ∞, and the terminal value adjustment of book value is θ. In the infinite time horizon, θ =0, and hence, prior studies of residual income model do not include the terminal value adjustments. However, managers are often engaged in many different projects at the same time. Successful managers can make proper decisions on when to adjust or terminate projects, and hence, these terminal value adjustments can send critical information about managerial ability to outsiders.

Equation 4 shows that stock prices reflect adjustments in future book value, and subtracting BV from the both sides of the equation shows that goodwill is a function of future abnormal earnings and the adjustment to book value. It is important to realize when nonrecurring items adjust book value, the time horizon is finite, and hence, the terminal adjustment θ has nonzero value.

Feltham and Ohlson (1995) show that, on average, conservative accounting generates economic goodwill.[7] Rearranging equation 4 by including a perpetual growth rate (g), produces

$$P_t - BV_t = E_t\left[\sum_{k=1}^{\infty}\frac{(1+g)^k(COE^a_{t+k})}{(1+r)^k}\right] - \theta, \qquad (5)$$

which explains goodwill in terms of the sum of future abnormal returns and the future adjustment to book value. I focus on these future adjustments. Whenever, managers modify projects by selling assets or writing downs inventory, these adjustments send signals to markets and revise goodwill. The term in the squared bracket is a Gordon Growth model (geometric series), which can be written as;

$$E\left[\sum_{k=1}^{\infty}\frac{(1+g)^k(COE^a_{t+k})}{(1+r)^k}\right] = E_t\left[\frac{[COE^a]}{r-g}\right], \qquad (6)$$

assuming (r – g) > 0, and k goes to infinity. The term $\left[\frac{[COE^a]}{r-g}\right]$ is the value of abnormal earnings based upon its rate of growth, assuming the summation is finite.[8] Substituting this term into equation 5 yields,

$$P_t - BV_t = E_t\left[\frac{[COE^a]}{r-g}\right] - \theta. \qquad (7)$$

[7] They note that under clean surplus and unbiased accounting, this difference should disappear as firms pay dividends. However, under "dirty" accounting, it captures deficiencies in the accounting system.
[8] This is similar to the dividend growth model discussed by Fama and Miller (1972).

Assuming that security returns capture most of the expected abnormal earnings and BTM is less than or equal to one, the above relationship indicates that goodwill is an increasing function of the growth rate and a decreasing function of the adjustment factor. That is

$$\frac{\partial[P-BV]}{\partial g}>0 \text{ and } \frac{\partial[P-BV]}{\partial \theta}<0, \text{ respectively.} \quad (7a)$$

Beaver and Ryan (2000; 2005) developed the model to capture the firm-specific accounting bias, which represents the persistent difference between the market and book value (goodwill) that arises from unconditional conservatism. When the terminal value θ is recognized in the current period, this value is nonzero. Dividing equation 7 by current share price P, I define the degree of accounting bias created by unconditional conservatism as,

$$1-BTM_t = E_t[\sum_{k=1}^{\infty} RET_{t+k}] - \frac{\theta}{P} \quad (8)$$

where the squared bracket in equation 7 divided by security price is the summation of future security returns, $\left[\frac{[COE^a]}{r-g}\right]/P = \sum_{t=0}^{\infty} RET_{t+\tau}$.

There is an inverse relationship between the terminal value θ and the degree of unconditional conservatism (1- BTM*)*. Holding security prices constant, as the adjustment increases, *BTM* approaches one as shown below,

$$\frac{\partial[1-BTM]}{\partial \theta}<0. \quad (8a)$$

When nonrecurring items adjust book value in a finite time period "t", bias is revised, and send a signal to markets. Accordingly, Beaver and Ryan (2000) use the above relationship to show accounting bias, which is estimated as the firm-specific-intercept from a regression of the BTM ratio on lagged security returns, varies with factors associated with unconditional conservatism (e.g., R&D expenditures, LIFO reserves, and accelerated depreciation). Therefore, I analyze whether nonrecurring items explain variation in their measure of accounting bias, and further

whether it is associated with CEO market-based compensation. When nonrecurring items reduce accounting bias, the relationship between the BTM ratio and it is positive,

$$\frac{\partial BTM}{\partial \theta} > 0.^{9} \qquad (8b)$$

2.2. Nonrecurring Items and Terminal Value Adjustments

I will use the above relationships to determine the quality of signals that arise from reports of nonrecurring items.[10] If reports of nonrecurring items signal an adjustment to terminal value (θ) of a previously recorded asset or unrecorded intangible, as the adjustment occurs, it will drive *BTM* closer to one as shown in equation 8.[11]

2.2.1 Special Items

Special items contain a wide range of expenses that include restructuring charges, patent sales, severance fees, legal costs, allowances for doubtful account, and inventory write-downs (Burgstahler, Jiambalvo and Shevlin 2002; McVay 2006).[12] Because of this wide range, there is a lack of specificity in reports of these items. Dechow and Ge (2006) find a systematic relationship between accruals and special items, and show that low accrual firms with the large negative special items are often under the uncertain business situation. I find that intangible-intensive firms report significantly larger negative values of special items. They also carry lower inventory than

[9] Beaver and Ryan (2000) estimate accounting bias based on the BTM ratio instead of 1-BTM.
[10] Romer (1986) contends that returns from knowledge are transitory, and diminish rapidly with time. For instance, inventory write-downs for high-tech firms are often the dumping of obsolete items. Panel A of Table 2 shows that the inventory-to-sales ratio is lower for intangible than for nonintangible intensive firms. Thus, this empirical evidence supports his argument.
[11] Beaver and Ryan (2000; 2005) indicate that accounting bias is directly related to unrecorded intangibles that are valued by capital markets, but are not reported as assets (goodwill). Their estimate of persistent firm-specific accounting bias has an inverse relationship with BTM. Thus, a positive correlation between firm-specific accounting bias and the incremental industry-wide value relevance of nonrecurring items would suggest that reports of these items send clear signals about the value of intangible investments for firms across the industry. In contrast, a negative association suggests that they send a noisy signal about expected industry-wide future growth opportunities.
[12] The frequency and magnitude of reported special items have increased in recent years (Francis, Hanna, and Vincent 1996; Gu and Chen 2004; and McVey 2006). Consistent with these reports, I find that the frequency of reports of special items based on COMPUSTAT item 17 increased between 1993 and 2003.

nonintangible-intensive firms (Panel B of Table 2), which is consistent with the notion that high-tech firms stock smaller inventories or take more frequent write-offs of inventory.[13]

Cready, Lopez, and Sisneros (2010) show negative special items are often reported in the same firm, and market participants treat these multiple reports more like the ordinary component of income. Their finding is consistent with the notion that restructuring activities and inventory write-downs are common for high tech firms due to shocks in technology and business environment. The BlackBerry and T-Mobile articles in *the New York Times* (on page 5) illustrate such industry-level shocks in the cellar phone sector.

Because intangibles often take a long time to produce positive cash flows and managers usually possess more timely information than outsiders, such investments can create costly information asymmetry. If inventory write-downs, patent sales, or restructuring charges reported in special items can send clear signals about the future productivity of (intangible) assets, they are probably useful not only for the reporting firm, but also for other firms competing across the industry. However, if they produce noisy information, or lead to overly optimistic industry-wide market perceptions of future growth, such signals increase information asymmetry. Burgstahler, Jiambalvo, and Shevlin (2002) and Dechow and Ge (2006) report that market participants response to reports of special items but underestimate the effect of them on future firm performance. These studies do not analyze the effect of special items on goodwill, which allow us to assess the simultaneous effect of special item on both book and market value.

2.2.2. Discontinued Operations

Although the values of most intangibles are not reflected on the balance sheet, when a firm discontinues or spin-offs part of an operation, it reveals previously unrecorded value. If there are gains, they are probably the realization of unrecorded intangible assets, which have created

[13] In Table 1, I define intangible and nonintangible-intensive industries.

hidden reserves (Penman and Zhang 2002).[14] Security prices should have reflected this expected value, creating "goodwill," which Ohlson (1995) and Feltham and Ohlson (1995) define as the expected economic value captured by the difference between security price and book value of equity per share. Equation 5 above represents such goodwill. However, this value is at best a noisy measure of the value of intangibles. When intangibles are disposed of, errors should be corrected, and hence goodwill decreases. This is shown in equation 7a where the partial derivative in terms of the adjustment is negative, and the book-to-market (BTM) ratio becomes closer to one as shown in equation 8a.

Discontinued operations reflect critical managerial decisions, such as spinoffs of a line, sales of segment or closing a unit of business. Although Shleifer and Vishny (1992) and Kruse (2002) find that managers strategically elect when to sell assets, they do not analyze managers' exiting decisions. Economic theory suggests if managers make proper decisions, they should improve or, at least, sustain the current level of operations after undergoing such decisions. Hence, it is reasonable to posit the reports of discontinued operations are value relevant and probably useful to evaluate managerial decisions.

I find that discontinued operations are, on average, positive for intangible-intensive firms and negative for nonintangible-intensive firms (Panel B of Table 2). This is consistent with the notion that discontinued operations contain information about previously unrecorded productive value of intangibles. Because precise information about intangibles is often unavailable, reports of discontinued operations might send clear signals that reduce uncertainty and convey useful information for firms across the industry.[15]

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[14] Under Accounting Principles Board Opinion (APB) No. 30, if a business segment is spun-off or disposed of, a firm is required to estimate any segment income or losses on operations during an assumed disposal period of one year or less. For example, Reynolds & Reynolds Corporation recorded an after tax gain of $10,853,000 from the discontinuation of an Information Solution segment in 2002, and Material Sciences Corporation recorded a $38,787,000 gain from the sale of its Specialty Films segment in 2002.

[15] Discontinued operations also contain information about impairments of long-lived assets, which are recognized as negative values (FASB 2001; FAS No. 144). Under conservative accounting rules, these impairments are probably associated with tangible assets or acquired intangibles. This is a balance sheet

2.2.3 Extraordinary Items

Extraordinary items are the other major class of nonrecurring items. There were concerns about managerial discretion in reporting extraordinary items (Barnea, Ronen, and Sadan 1975). The issuance of Staff Accounting Bulletin No. 67 (1986) was intended to mitigate such problems by more narrowly defining these items. The discretion in reporting extraordinary items may be narrower than for the other two types of nonrecurring items (APB No 30). But how managers report extraordinary items is still not well understood.[16] Thus, whether they send useful signals about adjustments to book value is an empirical question.

2.3 Development of the Hypothesis on the Value Relevance of Nonrecurring Items

In the above, I discuss that nonrecurring items can send a clear signal, which leads to adjustments of both book and market value by revealing the true value of assets. Such signals reduce goodwill. On the other hand, if reports of nonrecurring items send noisy signals, or lead to optimistic growth expectations (g), such information lacks in specificity to correct book value and more likely increases goodwill.

I posit that discontinued operations send clear signals about firm performance because they represent specific managerial decisions to adjust book value. However, since special items contain a wide range of information whether their signals are specific enough for investors is unclear. Kinney and Trezevant (1997) find that managers often use special items to manipulate earnings. McVay (2006) shows that managers attempt to increase core earnings by shifting operating expenses to special items. Thus, I posit that special items send noisy signals that lack details in information. Extraordinary items are defined more narrowly than special items.

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adjustment to the value of long-term assets, resulting in a reduction of both book value and probably security price.

[16] For example, APB No. 30 (AICPS, 1973) was issued to clarify managerial discretion with regard to extraordinary items (Barnea, Ronen, and Sadan 1975). However, there are still items reported as extraordinary where managers seem to have wide discretion. These include the cumulative effect of changes and bond redemptions. For example, prior to the issue of Statement No. 145, reporting gains and losses from extinguishment of debt is aggregated and, if material, is classified as an extraordinary item.

However, the specific information they relay is unclear, and hence, the signals they send are most likely noisy.

Accordingly, the first hypothesis is a signaling value of nonrecurring items, which determines their probable relationship with accounting bias. The hypothesis is presented in two forms (H1a and H1b):

H1a: The value relevant component of discontinued operations is positively associated with accounting bias.

H1b: The value relevant component of special items and extraordinary items is negatively associated with accounting bias.

2.4. Development of the Hypothesis on the CEO Market-Based Compensation

Next, I address the question of whether the value relevant component of nonrecurring items is associated with the use of CEO market-based compensation. Earnings are a commonly used performance measure in executive compensation contracts. However, when they convey little information about efforts exerted on innovative activities, it is doubtful that they can be effectively used to monitor managerial actions. The ideal compensation contract would provide incentives for executives to allocate sufficient effort to productive or cost-reducing actions. Otherwise managers might divert their time to nonproductive, manipulative activities.

