The Effectiveness of NYSE Guidelines to Regulate CEO Compensation through Independent Compensation Committees

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Abstract

The NYSE’s new governance standards require that all directors on the compensation committee of its registrants must be independent of the management. This requirement is motivated by the NYSE desire to mitigate any excesses in CEO compensation. Using a sample of firms who had effectively complied with the requirements, we find no evidence that NYSE regulations would result in reducing CEO excess compensation. Rather, our evidence demonstrates that what determines CEOs’ excess compensation is the fraction of non-independent directors (i.e., employee directors or affiliated outside directors) on the entire board, rather than whether or not the compensation committee comprises of independent directors. This suggests that if the NYSE wants to control the CEOs’ influence on their own compensation, it needs to refocus its energies on addressing the issue of the independence of the total board of directors rather than solely the compensation committee.
1. Introduction

A recent NY Times article, dated December 18, 2002, typifies public concerns about the relation between executives and the compensation committees. An examination of almost 2,000 corporations reveals “at hundreds of them, members of the compensation committee work for, or do business with the company or its chief executive.” In 2003, the New York Stock Exchange (NYSE) adopted much heralded corporate governance measures to increase board independence. Under the new standards, the audit, compensation, and nominating/corporate governance committees of the boards should consist solely of outside directors independent of the management (§ 303A of the NYSE’s Listed Company Manual). In addition, a majority of the board members should also be independent. The new standards become effective by the companies’ first annual meeting after Jan. 15, 2004, or by Oct. 31, 2004, whichever is earlier. By studying firms that already had independent compensation committees under the NYSE guidelines, we can test for the effectiveness of these proposed guidelines prior to the mandated adoption by the remaining NYSE firms.

Among the NYSE’s new governance standards is a clear stipulation that all directors on the compensation committee should be independent. Implicit in the NYSE requirement is a belief that, non-independent directors may provide CEOs with a level of compensation greater than would normally be expected. This belief is consistent with evidence from some prior studies. For example, results in Core, Holthousen, and Larker (1999) indicate that non-independent directors on the board provide CEOs with higher (or excess) compensation.

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1 The NASDAQ’s new listing standards have similar requirements that independent outside directors serve on board committees. Both NYSE and NASDAQ modified their listing standards in the spirit of the Sarbanes-Oxley Act of 2002, which stipulates that the firms should have independent audit committees (see Klein (2003) for a more complete discussion). The Sarbanes-Oxley Act, however, is silent on the independence of the compensation committee.
However, their focus on the total board leaves unanswered the importance of the independent compensation committee, as emphasized in the new NYSE standards.

Based on the NYSE’s revised Listed Company Manual, an independent director is one deemed by the board as having no material relationship with the listed company (§303A.02 (a)); thus, neither employee directors nor outside directors with material relationship with the listed company (i.e., affiliated directors) are considered independent. Non-independent directors can no longer serve on the compensation committee once the new standards become effective. Since 1993, however, compensation committees in most firms already consist solely of outside directors (including affiliated ones); such an outside-director-populated compensation committee is required by the IRS regulation 162(m) for companies to qualify for an exemption of the $1 million limit on the deductibility of executive compensation. Compared with IRS 162(m), the new NYSE requirement represents increased independence of the compensation committee, which is directly responsible for administering executive compensation plans.

In this paper, we empirically test whether proscribing non-independent (i.e., employee or affiliated) directors from compensation committees eliminates excess CEO compensation. With the exception of Newman and Mozes (1999) and Anderson and Bizjak (2000), which provides inconclusive evidence that CEOs receive higher compensation in firms with insiders on the compensation committee, there exists little research on the relation between CEO compensation and the presence of non-independent directors on the compensation committee. Evidence from a related line of research shows that CEO compensation is related to the independence of the total board (Lambert, Larker and Weigelt, 1993; Finkelstein and Hambrick, 1997; Core et al. 1999). This suggests that, when studying CEO compensation, it is important to consider both board independence and compensation-committee independence.
We use a sample of 3,734 firm-year observations between 1998 and 2002 to test the effectiveness of the NYSE’s new corporate governance standards in curbing excess CEO compensation. We are forced to conduct our tests using this NYSE sample from the pre-regulation period, because the new NYSE listing standards are still in a transition state. Our sample includes all NYSE firms with available information on directors’ affiliations with their management from a new database, the Investors Research Responsibility Center (IRRC) director database, and is not restricted only to firms with compensation committees comprised solely of independent outside directors.

In this sample, we find no evidence that having lower proportions of non-independent (employee or affiliated) directors on the compensation committee reduce excess CEO compensation. Rather, we find that CEO compensation decreases when there are lower proportions of employ or affiliated directors on the rest of the board (i.e., other than the compensation committee). We then study a sub-sample of 1,157 NYSE firm-year observations that had voluntarily implemented the new governance standards prior to the NYSE mandate, and find similar evidence. Specifically, while this sub-sample of firms all have independent compensation, as well as audit and nominating, committees, we find their CEOs receive lower compensation when lower proportions of employee or affiliated directors serve on their boards. Finally, we find that higher excess CEO compensation is associated with poorer subsequent operating performance for these firms, suggesting that CEOs extract rents from their companies.

Our findings bring into question the effectiveness of the NYSE’s new standards in reducing excess CEO compensation, and suggest that efforts to control excess compensation should be focused on the entire board of directors and not merely the compensation committee. Our paper makes several contributions. First, we empirically test the effectiveness of a new regulation, NYSE’s new governance standards. Second, we use a large sample from a new
database, the IRRC director database, to provide evidence on our research question. Prior studies on corporate governance typically rely on hand-collected data on board or compensation-committee characteristics, so the size of their samples is small. Third, we consider the influence of both compensation-committee independence and board independence on CEO compensation, while much of the prior literature focuses on either the board or the compensation committee. Also, our ability to identify a sub-sample with independent compensation committees enables us to separate the impact on CEO compensation from the compensation committee and the board.

The rest of the paper proceeds as follows. The second section is the sample selection and has a discussion of the nature of independent directors. Section 3 outlines our research design. Section 4 discusses our empirical results and Summary and Conclusions make up Section 5.

2. Sample Selection and Director Independence Categorization

On November 4, 2003, the SEC approved the NYSE’s newly proposed corporate-governance standards. These new standards become effective by the companies’ first annual meeting after Jan. 15, 2004, or by Oct. 31, 2004, whichever is earlier.² To test the effectiveness of the NYSE’s new governance standards, we identify two samples: (1) a primary sample of NYSE firms, and (2) a sub-sample of NYSE firms that had already voluntarily adopted the new governance standards before they were mandated.

2.1 Primary Sample

To select our primary sample, we use the intersection of three databases: the Investors Research Responsibility Center (IRRC) director database, Standard and Poor’s ExecuComp database, and the Compustat Industrial Annual database. IRRC is a not-for-profit agency that specializes in collecting and disseminating data about the characteristics of corporate directors.

² Special timelines apply for companies with classified boards and companies listing in conjunction with an IPO.
Between 1998 and 2002, IRRC covers 6,989 firm-years with information on individual directors, including directors’ committee (e.g., nominating, auditing, or compensation committee) membership and their affiliations with the management or the company. For each director, the database utilizes proxy data to identify affiliations each director has with the company, for example, whether a director is an employee, an outside director providing consulting service for the company, or an outside director who works for the company’s auditor.

We merge these 6,989 firm-year observations from IRRC with two other databases: Standard and Poor’s ExecuComp database and the Compustat Industrial Annual database. Table 1 describes our sample-selection process. The ExecuComp database provides compensation information (including cash, stock, and option compensation) for the top five highest-paid executives since 1992, and the Compustat Industrial Annual database provides companies’ financial information. When the ExecuComp database does not identify a CEO, we define the executive with the highest cash compensation as CEO. In our merged dataset, we drop the following observations with missing values: (1) 3,359 observations without available director-affiliation information from IRRC, (2) 1,208 observations with missing CEO compensation data, and (3) 383 observations with missing financial information (such as sales, book-to-market ratio, and firms’ financing constraints) shown by prior research to be associated with CEOs’ compensation level. We are left with 5,219 firm-year observations. After deleting non-NYSE firms, our primary sample consists of 3,734 firm-year observations for NYSE registrants between 1998 and 2002.

