CONSEQUENCES OF VOLUNTARY DISCLOSURE FOR CEOs:

EVIDENCE FROM ISSUING EARNINGS GUIDANCE IN THE FACE OF AN EARNINGS SURPRISE

by

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ABSTRACT

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Some CEOs decide to voluntarily issue warnings (tip-offs) when they expect a negative (positive) earnings surprise. Prior research suggests that warnings have incremental information beyond actual earnings and warning firms tend to experience permanent, instead of transitory, earnings losses. This paper investigates whether boards of directors use warnings or tip-offs when evaluating CEO performance. In particular, this study examines the effect of warnings and tip-offs on CEO annual bonus, option grants, and turnover. I find that warnings are significantly negatively associated with CEO bonus and positively associated with option grants. This finding indicates that boards of directors adjust CEO compensation toward a more future-oriented structure after warnings are issued. I also find that after warnings are issued, the sensitivity of bonus to stock returns increases significantly, while the sensitivity of option grants to stock returns does not differ from that of non-warning firms. Furthermore, I provide evidence that both CEOs' bonus and option grants incorporate peer firms' performance (both the stock returns and the information content from warnings) to filter out the external shocks that are common to the industry peers. In contrast, I find little evidence that tip-offs affect CEO bonus and option grants. Lastly, I show that as another potential direct benefit for CEOs, issuing warnings reduces CEO turnover. Overall, these findings suggest that the signal from warnings is used in determining

CEO compensation and job retention. In addition, my findings provide new insights into the trade-off between bonus, option grants and job retention when CEOs issue management earnings guidance in the face of an earnings surprise.

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Consequences of Voluntary Disclosure for CEOs:

Evidence from Issuing Earnings Guidance in the Face of an Earnings Surprise

1. Introduction

When faced with an upcoming earnings surprise, CEOs have to decide whether to voluntarily issue earnings guidance. The earnings guidance issued in the face of an earnings surprise can come in the form of warnings or tip-offs. Warnings are defined as negative earnings guidance (i.e., guidance that falls short of the existing market expectations) issued near or after the end of the fiscal quarter (Kasznik and Lev 1995; Tucker 2007) and tip-offs as positive earnings guidance (i.e., guidance that exceeds the existing market expectations) issued during the same time period. In this paper, I examine four questions related to warnings and tip-offs: (1) Do warnings/tip-offs affect CEO bonus and option grants? (2) Does the sensitivity of bonus and option grants to performance change when warnings/tip-offs are issued? (3) Conditional on the decision to warn/tip off, what is the effect of *peer* firms' warnings/tip-offs on a firm's sensitivity of bonus and option grants to performance? (4) Do warnings affect CEO turnover?

These research questions are important. Evidence in prior literature suggests that less than 25% of firms preempt negative earnings surprise and less than 10% of firms preempt positive earnings surprise (Skinner 1994; Kasznik and Lev 1995). Prior studies demonstrate some benefits of issuing earnings guidance such as reduced litigation cost (Skinner 1997), reduced information asymmetry among investors (Coller and Yohn 1997), and increased number of analysts following the firm (Lang and Lundholm 1996b).[1] However, little evidence is offered on

[1] Houston, Lev, and Tucker (2010) and Chen, Matsumoto, and Rajgopal (2011) study the firms that stopped issuing earnings guidance and they find similar results that forecast accuracy is reduced and forecast dispersion is increased after firms cease management earnings guidance. For a comprehensive review of benefits and costs of providing

the costs of providing earnings guidance with the exception of negative market reactions to warnings (Kasznik and Lev 1999; Tucker 2007). If there is little cost, one would expect that most firms that expect an earnings surprise would either warn or tip off so that the investors will not be caught off guard. So, why wouldn't they warn or tip off? Specifically, are there any consequences of providing warnings/tip-offs in terms of CEO compensation and turnover?

Research that directly examines the relation between management earnings guidance and CEO compensation is limited. Focusing on options that have fixed award schedule, Aboody and Kasznik (2000) show that CEOs are more likely to issue negative earnings guidance prior to the option grant dates. By timing the negative earnings guidance, CEOs try to lower the strike price on the grant date and maximize their stock option compensation. Nagar, Nandar and Wysocki (2003) argue that CEOs with greater levels of equity holdings have incentives to issue earnings guidance in order to avoid equity mispricing which may adversely affect their wealth. However, neither of these papers looks at the bonus component of the CEO compensation. Moreover, the evidence in their studies is *ex ante* in that it shows that equity compensation affects the decision to issue earnings guidance, but the *ex post* effect (i.e., *realized* effect) of the earnings guidance on CEO compensation has yet to be examined. My study tries to fill this void.