Compensation committees should turn to the use of market-based compensation when capital markets are better able to impound the likely value of intangibles (Smith and Watts 1992; Baber, Janakiraman and Kang 1996). Security prices are probably more sensitive to managerial efforts expended on intangibles than earnings. Because managers can internalize the effect of investments on share price, market-based compensation satisfies two objectives. First, the reflection of marginal product of effort in a compensation package directs managers to constructive value–increasing activities (Lambert 2001). Second, timely reflection of managerial effort and information helps to reduce uncertainty. These are desirable features since the probable outcomes of intangible investments are difficult for outsiders to deduce, and managers usually

have superior information. However, a drawback is that the use of market-based compensation can also produce undesirable outcomes since market values are influenced by many factors that are not under a manager's control. A typical example is a macroeconomic event, which can affect firms across an industry. Paul (1992) and Bushman and Indjejikian (1993) suggest whether security price has a contracting value or not is depending upon the level of noise in accounting information. Less noise is more useful for a contracting purpose.

In my previous hypothesis, I contend that discontinued operations are more likely to signal adjustments to the terminal values of discontinued or disposed assets, which can also reveal the underlying value of previously unrecorded intangibles. Because intangible investments create information asymmetry between managers and outsiders, such signals are very valuable to reduce uncertainty. Speculative growth expectations can occur at the industry level and are undesirable for compensation committees to provide incentives to CEOs through market-based compensation. Thus, when discontinued operations can reduce costly speculations or uncertainty in the industry, compensation committees across the sector might consider increasing the level of the market-based component in the pay of their CEOs. The structure of compensation contracts is similar across industries (Murphy 1999; Lord and Saito 2010). Relative performance evaluation theory suggests that agents' actions often affect the performance of the peer group (Janakiraman, Lambert, and Larcker 1992). Accordingly, my second hypothesis (H2) is:

H2: The portion of market-based compensation granted to managers is positively related to the industry-wide value relevant component of discontinued operations.

In my previous hypothesis, I argue that special items might send signals that are noisy or that often merely increase investors' expectations about future growth.This can lead to artificially inflate security prices in the industry and to increase volatility. Such signals are too noisy and an increase in CEO market-based compensation is probably undesirable.[17] If compensation

[17] It may produce perverse incentives for managers to exercise their options early, since managers have prior information. They can lock-in the current value if they expect the security price to decline in the future.

committees are concerned about noise in signals, they should intervene to adjust CEO incentives by reducing the scope of market-based compensation. Thus, there should be a negative relationship between the use of market-based compensation and signals sent by special items and extraordinary items.[18]

The third hypothesis (H3) is:

H3: The portion of market-based compensation granted to managers is negatively related to the industry-wide value relevant component of special items and extraordinary items.

The second and third propositions are joint hypotheses. First, the nonrecurring items must play a valuation role as tested in hypotheses H1a and b. When this condition holds, it is meaningful to analyze the association between their information content and the use of market-based compensation.

3. DATA COLLECTION

3.1. Sample Description

The data for this study are collected from three sources. Information on managerial compensation is taken from the EXECUCOMP database. Other necessary items are collected from the COMPUSTAT and the Center for Research in Security Prices (CRSP) databases for 12 fiscal years, from 1992 to 2003.

I eliminate all observations for firm-years that have missing data for any major valuation or compensation variables (e.g., core earnings, comprehensive earnings, assets, and the elements of CEO compensation). To accommodate my research design, I eliminate firms with negative book value of equity (BVE) and return on assets (ROA) less than negative one.[19] Because ROA is calculated as current earnings divided by the beginning-of-period assets, the first annual observation for all firms is lost in the analysis.

[18] This is similar to the notion that when information is too noisy, it might be best to mute the use of market-based incentives in executive contracts (Holmstrom and Milgrom 1991).
[19] Both of these are very small proportions of total observations (less than 0.5%).

When research and development (R&D, COMPUSTAT item 47), intangibles (COMPUSTAT item 33), intangible other (COMPUSTAT item 352), and goodwill (COMPUSTAT item 204) are not reported, I set their values to zero.[20] Since many firms do not report the values of my three measures of nonrecurring items, special items (COMPUSTAT item 17), discontinued operations (COMPUSTAT item 66), and extraordinary items (COMPUSTAT item 192),[21] I set unreported values to zero. These selection criteria result in a final sample of 11,236 firm-year observations from fiscal years 1993 to 2003.

3.2. Analysis of Intangible-Intensive of Industries

In a preliminary analysis, I classify firms into 21 industries, nine of these are intangible-intensive and the others are nonintangible-intensive as shown in Table 1. There are 4,175 firm-year observations in intangible-intensive industries, compromising 37.16% of total observations. I employ four proxies to measure intangible intensity and conduct mean comparison tests. If the SIC classification of intangible-intensive industries is appropriate, firms in the first nine industries in Table 1 would have positive standardized values of these three proxies.[22] In an untabulated analysis, I find that almost all of the nonintangible-intensive industries have negative and the majority of intangible-intensive firms have positive values for these proxies. These statistics indicate that this classification adequately captures the difference between nonintangible and intangible-intensive industries.

Panel A of Table 2 reports the results of the mean comparison tests for several variables. Four earnings related variables are core earnings (*ENsp*; COMPUSTAT item 18 minus item 17), special items (*SPITM*), discontinued operations (DISCP) and extraordinary items (*EXTRA*). Core earnings are significantly higher for intangible- than for nonintangible-intensive industries. For both discontinued operations and extraordinary items, there is no significant difference in values

[20] I also set these values to zero when they are reported as either insignificant or as combined figures.
[21] Extraordinary items include accounting changes.
[22] I calculate the population mean and standard deviation of *RD*, *INTG2*, and *INTG3*. Then I standardize by subtracting the population mean from each observation and dividing them by the population standard deviation.

between the two groups. But, special items (*SPITM*) are, on average, negative and the magnitude is larger in the intangible-intensive industries. I also present two variables related to write-offs and write-downs: accounts receivable and inventory both divided by sales, ARAS and INVTAS respectively. Both average values are lower for intangible than nonintangible-intensive firms/industries.[23]

3.3 Magnitude of Reports of Nonrecurring Earnings

Panel B of Table 2 presents descriptive statistics for three different levels of aggregation in earnings and three different types of nonrecurring items, after imposing the restriction that a firm must have at least four years of observations and after eliminating outliers. The mean values of earnings at the three different levels of aggregation are reasonably close. For example, in Panel B, *EN*, the mean value of earnings before extraordinary items (COMPUSTAT item 18), is $253 million; *cmpEN*, bottom line income (COMPUSTAT item 172), is $238 million; and *ENsp*, core earnings, is $317 million. The standard deviation is the highest for the most aggregated definition of earnings, *cmpEN*, and lowest for core earnings, *ENsp*. This is consistent with the notion that ongoing operations produce less-volatile, and that the inclusion of nonrecurring items generates variability. As reported by Dechow and Ge (2006), there is large negative in special items.

Panel C of Table 2 presents the frequency of reports of the three components of nonrecurring items, and the occurrence of negative and positive values. Nonrecurring items are typically negative, except for discontinued operations.[24] For example, in 2003, 73% of total observations reports special items, 57% of total observations is negative and 17% is positive. In

[23] I find that positive discontinued operations have a much higher value for intangible- than for nonintangible-intensive firms. This is reasonable because intangible-intensive firms should have high positive reserve form their investments.

[24] Although not reported in Table 2, Kurtosis is very high for all of these one-time items (more than 2,500).

contrast, 19% of total observations reports discontinued operations. The positive and negative reports are more evenly spread, 8% and 11%, respectively, [25]

Non-zero values of extraordinary items and discontinued operations are infrequent: 14.55% and 10.80% for the full sample, and 15.03% and 12.14% respectively for the restricted samples where firms must have at least four years of observations. More than half of the sample firms have non-zero values for special items: 61.6% for the full sample and 65.1% for the restricted sample. These statistics are quite different from those reported by Fairfield, Sweeney, and Yohn (1996) who found that the majority of special items and discontinued operations were negative, that more than 80% of extraordinary items were positive, and that only 23% of firms report non-zero special items. This is because they use data from an earlier period; 1973 to 1990.[26]

4. EMPIRICAL MODELS FOR TESTING HYPOTHESES H1 AND RESULTS

4.1. Testing Procedure for Hypothesis H1

The test of hypothesis H1 involves three steps. During these processes, observations are further reduced to 7,382 due to a data requirement.

Black, Carnes and Richardson (2000) show that there is a serious empirical problem with using raw values of firm-specific nonrecurring items directly in a regression equation. Because they are probably contemporaneously associated with firm security prices, the relationship between security prices or returns and the raw value of nonrecurring items cannot simply be interpreted as useful signals for investors to assess the value of intangibles or previously unknown values of assets. In addition, as only a small percentage of firms report discontinued operations

[25] Out of 11,236 observations, 46.58% have negative values and 14.52% have positive values for special items, 5.36% have negative values and 5.44% have positive values for discontinued operations, and 11.95% have negative values, and 2.6% have positive values for extraordinary items.

[26] The number of firms reporting special items in the full sample has increased drastically over time. There has also been a change in the characteristics of nonrecurring items. The proportions of firms reporting discontinued operations or extraordinary items are stable throughout most of the 1990's, but they have increased during the last couple of years, potentially due to SFAS No. 144 and SFAS No. 142. The incidence of negative values reported in special items also has increased. However, there is no similar rise in discontinued operations.

and extraordinary items, this probably does not provide enough variability to test the value relevance of the signals. My research design, which calculates the incremental value relevance of nonrecurring items at the industry level of R^2, mitigates the above concerns. Because the types of tangible and intangible assets used in production are industry specific, and an intense competition within industry, it is reasonable to think that industry-wide signals are useful for managers and market participants to take actions. The first step is that I estimate the industry-wide ability of nonrecurring items to explain goodwill by computing an incremental R^2 at the industry level as described below. This is my proxy for the incremental value relevance of nonrecurring items.

Second, I estimate firm-specific accounting bias using Beaver and Ryans' (2000) model. This measure is associated with unconditional conservatism arising from unrecorded intangible assets and/or persistently understated assets values.

Third, I test whether these two proxies are associated with each other to assess the information contained in nonrecurring items for firms across the industry. The above bias is based on the firm specific BTM ratio. When the association is positive, this indicates that the reports of the nonrecurring items by some firms in an industry signal useful information that alter the magnitude of goodwill, and drive the BTM ratio closer to one. On the other hand, when the association is negative, this indicates that they send noisy signals that increase future growth expectations, which cause the BTM ratio to drift away from one.

The R^2 has been used as a proxy for the value relevance of accounting earnings in prior research. Dechow (1994); Collins, Maydew, and Weiss (1997); Francis and Schipper (1999); Francis, LaFond, Olsson, and Schipper (2004); and Ecker, Francis, Kim, Olsson, and Schipper (2006) all estimate proxies for the value relevance of earnings using a R^2-based market model.[27] I follow this approach and use an estimation technique described by Theil (1971) to obtain 21

[27] Some criticize the use of R^2 for its lack of comparability and for containing a scale effect. However, Brown, Lo, and Lys (1999) conduct a validity test of the use of R^2. They show that although R^2 is dependent on the scale factor's coefficient of variation, the inclusion of one-time items and size in the regression controls for the scale effect. I follow their method.

industry-level measures of incremental R^2 (GW_incR^2) based on the value of the difference in the R^2 between the two models below. I also use a R^2 ratio employed by Hou and Moskowitz (2005) to conduct similar analyses, and report the results later in the section.

$$GW_{it} = \alpha_0 + \alpha_1 ENsp_{it} + \alpha_2 SIZE_{it} + \alpha_3 DMD_{it} + \alpha_4 DMOUT_{it} + u_{it} \quad (9)$$

$$GW_{it} = \phi_0 + \phi_1 TRE_{it} + \phi_2 ENsp_{it} + \phi_3 SIZE_{it} + \phi_4 DMD_{it} + \phi_5 DMOUT_{it} + \nu_{it} \quad (10)$$

where GW_{it} is the measure of goodwill, the difference between security price and book value per share in year *t* for firm *i*. $ENsp_{it}$ is earnings per share before extraordinary items minus special items. $SIZE_{it}$ is the square root of sales. The models above include two dummy variables. DMD_{it} is set to one in any year when a firm pays dividends and zero otherwise, and $DMOUT_{it}$ is set to one for a year when a firm issues stock dividends or engages in a stock split and zero otherwise. The inclusion of these dummy variables is based on Gelb and Siegel (2000), who show that firms in intangible-intensive industries use financial signals to try to overcome some of their transparency problems. TRE_{it} is nonrecurring items per share for year *t*, for firm *i*. I estimate model 10 three times, using three types of nonrecurring items; special items (*TREsp*), discontinued operations (*TREdc*), and extraordinary items (*TREext*). The industry-level estimates of GW_incR^2 should capture the ability of nonrecurring items to explain goodwill. I delete any observations that have regression residuals with values of Cook's D greater than one or R-Student residuals greater than the absolute value of three in each analysis.[28]

To estimate accounting bias (*BC*), I follow Beaver and Ryan (2000), and estimate the firm-specific fixed component using the following model:

$$BTM_{it} = BC_i + a_t + \sum_{j=0}^{J=3} \beta_j R_{t-j,i} + e_{it} \quad (11)$$

[28] See Welsch (1980) for more details.

where BTM is the book-to-market ratio at the end of the fiscal year *t* for firm *i*, and *R* are the lagged annual security returns for firm *i* for each of the three previous years.[29] A single measure of accounting bias for each firm is reasonable, as the decay in unconditional conservatism is slow (Beaver and Ryan 2005). Larger values of BC indicate a lower degree of unconditional conservatism, and the parameter a_t controls for the year-by-year variation.