2.2 Director Independence Categorization

The NYSE’s new governance standards have tightened the definition of “independent director”, and set clear requirements on when an outside director is deemed independent. Consistent with the new standards, we classify directors into three categories: employee (or
inside) directors, affiliated (outside) directors, and independent (outside) directors. Employee directors are executives who serve on their companies’ boards. Affiliated directors are outside directors with certain affiliations (as discussed below) with the management; such affiliations may impair their impartial monitoring of the management. Finally, outside directors unaffiliated with the management are considered independent.

To classify directors into the above three categories based on the NYSE’s new standards, we use the director-affiliation information provided by the IRRC. Among the three types of directors, employee directors are easy to identify. Classifying outside directors into affiliated or independent directors, however, is more complicated. The NYSE provides several criteria to determine whether an outside director is affiliated with the management; an outside director satisfying any of these criteria is considered affiliated. We discuss these criteria below, and focus on how they translate into our corresponding classification procedures. Appendix A provides a summary.\(^3\)

a) We classify outside directors as affiliated directors if they (i) provide business supporting, technological supporting, consulting, financial, legal, real estate, or auditing service to the listed company, (ii) are suppliers or contractors of the listed company, (iii) are relatives with an executive officer, or (iv) make (receive) charitable contribution to (from) the listed company.

This classification procedure is based on Section 303A.02 (a), which states that, “No director qualifies as “independent” unless the board of directors affirmatively determines that the director has no material relationship with the listed company... Material relationships can include commercial, industrial, banking, consulting, legal, accounting, charitable and familial relationships, among others.”

\(^3\) As summarized in Appendix A, the NYSE has six criteria to determine whether an outside director is affiliated with the management. We leave out one criterion, because director affiliation based on this criterion cannot be determined using publicly-available data. Specifically, this criterion (Section 303A.02(b)(ii) of the NYSE’s Listed Company Manual) states that, “A director who receives, or whose immediate family member receives, more than $100,000 per year in direct compensation from the listed company, other than director and committee fees and pension or other forms of deferred compensation for prior services, is not independent until three years after he or she ceases to receive more than $100,000 per year in such compensation.” Though this criterion concerns compensation for individual directors, companies are not required to disclose such information. Even if such information is available, we cannot determine which portion of the compensation is related to prior years’ service.
b) We classify an outside director who served as an executive officer of the listed company within the past three years as an affiliated director.

This classification procedure is based on Section 303A.02(b)(i) provides that, “A director who is an employee, or whose immediate family member is an executive officer, of the company is not independent until three years after the end of such employment relationship.”

c) We classify outside directors as affiliated if they work for a company provide auditing service for the listed company, as described in criterion (a)(i) above.

This classification procedure is based on Section 303A.02(b)(iii), which provides that, “A director who is affiliated with or employed by, or whose immediate family member is affiliated with or employed in a professional capacity by, a present or former internal or external auditor of the company is not “independent” until three years after the end of the affiliation or the employment or auditing relationship.”

d) We classify all outside directors with interlocking relationships with the listed company as affiliated.

This classification procedure is based on Section 303A.02(b)(iv), which provides that, “A director who is employed, or whose immediate family member is employed, as an executive officer of another company where any of the listed company’s present executive serve on that company’s compensation committee is not “independent” until three years after the end of such service or the employment relationship.”

Note that our classification is much broader than the NYSE definition due to our data limitation. In the above quoted Section 303A.02(b)(iv), NYSE identifies a particular type of interlocking directorship; however, the IRRC database does not differentiate among different types of interlocking directorships. As a result, we classify all outside directors with any type of interlocking relationships with the listed company as affiliated.

e) We classify all outside directors whose companies provide service to the listed company as affiliated, as described in criterion (a)(i) above.

This classification procedure is based on Section 303A.02(b)(v) provides that, “A director who is an executive officer or an employee, or whose immediate family member is an executive officer, of a company that makes payments to, or receives payments from, the listed company for property or services in an amount which, in any single fiscal year, exceeds the greater of $1 million, or 2% of such other company’s consolidated gross revenues, is not “independent” until three years after falling below such threshold.”

Note that our classification is much broader than the NYSE definition because of our data limitation. Companies do not disclose the amount of service or product revenue between the listed company and the company where an outside director is an employee. As a result, we classify all outside directors whose companies provide service to the listed company as affiliated.
Because of data restrictions, as explained in the above (d) and (e), our definition of affiliated outside directors is broader, and thus stricter, than the NYSE’s definition. Therefore, we may classify some outside directors as affiliated while NYSE standards deem them independent. Our classification of directors will bias against us finding the results when we test if firms with more affiliated directors grant their CEOs excess pay.

2.3 The Sub-sample of NYSE Firms Already Complying with the New Standards

As the final step in our sample selection, we choose a sub-sample of NYSE firms that had already voluntarily adopted the NYSE new governance standards before they became mandated. The new standards make specific stipulations on what types of directors should serve on the board and its various committees. Such stipulations are:

- Listed Companies must have a majority of independent directors on their boards. (§303A.01)
- Listed companies must have a nominating / corporate governance committee composed entirely of independent directors (§303A.04).
- Listed companies must have a compensation committee composed entirely of independent directors (§303A.05).
- All audit committee members must satisfy the requirements for independence set out in Section 303A.02, in addition to any requirement of Rule 10A-3(b)(1) under the Securities Exchange Act of 1934.

Out of the primary sample of 3,734 NYSE firm-year observations between 1998 and 2002, we choose the 1,157 firm-year observations already complying with the NYSE new governance standards. A detailed description of the relevant sections of the new standards and our corresponding selection procedures are available in the Appendix B.

3. Research Design

In this section, we discuss our empirical specification to test whether proscribing non-independent (i.e., employee or affiliated) directors from compensation committees eliminates excess CEO compensation. Before we proceed, we review the related literature first. Two
themes of the literature relate to our research question: one studies the relation between CEO compensation and the independence of the compensation committee (Newman and Mozes, 1999; Anderson and Bizjak, 2000), and the other the relation between CEO compensation and board independence (Lambert, Larker and Weigelt, 1993; Finkelstein and Hambrick, 1997; Core et al. 1999). Evidence on the first theme, however, is limited. Newman and Mozes (1999) find no evidence that CEO compensation is higher in firms with insiders on the compensation committees than that in firms without. However, in a subset of firms with poor performance, they find that firms with insiders on the compensation committees do not penalize their CEOs as much as firms without insiders on the compensation committees. Anderson and Bizjak (2000) examine a sample of 75 NYSE firms from 1985-1994. When comparing firms whose compensation committees consist solely of independent directors with the rest of the firms, they find that the former tend to use more equity compensation and tend to pay their executives more. They argue that insiders on the compensation committees do not influence CEO compensation.

Researchers have provided extensive evidence on how board independence affects CEO compensation. For example, Lambert, Larker and Weigelt (1993) and Finkelstein and Hambrick (1997) find opposite results on the relation between CEO compensation and measures of board independence. Core et al. (1999) argue that the mixed results in the literature are due to lack of control for firms’ ownership structure, a correlated omitted variable shown by Holderness and Sheehan (1988) and Allen (1981) to be related to CEO compensation as well. After controlling for firms’ ownership structure in a sample of 205 firm-year observations from 1982 to 1984, Core et al. (1999) indeed find that firms with more insiders or affiliated outside directors on the boards pay their CEOs greater compensation.

We test out research question using a methodology similar to that of Core et al. (1999), where they use board independence, firms’ stock ownership structure, and some firm
characteristics (e.g., firm performance and growth opportunities etc.) to explain CEO compensation. Unlike Core et al. (1999), who focus on the entire board, we test the influence of both compensation-committee independence and board independence on CEO compensation. We adopt this different approach for two reasons. First, though the compensation committee is directly responsible for administering executive compensation, it is under the influence of the rest of the board. Second, the new NYSE governance standards are more restrictive on the independence of directors on the compensation committee than that of directors not serving on any committees. For example, while neither employee nor affiliated directors can serve on compensation, audit, or nominating committee (§303A.04, §303A.05, and §303A.07 (b)), these directors can still serve on the board without belong to any committee, as the entire board is only required to have a majority of independent directors (Section 303A.01). Considering both the compensation committee and the board simultaneously allows us to test whether, after satisfying all the new governance standards, the less-than-half of insider directors or affiliated directors serving on the board still have an impact on excess CEO compensation.