Research on the association between earnings guidance and CEO turnover is also limited with the exception of Lee, Matsunaga, and Park (2010). Lee et al. (2010) find evidence that probability of CEO turnover decreases with management guidance accuracy, indicating that management guidance acts as a signal regarding the CEOs' capability of handling uncertainty of the business. The most notably difference between Lee et al. (2010) and my study is that they use the initial management guidance to measure the CEOs' forecast capability while I study the

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earnings guidance, see http://www.capmktsreg.org/pdfs/09-Sept-15_CCMR-Miller_Study_on_Earnings_Guidance.pdf.

guidance issued at a later time of a quarter to measure information content of the guidance. Taken together, the four questions I raise are new to accounting literature and answers to these questions will contribute to both CEO compensation and CEO turnover literature.

First, I study the effect of warnings/tip-offs on CEO annual bonus. Results from Kasznik and Lev (1995) and Tucker (2007) suggest that warnings are issued for permanent earnings disappointments and transitory ones are unwarned. Specifically, KL find that analysts adjust forecast of *next year's* earnings more negatively for warning firms, and Tucker (2007) shows that warning firms' next year performance is significantly lower than non-warnings firms'. Since Holmstrom (1979) suggests that optimal contract should include all informative variables that reflect the agents' performance, the above evidence predicts that CEOs of firms that issue warnings may experience greater bonus reductions than those that do not issue warnings if compensation committees consider the signal of warnings as another indicator of CEO performance in addition to accounting based and stock based returns. On the contrary, it is possible that compensation committees do not regard signal of warnings as useful since actual earnings are released by the time the compensation committees determine the compensation level. Besides, it is also possible that compensation committees become more lenient towards those CEOs who are up-front about the forthcoming bad news as they are more knowledgeable of the situation. Therefore, these arguments suggest that it is an empirical question whether and how warnings affect CEO bonus.

Stock-based compensation is another important component of compensation contract. The poor performance signaled by warnings may indicate that the interests of managers are not well aligned with those of shareholders. Core, Guay, and Larcker (2003), among others, argue that equity incentive levels could affect CEOs' action and firm performance. Because warning firms' equity incentive levels are significantly lower than their control firms during the years before the year when warnings are issued, I expect that boards of directors will grant more option-based compensation to provide more incentives to CEOs. Moreover, the opportunistic timing of negative earnings guidance by CEOs to maximize the value of their option grants may be allowed by the board of directors as an implicit form of compensation (Aboody and Kasznik 2000). In addition, granting more options can make up CEOs' potential bonus cuts and encourage CEOs to voluntarily disclose negative earnings guidance.

While Prior literature offers no direct evidence on whether tip-offs contain incremental information beyond actual earnings, previous analytical and empirical findings suggest that voluntary disclosures of good news (e.g., tip-offs) are less credible than bad news (e.g., warnings) (Sansing 1992; Jennings 1987; Hutton, Miller, and Skinner 2003; Rogers and Stocken 2005). Hence, another empirical question to ask is what the impact of tip-offs on CEO bonus and options would be. My sample for testing warning effect consists of 1,218 warning firms and 5,729 non-warning control firms from 1996-2005, and the sample for testing tip-off effect consists of 494 tip-off firms and 9,028 non-tip-off control firms from the same time period.[2] After controlling for self-selection of warnings and tip-offs, I find that warnings are significantly negatively associated with CEO bonus and positively associated with option grants. However, I find little evidence on the impact of tip-offs on CEO bonus and option grants.[3] It thus appears that compensation committees view the information from warnings but not from tip-offs as an important performance measure in addition to actual earnings announced shortly after the warnings. More importantly, it appears that the compensation structure is shifted away from

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[2] Non-warning control firms are defined as firms that (1) expected a negative earnings surprise and (2) decided not to warn. Non-tip-off control firms are defined as firms that (1) expected a positive earnings surprise and (2) decided not to tip off. For details, please refer to sample selection and descriptive statistics.

[3] To conserve space, I only develop hypotheses regarding the effect tip-offs on CEO bonus. The results of tip-offs' impact on option grants are statistically insignificant and unreported.

cash-based compensation and move toward more option-based compensation after warnings are issued, indicating that boards of directors reduce CEOs' bonus because of their bad performance but increase option grants to provide more incentives to CEOs.

The second issue I examine is the effect of warnings/tip-offs on bonus-to-performance sensitivity and option-to-performance sensitivity. When warnings are issued, stock returns reflect more information about firm performance and future prospect than do accounting earnings. Lambert and Larcker (1987) suggest that stock returns become more useful in evaluating CEO performance when stock returns are more informative about firm performance. Consistent with this prediction, I find that sensitivity of CEO bonus to stock returns increases significantly when warnings are issued, but warning firms' sensitivity of option grants to stock returns does not differ from non-warning firms'. On the contrary, I find no evidence of systematic difference in the sensitivity of bonus and option grants to stock returns between tip-off and non-tip-off firms.