I employ Beaver and Ryans' model (2000) that assess undervaluation of book value (unconditional conservatism) to test hypotheses H1a and b. My test variable is the incremental industry-level R^2. The firm-specific estimated intercept term from equation 11, accounting bias *(BC)* is the dependent variable,

$$BC_i = \alpha_1 + \alpha_2 GW\_incR_k^2 + \alpha_3 IBC_i + \alpha_4 CAP_i + \alpha_5 RD_i + \alpha_{6i} GROWTH_i + \alpha_7 LIFOAST_i + v_i \qquad (12)$$

where $GW\_incR_k^2$ is the incremental industry-level R^2 that is the difference in the R^2 between models 9 and 10 for the firm's industry. There are three sets of proxies of $GW\_incR_k^2$ depending on the specification of nonrecurring items (special items, discontinued operations, or extraordinary items). A larger value of $GW\_incR_k^2$ indicates a greater ability of nonrecurring items to explain goodwill.

Because intangible investments and assets used in firms are similar across industries, I include IBC_{it}, the industry-specific mean of *BC* for the year, to control for any industry specific factors in bias. I also estimate a modified model 12 by including interaction terms, $GWP\_incR_k^2$ and $GWN\_incR_k^2$. $GWP\_incR_k^2$ is the interaction between $GW\_incR_k^2$ and a dummy variable set to one if nonrecurring items have positive value and zero otherwise.[30] Similarly, $GWN\_incR_k^2$ is the interaction between $GW\_incR_k^2$ and a dummy variable set to one if

[29] Beaver and Ryan use six lags instead of three. However, since a long time-series of observations is not available on the EXECUCOMP data set, I use only three lags. Using more lagged returns would generate data problems from losing critical time-series observations. In my model, A firm must have at least four years of data to estimate this measure. I subtract the mean from the sample annual return for each observation.

[30] Because the nonrecurring items have many missing and zero values, a single dummy variable coded to one for either a positive or a negative value would fail to properly record these.

nonrecurring items have negative value and zero otherwise. Because positive or negative reports of nonrecurring items are firm-specific information, this cross produce terms provide variations in the industry-level variable, $GW\_incR_k^2$.

A significant positive sign on the coefficient $GW\_incR_k^2$ indicates that the BTM ratio is approaching one, making bias smaller. On the other hand, a negative coefficient indicates that they send possible misleading signals about future growth opportunities, resulting in the BTM ratio drifting away from one. I hypothesize that the coefficient on $GW\_incR_k^2$ should be significantly positive for discontinued operations and negative for special items and extraordinary items. The coefficients on the interaction terms ($GWP\_incR_k^2$ and $GWN\_incR_k^2$) separately assess the value relevance of firm-specific information beyond the level of the industry-wide effect.

Four of the control variables are taken directly from Beaver and Ryan (2000). $CAP_{it,}$ is a proxy for financial leverage, which is the ratio of long-term debt to the sum of long-term debt and the market value of equity, RD_{it} is R&D scaled by sales, which is a proxy for unrecognized intangible assets. There are many types of intangibles that this variable cannot capture. This variable as control to assure the incremental value relevance of nonrecurring items captures the value of unrecorded intangibles. $LIFOAST_{it}$, is LIFO reserve divided by total assets. Beaver and Ryan (2000) also include a proxy for firm growth that is based on dividend payments. For this proxy, I use the three-year average growth rate in sales instead of a growth rate based on dividends, because growth firms often do not pay dividends, $GROWTH_{it}$. All control variables are for firm *i* and year *t*.

4.2. The Empirical Results for the Hypotheses H1a and b

Accounting Bias and the Incremental Value Relevance of Nonrecurring Items.

I first calculate goodwill and estimate the incremental value relevance of nonrecurring items. My sample has 1,373 firms and 7,272 firm-year observations. Panel A of Table 3 contains descriptive statistics for the variables. I conduct the analyses using three different types of

nonrecurring items per share, *TREsp* (special items), *TREdc* (discontinued operations), and *TREext* (extraordinary items). Panel B reports summary statistics for the estimated firm specific *BC* from model 11 sorted by industry and the estimates of my proxies for the incremental ability of nonrecurring items to explain goodwill. Because there are three specifications of GW_incR^2, model 12 is estimated three times, one for each of the three major categories for each of the 21 industries.[31] The type of nonrecurring items used as the basis for each model is indicated along the top row of panel B.

The first column contains the estimates of *BC,* which are, on average, negative for intangible-intensive firms and positive for nonintangible-intensive firms. This is consistent with the prediction from the theory that higher the value of *BC*, the lower the degree of unconditional conservatism.

The next three columns contain data on the estimated values of the incremental R^2, the proxy for the industry-wide value relevance of the reports of nonrecurring items. Although the mean of GW_incR^2 based on special items is lower in intangible- than in nonintangible-intensive industries, and that based on discontinued operations is higher for intangible than in nonintangible-intensive industries, these differences are insignificant.

The Results for Hypotheses H1a and b

Panel A of Table 4 presents the descriptive statistics for the variables that are used to test hypothesis H1 (model 12). The results of the tests of hypotheses H1a and b are presented in Panel B of Table 4. The first two columns are special items, without and with interaction terms. Then discontinued operations and extraordinary items follow. I eliminate all observations that have residuals with a Cook's D value higher than one, and/or an R-Student value with an absolute

[31] Two industries have negative value of $GW\_incR.^2$ Because I eliminate outliers before I estimate each model, R^2 for model 9 became larger than for that for the model 10 due to the difference in the number of observations. These are Computer Equipment (ID3) and Financial Institutions (ID12). To avoid the influence of negative value, I took the absolute value for all estimated $GW\_incR.^2$.

value greater than three.[32] The p-values reported in the Table are based on heteroscedasticity adjusted t-values.

The coefficients on GW_incR^2 for discontinued operations and special items are statistically significant at an α level of 0.05. The negative sign on the coefficients on GW_incR^2 in the first column of panel B (-0.1385) supports the hypothesis H1b that special items, on average, send noisy signals in the industry that increase the size goodwill, while the positive sign on the coefficient on GW_incR^2 in the third column of panel B (0.4275) supports the hypothesis H1a that the value relevant component of discontinued operations, on average, provides clear signals in the sector that reduce the magnitude of goodwill, corresponding to the equation 8b. The coefficients on GW_incR^2 for extraordinary items (*TREext*) are insignificant, suggesting that they do not contain value relevant information.

The coefficients on the interaction are significant for GWP_incR^2 but insignificant for GWN_incR^2 for all three specifications. For special items (in the second column of panel B), the magnitude of the coefficient on GWP_incR^2 is -0.0006, indicating when a firm reports positive special items, accounting bias increases. For discontinued operations (in the fourth column), the sign of the coefficient is the opposite of the positive coefficient on GW_incR^2 and, the relative magnitude is small. This indicates when a firm reports positive discontinued operations it mildly weakens the usefulness of overall signals. For extraordinary items, the magnitude of coefficient is -0.0021. The insignificant coefficient on GWN_incR^2 suggests that firm-specific negative reports do not seem to provide incremental value relevant information beyond the signals provided at the industry level.

Most of the signs of the estimated coefficients for the control variables agree with those found by Beaver and Ryan (2000). Consistent with the notion that the conservative treatment of

[32] Because of this outlier analysis, the reduction of observations results in a slightly different sample size for the estimates of models 9 and 10. This creates a situation in estimating models for special items where for two out of 21 industries adjusted R^2 is higher in model 9 than model 10. Thus, to calculate the adjusted R^2 I took the absolute value. I also conduct the same analysis without the outlier analysis. All results generally remain the same.

assets introduces bias due to the growth expectation (g in equation 7a), the coefficients on *RD*, the proxy for unrecognized intangible assets, is negative at an α level of 0.05 or less in all models. As expected, all coefficients on *IBC* are significantly positive at an α level of 0.01. The coefficient on *CAP* is insignificant, and that on *LIFOAST* is all positive at α levels 0.01. The coefficient on *LIFOAST* is contrary to Beaver and Ryans' (2000) theoretical expectations. The coefficients on the growth proxy, *GROWTH*, are significantly negative at an α level of 0.01 in all models. This is consistent with Penman (2004) who notes that the effect of conservatism is most severe for growth firms, and the growth expectation (g in equation 7a).[33]

Overall, the results from two specifications of model 12 support hypotheses H1a and H1b. The incremental industry-wide value relevance of special items and discontinued operations are associated with the estimated firm-specific accounting bias. The significant negative coefficient on special items indicates that they do not contain specific information that reduces noise, but this information increases goodwill. On the other hand, the significant positive coefficient on discontinued operations suggests that they provide clear signals about the disposal of unrecorded intangibles or the terminal value of previously recorded assets. These results indicate that the information contained in these two nonrecurring items is very different. Special items are too noisy to reduce goodwill while discontinued operations contain specific information to reduce goodwill. Because my second hypothesis requires nonrecurring items to be value relevant, and extraordinary items do not contain the value relevant information, there is no reason to analyze them further.

4.3. *Testing Procedure for Hypotheses H2 and H3*

In hypotheses H2 and H3, I test for a link between the information contained in nonrecurring items reported by some firms in an industry and the use of CEO market-based

[33] The sign of the estimated coefficient is different from that of Beaver and Ryan (2000). A potential reason for this difference is how growth is proxied. Beaver and Ryan try to account for reinvestments in "recognized tangibles," so they use the average retention ratio over four years as their growth proxy. In contrast, I account for growth in intangible assets, using sales growth.

compensation after controlling for a firm-specific abnormal bias. In Panel A in Table 5, I present the Spearman correlations among a set of variables. I confirm all of the expected relationships among them, based on the theory developed in section 2.1 to provide validity for the theory, which I utilize to develop hypotheses H2 for discontinued operations and H3 for special items and extraordinary items; there is a negative correlation between goodwill (*GW*) and accounting bias (*BC*). There is a positive correlation between goodwill (*GW*) and the expected growth rate based on the annual percentage change in assets (*Gr_AST*) as well as sales (*Gr_SALE*).

To test hypotheses H2 and H3, I employ the proportion of market-based compensation for the CEO of the firm (*MBC_TC*) as the dependent variable. This value is the sum of annual dollar value of options and restricted stock grants divided by total annual CEO compensation. I regress the set of two measures of GW_incR^2 one-at-a-time on *MBC_TC* to test whether the industry-wide incremental value relevance of discontinued operations (GW_incR^2) is positively and that on special items is negatively associated with the use of the market-based compensation. The measure of the incremental value relevance of nonrecurring items (GW_incR^2) captures the strength of signals sent by reports of these items by some firms in the industry for all of the firms in the sector.

There are potential reference groups for CEO pay (Bouwman 2013). Audrestsch and Feldman (1996) suggest that firms in the same industry tend to locate in the similar area. Since executives in the same industry compete in labor markets, the compensation of one CEO influences that of the others in the area (Bouwman 2013). Because a deviation of bias from the industry average controls for the abnormal difference, I include *ABC,* abnormal accounting bias to control for the firm specific bias beyond the level of an industry average to test hypotheses H2 and H3.

I also include *RDAST* in the model to control for the possible preexisting association of variables with the use of market-based compensation. Since R&D expenditures are expected to be

higher for intangible- than nonintangible-intensive firms, it is important to control for this factor to mitigate an omitted variable problem. The empirical model is as follows:

$$MBC\_TC_{it} = \phi_0 + \phi_1 GW\_incR_k^2 + \phi_2 ABC + \phi_3 RDAST_k + \phi_4 ENsp_{t-1} + \phi_5 CASHCON_{it} + \phi_6 CAP_{it} + \phi_7 RISK_{it} + \phi_8 CEOSH_{it} + \phi_9 SIZE_{it} + e_{it} \quad (13)$$

where *ABC* is abnormal accounting bias, which is the difference between firm-specific bias and industry average bias, and *RDAST* is R&D scaled by assets. I also include six other control variables commonly included in compensation research: firm size ($SIZE_{it}$), cash constraints ($CASHCON_{it}$), capital structure (CAP_{it}), security return volatility ($RISK_{it}$), the CEO's shareholding ($CEOSH_{it}$), and core earnings ($ENsp_{it-1}$), all for firm *i* in year *t*.