3.1 Determinants of CEO compensation.

In our tests, we include four sets of variables to estimate CEO compensation: characteristics of the compensation committee, characteristics of the rest of the board, firms’ ownership structure, and relevant economic determinants. Among these four sets, we differentiate between characteristics of the compensation committee and the rest of the board in order to separate the influence of directors on the compensation committee and those who are not on CEO compensation.

3.1.1 Characteristics of the compensation committee

We use three variables to capture characteristics of the compensation committee: compensation committee size, % (percentage) of insiders on the compensation committee, and %
(percentage) of affiliated directors on the compensation committee. We define compensation committee size as the total number of directors serving on the compensation committee. If employee or affiliated directors tend to provide CEOs with a higher level of compensation, we expect positive coefficients on both % of insiders on the compensation committee and % of affiliated directors on the compensation committee.

3.1.2 Characteristics of the rest of the board

To capture the characteristics of the rest of the board (other than the compensation committee), we use the following four variables: number of directors on the rest of the board, % of insiders on the rest of the board, % of affiliated directors on the rest of the board, and CEO is board chair (a dummy variable equal to one if CEO is board chair, and zero otherwise). We predict positive coefficients on both number of directors on the rest of the board and CEO is board chair based on prior studies (Jensen, 1993; Yermack, 1996). Their evidence suggests that large board of directors are often expected to be less effective in monitoring the management and more likely to fall under the influence of the CEO, and that there exist more severe agency problems when the CEOs serves as the board chair. In addition, we expect positive coefficients on both % of insiders on the rest of the board and % of affiliated directors on the rest of the board, if employee or affiliated directors not serving on the compensation committee can still exert influence on the committee to provide CEOs with a higher level of compensation.

3.1.3 Firms' ownership structure

We focus on three variables: CEO % ownership (defined as the fraction of a firm’s stock held by its CEO), average % stock ownership by non-CEO insider directors (defined as the total fraction of a firm’s stock held by non-CEO employee directors divided by the total number of non-CEO employee directors), and outside director 1% holding (a dummy variable equal to 1 if there is an outside blockholder owning at least 1% of the firm’s outstanding common stock
sitting on the board, and zero otherwise). Based on prior research (Allen, 1981; Finkelstein and Hambrick, 1989; Core et al., 1999), we predict negative coefficients on all three variables, as CEO entrenchment may decrease when other employee directors have large equity holdings in the firm, and when there exist an outside blockholder with substantial holdings in the firm’s outstanding common stock sitting on the board.

3.1.4 Economic determinants of CEO compensation

We include six variables (i.e., log(sales), book-to-market ratio, stock return, net operating loss, cash constraint, and dividend constraint) identified by prior research to be associated with CEO compensation (Matsunaga, 1995; Yermack, 1995; Dechow et al., 1996; Core and Guay, 1999). CEO compensation typically increases with firm size, growth opportunities, and firm performance: CEOs of large firms or growth firms receive higher total pay, because these firms require more talented CEOs. Following Core and Guay (1999), we measure firm size and growth opportunities by log(sales) and book-to-market ratio of assets, and measure firm performance by stock returns in both the compensation-award year and the previous year. Prior studies also find that tax, financing, and accounting considerations influence firms’ use of option compensation. Similar to these studies, we use as proxy for expected future corporate tax rates net operating loss, a dummy variable indicating nonzero tax loss carry-forwards. Cash-constrained firms are more likely to use equity compensation, because equity grants do not involve a cash payment. We measure cash constraints as the three-year average of [(common and preferred dividends + cash flow used in investing activities – cash flow from operations)/market value of assets]. Finally, firms with earnings constraints may opt for option compensation, because at-the-money option grants (in contrast to cash or stock compensation) do not result in accounting expense. We measure this constraint by firms’ ability to pay cash dividends and make stock repurchases. Dividend constraint is a dummy variable equal to one if
[(retained earnings at year-end + cash dividends and stock repurchases during the year)/the prior year’s cash dividends and stock repurchases] is less than two in the current or any of the previous two years. If the denominator is zero for all three years, the firm is also categorized as dividend constrained.

3.2 Model

We summarize the four sets of variables discussed above into equation (1) to estimate CEO compensation. In the equation, we also include year dummies and dummy variables corresponding to 2-digit SIC codes:

\[
(\text{CEO Compensation})_t = \alpha_0 + \alpha_1 \left( \% \text{ of insiders on the compensation committee} \right)_t + \alpha_2 \left( \% \text{ of affiliated directors on the comp. committee} \right)_t + \alpha_3 \left( \text{comp. committee size} \right)_t + \beta_1 \left( \text{CEO is board chair} \right)_t + \beta_2 \left( \text{number of directors on the rest of the board} \right)_t + \beta_3 \left( \% \text{ of insiders on the rest of the board} \right)_t + \beta_4 \left( \% \text{ of affiliated directors on the rest of the board} \right)_t + \gamma_1 \left( \text{CEO \% ownership} \right)_{t-1} + \gamma_2 \left( \text{Average \% stock ownership by non-CEO insider directors} \right)_{t-1} + \gamma_3 \left( \text{Outside director 1\% holding} \right)_{t-1} + \tau_1 \left( \text{log(sales)} \right)_{t-1} + \tau_2 \left( \text{book-to-market ratio} \right)_{t-1} + \tau_3 \left( \text{stock return} \right)_{t-1} + \tau_4 \left( \text{stock return} \right)_{t-1} + \tau_5 \left( \text{net operating loss} \right)_{t-1} + \tau_6 \left( \text{cash constraint} \right)_{t-1} + \tau_7 \left( \text{dividend constraint} \right)_{t-1} + \text{year controls} + \text{industry controls} + \epsilon
\]

In equation (1), coefficients on four hypothesis variables will provide evidence on whether improving the independence of the compensation committee alone can curb excess CEO compensation. Two hypothesis variables (\% of insiders on the compensation committee and \% of affiliated directors on the compensation committee) are related to the independence of the compensation committee, and the other two (\% of insiders on the rest of the board, and \% of affiliated directors on the rest of the board) related to the independence of the rest of the board. In particular, a significantly positive coefficient on \% of insiders on the compensation committee (\% of affiliated directors on the compensation committee) will indicate that CEO compensation increases with the proportion of employee (affiliated) directors on the compensation committee. Thus, removing employee (affiliated) directors from the committee will have the desirable effect of curbing excess CEO pay. On the other hand, insignificantly coefficients on these two
variables indicate that removing employee (affiliated) directors from the committee independence will not have any impact on excess CEO pay. Further, a significantly positive coefficient on \( \% \text{ of insiders on the rest of the board} \) or \( \% \text{ of affiliated directors on the rest of the board} \) will indicate that CEO compensation increases with the proportion of employee or affiliated directors on the rest of the board other than the compensation committee. As a result, focusing on the independence of the compensation committee is not adequate to curb excess CEO compensation.

4 Empirical Results

4.1 Summary Statistics

We report summary statistics on our test variables in Table 2. The average cash compensation is $1.55 million, and the median is $1.18 million. This reflects a slight skewness to the distribution, as is commonly observed. These numbers are higher than those reported by Core et al. (1999), who study a much earlier sample of firms between 1982 and 1984. We find that the mean (median) of total compensation is $5.51 ($3.06) million. This multiple of approximately 3 times cash compensation reflects the importance of the stock options during the time period of our study.

Table 2 indicates that, on average, the compensation committee has 3.83 members. The 50th and 75th percentiles are both 4, while the 25th percentile is 3. In our sample period, which is prior to the effective date of the NYSE’s new governance standards, insiders, on average, only account for 0.98% of directors serving on the compensation committee. However, the mean (median) of the percentage of affiliated directors on the compensation committee is much higher at 6.89% (0.00%). Un-tabulated results also show that only 1.89% of firm-years have insiders on
the compensation committee, in contrast to a fraction of 25% of firm-years with affiliated directors on the compensation committee.

We are also interested in the rest of the board of directors, which includes directors not serving on the compensation committee. On average, a mean of 33.89% (median 28.57%) insiders on the rest of the board is comparable to what is observed in studies such as Klein (2002). We also observe a large number of affiliated directors serving on the rest of the board. On average, affiliated directors account for 12.90% (median 11.11%) of all directors not serving on the compensation committee (i.e., the rest of the board). When inside and affiliated directors are combined, the average percentage is close to 45%, which suggests that a large portion of directors not serving on the compensation committee is not independent of the management. This is in marked contrast to what we observe for the compensation committee.