Third, I investigate the effect of *peer* firms' warnings/tip-offs on a firm's pay-performance sensitivity. Based on the literature on relative performance evaluation (RPE) and information transfer, I expect that signal from peer firms' warnings is utilized in determining CEO compensation to filter out the systematic shocks that are common to industry peers. I find evidence that bonus-to-stock-returns sensitivity and option-to-stock-returns sensitivity for warning firms decreases as the number of warning peers increases. This means that when more peer firms issue warnings, the signal of warnings indicate an industry-wide effect and therefore, CEO compensation will be less responsive to warnings. I do not find evidence that pay-performance sensitivity of tip-off firms differs from that of non-tip-off firms, indicating again that credibility of tip-offs does play an important role when it comes to CEO compensation.

Lastly, I explore the potential benefits of issuing warnings for CEOs. Previous studies document some benefits of voluntarily disclosing bad news such as reduced litigation cost (Skinner 1997), avoidance of a decrease in analyst following (Tucker 2010), and lower option strike price (Aboody and Kasznik 2000). Nevertheless, these documented benefits are *indirectly* related to CEOs themselves. To see if there is any direct benefit, I empirically investigate whether CEOs are willing to forgo their bonus in order to lock in their position and prevent job termination. Consistent with Trueman (1986) and Lee et al. (2010) that management forecast accuracy is an indicator of CEO ability, I predict that warnings increase management forecast accuracy and further reduce CEO turnover. As predicted, I find that CEO turnover is attenuated by issuing warnings. To assess the economic significance of this potential benefit, I calculate the marginal benefit of issuing warnings and find that, holding other conditions constant, turnover rate of warning firms is 6.5 percentage point lower than non-warning firms. Therefore, the effect of reduced turnover sensitivity is economically significant. Thus, I provide *direct* evidence of a benefit from issuing warnings for CEOs.

This paper contributes to the accounting literature in several ways. First, it contributes to the management earnings guidance literature by examining both positive and negative earnings guidance. This research design produces rich implications on the asymmetric benchmarking in compensation in the context of good news and bad news voluntary disclosures. In doing so, I add new evidence to the current debate over the usefulness of management earnings guidance.

Second, this paper adds to the literature on the determinants of CEO compensation by demonstrating that compensation committees also view the information conveyed in warnings as an important performance measure. Furthermore, I show that bonus-to-stock-returns sensitivity increases when warnings are issued, suggesting that in the case of warnings, stock returns become more relevant in evaluating CEOs' performance.

Third, this paper contributes to the literature on both RPE and information transfer. This paper extends RPE literature by documenting an effect of peer firms' management guidance on a firm's pay-performance sensitivity. This finding sheds light on the long-term debate concerning the existence of RPE. Information transfer literature has mainly looked at how investors take account of information transferred among peer firms and among firms that in a supply chain (i.e., suppliers and buyers), and the internal usefulness of the information transferred has received less attention. This paper fills this void by documenting that the information transferred is also used in the compensation contract.

Lastly, this study provides evidence on direct benefits of issuing warnings for CEOs. The result shows that CEO turnover is lower for warning firms than non-warning firms. This evidence suggests that CEOs are willing to issue negative earnings guidance to help keep their jobs.

The rest of the paper is organized as follows. Section 2 reviews related literature and develops hypotheses. Sample selection and descriptive statistics are discussed in section 3. Research designs and empirical results are presented in section 4. Section 5 details the robustness checks and section 6 concludes the paper.

2. Literature Review and Hypothesis Development

2.1 Cash Compensation and Pay-Performance Sensitivity

The standard agency model (Holmstrom 1979) shows that agent's compensation is a function of the firm's performance and optimal contracts should include *all* informative variables about the agent's action or the state of nature. Evidence from companies' proxy statement supports the prediction of the agency model. For example, J & J Snack's 2000 proxy statement indicates the following:

> *"…The Committee also considers matters which are likely to have a long term impact on the Company but may not be reflected on the annual financial statements."*

Kasznik and Lev (1995) document significantly lower abnormal returns for firms that issue warnings about impending earnings disappointments than returns for non-warning firms during a combined window of 5 days around warnings and 5 days around earnings announcements.[4] More importantly, they also argue that warnings are issued for permanent earnings disappointments while transitory earnings disappointments are not warned by showing that analysts adjust forecast of *next year's* earnings more negatively for warning firms. As accounting earnings reflect the past performance, the analysts' adjustment is more likely to reflect the incremental information revealed by warnings.[5] This is also supported by the anecdotal evidence that warnings raise analysts' concern about the firms' long-term comparability. Therefore, compensation committees are likely to consider the information implication of warnings when granting bonuses to CEOs as warnings signal the persistence of earnings disappointments not reflected in actual earnings.[6]

Matsunaga and Park (2001) document a significant incremental adverse effect on CEO bonus when a firm's quarterly earnings fall short of the consensus analyst forecast or the

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[4] After controlling for self-selection and expanding the test window to three months, Tucker (2007) finds that warning firms still experience a lower abnormal return than non-warning firms during the three-month window starting from the beginning of the third fiscal month of the event quarter to one month after the earnings announcement. Although she does not find evidence of lower abnormal returns if the event window is further extended to two months after the end of the earnings announcement month, this finding may result from the contamination by other events.