Since special items are overwhelmingly negative, this may raise a concern. Hence, I estimate an additional model including interaction terms, GWP_incR^2 and GWN_incR^2, to examine whether the negative or positive values of nonrecurring items have parallel effects on the estimated coefficient on GW_incR^2. The variables GWP_incR^2 and GWN_incR^2 are previously defined. Because whether nonrecurring items are negative or positive is depend upon the firm level, these interaction terms introduce the firm level variation into the industry level incremental value relevance GW_incR^2.[34] The model is

$$MBC\_TC_{it} = \phi_0 + \phi_1 GW\_incR_k^2 + \phi_2 GWP\_incR^2{}_{it} + \phi_3 GWN\_incR^2{}_{it} + \phi_4 ABC + \phi_5 RDAST_k + \phi_6 ENsp_{t-1} + \phi_7 CASHCON_{it} + \phi_8 CAP_{it} + \phi_9 RISK_{it} + \phi_{10} CEOSH_{it} + \phi_{11} SIZE_{it} + e_{it} \quad (14)$$

My test variables are the estimated coefficients on GW_incR^2 (ϕ_1) in model 13, and GW_incR^2 (ϕ_1), GWP_incR^2 (ϕ_2), and GWN_incR^2 (ϕ_3) in model 14. A positive coefficient on GW_incR^2 would suggest that as the incremental value relevance of nonrecurring items increases, the proportion of CEO market-based compensation relative to total compensation also increases, while a negative coefficient would indicate that market-based remuneration decreases with it.

[34] I also estimate the model 14, for each dummy variable separately into the model. Each equation is estimated twice, once using each of the two dummy variables. The signs of the associations between the use of market-based compensation and the incremental value relevance of both special items and discontinued operations remain the same.

Prior studies (e.g., Smith and Watts 1992; Bushman, Indjejikian, and Smith 1996; Core and Guay 1999) show that firm size is often positively associated with CEO market-based compensation. I use the square root of sales as the size proxy. Core and Guay (1999; 2002) suggest that cash- or dividend-constrained firms pay a higher proportion of market-based compensation. My *CASHCON* proxy is the difference between necessary cash outflows (the sum of annual common and preferred dividends, capital expenditures and additions to investments) and cash inflows (the sum of operating profits and depreciation and amortization expenses) scaled by total assets. When this figure is negative, operating cash flows are sufficient to cover outflows.[35]

Agency theory suggests that the conflict between debt and equity holders creates a need for monitoring mechanisms to mitigate expensive conflicts (Jensen and Meckling 1976). According to this theory, the higher the proportion of debt financing, the better the quality of the monitoring structures required. I include CAP_{it}, the ratio of long-term debt to the sum of long-term debt and the market value of equity to control for the effects of this agency conflict. I also include share return volatility, *RISK*, which is annualized standard deviation of daily stock returns, to control for the risk of the firm stock. The proportion of firm shares owned by CEOs, *CEOSH*, controls for the risk the manager faces. A high level of stock holding increases the manager's risk. Therefore, I anticipate a negative association between CEO holdings and market-based compensation. Ohlson's (1995) Information Dynamic suggests that the one-year-lagged core earnings should help to predict residual income, which is reflected in goodwill. Thus, I include $ENsp_{t-1}$, lagged core earnings scaled by assets, to assess this impact.[36]

4.4. Descriptive Statistics and Results for Hypotheses H2 and H3

[35] Core and Guay (1999) recommend two other cash constraint proxies. As a sensitivity analysis, I also use these two other proxies. The first is a dummy variable set to one when the firm pays no common or preferred dividends and zero otherwise. The second is a dummy variable set to one when the ratio of the sum of all common and preferred stock dividends and repurchases to the value of retained earnings is greater than 0.50 and zero otherwise. The results are not significantly different.

[36] Core earnings are defined as earnings before extraordinary items, after subtracting special items.

Panel B in Table 5 presents descriptive statistics for firms that have at least four years of observations. On average, about 41% of CEO compensation for these firms is market-based (either options, restricted stocks or both). CEO market-based compensation (*MBC_TC*) is higher for intangible-intensive firms (46%) than for nonintangible-intensive firms (38%) (untabulated).

Table 6 reports the results for the tests of hypotheses H2 and H3 for each of the two classes of nonrecurring items, as indicated in the top row of the four columns. The results in the first two columns are for GW_incR^2 based on discontinued operations, and the results in the last two columns are based on special items.[37] Because several firms pay either 0% or 100% in market-based compensation and the data are bounded between zero and one, I specify Tobit models. Since Tobit is a nonlinear function, the likelihood estimator for fixed effect model is biased and inconsistent. Consequently, I do not include for year dummy variables. [38]

As hypothesized, the coefficients on GW_incR^2 (model 13) are significantly positive at an α level of 0.05 for the specification based on discontinued operations (the first column). The positive coefficient for discontinued operations indicates that the portion of market-based compensation increases with the incremental value relevance of discontinued operations at the industry-level. Earlier, I find that information from discontinued operations reduces firm-specific accounting bias, suggesting that they relay clear signals about performance in the sector. Together these results suggest that the industry-wide signals sent by discontinued operations are favorable for compensation committees to increase the level of market-based compensation.

The coefficient on GW_incR^2 based on special items is negative at an α level of 0.01 (the third column). This indicates that as the incremental value relevance of special items at the industry-level increases, the use of market-based compensation decreases. In the analysis of bias,

[37] I estimate two models, one that includes the prior period's core earnings ($EPsp_{t-1}$), and another excluding it. Because the results are almost identical, I only report those for the model that includes $EPsp_{t-1}$.
[38] The Tobit is the most common model for corner solution dependent variable (Tobin 1958). I also conduct the analyses with the OLS regression, including year dummy variables (a year fixed effect model). But the major results are very similar. In addition, I also estimate the same model by replacing GW_incR^2 for RSRAT, the ratio of R^2 employed by Hou and Moskowitz (2005). These results are reported in the later section.

I find that special items send noisy signals that increase goodwill. Ambiguous information that artificially creates a volatile environment is costly. Previous studies (e.g., Paul 1992; Sloan 1993; Lambert 1993; 2001) suggest that noise in capital markets is undesirable for compensation committees to provide incentives to CEOs, and hence, they try to reduce the impacts of noise on CEO compensation. Thus, my result supports the argument that the compensation committees attempt to mitigate the effect of the industry-wide noisy signals on equity value by decreasing the use of market-based compensation.

The inclusion of the interaction term does not alter the main findings as shown in the second and fifth columns of Table 6. The coefficient on GW_incR^2 based on discontinued operations is positive and that based on special items is negative. The coefficient on GWP_incR^2 for discontinued operations is insignificant, and that of GWN_incR^2 is negative and significant at an α level of 0.1. The magnitude of this coefficient is very small relative to that of the coefficient on GW_incR^2, and hence, the effect of firm's reports on discontinued operations does not contradict my original findings. However, the result indicates the firm-specific component of information mildly weakens the general level of a positive association.

The coefficient on GWP_incR^2 for special items is significant and positive at an α level of 0.10. Since the magnitude of the coefficient is very small relative to that of the coefficient on GW_incR^2, the effect is minimal. The coefficient on GWN_incR^2 for special items is significant and negative at an α level of 0.01. But, again the magnitude of the coefficient is small, and hence the industry-level information captures the fundamental relationship between the value relevance of nonrecurring items and CEO market-based compensation.

In sum, these results indicate that whether the individual firm's reports of discontinued operations or special items have a negative or positive value have a minimal effect on the coefficients on GW_incR^2. Thus, my results provide compelling evidence to confirm the link between the value relevant components of discontinued operations and special items and CEO market-based compensation.

The coefficients for all control variables have very similar signs and magnitudes across all models. The coefficient on abnormal bias is negative at an α level of 0.01. Those for R&D expenditures are positive, consistent with the notion, intangible-intensive firms use high levels of market-based compensation. The coefficients on cash constraints are positive. This result is consistent with Core and Guay (1999), who argue that as the available cash decreases, the use of market-based compensation increases. The coefficients on the capital structure proxies are negative, indicating that as debt increases, the use of market-based compensation decreases.[39] The coefficients on security return volatility are positive, consistent with Demsetz and Lehn's (1985) claim that for risky firms it is important to grant the managers a higher portion of market-based compensation to properly align their incentives with those of outside shareholders. The negative coefficients on CEO shareholding suggest that the more shares the managers own, the smaller the proportion of market-based compensation they receive, which is consistent with the claim of Lambert, Larcker, and Verrecchia (1991). Size has positive coefficients, indicating that larger firms use higher levels of market-based compensation (e.g., Smith and Watts 1992).

4.4.1 The Firm Level Variation In The Incremental Value Relevance of Nonrecurring Items

Because my measure of the incremental value relevance of nonrecurring items is at the industry-wide level, there may be a question of whether these signals are useful for compensation committees at other firms to adjust incentives for their CEOs. Industry characteristics are an important external environmental factor that affects the structure of CEO compensation (Karuna 2007; Joh 1999; Jankiraman, Lambert, and Larcker 1992). However, managers face firm-specific risk in making their decisions.

Because intangible investments involve considerable uncertainty, such investments often introduce noise in capital markets. Previous studies (e.g., Sloan 1993; Lambert 1993; 2001) show that compensation committees try to eliminate the effect of noises on CEO pay. This often makes

[39] The results of prior studies of the relationship between market-based compensation and financial leverage are mixed (Matsunaga 1995; and Ryan and Wiggins 2001 and 2002).

it difficult to determine the association between the risk of firm equity and market-based compensation. For example, Aggarwal and Samwick (1999), Ittner, Lambert and Larcker (2003), Williams and Rao (2006), Belkhir and Chazi (2010) and Lord and Saito (2012) find a positive relationship between the risk of firm equity and market-based compensation, while Beatty and Zajac (1994) and Zajac and Westphal (1994) find a negative relationship. Thus, I introduce the firm-specific variation to the incremental value relevance of nonrecurring items at the industry-level.

This variable is the product of GW_incR^2 and firm specific security return volatility (RISK). I substitute this variable into Equation 13 for the industry-wide level GW_incR^2. Since RISK is already included in the model, the coefficient on this multiplicative variable captures how the incremental value relevance of nonrecurring items affects the use of CEO market-based compensation after considering firm-specific noise arising from risk. This new multiplicative measure should assess the association between the incremental value relevance of nonrecurring items and CEO market-based compensation at the firm-level.

This result is shown in the last column of Table 6. I continue to find a positive coefficient for the cross product (GW_DincR^2) for discontinued operations and a negative coefficient for the cross product for special items. The coefficient for discontinued operations is significantly positive at an α level of 0.10 and that for special items is significantly negative at an α level of 0.0001. All control variables have very similar coefficients as in the main model. Thus, these results provide additional evidence at the firm-specific level to support hypotheses H2 and H3. My result on special items further confirms prior findings that compensation committees try to reduce the effect of noise in capital markets on CEO compensation.

4.5 Results Employing R^2 Ratio

Because there are concerns about the use of differences in R^2 (GW_incR^2), I also conduct the analysis, using a R^2 ratio employed by Hou and Moskowitz (2005). This is the complement

of the ratio of R^2 from regression of restricted model, equation 9, over R^2 from regression of nonrestricted model, equation 10 as follows,

$$RSRAT = 1 - \frac{R^2_{rstrict}}{R^2} \qquad (15)$$

This ratio measures the fraction of variation of contemporaneous goodwill explained by nonrecurring items. It is similar to an F-test on the joint significance of nonrecurring items scaled by the amount of total variation explained contemporaneously. The larger this number, the more goodwill variation is captured by nonrecurring items. I replace GW_incR^2 in equation 12 with *RSRAT* and conduct the same analysis for special items and discontinued operations. [40]

Two industries have negative values of *RSRAT* in the analysis of value relevance of special items. [41] These are Computer Equipment (ID3) and Financial Institutions (ID12) sectors. For the analysis of discontinued operations, no industries have negative values of *RSRAT*. However, the values of *RSRAT* are very low in the Electric Equipment (ID4) and Extraction industries (ID15), with values of 0.0003 and 0.00001 respectively.[42] Therefore, in a second iteration, I also estimate equation 12, replacing GW_incR^2 with *RSRAT*, and eliminating the two industries in each case that have negative or very low values. These results are shown in Table 7.

The first two columns contain the results for special items. They are very similar to those reported in Panel B of Table 4. The coefficient on *RSRAT* is statistically significantly negative for

[40] Although I have not reported the correlations between GW_incR^2 and RSRAT, they are very high. For special items is 0.79 and for discontinued operations is 0.93. The correlation for special items is probably due to how I handled the negative value in GW_incR^2 described in footnote 31.For brevity, I did not report these two figures. However, the comparison of these two figures is available by the request.

[41] Because I eliminate outliers before I estimate each model, it is possible for R^2 for the restricted model to be larger than for the nonrestricted model. For example, after eliminating outliers, there are 194 observations for the Computer Equipment industry in the restricted model, while there are 195 observations in the nonrestricted model in the analysis of special items. The coefficient on special items is insignificant in the equation 10. For the analyses employing GW_incR^2, I took the absolute values of the differences of R^2 to estimate equation 12. But, for the analysis using *RSRAT*, I retain any negatives value in my estimation of the equation 12.