For variables related to firms’ ownership structure, we find that the mean (median) of CEO % ownership is 1.91% (0.26%), higher than that reported in Core et al. (1999). Average % stock ownership by non-CEO insider directors has a mean (median) of 0.62% (0.00%). In addition, an average of 28% of firms has an outside blockholder with more than 1% of the firm’s outstanding stock sitting on the board. The last set of summary statistics relate to selected firm characteristics. Average sales are $5.85 billion, reflecting the fact that IRRC tends to follow larger firms. The mean of stock returns is 11.94%. Table 3 provides the correlation matrix for all of the variables used in this study. There are no obviously significant relations among the variables, suggesting that we are not likely to have any concerns regarding multicollinearity.

4.2 Evidence on Our Primary Sample of NYSE Firms

We estimate equation (1) for our primary sample of 3,734 firm-year observations, and report results in Table 4. To mitigate the influence of outliers, we set the upper and lower-most percentiles for explanatory variable reflecting firms’ ownership structure and economic
determinants of CEO compensation equal to the values at the 1\textsuperscript{st} and 99\textsuperscript{th} percentiles in each year, respectively. In addition, we also set the upper-most percentile of the value of option grants equal to the option grants of CEOs at the 99\textsuperscript{th} percentiles to reduce the influence of a few CEOs that receive extremely large option grants.

We find that it is board independence, rather than the independence of the compensation committee, that explains excess CEO compensation. For example, in Column 1 that estimates CEOs’ cash compensation, the coefficients, i.e., -0.22 and 0.07, on the two proxies for the independence of the compensation committee (\% of insiders on the compensation committee and \% of affiliated directors on the compensation committee) are both insignificant. Similarly, the two corresponding coefficients, i.e., 0.48 and -0.19, in Column 2 that estimates CEOs’ stock and option compensation are also insignificant.\textsuperscript{4} These insignificant coefficients suggest that there is little relation between levels of CEO compensation (whether in terms of cash, stock and option compensation, and total compensation) and the independence of the compensation committee.

Importantly, our evidence indicates that CEO compensation increases with the percentage of non-independent directors on the rest of the board (other than the compensation committee). Specifically, in Column 1 (Column 2) that estimates cash compensation (stock and option compensation), we find a positive coefficient of 0.12 (0.11) on \% of insiders on the rest of the board, which is significant at a p-value of 0.10 (insignificant). These coefficients indicate that CEOs receive moderately higher cash compensation when there are higher proportions of employee directors serving on the rest of the board, but their stock and option are not related to the percentage of employee directors on the rest of the board. Further, in both Columns 1 and 2,

\textsuperscript{4} The insignificant results could be due to lack of variation in the explanatory variables: percentages of insider or affiliated directors on the compensation committee. However, when we substitute the percentage of inside (or affiliated) directors on the compensation committee by a dummy variable indicating the existence of inside (affiliated) directors on the compensation committee, coefficients on these two dummy variables are still insignificant.
we find positive coefficients of 0.25 and 1.89 on % of affiliated directors on the rest of the board, both significant at conventional levels. Our evidence shows that both cash pay and stock and option compensation increases with the percentage of affiliated directors serving on the rest of the board. When estimating total compensation in Column 3, we find an insignificant coefficient 0.20 on % of insiders on the rest of the board, and a significantly positive coefficient of 2.28 on % of affiliated directors on the rest of the board. Thus, CEOs’ total compensation increases with the proportion of affiliated directors on the rest of the board other than the compensation committee.5 Taken together, our above findings indicate that, though non-independent (employee or affiliated) directors serving on the compensation committee do not reduce excess CEO compensation, non-independent directors on the rest of the board do. Thus, it seems that NYSE’s focus on improving the independence of the compensation committee will not serve the desired purpose of eliminating excess CEO compensation.

We also find that CEOs receive higher cash compensation when they serve as the chair of the board, or when the board size is larger. In Column 1, coefficients on the two variables, CEO is board chair and number of directors on the rest of the board, are 0.17 and 0.04, both significant at p-values less than 0.001. However, we do not find similar evidence for stock and option compensation. In Column 2, the two corresponding coefficients are -0.13 and -0.07 (both are insignificant at p-values less than 0.1, two-tailed tests), suggesting that there is no significant difference in CEOs’ stock and option compensation for firms with different size of the board or whether CEO is board chair.

For the three variable reflecting firms’ ownership structures, their coefficients are largely consistent with those in prior studies (Allen, 1981; Finkelstein and Hambrick, 1989; Core et al.,

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5 Though cash compensation is significantly positively related with the proportion of employee directors on the board in Column 1 of Table 4, the relation between total compensation and the proportion of employee directors on the board is insignificant in Column 3 of the same table. This is because CEOs’ cash compensation only account for a small fraction, 28%, of their total compensation (see Table 2).
1999). Except for a positive coefficient of 0.03 on average % stock ownership by non-CEO insider directors in Column 1 that estimates cash compensation, the coefficients on the three variables across the three columns are all negative.

Finally, the coefficients on economic determinants of CEO compensation are largely consistent with our predictions and the empirical results reported by prior studies (e.g., Core and Guay, 1999). We find that CEOs in large firms are paid more in terms of cash, stock and options, and total compensation, as evidenced by the significantly positive coefficients (i.e., 0.54, 1.72, and 2.55) on log(sales) across the three columns. Though book-to-market ratio has an insignificant coefficient of -0.05 in Column 1 (cash compensation), its coefficients in Column 2 (stock and option compensation) and Column 3 (total compensation) are -4.50 and -4.91, both significantly negative at p-values less than 0.01. These negative relations suggest that CEOs in growth firms receive higher compensation. We also find that CEOs in firms with higher stock returns in the compensation-award year receive higher compensation, as evidenced by a significantly positive coefficient of 0.85 (p-value <0.01, one-tailed) on stock return in Column 3. Finally, we find that firms with financial constraints tend to pay the CEOs less cash compensation (higher stock and option compensation), as evidenced by the negative (positive) coefficients of -0.11, -0.99, and -0.10 (0.41, 0.95, and 0.28) on net operating loss, cash constraint, and dividend constraint in Column 1 (Column 2).

4.3 Evidence on the Sub-sample of NYSE Firms that Had Voluntarily Adopted the New Standards Before They Became Mandated

In our primary sample, we find no significant relation between CEO compensation and the independence of the compensation committee. Instead, we find CEO compensation is positively related to proportions of non-independent (employee or affiliated) directors serving on the rest of the board (i.e., other than the compensation committee). In this section, we further
test whether such a positive relation still exist in the sub-sample of NYSE firms that had voluntarily adopted the new standards, what are perceived to be of high governance quality, before they became mandated.

The new NYSE governance standards require that all of the directors serving on three board committees (i.e., nominating/ corporate governance, audit, and compensation committees) are independent outside directors. Though employee or affiliated directors can still serve on the board, they cannot be members of the aforementioned committees, and their proportion has to be less than half of total board members. For this subset of firms, we investigate whether employee or affiliated directors serving on the rest of the board (i.e., other than the compensation committee) still have an impact on excess CEO compensation. One could argue that these firms are not randomly selected from the total population of IRRC companies. However, given these firms’ predisposition towards high-quality corporate-governance policies, we would expect them to be less likely to pay their executives excessively. Thus, in this sub-sample, we are biased against finding any significant results.

Table 5 reports our results from estimating equation (1) in this sub-sample. However, we remove from this equation two variables, i.e., % of insiders on the compensation committee and % of affiliated directors on the compensation committee, whose value is always zero for this sub-sample. We find that, although firms in this sub-sample have no employee or affiliated directors serving on their compensation committees, CEO compensation still increases with higher proportions of employee or affiliated directors serves on the rest of the boards (i.e., other than compensation committee). Specifically, in Column 1 that estimates cash compensation, the coefficient on % of insiders on the rest of the board is 0.28, significant at a p-value less than 0.05; the coefficient on % of affiliated directors on the rest of the board is 0.20, positive but insignificant. The significantly positive coefficient of 0.28 on % of insiders on the rest of the
board indicates that CEOs receive higher cash compensation in firms with higher proportions of employee directors on the rest of the board. Further, in Columns 2 that estimates stock and option compensation, coefficients on \% of insiders on the rest of the board and \% of affiliated directors on the rest of the board are 1.58 and 2.93, both significant at p-values less than 0.05. These two coefficients indicate that CEOs receive higher stock and option compensation in firms with higher proportions of employee or affiliated directors on the rest of the board.