[42] The Industry Chemical (IN1) sector also has small *RSRAT* value. Since Electric Equipment sector has the larger proportion of CEO market-based compensation and much higher SDS than the Industry Chemical sector, I dropped this industry. However, I also drop the Industry Chemical sector instead of the Electric Equipment and reestimated models. The tenor of results remains the same.

both samples, the one with all industries and the other after eliminating two industries. All control variables also have very similar coefficients.

The results for discontinued operations are shown in the next two columns. The coefficient on *RSRAT* is positive but in this case, is insignificant in both samples. All of the control variables again have coefficients very similar to the earlier findings.

I also test hypotheses H2 and H3 employing *RSRAT*. Table 8 presents results based on OLS regression models. Since I could not estimate the fixed effect model with a Tobit specification, I use the year fixed effect model in this analysis. The results for special items for both GW_incR^2 and *RSRAT* are shown in Panel A and for discontinued operations in Panel B. I estimate equation 13 using two samples for both analyses, one with all industries and the other eliminating two sectors with very low or negative values of *RSRAT* as the above.

For special items the coefficients on GW_incR^2 are statistically significantly negative for both the full and reduced samples. The magnitudes of the coefficients shown in first two columns are very similar. The coefficients for *RSRAT* are also statistically significantly negative for the full sample but insignificant for the reduced sample. All control variables have similar estimated coefficients to those for the main results reported in Panel B of Table 4.

The results for discontinued operations presented Panel B show that the coefficients on $GW_incR^2$and *RSRAT* are positive and insignificant in the full sample. However, in the reduced sample, the coefficients on both $GW_incR^2$and *RSRAT* are significantly positive. All control variables are again very similar to those presented in Panel B of Table 4.

In sum these results provide robust evidence across the two alternative measures that information contained in special items send signals that increases accounting bias, suggesting they are noisy. On the other hand, information contained in discontinued operations reduces accounting bias, suggesting these signals help outsiders to revise their estimates of equity value. These signals are also systematically associated with variation in the use of market-based compensation. When information sends noisy signals to markets, compensation committees

reduce the use of market-based pay. But when information helps to adjust equity value, they increase the level of market-based pay.

4.6. Robustness Checks

Although I have already reported results for several sensitivity analyses, I further check the robustness of my findings. Bonuses are the other form of commonly used incentive-based compensation. The use of bonuses might affect the relationship of the incremental value relevance of special items or discontinued operations with CEO market-based compensation. Thus, I include the proportion of CEO bonus to total compensation as an additional independent variable and then reestimate models 13 and 14. But, the coefficient on this bonus variable is insignificant, and the rest of results remain essentially unchanged.

I reestimate equation 12 using an asset-based growth proxy. If sales can be manipulated by managers, my sales-based growth measure may overstate reality. Since managers are less likely to manipulate assets than sales, the new specification of this model might reduce the possibility that managerial manipulation could affect the outcome. However, the main result remains the same. I also re-estimate eqautions 13 and 14 using earnings per share rather than $ENsp_{t-1}$ because some argue that accounting conservatism results in understatement of the value of assets, therefore, variables scaled by assets may be overstated. However, the tenor of the results is unchanged.

Because GW_incR^2 is the industry-wide level of the value relevant measure, there is a concern about the influence of the industry-wide factor on my findings. To address this problem, I include industry dummy variables to model 13. When the value of GW_incR^2 for the industry is either zero or close to zero (ID1, ID 4 and ID 15 in Table 1 for discontinued operations and ID1, ID8 and ID12 for special items), I include the industry dummy variable to control for weak value relevance. Including these industry dummy variables should increase the significant level on the coefficient GW_incR^2. As expected, after controlling for these industries, I found that the

magnitude of the coefficient on *GW_incR*^{2} increases so as the statistically significant level of the coefficient.

Finally, the link between the value relevance of nonrecurring items and CEO market-based compensation might be driven by the value relevance of the control variables in the goodwill models (equations 9 and 10). To test this possibility, I reestimate R^2 excluding *ENsp* (the core component of earnings), *TRE* from model 10 and conduct the analyses with only the three remaining control variables. This estimated value of R^2 is neither associated with accounting bias nor CEO market-based compensation. These results strengthen my findings that the value relevance of special items and discontinued operations provides the pivotal information, not the other control variables.

In sum, my results are robust to various sensitivity analyses, and the two main concepts discussed in compensation literature shine through; the monitoring role of the use of market-based compensation and the negative effect of noisy signals on the sensitivity of earnings to efforts. Since my measure of the incremental value relevance of the nonrecurring items is calculated at the industry-level, caution should be exercised when interpreting my findings. However, I controlled for the industry factors, to some extent, and found the consistent result. I do not feel that an industry effect creates a systematic bias toward confirming my hypotheses.

5. SUMMARY AND DISCUSSION

Prior analyses provide mixed evidence about the valuation of nonrecurring items. I further investigate this issue, but my analyses are distinctly different in two aspects. First, I analyze whether reports of nonrecurring items revise accounting bias, which assesses the magnitude of goodwill, created by unconditional conservatism. Nonrecurring items are more prevalent in innovative industries because products face short life-cycles. Many of critical intangible assets for these sectors are not recorded, creating large goodwill. In addition, innovative ideas are a competitive edge in these industries, and a new innovation can quickly

change the business environment. Thus, I posit that industry–wide information about nonrecurring items can convey useful information to markets about the competitiveness of firms.

I find that the information contained in discontinued operations at the industry-level is positively, and that in special items is negatively associated with firms-specific accounting bias. The information contained in extraordinary items does not have any association with firms-specific accounting bias. The positive association indicates that this information adjusts book value and allows a revision of equity value, which reduces goodwill in capital markets. On the other hand, the negative association indicates that adjustment based on the information increases goodwill. From these results, I infer the characteristics of information contained in nonrecurring items: Discontinued operations provide clear signals about the business environments, which reduce the magnitude of firm-specific accounting bias. This, in-turn, indicates that the signals reduce goodwill created by unconditional conservatism. On the other hand, special items increase goodwill,and therefore, accounting bias. I interpret this as showing that the information contained special items is noisy. An alternative interpretation is that special items send signals that increase growth expectation. Finally, I find that extraordinary items do not contain any value relevant information.

Second, I further analyze the relationship between these signals and CEO market-based compensation. Goodwill is associated with uncertainty because market speculation can create goodwill. Uncertainty is costly and speculative expectations are problematic for compensation committees when trying to provide appropriate incentives to managers. I find that signals sent by discontinued operations are significantly positively and those send by special items are significantly negatively associated with the portion of CEO market-based pay. These results are robust across two alternative measures of the incremental value relevance of these nonrecurring items. I perceive these results indicate that a clear signal increases the level of CEO market-based compensation, while noisy signals reduce it.

In sum, these findings suggest that the industry-level signals sent by discontinued operations and special items are meaningful drivers of CEO market-based compensation. Because accounting bias (unconditional conservatism) is associated with intangibles, my findings raise a possibility that special items and discontinued operations may contain useful information to assess the performance of intangible investments. Compensation committees selectively design CEO market-based compensation based on the usefulness of the signals. They reduce the use of CEO market-based compensation when they are concerned about noisy information that artificially inflates future growth expectations. Alternatively, some might argue that the industry-wide value relevance of nonrecurring items simply captures industry variation. However, I conduct various sensitivity analyses, wedding firm variation with the industry-level value relevance of nonrecurring items and including some industry controls, and still find robust results.

While the previous compensation literature generally focuses on earnings excluding nonrecurring items (Banker, Huang, and Natarajan 2009; Baber, Janakiraman, Kang 1996), or treats nonrecurring items as noisy information (Bushman, Engel and Smith 2006), my findings suggest that compensation committees appear to use the information contained in these items in the design of CEO compensation packages. Precision of information content and measurement errors are an important attribute for a performance measure when managers face multiple investment decisions. Thus, my results are related to a long line of research on the sensitivity-to-noise ratio of performance measures, and extend the scope of future research opportunities in several different directions.

References

Austen, Ian. 2013. BlackBerry to cut 40% of work force after big loss. *The New York Times* (20, September)

Aggarwal, K. R. and A.A. Samwick. 1999, 'The Other Side of the Trade Off: The Impact of Risk on Executive Compensation', *The Journal of Political Economy*, Vol. 107, pp. 65-105.

Audrestsch, B David and Feldman, P. Maryann. 1996 R&D spillovers and the Geography of innovation and production. *The American Economic Review*. Vol. 86. No. 3 p.630-640

Baber, W.; S. Janakiraman; and S. Kang . 1996..Investments and the structure of executive compensation. *Journal of Accounting and Economics* 21: 297-318.

Banker, R.; R. Huang; and R. Natarajan. 2009. Incentive contracting and value-relevance of Earnings and Cash flows. *Journal of Accounting Research* 47. 3: 647-678.

Barua A. S. Lin, and A. Sbaraglia 2010. Earnings management using discontinued operations. . *The Accounting Review*. 85. 5: 1485-1509

Barnea, A.; J. Ronen, ; and S. Sadan. 1975. The implementation of accounting objectives: an application to extraordinary items. *The Accounting Review* 50. 1 : 59-68.

Beaver, W., and S. Ryan. 2000. Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research* 38. 1 (2000) :127-148.

Beaver, W., and S. Ryan. 2005. Conditional and unconditional conservatism; concepts and modeling. *Review of Accounting Studies* 10 : 269-309.

Beatty, R.P. and E.J. Zajac. 1994, 'Managerial Incentives, Monitoring, and Risk Bearing: A Study of Executive Compensation, Ownership, and Board Structure in Initial Public Offerings', *Administrative Science Quarterly*, Vol. 39, pp. 313-335.

Belkhir, M. and A. Chazi. 2010, Compensation Vega, Deregulation, and Risk Taking: Lessons from the US Banking Industry, *Journal of Business Finance and Accounting*, Vol. 37, No. 9/10, pp. 1,218-1,247.

Black, E. L; T. A. Carnes; and V. J. Richardson. 2000. The value relevance of multiple occurrences of nonrecurring items. *Review of Quantitative Finance and Accounting* 15 4. : 391-411.

Bouwman, H.S. C. 2013. The Geography of executive compensation. *Journal of Financial Economics*, forthcoming.

Bradshaw, M.. and R. G. Sloan. 2002. GAAP versus The Street: An Empirical Assessment of Two Alternative Definitions of Earnings. *Journal of Accounting Research*. 40. 1. 41-66.

Brown, S.; K. Lo; and T. Lys. , 1999. Use of R^2 in accounting research: measuring changes in value relevance over the last four decades. *Journal of Accounting and Economics* 28: 83-115.

Brown, D. L. and K. Sivakumar 2003. Comparing the value relevance of two operating income measures. *Review of Accounting Studies*, 8. 561-575.

Burgstahler, D., J. Jiambalvo, and T. Shevlin. 2002. Do stock prices fully reflect the implication of special items for future earnings?" *Journal of Accounting Research* 40.3: 585-612.

Bushman, R., and R. Indjejikian. 1993. Stewardship value of "distorted" accounting disclosures. *The Accounting Review* 68 : 765-782.

Bushman, R.; R. Indjejikian; and A. Smith. 1996. CEO compensation: The role of individual performance evolution. *Journal of Accounting and Economics* 21: 161-193.

Bushman, R.; E. Engel; and A. Smith. 2006.An analysis of the relation between the stewardship and valuation roles of earnings. *Journal of Accounting Research* 44.1: 53-83.

Choi Y., S. Lin, M. Walker, and S.Young. 2007. Disagreement over the persistence of earnings components: evidence on the properties of management-specific adjustments to GAAP earnings. *Review of Accounting Studies*. 12:595-622

Collins, D.; E. Maydew; and I. Weiss. 1997. Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics* 24: 39-67.

Core, J., and W. Gauy. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics* 28: 151-184.

Core, J., and W. Gauy. 2002. Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility. *Journal of Accounting Research* 40: 613-630.

Cready, W. ,T. J. Lopez and C. A. Sisneros. 2010. The persistence and market valuation of recurring nonrecurring items. *The Accounting Review*. .85. 5. 1577-1615.

Comment, R., and Jarrell, G.A. 1995.Corporate focus and stock returns. *Journal of Finance*. 37: 67-87.

Daley, L, ,Mehrotra V. and R. Sivakumar 1997 Corporate focus and value creation evidence from spinoffs, *Journal of Financial Economics*. 45.2.257-281

Dechow, P.M. 1994. Accounting earnings and cash flows as measures of firm performance the role of accounting accruals. *Journal of Accounting and Economics* 18: 3-42.

Dechow P. M. and W. Ge. 2006. The persistence of earnings and cash flows and the role of special items: implications for accrual anomaly. *Review of Accounting Studies*. 11: 253-296.

Dechow, P.M., M.R. Huson,,and G.R. Sloan 1994. The effect of restructuring charges on executives' cash compensation. *The Accounting Review* 29.1: 139-156.