In Table 5, our evidence on both board-independence variables and control variables is consistent with our results in Table 4. Results in Table 5 are based on a sub-sample that only includes firms with independent directors (i.e., employee or affiliated directors excluded) serving on the compensation, auditing, and nominating committees; further, independent directors should account for a majority of all board members. Even for this sample of firms, their CEOs can still receive higher compensation due to employee directors or affiliated directors sitting on the rest of the board. This brings into question the effectiveness of the new NYSE governance standards.

4.4 The Relation between Excess CEO Compensation and Subsequent Firm Performance

The above finding that firms with higher proportions of employee or affiliated directors serving on their boards provide CEOs with higher compensation does not constitute conclusive evidence that these CEOs’ compensation level is excessive. As pointed out by Core et al. (1999), the higher compensation level might be for reasons other than the domination of the board and its compensation committee by CEOs. One reason could be that the CEO has a particularly difficult and complex organization to operate and, as a result, the excess compensation is warranted. Another possibility is that a firm might want the CEO to take on added risk, and thus reward the executive for those actions. Under these alternatives, a higher level of CEO compensation should have no association with firm performance in subsequent periods. On the other hand, if the higher level of compensation reflects excess compensation, we
would then expect that this excess compensation is negatively related to subsequent firm performance.

In this section, we test the relation between excess CEO compensation and subsequent firm performance. Similar to Core et al. (1999), we use estimated coefficients reported in Table 5 to estimate the predicted excess compensation. Table 5 includes four sets of explanatory variables: compensation-committee size, composition of the rest of the board, firms’ ownership structure, and economic determinants of CEO compensation. Out of these four sets, we use the coefficients on the first three to estimate predicted excess compensation:

\[
\text{Predicted excess compensation} = a_1 (\text{compensation-committee size}) + \sum \beta_i \text{board structure} + \sum \gamma_i \text{ownership structure} \]  

Equation (2) represents the predicted component of compensation arising from the compensation-committee size, board structure, and firms’ ownership structure variables. We test whether the predicted excess compensation is negatively related to subsequent firm performance. Compared with Core et al. (1999), CEOs in our sample receive drastically different compensation packages. They study 205 firm-years between 1982 and 1984. On average, CEOs in their sample receive about $0.62 million in cash compensation, about 66% of the total compensation. Our sample spans 1998 to 2002, and CEOs on average receive $1.55 (3.38) million in cash pay (stock and options), only about 28% (72%) of their total compensation. Thus, in the sample studied by Core et al. (1999), CEOs’ predicted excess compensation is dominated by the cash component. To facilitate comparison with the related results in Core et al. (1999), we separately estimate CEOs’ predicted excess cash compensation and predicted excess stock and option compensation, and investigate how these two variables each related to subsequent firm performance.
We first test whether the predicted excess compensation is negatively related to subsequent operating performance, as proxied by Return on Assets (ROA). Similar to Core et al. (1999), we define ROA as the ratio of earnings before interest and taxes to total assets for the prior year. We estimate the following equation:

$$(ROA)_{t+1,2,3} = \delta_0 + \delta_1 (\text{Predicted Excess Compensation})_t + \delta_2 (\text{Std dev of ROA})_{t-1} + \delta_3 (Sales)_{t-1} + \text{Year Controls} + \text{Industry controls} + \epsilon_i,$$

where the standard deviation of ROA is standard deviation of annual percentage corporate return on assets for the five years ending with the year prior (e.g., 1998) to the year in which compensation is awarded (e.g., 1999). Sales are for the year prior to the year in which compensation is awarded. We also include year dummies and dummy variables corresponding to 2-digit SIC codes.

Panel A of Table 6 reports results from estimating the average ROA for the subsequent one-, two-, and three-year periods using equation (3). The first (last) three columns present results related to cash (stock and option) compensation. In columns 1~3 for the subsequent one-, two-, and three-year periods, the coefficients on predicted excess cash compensation are -8.64, -7.16, and -5.03 respectively, all significantly negative at p-values less than 0.05. These negative relations suggest that the excess cash compensation is associated with inferior subsequent operating performance. As the subsequent-performance window becomes longer, the magnitude of the coefficient is decreasing, suggesting that the decline in performance becomes less significant over longer windows.

Similarly, in columns 4~6 for the subsequent one-, two, and three-year periods, coefficients on predicted excess stock and option compensation are -2.16, -1.66, and -1.08 respectively. Though all three coefficients are negative, the last one is insignificant while the first two are significantly negative at p-values less than 0.05. These negative relations indicate
that the excess stock and option compensation is associated with inferior subsequent operating performance. This is an important finding, because it shows that excess stock and option compensation are not awarded to motivate CEOs and induce better performance. Instead, this excess portion of the stock and option compensation actually is associated with inferior subsequent performance.

Next, we test whether predicted excess compensation is negatively related with an alternative firm-performance measure, subsequent stock performance. Different from accounting-based performance measures, stock price can incorporate expected future information. Even if excess compensation is a manifestation of management entrenchment, we may not be able to find any relation between excess compensation and subsequent stock return, because the market may have already fully incorporated the firm’s agency problems into stock price at an earlier time. We use the following equation to test the relation between excess compensation and subsequent stock performance:

\[
(Stock \ Return)_{t+1, 2, 3} = \alpha_0 + a_1 (Predicted \ Excess \ Compensation)_t \\
+ a_2 (Std \ dev \ of \ Stock \ Returns)_{t-1} + a_3 \ln(Market \ value \ of \ Equity)_{t-1} \\
+ a_4 (Market-to-Book)_{t-1} + Year \ Controls + Industry \ controls + \varepsilon_i,
\]

(4)

where the \( LN(\text{market value of equity}) \) and the \( \text{book-to-market ratio} \) are calculated based on the market value and book value of the firm’s equity at the end of the year prior to which compensation is awarded. The standard deviation of stock returns is standard deviation of annual percentage stock market return for the five years ending with the year prior to the year in which compensation is awarded. Panel B of Table 6 reports results from estimating the average stock return for the subsequent one-, two-, and three-year periods using equation (4). The first (last) three columns present results related to cash (stock and option) compensation. None of the coefficients on predicted excess cash compensation and predicted excess stock and option compensation are significant.
To summarize, we find evidence that excess CEO compensation is associated with inferior subsequent operating performance (ROA). Our findings is consistent with CEOs extracting rents from their companies in the form or excess compensation.

5. Summary and Conclusion

The NYSE recently adopted a set of new corporate governance standards. Among the requirements of these standards, there is a clear stipulation that all firms list on the Exchange must have completely independent compensation committees. The underlying assumption of this requirement is that the compensation committee is primarily or solely responsible for executive compensation. Thus, requiring all directors on the compensation committee to be independent outside directors can curb excess CEO compensation.

For a sample of 3,734 NYSE firm-year observations, we test the relation between excess CEO compensation and the independence of the compensation committee. We find that the proportion of insiders or affiliated directors on the compensation committee does not relate to excess CEO compensation. However, CEOs receive higher levels of compensation in firms with higher proportions of insiders or affiliated directors serving on the rest of the board (i.e., other than the compensation committee). We confirm this finding in a sub-sample of NYSE firms that had voluntarily complied with the new governance standards before they became mandated. Though all of these firms have independent compensation committees, we still find that CEO compensation increases with the proportion of insiders or affiliated directors serving on the boards. Since we find that non-independent (employee or affiliated) directors not serving on the compensation committee still affect CEO compensation, our results indicate that NYSE’s focus on improving the independence of the compensation committee will not serve the desired purpose of eliminating excess CEO compensation.
References


Appendix A  
The NYSE’s Definition of Director Independence and Our Classification Criteria

<table>
<thead>
<tr>
<th>Sections</th>
<th>NYSE Corporate Governance Rules in its Listed Company Manual</th>
<th>Our Classification Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>303A.02(a)</td>
<td>No director qualifies as “independent” unless the board of directors affirmatively determines that the director has no <em>material</em> (emphasis added) relationship with the listed company. <strong>Commentary:</strong> References to “company” would include any parent or subsidiary in a consolidated group with the company. Material relationships can include commercial, industrial, banking, consulting, legal, accounting, charitable and familial relationships, among others.</td>
<td>1. We identify a director working as an officer in the listed company’s subsidiary as an <em>employee director</em>. 2. We identify an outside director with the following relations as an <em>affiliated director</em>: o Providing service or products o A relative with an executive officer o Making (receiving) Charitable contribution to (from) the listed company</td>
</tr>
<tr>
<td>303A.02(b)(i)</td>
<td>A director who is an employee, or whose immediate family member is an executive officer, of the company is not independent until three years after the end of such employment relationship.</td>
<td>We define the directors who served as an executive officer of the listed company within the past three years as an <em>affiliated director</em>.</td>
</tr>
<tr>
<td>303A.02(b)(ii)</td>
<td>A director who receives, or whose immediate family member receives, more than $100,000 per year in direct compensation from the listed company, other than director and committee fees and pension or other forms of deferred compensation for prior services, is not independent until three years after he or she ceases to receive more than $100,000 per year in such compensation.</td>
<td>Since firms are not required to disclose the compensation for each individual director, we are unable to identify this type of affiliation.</td>
</tr>
<tr>
<td>303A.02(b)(iii)</td>
<td>A director who is affiliated with or employed by, or whose immediate family member is affiliated with or employed in a professional capacity by, a present or former internal or external auditor of the company is not “independent” until three years after the end of the affiliation or the employment or auditing relationship.</td>
<td>We classify directors whose companies provide auditing service as affiliated, as described above.</td>
</tr>
</tbody>
</table>
Appendix A
The NYSE’s Definition of Director Independence and Our Classification Criteria
(continued)

<table>
<thead>
<tr>
<th>Sections</th>
<th>NYSE Corporate Governance Rules in its Listed Company Manual</th>
<th>Our Classification Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>303A.02(b)(iv)</td>
<td>A director who is employed, or whose immediate family member is employed, as an executive officer of another company where any of the listed company’s present executive serve on that company’s compensation committee is not “independent” until three years after the end of such service or the employment relationship.</td>
<td>Since we can not identify this specific type of interlocking directors as described by NYSE, we classify all outside directors with interlocking relationships with the listed company as affiliated. This classification is much broader than the NYSE definition.</td>
</tr>
<tr>
<td>303A.02(b)(v)</td>
<td>A director who is an executive officer or an employee, or whose immediate family member is an executive officer, of a company that makes payments to, or receives payments from, the listed company for property or services in an amount which, in any single fiscal year, exceeds the greater of $1 million, or 2% of such other company’s consolidated gross revenues, is not “independent” until three years after falling below such threshold.</td>
<td>We classify all outside directors whose companies provide service to the listed company as affiliated. This classification is much broader than the NYSE’s.</td>
</tr>
</tbody>
</table>
Appendix B
The NYSE’s Requirements on Board and Committee Composition

<table>
<thead>
<tr>
<th>Sections</th>
<th>NYSE Corporate Governance Rules in its Listed Company Manual</th>
<th>Our Sample Selection Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>303A.01</td>
<td>Listed Companies must have a majority of independent directors.</td>
<td>We select companies with more than 50% of independent outside directors.</td>
</tr>
<tr>
<td>303A.04</td>
<td>Listed companies must have a nominating / corporate governance committee composed entirely of independent directors.</td>
<td>We select firms with independent nominating / corporate governance committees.</td>
</tr>
<tr>
<td>303A.05</td>
<td>Listed companies must have a compensation committee composed entirely of independent directors.</td>
<td>We select firms with independent compensation committees.</td>
</tr>
<tr>
<td>303A.07(b)</td>
<td>In addition to any requirement of Rule 10A-3(b)(1), all audit committee members must satisfy the requirements for independence set out in Section 303A.02.</td>
<td>We select firms with independent audit committees.</td>
</tr>
</tbody>
</table>
Table 1  Sample Selection

<table>
<thead>
<tr>
<th>Sample Selection</th>
<th># of firm-year Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO-years from ExecuComp between 1998 and 2002*</td>
<td>9,098</td>
</tr>
<tr>
<td>firm-years from IRRC between 1998 and 2002</td>
<td>6,989</td>
</tr>
<tr>
<td>CEO-years after merging ExecuComp and IRRC</td>
<td>10,169</td>
</tr>
<tr>
<td>(\text{Minus firm-years with missing information:})</td>
<td></td>
</tr>
<tr>
<td>– firm-years without CEO compensation information</td>
<td>(1,208)</td>
</tr>
<tr>
<td>– firm-years without board-structure or stock-ownership data</td>
<td>(3,359)</td>
</tr>
<tr>
<td>– firm-years without relevant data on firms’ sales, book-to-market ratio, and some financing constraints</td>
<td>(383)</td>
</tr>
<tr>
<td>– non-NYSE firms</td>
<td>(1,485)</td>
</tr>
<tr>
<td>Final NYSE Sample</td>
<td>3,734</td>
</tr>
<tr>
<td>(\text{Minus NYSE firms not satisfying the new governance standards:})</td>
<td></td>
</tr>
<tr>
<td>– firm-years without independent compensation, auditing, nominating / governance committees)</td>
<td>(2,563)</td>
</tr>
<tr>
<td>– firm-years without a majority of independent directors on the board)</td>
<td>(14)</td>
</tr>
<tr>
<td>Sub-samples of NYSE firms already satisfying the new governance standards</td>
<td>1,157</td>
</tr>
</tbody>
</table>

* We select all CEOs between 1998 and 2002 (ExecuComp Variable ‘CEOANN’ equals ‘CEO’); for firms not identifying their CEOs, we select the executive with the highest cash compensation.
### Table 2  Summary Statistics on NYSE Firms Covered by IRRC

The sample includes 3,734 NYSE firm-year observations from 1998 to 2002.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CEO Compensation Variables (in million $)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash compensation</td>
<td>1.55</td>
<td>1.30</td>
<td>0.75</td>
<td>1.18</td>
<td>1.91</td>
</tr>
<tr>
<td>Stock and option compensation</td>
<td>3.38</td>
<td>5.85</td>
<td>0.30</td>
<td>1.29</td>
<td>3.67</td>
</tr>
<tr>
<td>Total compensation</td>
<td>5.51</td>
<td>7.19</td>
<td>1.43</td>
<td>3.06</td>
<td>6.29</td>
</tr>
<tr>
<td><strong>Comp. Committee Structure Information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation committee size</td>
<td>3.83</td>
<td>1.26</td>
<td>3.00</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>% of insiders on the comp. committee</td>
<td>0.98%</td>
<td>7.30%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>% of affiliated directors on the comp. committee</td>
<td>6.89%</td>
<td>15.11%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>16.67%</td>
</tr>
<tr>
<td><strong>Structure of the Rest of the Board</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of directors on the rest of the board</td>
<td>6.23</td>
<td>2.34</td>
<td>5.00</td>
<td>6.00</td>
<td>8.00</td>
</tr>
<tr>
<td>CEO is board chair (dummy)</td>
<td>0.72</td>
<td>0.45</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>% of insiders on the rest of the board</td>
<td>33.89%</td>
<td>20.23%</td>
<td>20.00%</td>
<td>28.57%</td>
<td>40.00%</td>
</tr>
<tr>
<td>% of affiliated directors on the rest of the board</td>
<td>12.90%</td>
<td>15.21%</td>
<td>0.00%</td>
<td>11.11%</td>
<td>20.00%</td>
</tr>
<tr>
<td><strong>Ownership Structure Information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO % stock ownership</td>
<td>1.91%</td>
<td>4.65%</td>
<td>0.08%</td>
<td>0.26%</td>
<td>1.00%</td>
</tr>
<tr>
<td>Average % stock ownership by non-CEO insider directors</td>
<td>0.62%</td>
<td>1.41%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.51%</td>
</tr>
<tr>
<td>Outside director 1% holding (dummy)</td>
<td>0.28</td>
<td>0.45</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Firm-characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales (in billion of dollars)</td>
<td>5.85</td>
<td>9.67</td>
<td>0.86</td>
<td>2.11</td>
<td>6.07</td>
</tr>
<tr>
<td>log(sales)</td>
<td>7.76</td>
<td>1.35</td>
<td>6.76</td>
<td>7.65</td>
<td>8.71</td>
</tr>
<tr>
<td>Book-to-market</td>
<td>0.66</td>
<td>0.25</td>
<td>0.47</td>
<td>0.68</td>
<td>0.86</td>
</tr>
<tr>
<td>Stock Return</td>
<td>11.94%</td>
<td>43.84%</td>
<td>-17.05%</td>
<td>5.20%</td>
<td>33.26%</td>
</tr>
<tr>
<td>Net Operating Loss (dummy)</td>
<td>0.26</td>
<td>0.44</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Cash Constraint</td>
<td>0.01</td>
<td>0.04</td>
<td>-0.02</td>
<td>0.003</td>
<td>0.03</td>
</tr>
<tr>
<td>Dividend Constraint (dummy)</td>
<td>0.24</td>
<td>0.43</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Variable Description:

**CE0 Compensation Variables (in million $)**

Cash Compensation = cash compensation in year t (ExecuComp Variable ‘TCC’)

Stock and option Compensation = value of restricted stock and option grants (ExecuComp variables ‘RSTKGRNT’ + ‘BLK_VALU’)

Total Compensation = total compensation in year t (ExecuComp Variable ‘TDC1’)

**Comp. Committee Structure Information**

Compensation committee size = Number of directors on Compensation Committee

% of insiders on the comp. committee = Number of executive directors on the Compensation Committee / total number of directors on the Committee

% of affiliated directors on the compensation committee = Number of affiliate outside directors on Compensation Committee / total number of directors on the Committee

**Board Structure Information**

Number of directors on the rest of the board = # of directors not on the Compensation Committee

CEO is board chair = 1 if CEO also serves as Chairman of the board; 0 otherwise.

% of insiders on the rest of the board = Number of executive directors not serving on the Compensation Committee / total number of directors not serving on the Compensation Committee

% of affiliated directors on the rest of the board = Number of affiliated outside directors not serving on the Compensation Committee / total number of directors not serving on the Compensation Committee

**Ownership Structure Information**

CEO % stock ownership = % of employer firm’s stock owned by the CEO

Average % stock ownership by non-CEO insider directors = total % of stock owned by non-CEO employee directors / total number of non-CEO employee directors

Outside director 1% holding = 1 if there is an outside blockholder with at least 1% of the firm’s outstanding common stock sitting on the board; 0 otherwise.
<table>
<thead>
<tr>
<th><strong>Firm-characteristics</strong></th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(sales)</td>
<td>$\text{log of sales}$</td>
</tr>
<tr>
<td>Book-to-market</td>
<td>$= \frac{\text{book value of assets}}{\text{(book value of debt + market value of equity)}}$</td>
</tr>
<tr>
<td>Net Operating Loss</td>
<td>$= 1$ if net operating loss carry forward is non-zero in the current or any of the two previous years; 0 otherwise;</td>
</tr>
<tr>
<td>Cash constraint</td>
<td>$= \text{three years’ average of } \frac{[(\text{common and preferred dividends} + \text{cash flow used in investing activities} - \text{cash flow from operations})]}{\text{Market value of assets;}}$</td>
</tr>
<tr>
<td>Dividend Constraint</td>
<td>$= 1$ if $(\text{Retained earnings} + \text{cash dividend and stock repurchases})/(\text{prior year’s cash dividend and stock repurchases}) \leq 2$ in the current or any of the two previous years or if the denominator is zero for all three years. 0 otherwise;</td>
</tr>
</tbody>
</table>
## Table 3: Correlation Matrix

The sample includes 3,734 NYSE firm-year observations from 1998 to 2002

| Variables                                                                 | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    |
|---------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 Comp. Comm. size                                                        | 1.00  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 2 % of insiders on the Comp. Committee                                    | -0.01 | 1.00  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 3 % of affiliated directors on the comp. committee                        | -0.03 | 0.03  | 1.00  |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 4 Number of directors on the rest of the board                           | -0.05 | -0.06 | -0.07 | 1.00  |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 5 CEO is board chair                                                      | 0.09  | -0.08 | -0.08 | -0.01 | 1.00  |       |       |       |       |       |       |       |       |       |       |       |       |
| 6 % of insiders on the rest of the board                                 | 0.05  | 0.04  | 0.09  | -0.36 | -0.07 | 1.00  |       |       |       |       |       |       |       |       |       |       |       |
| 7 % of affiliated directors on the rest of the board                      | -0.07 | 0.06  | 0.09  | 0.09  | -0.09 | -0.15 | 1.00  |       |       |       |       |       |       |       |       |       |       |
| 8 CEO % stock ownership                                                   | -0.16 | 0.07  | 0.15  | -0.07 | 0.08  | 0.21  | 0.10  | 1.00  |       |       |       |       |       |       |       |       |       |
| 9 Average % stock ownership by non-CEO inside directors                   | -0.15 | 0.11  | 0.15  | -0.07 | -0.22 | 0.17  | 0.18  | 0.21  | 1.00  |       |       |       |       |       |       |       |       |
| 10 Outside director 1% holding                                            | -0.08 | 0.02  | 0.12  | 0.01  | -0.20 | -0.07 | 0.24  | 0.08  | 0.42  | 1.00  |       |       |       |       |       |       |       |
| 11 log(sales)                                                             | 0.26  | -0.09 | -0.09 | 0.44  | 0.16  | -0.20 | 0.02  | -0.16 | -0.17 | -0.20 | 1.00  |       |       |       |       |       |       |
| 12 Book-to-market                                                         | 0.05  | -0.02 | -0.04 | -0.06 | 0.01  | -0.05 | -0.06 | -0.01 | -0.06 | 0.02  | -0.09 | 1.00  |       |       |       |       |       |
| 13 Stock Return                                                           | -0.04 | -0.02 | 0.03  | -0.01 | 0.004 | 0.06  | 0.02  | 0.02  | 0.003 | -0.03 | 0.04  | -0.36 | 1.00  |       |       |       |       |
| 14 Net operating loss                                                     | 0.04  | -0.03 | 0.02  | -0.06 | 0.01  | 0.03  | -0.01 | -0.01 | 0.01  | -0.02 | 0.03  | -0.01 | -0.01 | 1.00  |       |       |       |
| 15 Cash Constraint                                                        | -0.03 | 0.04  | 0.07  | 0.01  | -0.03 | 0.03  | 0.02  | -0.03 | -0.01 | 0.02  | 0.003 | 0.19  | -0.12 | 0.02  | 1.00  |       |       |
| 16 Dividend constraint                                                    | -0.08 | 0.01  | 0.03  | -0.13 | 0.002 | 0.03  | 0.002 | 0.03  | 0.02  | -0.03 | -0.11 | -0.02 | 0.04  | 0.11  | 0.07  | 1.00  |       |
Table 4  Regression Analysis on NYSE Firms Covered by IRRC

The sample includes 3,734 NYSE firm-year observations from 1998 to 2002. Intercept terms, coefficients on year dummies, and coefficients on dummy variables corresponding to 2-digit SIC codes are not reported. T-statistics are calculated using Huber-White heteroscedasticity- and autocorrelation-consistent standard errors, and presented in the parentheses. All variables are defined in table 2.