Demsetz, H., and K. Lehn. 1985. The structure of corporate ownership: causes and consequences. *Journal of Political Economy* 93: 1155-1177.

Denis, D.J. Denis, D.K and Yost, K 2002. Global diversification, industrial diversification and firm value. *Journal of Finance*. 57. 7. 1951-1979.

Doukas, A J. and O. B Kan. 2006. Does global diversification destroy firm value? *Journal of International Business Studies*. 37. 352-371.

Ecker, F., J. Francis, I. Kim; P. Olsson, and K. Schipper. 2006. A return-based representation of earnings quality. *The Accounting Review* 81: 749-780.

Fairfield, P. M,, K. A Kitching, and V. W. Tang 2009. Are special items informative about future profit margin? *Review of Accounting Studies.* 14: 204-236.

Fairfield, P.M., R. Sweeney; and T. Yohn. 1996. Accounting classification and the predictive content of earnings. *The Accounting Review* 71.3 : 337-355.

Fama E. F, and M. H. Miller. 1972. The theory of Finance. Dryden Press, Hinsdale, Illinois.

Financial Accounting Standards Board (FASB). *Accounting for the impairment or Disposal of Long-Lived Assets*. Statement of Financial Accounting Standards No. 144. Norwalk, CT: FASB, 2001.

Financial Accounting Standards Board (FASB). *Goodwill and Other Intangible Assets*. Statement of Financial Accounting Standards No. 142. Norwalk, CT: FASB 2001.

Feltham G.A., and J. Ohlson, 1995. Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research* 11: 689-732.

Francis, J. J.D. Hanna and L. Vincent. 1996. Causes and effects of discretionary assets write-offs. *Journal of Accounting Research* 34 Supplement: 117-134.

Francis, J., and K. Schipper. 1999. Have financial statements lost their relevance? *Journal of Accounting Research.* 37. 2: 319-352.

Francis, J. R. LaFond P. Olsson; and K. Schipper . 2004. Cost of capital and earnings attributes. *The Accounting Review* 79.4: 967-1010.

Gelb, D.S., and P. Siegel. 2000. Intangible assets and corporate signaling. *Review of Quantitative Finance and Accounting* 15: 307-323.

Gjesdal, F., 1981. Accounting for Stewardship. *Journal of Accounting Research.* 19. 1: 208-231.

Greenspan, A. 2002. Testimony before the Committee on Banking, Housing and Urban Affairs. US Senate.

Gu, Z., and T. Chen. 2004. Analysts' treatment of nonrecurring items in street earnings. *Journal of Accounting and Economics* 38 : 129-170.

Harford, J.. 2005. What drives merge waves?. *Journal of Financial Economics* 77. 529-560.

Holmstrom, B., and P. Milgrom. 1991 .Multitask principal agent analyses: incentive contracts, asset ownership, and job design. *Journal of Law, Economics, & Organization* 7: 24-52.

Hou, K. and T. J. Moskowitz. 2005. Market frictions, price delay, and the corss-section of expected returns. *The Review of Financial Studies*. Vo.8. 3. 981-1020.

Ittner, C.D., R.A. Lambert and D.F. Larcker .2003., The Structure and Performance Consequences of Equity Grants to Employees of New Economy Firms, *Journal of Accounting and Economics,* Vol. 34, pp. 89-127.

Janakiraman, S. N., R. A. Lambert., and D. F. Larcker, 1992. An Empirical Investigation of the Relative Performance Evaluation Hypothesis, *Journal of Accounting Research*, 30: 53-69

Jensen, M.C., and H.W. Meckling. 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3:305-360.

Joh, S.W. 1999. Strategic managerial incentive compensation in Japan: Relative performance evaluation and product market collusion. *The Review of Economics and Statistics* 81.2: 303-313.

John, K.and Eli Ofek. 1995. Asset sales and increase in focus. *Journal of Financial Economics*. 37. 105-126.

Kinney, M., and R. Trezevant.1997. The use of special items on manage earnings and perceptions. *Journal of Financial Statement Analysis* 1: 45-53.

Karuna, C. 2007. Industry product market competition and managerial incentives. *Journal of Accounting and Economics* 43 : 275-297.

Kruse, A T. 2002. Asset liquidity and the determinants of assets sales by poorly performing firms. *Financial Management*. 31. 4 107-129.

Lambert, R. A.. 1993. The use of accounting and security price measures of performance in managerial compensation contracts, a discussion. *Journal of Accounting and Economics.* 16. 101-123

Lambert R. A.. 2001. Contracting Theory and Accounting. *Journal of Accounting and Economics* 32: 3-87.

Lambert, R. A.; D. Larcker; and R.E. Verrecchia. 1991. Portfolio consideration in valuing executive compensation. *Journal of Accounting Research* 29.: 53-69.

Lev, B., and P. Zarowin. 1999. The boundaries of financial reporting and how to extend them. *Journal of Accounting Research* 37 2: 353-377.

Lord, R. A. and Y. Saito. 2010.Trends in CEO Compensation and Equity Holdings for S&P 1,500 Firms: 1994-2007. *Journal of Applied Finance*. No2. 40-56.

Lord, R. A. and Y. Saito. 2012. Does compensation structure alleviate personal CEO risk?. *Journal of Business Finance and Accounting*. 39.9/10:1,272-1,296.

Matsunaga, R.S. 1995. The effects of financial reporting costs on the use of employee stock options. *The Accounting Review* 70.1.: 1-26.

McVay, S. E. 2006. Earnings management using classification shifting: an examination of core earnings and special items. *The Accounting Review* 81.3: 501-531.

Mitchell, L M. and J H. Mulherin. 1996. The impact of industry shocks on takeover and restructuring activities. *Journal of Financial Economics*. 41. 193-229.

Murphy, K. Kevin, 1999, Executive Compensation, Handbook of Labor Economics, Vol 3B, Edited Ashenfelter, Orely and David Card, Chapter 38, p.2486-2563, Elsevier.

Ofek, E., 1993.Capital structure and firm response to poor performance: an empirical analysis, *Journal of Financial economics*. 34.3-30

Ohlson, J. A. 1995. Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research* 11.2.: 661-687.

Ohlson J. A. 1999. On Transitory Earnings. *Review of Accounting Studies*. 4.145-162

Paul, M.J. 1992. On the efficiency of stock based compensation. *The Review of Financial Studies* 5.3: 471-502.

Penman, H. S. "Financial Statement Analysis in security valuation." Second Edition. New York: The McGraw-Hill Companies, 2004.

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

Romer, M. P. "Increasing returns and long-run growth." *Journal of Political Economy* 94.5 (1986): 1002-1037

Ravenscraft, D and Scherer, F 1987. Mergers, selloffs and economic efficiency. Brookings Institution, Washington

Ryan, H.E., and R.A. Wiggins. 2001 .The influence of firm and manager-specific characteristics and the structure of executive compensation. *Journal of Corporate Finance* 7: 101-123.

Ryan, H.E., and R.A. Wiggins. 2002. The interactions between R&D investment decision and compensation policy. *Financial Management*: 5-29.

Shleifer A. and R. W. Vishny. 1992. Liquidation values and debt capacity: A market equilibrium approach. *Journal of Finance*. 47. 1343-1366.

Shleifer A. and R. W. Vishny. 2003. Stock market driven acquisition. *Journal of Financial Economics* 70.3. 295-311.

Sloan R. G. 1993. Accounting earnings and top executive compensation. *Journal of Accounting and Economics*. 16. 55-100

Smith, C.W., and L. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics* 32: 263-292.

Solow, M.R. 1957 .Technical change and the aggregate production function. *The Review of Economics and Statistics* 39.3: 312-320.

Stewart, James. 2013. Brash C.E.O. keeps the gains of Mobile off balance. *The New York Times*. (29, November).

Theil, H. 1971. Principles of Econometrics. Wiley, New York. NY,

Tobin, J. 1958. Estimation of relationships for limited dependent variables. *Econometrica* 26.1: 24-36.

Welsch, R.E. (1980), 'Regression Sensitivity Analysis and Bounded-Influence Estimation', *Evaluation of Econometric Models*, Edited by Kementa, J., and J.B. Ramsey. Academic Press. New York, pp. 153-167.

Williams, M.A. and R.P. Rao. 2006, CEO Stock Options and Equity Risk Incentives', *Journal of Business Finance and Accounting*, Vol. 33, No. 1&2, pp. 26-44.

Zajac, E.J. and J.D. Westphal. 1994, 'The Costs and Benefits of Managerial Incentives and Monitoring in Large U.S. Corporations: When is More Not Better?', *Strategic Management Journal*, Vol. 15 (Special Issue), pp. 121-142.

Table 1. Industry Classification

Panel A: Under SIC Codes

SIC Code	Industry	ID	Intangible	Number of obs	Proportion (%)	Number of firms
2800=< siccd < 2830 2840=< siccd < 2900	Industrial Chemical	1	*	509	4.53	67
2829 < siccd < 2840	Pharmaceuticals	2	*	381	3.39	44
3569 < siccd < 3580	Computer Equip	3	*	326	2.90	60
3599 < siccd < 3700	Electric Equip	4	*	965	8.59	163
3699 < siccd < 3800	Transport Equip	5	*	371	3.30	57
3799 < siccd < 3899	Measurement Equip	6	*	592	5.27	104
4799 < siccd < 4900	Communication	7	*	192	1.71	38
7369 < siccd < 7380	Computer	8	*	717	6.38	136
8699 < siccd < 8800	Engineer and Consulting	9	*	122	1.09	26
3299 < siccd < 3400	Primary	10		334	2.97	46
4899 < siccd < 5000	Utilities	11		122	1.09	27
6000=< siccd < 6300	Financial Institutions	12		857	7.63	155
6299 < siccd < 6400	Insurance	13		82	0.73	20
1000=< siccd < 1300 1400=< siccd < 2000	Mining and Construction	14		234	2.08	35
1300=< siccd < 1400 2900=< siccd < 3000	Extraction	15		470	4.18	74
2000=< siccd < 2111	Food	16		376	3.35	48
2200=< siccd < 2780	Textiles and Printing	17		928	8.26	118
4000=< siccd < 4800	Transportation and Air	18		158	1.41	23
5000=< siccd < 6000	Retail	19		1,667	14.84	243
7000=< siccd < 7370, 7380=< siccd < 8700, 8800=< siccd < 9000	Service	20		572	5.09	124
Rest	Others	21		1,261	11.22	187
Total				11,236	100.00	1,795

Table 2. Descriptive Statistics for Intangible Proxies

Panel A. Mean Comparison of Intangible Proxies Between Nonintangible and Intangible-intensive Firms.

VARIABLE	GROUP by SIC Classification	OBS	MEAN	STD	T-VALUE
Intangible Intensity Variables					
RD	NONINTANGIBLE[a]	7,061	0.0073	0.0267	
RD	INTANGIBLE	4,175	0.1088	0.6550	-10.01***
INTG2	NONINTANGIBLE	1,959	0.0466	0.0500	
INTG2	INTANGIBLE	1,106	0.1415	0.1327	-22.88***
INTG3	NONINTANGIBLE	7,061	0.2128	0.3763	
INTG3	INTANGIBLE	4,175	0.4235	1.1646	-11.34***
Earning Related Variables					
ENsp	NONINTANGIBLE	7061	239.63	724.83	
ENsp	INTANGIBLE	4175	293.49	944.3	-3.17***
SPITM	NONINTANGIBLE	7061	- 42	614.39	
SPITM	INTANGIBLE	4175	-76.48	514.85	3.19***
DISCP	NONINTANGIBLE	7061	-0.575	95.948	
DISCP	INTANGIBLE	4175	5.7078	343.1	-1.16
EXTRA	NONINTANGIBLE	7061	-11.77	647.96	
EXTRA	INTANGIBLE	4175	-14.19	319.11	0.26
Managerial decision Related Variables					
ARAS	NONINTANGIBLE	7061	0.204	0.1877	
ARAS	INTANGIBLE	4175	0.1777	0.0954	9.77***
INVTAS	NONINTANGIBLE	7061	0.1462	0.0879	
INVTAS	INTANGIBLE	4175	0.1071	0.1312	17.27***
RECYC	NONINTANGIBLE	7015	384.03	959.36	
RECYC	INTANGIBLE	4166	74.049	36.768	27.03***

Panel B: Observations after Imposing Restrictions[b] and Elimination of Outliers

Variable	N	MEAN	MEDIAN	STD	SKEWNESS	Q1	Q3
EN	7272	253.4002	57.5265	1048.12	-7.31722	13.0875	192.2765
cmpEN	7272	238.1402	56.3215	1507.456	-37.9432	11.863	190.6915
ENsp	7272	316.8881	72.83	922.7849	6.74549	22.09	227.9015
SPITM	7272	-63.4879	0	678.4818	-49.9391	-24.53	0
DISCP	7272	1.02266	0	204.991	-29.5591	0	0
EXTRA	7272	-16.2827	0	673.6123	-73.9316	0	0