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Predicted Sign</th>
<th>Dependent Variables</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cash Comp., (1)</td>
<td>Stock &amp;Option Comp., (2)</td>
</tr>
</tbody>
</table>

**Comp. Committee Structure Information**

- % of insiders on the comp. committee, \( t \): + (0.22) 0.48 0.29
- % of affiliated directors on the comp. committee, \( t \): + 0.07 -0.19 -0.14
- Compensation committee size, \( t \): ? 0.02 -0.11 -0.10

**Board Structure Information**

- % of insiders on the rest of the board, \( t \): + 0.12 0.11 0.20
- % of affiliated directors on the rest of the board, \( t \): + 0.25 1.89 2.28
- CEO is board chair, \( t \), (dummy): + 0.17 -0.13 0.15
- Compensation committee size, \( t \): ? 0.02 -0.11 -0.10

**Ownership Structure Information**

- CEO % stock ownership, \( t \): - -0.89 -8.18 -10.44
- Average % stock ownership by non-CEO insider directors, \( t \): - 0.03 -0.19 -0.16
- Outside director 1% holding, \( t \): - -0.15 -0.21 -0.43

**Firm-characteristics**

- log(sales, \( t-1 \)) + 0.54 1.72 2.55
- Book-to-market, \( t-1 \): - -0.05 -4.50 -4.91
- Stock Return, \( t \): + 0.45 0.33 0.85
- Stock Return, \( t-1 \): + 0.29 0.08 0.16
- Net Operating Loss, \( t-1 \): - -0.11 0.41 0.22
- Cash Constraint, \( t-1 \): - -0.99 0.95 -1.00
- Dividend Constraint, \( t-1 \): - -0.10 0.28 0.26

**Adjusted R²**

48.75% 28.86% 38.09%
Table 5  Regression Analysis on a Sub-sample
Already Complying with NYSE’s New Governance Standards

The sample includes 1,157 NYSE firm-year observations from 1998 to 2002, which already satisfy the
requirements of the NYSE’s new corporate governance (i.e., compensation, audit, and nominating / corporate
governance committees are composed solely of independent directors, and the boards have a majority of
independent directors). Intercept terms, coefficients on year dummies and on dummy variables corresponding
to 2-digit SIC codes are not reported. T-statistics are calculated using Huber-White heteroscedasticity- and
autocorrelation-consistent standard errors, and presented in the parentheses. All variables are defined in table 2.

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>Predicted</th>
<th>Cash Comp.</th>
<th>Stock &amp; Option Comp.</th>
<th>Total Comp.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sign</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

**Comp. Committee Information**

Compensation committee size \(t\)
-0.003 (-0.15) 0.03 (0.21) -0.02 (-0.14)

**Board Structure Information**

% of insiders on the rest of the board \(t\)
0.28 (1.75) 1.58 (1.65) 1.99 (1.82)

% of affiliated directors on the rest of the board \(t\)
0.20 (0.71) 2.93 (1.83) 3.81 (1.97)

CEO is board chair \(t\) (dummy)
0.11 (2.12) -0.64 (-1.28) -0.43 (-1.09)

Number of directors on the rest of the board \(t\)
0.05 (3.13) 0.07 (0.60) 0.12 (0.86)

**Ownership Structure Information**

CEO % stock ownership \(t\)
-0.99 (-0.73) -10.30 (-2.35) -11.46 (-2.16)

Average % stock ownership by non-CEO insider directors
0.06 (2.27) -0.17 (-1.71) -0.13 (-1.17)

Outside director 1% holding \(t\)
-0.22 (-3.74) -0.50 (-1.71) -0.74 (-2.09)

**Firm-characteristics**

log(sales \(_{t-1}\))
0.52 (14.56) 1.61 (9.11) 2.48 (12.01)

Book-to-market \(_{t-1}\)
-0.18 (-1.41) -4.55 (-7.47) -4.92 (-7.09)

Stock Return \(_t\)
0.44 (7.54) 0.34 (0.96) 0.85 (2.20)

Stock Return \(_{t-1}\)
0.18 (2.76) 0.33 (1.10) 0.19 (0.48)

Net Operating Loss \(_{t-1}\)
-0.11 (-1.83) 0.47 (1.45) 0.36 (0.94)

Cash Constraint \(_{t-1}\)
-0.45 (-0.99) 3.79 (1.68) 2.91 (1.11)

Dividend Constraint \(_{t-1}\)
-0.05 (-1.04) 0.31 (1.07) 0.19 (0.56)

Adjusted \(R^2\) 57.76% 32.93% 42.80%

37
The Relation between subsequent firm performance and predicted excess CEO compensation - An analysis on firms already complying with NYSE’s New Governance Standards

The sample consists of a sub-sample of firms already complying with NYSE’s new governance standards for which subsequent performance data is available in the years after CEO compensation was earned. Predicted excess compensation is the amount of compensation attributable to the board and ownership variables (estimated with the coefficients from the total compensation regression in Table 5), scaled by total compensation. ROA is the ratio of earnings before interest and taxes to total assets for the prior year. The standard deviation of ROA (stock returns) is standard deviation of annual percentage corporate return on assets (annual percentage stock market return) for the five years ending with the year prior (e.g., 1998) to the year in which compensation is awarded (e.g., 1999). Sales are for the year prior to the year in which compensation is awarded. LN(market value of equity) and the book-to-market ratio are calculated based on the market value and book value of the firm’s equity at the end of the year prior to which compensation is awarded. Intercept terms, coefficients on year dummies, and coefficients on dummy variables corresponding to 2-digit SIC codes are not reported. T-statistics are based on OLS standard errors.

Panel A: Subsequent Operating Performance

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>(1) One-year</th>
<th>(2) Two-year</th>
<th>(3) Three-year</th>
<th>(4) One-year</th>
<th>(5) Two-year</th>
<th>(6) Three-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicated excess cash compensation</td>
<td>-8.64 (-3.86)</td>
<td>-7.16 (-2.66)</td>
<td>-5.03 (-1.63)</td>
<td>-2.16 (-2.77)</td>
<td>-1.66 (-1.83)</td>
<td>-1.08 (-1.00)</td>
</tr>
<tr>
<td>Predicated excess stock and option compensation</td>
<td>0.08 (0.92)</td>
<td>0.11 (1.03)</td>
<td>0.11 (0.84)</td>
<td>0.09 (1.10)</td>
<td>0.13 (1.21)</td>
<td>0.11 (0.84)</td>
</tr>
<tr>
<td>Standard deviation of ROA</td>
<td>-0.00008 (-2.38)</td>
<td>-0.00008 (-1.97)</td>
<td>-0.00007 (-1.28)</td>
<td>-0.00006 (-1.79)</td>
<td>-0.00006 (-1.55)</td>
<td>-0.00005 (-0.99)</td>
</tr>
<tr>
<td>Sales</td>
<td>Adj.-R²</td>
<td># of Observations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23.89%</td>
<td>23.54%</td>
<td>28.46%</td>
<td>23.23%</td>
<td>23.01%</td>
<td>28.06%</td>
</tr>
<tr>
<td></td>
<td>894</td>
<td>596</td>
<td>348</td>
<td>894</td>
<td>596</td>
<td>348</td>
</tr>
</tbody>
</table>
### Panel B: Subsequent Stock Performance

<table>
<thead>
<tr>
<th>Explanatory Variables</th>
<th>One-year</th>
<th>Two-year</th>
<th>Three-year</th>
<th>One-year</th>
<th>Two-year</th>
<th>Three-year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicated excess cash compensation</td>
<td>12.05</td>
<td>9.64</td>
<td>5.96</td>
<td>3.03</td>
<td>1.22</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>(0.99)</td>
<td>(0.49)</td>
<td>(0.60)</td>
<td>(0.84)</td>
<td>(0.17)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Predicated excess stock and option compensation</td>
<td>-0.36</td>
<td>-0.16</td>
<td>-0.05</td>
<td>-0.37</td>
<td>-0.32</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>(-2.74)</td>
<td>(-1.13)</td>
<td>(-0.87)</td>
<td>(-2.82)</td>
<td>(-0.21)</td>
<td>(0.63)</td>
</tr>
<tr>
<td>Standard deviation of Stock Returns</td>
<td>-2.04</td>
<td>-1.68</td>
<td>-1.31</td>
<td>-2.35</td>
<td>-2.82</td>
<td>-1.53</td>
</tr>
<tr>
<td></td>
<td>(-1.69)</td>
<td>(-1.34)</td>
<td>(-1.16)</td>
<td>(-2.07)</td>
<td>(-2.26)</td>
<td>(-1.33)</td>
</tr>
<tr>
<td>LN(Market value of equity)</td>
<td>15.40</td>
<td>15.62</td>
<td>-3.89</td>
<td>16.19</td>
<td>16.03</td>
<td>2.74</td>
</tr>
<tr>
<td></td>
<td>(2.72)</td>
<td>(2.49)</td>
<td>(-0.58)</td>
<td>(2.90)</td>
<td>(2.49)</td>
<td>(0.41)</td>
</tr>
<tr>
<td>Book-to-market ratio</td>
<td>7.59%</td>
<td>19.49%</td>
<td>20.87%</td>
<td>8.55%</td>
<td>18.92%</td>
<td>19.49%</td>
</tr>
<tr>
<td></td>
<td>894</td>
<td>596</td>
<td>348</td>
<td>894</td>
<td>596</td>
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