Panel C: Summary of Nonrecurring Items

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
# of OBS	296	794	1,087	1,114	1,087	1,112	1,126	1,032	1,136	1,186	1,266
Frequency											
SPITM	58%	43%	49%	49%	54%	62%	62%	64%	73%	72%	73%
DISCP	7%	7%	9%	9%	9%	9%	10%	11%	10%	15%	19%
EXTRA	40%	15%	8%	7%	12%	12%	13%	14%	20%	24%	14%

Negative	Incidents										
SPITM	44%	30%	38%	35%	40%	50%	44%	44%	63%	57%	57%
DISCP	4%	3%	4%	3%	3%	4%	3%	5%	5%	10%	11%
EXTRA	30%	12%	7%	6%	11%	10%	10%	10%	15%	21%	10%
Positive	Incidents										
SPITM	14%	14%	12%	14%	14%	12%	19%	20%	10%	15%	17%
DISCP	3%	3%	6%	5%	6%	5%	7%	5%	5%	5%	8%
EXTRA	11%	3%	1%	1%	1%	1%	2%	3%	5%	2%	4%

RD	Research and Development (Compustat item 46) divided by sales (Compustat item 12).
INTG2	Sum of research and development (Compustat item 46) and advertising expenses (Compustat item 45) divided by sales (Compustat item 12).
INTG3	Sum of research and development (Compustat item 46), intangible (Compustat item 33), and goodwill (Compustat item 204) divided by sales (Compustat item 12).
ENsp	Income before extraordinary items adjusted for special items (Compustat item 18 – Compustat item 17).
SPITM	Special items (Compustat item 17)
DISCP	Discontinued operations (Compustat item 66)
EXTRA	Extraordinary items (Compustat item 192)
ARAS	Accounts receivable (Compustat item 2) divided by sales (Compustat item 12)
INVTAS	Inventory (Compustat item 3) divided by sales (Compustat item 12)
RECYC	Accounts receivable (Compustat item 2) divided by two-year average sales divided by 365
EN	Earnings before extraordinary items (Compustat item 18)
cmpEN	Comprehensive income (Compustat item 172)
Frequency	the percentage of the total number of reports to total observations.
Negative incidents	the percentage of the total number of negative figures reported to total observations.
Positive incidents	the percentage of the total number of positive figures reported to total observations.
[a]	The classification is defined in Table 1.
[b]	Firms that have at least four–years of observations.

Table 3. Goodwill Model Estimation

Panel A Descriptive Statistics for Variables in the Goodwill Model

Variables	N	MEAN	MEDIAN	STD	SKEWNESS	Q1	Q3
GW	7272	19.00572	14.90895	18.33844	1.23122	5.39148	28.19438
TREsp	7272	-0.37196	0	1.5836	-1.87462	-0.38576	0
TREdc	7272	0.00160	0	1.29598	46.34623	0	0
TREext	7272	- 0.06460	0	0.59705	-21.22242	0	0
ENsp	7272	1.33001	1.20277	1.52190	-0.02751	0.57445	1.96438
SIZE	7272	50.13085	35.93272	43.50698	2.76587	23.14638	61.37912
DMD	7272	0.63875	1	0.4804	-0.57781	0	1
DMOUT	7272	0.11482	0	0.31883	2.41684	0	0

Panel B The Incremental R^2 from the Goodwill Model for Each of 21Industry Groups

$$GW_{it} = \alpha_0 + \alpha_1 ENsp_{it} + \alpha_2 SIZE_{it} + \alpha_3 DMD + \alpha_4 DMOUT + u_{it}$$

$$GW_{it} = \phi_0 + \phi_1 TRE_{it} + \phi_2 ENsp_{it} + \phi_3 SIZE_{it} + \phi_4 DMD_{it} + \phi_5 DMOUT_{it} + \nu_{it}$$

IND	BC	GWsp_incR^2	GWdc_incR^2	GWext_incR^2
1	-0.06550	0.00033	0.00005	0.004809
2	-0.19577	0.00084	0.00096	0.001821
3	-0.03941	0.01503	0.01279	0.000405
4	-0.02730	0.00173	0.00008	0.000027
5	0.05439	0.00519	0.02005	0.020807
6	-0.09878	0.00400	0.01845	0.000000
7	-0.00453	0.01459	0.02538	0.025144
8	-0.14893	0.00002	0.00463	0.001635
9	-0.02559	0.14198	0.17568	0.004228
10	0.29275	0.00822	0.00263	0.001402
11	0.14585	0.05892	0.01929	0.016638
12	-0.01389	0.04069	0.00023	0.002387
13	-0.04390	0.00268	0.06642	0.001806
14	0.06514	0.01981	0.00228	0.006761
15	0.05178	0.00601	0.00000	0.005930
16	-0.15214	0.00890	0.00880	0.000038
17	0.09784	0.26408	0.00717	0.005238
18	0.11632	0.03787	0.01694	0.000587
19	0.13995	0.00371	0.00348	0.013614
20	0.07645	0.04753	0.00653	0.017382
21	0.00883	0.00059	0.00225	0.000513
Mean				
Intangible[a]	0.06823	0.02041	0.02867	0.00654
Nonintangible[b]	-0.07270	0.04158	0.01134	0.00602
T-value difference	21.02***	-0.76	1.01	0.15

Table 3. Continued

GW	Security price (Compustat item 199) minus book value of equity (Compustat item 60) divided by outstanding shares (Compustat item 25 times Compustat item 27),
TRE	Three specifications are explained below.
TREsp	special items (Compustate item 17) divided by outstanding shares (Compustat item 25 times Compustat item 27).
TREdc	discontinued operations (Compustat item 66) divided by outstanding shares (Compustat item 25 times Compustat item 27).
TREext	Extraordinary items (Compustat item 192) divided by outstanding shares (Compustat item 25 times Compustat item 27).
GWsp_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREsp.
GWdc_incR^2	Industry level Incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREdc.
GWext_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREext.
BC	Firm specific coefficients estimated from model 11.
ENsp	Income before extraordinary items adjusted for special items (Compustat item 18 – Compustat item17) divided by outstanding shares (Compustat item 25 times Compustat item 27).
SIZE	Square root of sales (Compustat item 12),
DMD	A dummy variable set to one if both cash dividends (Compustat item 26) and preferred dividends (Compustat item 19) are zero, and zero otherwise.
DMOUT	A dummy variable set to one if the year a firm has either stock dividends or stock splits and zero otherwise. The share adjustment figure (Compustat item 27) for the firm is used for this identification.
[a]	Intangible-intensive firms define Panel B of Table 1.
[b]	Nonintangible-intensive firms defined Panel B of Table 1.

Table 4. Descriptive Statistics and The Results for Hypothesis H1

Panel A: Descriptive Statistics

VARIABLE	N	MEAN	MEDIAN	STD	SKEWNESS	Q1	Q3
BTM	7382	0.49356	0.39483	0.42584	2.33633	0.21303	0.62708
RETG	7382	0.06357	0.09843	0.4601	-0.55435	-0.16386	0.32001
DINTG	7272	0.35822	0	0.47951	0.5915	0	1
IBC	7272	0.01767	0.00883	0.10802	0.06205	-0.03941	0.09784
CAP	7255	0.18445	0.1296	0.18969	1.16448	0.02299	0.28765
RD	7272	0.03681	0	0.09365	13.88978	0	0.0356
GROWTH	7270	0.10198	0.07703	0.18038	2.02914	0.00728	0.1692
LIFOAST	6367	0.00784	0	0.02463	9.449	0	0.0043
BC	1373	0.03368	-0.01856	0.31383	1.27041	-0.17618	0.17044

Panel B Test for Hypothesis H1

$$BC_i = \alpha_1 + \alpha_{2i} GW\_incR_k^2 + \alpha_3 IBC_i + \alpha_4 CAP_i + \alpha_5 RD_i + \alpha_6 GROWTH_i + \alpha_7 LIFOAST + v_t$$

DEP: BC	SPITM		DISCP		EXTRA	
	EST	EST	EST	EST	EST	EST
	(P-value)	(P-value)	(P-value)	(P-value)	(P-value)	(P-value)
INT	-0.0865	-0.0865	-0.0957	-0.0955	-0.0897	-0.0898
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
GW_incR^2	-0.1385	-0.1319	0.4275	0.4411	-0.5014	-0.4184
	(0.0007)	(0.0013)	(0.0017)	(0.0145)	(0.3661)	(0.4570)
GWP_incR^2		-0.0006		-0.0023		-0.0021
		(0.0006)		(0.0078)		(0.0099)
GWN_incR^2		0.0000		0.0000		-0.0002
		(0.7433)		(0.9521)		(0.0967)
IBC	0.6971	0.6672	0.6497	0.6487	0.6561	0.6534
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
CAP	0.6168	0.6166	0.6182	0.6185	0.6196	0.6194
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
RD	-0.1238	-0.1241	-0.1072	-0.1084	-0.1191	-0.1197
	(0.0021)	(0.0020)	(0.0075)	(0.0069)	(0.0030)	(0.0029)
GROWTH	-0.0015	-0.0015	-0.1499	-0.1496	-0.1462	-0.1472
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
LIFOAST	0.4075	0.4050	0.4185	0.4160	0.4043	0.4036
	(0.0084)	(0.0089)	(0.0068)	(0.0072)	(0.0099)	(0.0100)
# of OBS	6,254	6,254	6,248	6,248	6,260	6,260
Adjusted R^2	0.3132	0.3132	0.3125	0.3126	0.3129	0.3130

Table 4 continued

BTM	Book value of equity (Compustat 60) divided by outstanding shares (Compustat item 25 times Compustat item 27) over security price (Compustat item 199).
RETG	Geometric mean of annual security returns before subtracted overall means
DINTG	A dummy variable set one if a firm belongs to an intangible-intensive industry defined by SIC.
BC	Firm specific coefficients estimated from model 11.
INT	The intercept
GWsp_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREsp.
GWdc_incR^2	Industry level Incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREdc.
GWext_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREext.
GW_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10.
GWP_incR^2	An interaction between GW_incR^2 and a dummy variable set to one if nonrecurring items is positive and otherwise zero.
GWN_incR^2	An interaction between GW_incR^2 and a dummy variable set to one if nonrecurring items is negative and otherwise zero.
IBC	Bias adjusted for industry specific means.
CAP	Long term debt (Compustat item 9) divided by the sum of long term debt plus liquidation value (Compustat item 10) plus the market value of equity (Compustat item 25 times Compustat items 27 times Compustat item 199).
RD	Research and Development (Compustat item 46) divided by sales (Compustat item 12).
GROWTH	The average change in sales over three years.
LIFOAST	LIFO reserve (Compustat item 240) divided by book value of assets (Compustat item 6).
GROWTH	The average change in sales over three years.
LIFOAST	LIFO reserve (Compustat item 240) divided by book value of assets (Compustat item 6).

Table 5. Correlation and Descriptive Statistics

Panel A: Correlation Among Variables

	MBC_TC	Gr_AST	Gr_SALE	BC	RDAST	GWsp_IncR^2	GWdc_incR^2
GW	0.1638	0.3301	0.2957	-0.6118	0.1198	-0.0226	-0.0532
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
MBC_TC		0.0638	0.0390	-0.2380	0.1638	-0.0625	-0.03447
		(<.0001)	(.0009)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Gr_Ast			0.6187	-0.1477	-0.0199	0.0068	-0.0207
			<.0001	(<.0001)	(0.0911)	(0.5586)	(0.0783)
Gr_Sale				-0.1038	0.0318	-0.0023	0.0078
				(<.0001)	(0.0608)	(0.8444)	(0.5069)
BC					-0.3173	0.1717	0.0032
					(<.0001)	(<.0001)	(0.7872)
RDAST						-0.4360	0.0342
						(<.0001)	(0.0036)
GWsp_IncR^2							0.4143
							(<.0001)

Panel B: Descriptive Statistics for Variables to Test Hypothesis 2

Variable	N	MEAN	MED	STD	MIN	Q1	Q3	MAX
MBC_TC	7110	0.4104	0.4241	0.2902	0.0000	0.1528	0.6487	1.0000
$ENsp_{t-1}$	6966	0.0578	0.0575	0.0759	-1.1417	0.0239	0.0930	0.5747
SIZE	7110	48.9717	35.8328	41.2534	1.4910	23.2212	60.5227	507.1065
CASHCON	5970	-0.0762	-0.1108	0.2342	-0.8202	-0.1566	-0.0584	6.9906
CAP	7093	0.1875	0.1353	0.1900	-0.1189	0.0259	0.2920	0.9547
RISK	7110	0.4511	0.4055	0.2005	0.0734	0.3080	0.5455	1.9431
CEOSH	7002	0.0241	0.0031	0.0614	0.0000	0.0009	0.0142	1.2247
ABS	7110	0.0048	-0.0418	0.2766	-1.0205	-0.1767	0.1243	1.4987

GW	Security price (Compustat item 199) minus book value of equity (Compustat item 60) divided by outstanding shares (Compustat item 25 times Compustat item 27).
MBC_TC	Ratio of the value of stock options and restricted stock grants to total compensation for the CEO of firm i in year t.
Gr_AST	Annual rate of growth in assets.
Gr_SALE	Annual rate of growth in sales.
BC	Bias estimated as the firm specific coefficient for the fixed effect model 11.
RDAST	Research and Development (Compustat item 46) divided by assets (Compustat item 6).
GWsp_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREsp.
GWdc_incR^2	Industry level Incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREdc.

Table 5 continued

$ENsp_{t-1}$	One lag of earnings excluding special items per share (Compustat item 18) divided by the prior period book value of assets (Compustat item 6).
SIZE	Square root of sales (Compustat item 12).
CASHCON	Difference between necessary cash outflows (the sum of annual common and preferred dividends, capital expenditures, and additions to investments) and cash inflows (the sum of operating profits and depreciation and amortization expenses) scaled by total assets.
CAP	Long term debt (Compustat item 9) divided by the sum of long term debt plus preferred stock liquidating value (Compustat item 10) plus the market value of equity.
RISK	Annualized standard deviation of daily stock returns.
CEOSH	The proportion of firm shares owned by CEOs.
ABC	*ABC* is abnormal accounting bias, which is the difference between firm-specific bias and industry average bias.

Table 6. Hypotheses H2 and H3: Dependent Variable--Market Based Compensation[a]

$$MBC\_TC_{it} = \phi_0 + \phi_1 GW\_incR_k^2 + \phi_2 ABC + \phi_3 RDAST_k + \phi_4 ENsp_{t-1} + \phi_5 CASHCON_{it} + \phi_6 CAP_{it} + \phi_7 RISK_{it} + \phi_8 CEOSH_{it} + \phi_9 SIZE_{it} + e_{it}$$

$$MBC\_TC_{it} = \phi_0 + \phi_1 GW\_incR_k^2 + \phi_2 GWP\_incR^2{}_{it} + \phi_3 GWN\_incR^2{}_{it} + \phi_4 ABC + \phi_5 RDAST_k + \phi_6 ENsp_{t-1} + \phi_7 CASHCON_{it} + \phi_8 CAP_{it} + \phi_9 RISK_{it} + \phi_{10} CEOSH_{it} + \phi_{11} SIZE_{it} + e_{it}$$

DEP:MBC_TC	DISCP			SPITM		
	EST (P-Value)	EST (P-Value)	EST (P-Value)	EST (P-Value)	EST (P-Value)	EST (P-Value)
INT	0.3103	0.3114	0.3130	0.3217	0.3240	0.3161
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
GW_incR^2	0.3641	0.3169		-0.1561	-0.1904	
	(0.0449)	(0.0879)		(0.0001)	(0.0001)	
GWP_incR^2		0.0016			0.0008	
		(0.3477)			(0.0548)	
GWN_incR^2		-0.0091			-0.0007	
		(0.0894)			(0.0079)	
GW_DincR^2			0.5811			-0.4301
			(0.0801)			(0.0001)
ABC	-0.1195	-0.1197	-0.1193	-0.1228	-0.1222	-0.1225
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
RDAST	0.7734	0.7738	0.7735	0.7398	0.7354	0.7271
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
ENsp$_{t-1}$	0.2304	0.2307	0.2302	0.2288	0.2315	0.2336
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
CASHCON	0.0329	0.0330	0.0333	0.0309	0.0305	0.0300
	(0.0098)	(0.0094)	(0.0089)	(0.0153)	(0.0164)	(0.0183)
CAP	-0.0357	-0.0370	-0.0363	-0.0295	-0.0320	-0.0255
	(0.0811)	(0.0711)	(0.0762)	(0.1510)	(0.1188)	(0.2142)
RISK	0.2676	0.2678	0.2645	0.2637	0.2629	0.2759
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
CEOSH	-0.2233	-0.2217	-0.2231	-0.2158	-0.2127	-0.2130
	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0004)	(0.0004)
SIZE	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
OBS	5,749	5,749	5,749	5,758	5,758	5,758
Right-censored	1,193	1,193	1,193	1,195	1,195	1,195
Left-censored	10	10	10	10	10	10
L-likelihood	522.5	524.3	522.	527.3	532.5	530.5

Table 6 Continued Hypothesis H2: Dependent Variable--Market Based Compensation[a]

MBC_TC	Ratio of the value of stock options and restricted stock grants to total compensation for the CEO.
ABC	*ABC* is abnormal accounting bias, which is the difference between firm-specific bias and industry average bias.
RDAST	Research and Development (Compustat item 46) divided by assets (Compustat item 6).
D	Two cases: (1) A dummy variable set to one if nonrecurring items have a positive value and set to zero otherwise, and (2) a dummy variable set to one if nonrecurring items have negative value and set to zero otherwise.
GWsp_incR^2	Industry level incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREsp.
GWdc_incR^2	Industry level Incremental R^2 calculated as the absolute value of the difference in R^2 between models 9 and 10, where TRE is TREdc.
GW_incR^2	The incremental R^2 from the goodwill models 9 and 10.
GW_DincR^2	An cross product of Gw_incR^2 and RISK
DGW_incR^2	Interaction term between D and GW_incR^2.
$ENsp_{t-1}$	Lag-one of earnings excluding special items per share divided by the prior period book value of assets.
CASHCON	The difference between necessary cash outflows (the sum of annual common (Compustat item 21) and preferred dividends (Compustat item 19), capital expenditures (Compustat item 128) and additions to investments (Compustat item 113)) and cash inflows (the sum of operating profits (Compustat item 13) and depreciation and amortization expenses (Compustat item 14)) scaled by total assets.
CAP	Long term debt (Compustat item 9) divided by the sum of long term debt plus liquidation value (Compustat item 10) plus the market value of equity (Compustat item 25 time) adjusted for stock split and dividends.
RISK	Annualized standard deviation of daily stock returns
CEOSH	The proportion of firm shares owned by CEOs.
SIZE	Square root of sales (Compustat item 12).
R-censored	Right censored
L-censored	Left censored
L-likelihood	Log likelihood
[a]	positive nonrecurring items
[b]	negative nonrecurring items

Table 7 Sensitivity Analysis using the R^2 Ratio

$$BC_i = \alpha_1 + \alpha_{2i} RSRAT_k + \alpha_3 IBC_i + \alpha_4 CAP_i + \alpha_5 RD_i + \alpha_6 GROWTH_i + \alpha_7 LIFOAST + v_t$$

DEP: BC	SPITM	SPITM (reduced[a])	DISCP	DISCP (reduced[b])
	EST	EST	EST	EST
	(P-value)	(P-value)	(P-value)	(P-value)
INT	-0.0854	-0.0856	-0.0937	-0.0990
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
RSRAT	-0.0854	-0.0890	0.0617	0.0951
	(0.0003)	(0.0002)	(0.3935)	(0.2026)
IBC	0.9718	0.6674	0.6457	0.6677
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
CAP	0.6189	0.6221	0.6172	0.6224
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
RD	-0.1284	-0.1577	-0.1113	-0.0712
	(0.0015)	(0.0002)	(0.0058)	(0.1174)
GROWTH	-0.0015	-0.0015	-0.1485	-0.1538
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
LIFOAST	0.3977	0.4029	0.4102	0.4647
	(0.0106)	(0.0096)	(0.0082)	(0.0036)
# of OBS	6,254	6,048	6,248	5,413
Adjusted R^2	0.3135	0.3176	0.3119	0.3192

SPI	Special items
DC	Discontinued operations
BC	Firm specific coefficients estimated from model 11.
INT	The intercept
RSRAT	one minus the ratio of R^2 from regression of restricted model, model 9, over R^2 from regression of nonrestricted model 10.
IBC	Bias adjusted for industry specific means.
CAP	Long term debt (Compustat item 9) divided by the sum of long term debt plus liquidation value (Compustat item 10) plus the market value of equity (Compustat item 25 times Compustat items 27 times Compustat item 199).
RD	Research and Development (Compustat item 46) divided by sales (Compustat item 12).
SALEG3	The average change in sales over three years.
LIFOAST	LIFO reserve (Compustat item 240) divided by book value of assets (Compustat item 6).
GROWTH	The average change in sales over three years.
LIFOAST	LIFO reserve (Compustat item 240) divided by book value of assets (Compustat item 6).
a	Eliminate Computer Equipment and Financial Institution sectors.
b	Eliminate Electric Equipment and Extraction industries

Table 8 Market-Based Compensation with OLS

$$MBC\_TC_{it} = \sum_{j=95}^{03} Y_j + \phi_1 GW\_incR_k^2(RSRAT_{it}) + \phi_2 ABC + \phi_3 RDAST_k + \phi_4 ENsp_{t-1} + \phi_5 CASHCON_{it}$$

$$+ \phi_6 CAP_{it} + \phi_7 RISK_{it} + \phi_8 CEOSH_{it} + \phi_9 SIZE_{it} + e_{it}$$

Panel A Special items

DEP: MBC	SPITM EST	SPITM (reduced[a]) EST		SPITM EST	SPITM (reduced[a]) EST
GW_incR^2	-0.1126**	-0.1102**	RSRAT	-0.0653**	-0.0468
ABC	-0.1225***	-0.1254***	ABC	-0.1230***	-0.1254***
RDAST	0.7792***	0.8169***	RDAST	0.7678***	0.8174***
$ENsp_{t-1}$	0.2309***	0.1701**	$ENsp_{t-1}$	0.2293***	0.1702***
CASHCON	0.0418**	0.0411**	CASHCON	0.0415**	0.0413**
CAP	0.0098	0.0035	CAP	-0.0082	0.0039
RISK	0.1525***	0.1409***	RISK	0.1528***	0.1426***
CEOSH	-0.8077***	-0.8006***	CEOSH	-0.8058***	-0.7991***
SIZE	0.0013***	0.0013***	SIZE	0.0013***	0.0013***
Fixed Effect[c]	yes	yes		yes	yes
# of OBS	5,758	5,571		5,758	5,571
Adjusted R^2	0.1508	0.1462		0.1509	0.1458

Panel B Discontinued Operations

DEP: MBC	DISCP EST	DISCP (reduced[b]) EST		DISCP EST	DISCP (reduced[b]) EST
GW_incR^2	0.3750	0.5195**	RSRAT	0.1439	0.2161**
ABC	-0.1212***	-0.1149***	ABC	-0.1209***	-0.1144***
RDAST	0.8025***	0.8762***	RDAST	0.8055***	0.8813***
$ENsp_{t-1}$	0.2318***	0.2452***	$ENsp_{t-1}$	0.2340***	0.2493***
CASHCON	0.0429**	0.0179	CASHCON	0.0432**	0.0182
CAP	-0.0136	-0.0149	CAP	-0.0146	-0.0163
RISK	0.1570***	0.1419***	RISK	0.1576***	0.1427***
CEOSH	-0.8087***	-0.7256***	CEOSH	-0.8098***	-0.7273***
SIZE	0.0014***	0.0016***	SIZE	0.0014***	0.0016***
Fixed Effect[c]	yes	yes		yes	yes
# of OBS	5,749	4,992		5,749	4,992
Adjusted R^2	0.1503	0.1539		0.1502	0.1540

Table 8 continued

MBC_TC	Ratio of the value of stock options and restricted stock grants to total compensation for the CEO.
ABC	*ABC* is abnormal accounting bias, which is the difference between firm-specific bias and industry average bias.
RDAST	Research and Development (Compustat item 46) divided by assets (Compustat item 6).
D	Two cases: (1) A dummy variable set to one if nonrecurring items have a positive value and set to zero otherwise, and (2) a dummy variable set to one if nonrecurring items have negative value and set to zero otherwise.
GW_incR^2	The incremental R^2 from the goodwill models 9 and 10.
RSRAT	one minus the ratio of R^2 from regression of restricted model, model 9, over R^2 from regression of nonrestricted model 10.
$ENsp_{t-1}$	Lag-one of earnings excluding special items per share divided by the prior period book value of assets.
CASHCON	The difference between necessary cash outflows (the sum of annual common (Compustat item 21) and preferred dividends (Compustat item 19), capital expenditures (Compustat item 128) and additions to investments (Compustat item 113)) and cash inflows (the sum of operating profits (Compustat item 13) and depreciation and amortization expenses (Compustat item 14)) scaled by total assets.
CAP	Long term debt (Compustat item 9) divided by the sum of long term debt plus liquidation value (Compustat item 10) plus the market value of equity (Compustat item 25 time) adjusted for stock split and dividends.
RISK	Annualized standard deviation of daily stock returns
CEOSH	The proportion of firm shares owned by CEOs.
SIZE	Square root of sales (Compustat item 12).
[a]	Eliminate Computer Equipment and Financial Institution sectors.
[b]	Eliminate Electric Equipment and Extraction industries.
[c]	Include dummy variables for year.
*,**,***	Significant level at the alpha 10%, 5% and 1%.