[5] The analyst forecast revision is measured around warnings as wells as earnings announcements.

[6] One may argue that since the market values the warning signals, compensation committees can directly use stock returns as the performance measure, instead of warnings, to decide the amount of bonus. However, Murphy (1999) provides survey evidence suggesting that almost all bonus plans rely on some measure of accounting profits and stock-returns are not commonly used.

earnings for the same quarter of the prior year for at least two quarters during the year. One explanation of the results, they suggest, is that the compensation committee views missing the forecast as a signal of poor performance.[7] Likewise, compensation committees may also consider warnings as a signal of poor performance, and CEO bonuses may be adversely affected.[8] In sum, the above arguments suggest that issuance of warnings may raise the compensation committees' concern about the firm's viability and lead to a reduction of CEO bonus.

Nonetheless, it is possible that compensation committees do not regard information from warnings as useful since the actual earnings will be available when bonuses are granted. On the other hand, CEOs voluntarily issue warnings before earnings are released, indicating that these CEOs have a better handle of the situation and can act accordingly. As suggested by Murphy (1999) that board-level discretion also affects some portion of bonus plan, compensation committees may become lenient with these CEOs, leading to a less negative or even a positive effect on CEO pay. Taken together, it is an empirical question as to whether and in what direction warnings affect CEO bonus.

Therefore, my first hypothesis is stated in null form:

Hypothesis 1a: Ceteris paribus, CEO bonus is not associated with whether an earnings warning is issued.

Turning to the issuance of tip-offs, Choi, Myers, Zang, and Ziebart (2010) find that management guidance allows returns to better reflect future earnings. They do not differentiate negative and positive guidance, so it is possible that positive earnings guidance also has

[7] In addition, they also suggest that because missing analysts' forecasts could cause negative market reactions (Barth, Elliott and Finn 1999), directors are concerned about this negative market reaction and as a result, CEO bonus will be negatively affected by this event.

[8] The warnings/tip-offs effect is twofold: warnings/tip-offs could directly affect CEO bonus (H1) and warnings/tip-offs could also affect the sensitivity of bonus to performance measures (H2).

information implication for future earnings and compensation committees may consider tip-offs as a positive signal of CEO performance. However, both empirical and theoretical papers have suggested that good news forecasts are in general less credible.[9] Sansing's (1992) model predicts that favorable management forecasts are less credible than unfavorable forecasts because accounting system does not capture all value-relevant information and, specifically, some of good news is not reflected in the accounting system and thus investors find it hard to verify. A few empirical studies provide the evidence that support this theoretical prediction. Jennings (1987) documents that good news management forecasts are less credible than bad news forecasts where the type of news is measured by the subsequent analysts' forecasts revisions. He further shows that "believability" has incremental explanatory power over the surprise component of the management forecasts in explaining security returns. A recent study by Ng, Tuna, and Verdi (2008) shows that post-forecast returns seem to be more prominent for good news forecasts, suggesting that the market regards good news as being less credible and thus takes a longer time to respond to them. Thus, it is unclear whether compensation committees consider tip-offs as a credible signal of CEO performance. I state hypothesis 1b as follows:

Hypothesis 1b: Ceteris paribus, CEO bonus is not associated with whether an earnings tip-off is issued.

Next, I examine whether the sensitivity of CEO bonus to performance is affected by warnings and tip-offs. Lambert and Larcker (1987) suggest that *market* measures of performance, such as stock returns, become more useful to evaluate agent's performance when the consequences of the agent's current-period actions tend to be realized in the future and are not fully reflected in current-period accounting numbers.

[9] I use management forecast and management guidance interchangeably in this paper.

Choi et al. (2010) show that current period returns are more positively associated with future earnings for guidance firms, with good or bad news guidance, than for non-guidance firms. Furthermore, they find that this association is even stronger for firms providing short-term quarterly (annual) management forecasts, indicating that warnings and tip-offs provide incremental information that allows stock returns to better reflect future earnings.[10,11] Combined with the evidence referenced earlier that stock returns impound the incremental information of warnings, Lambert and Larcker's (1987) argument can be extended that CEO pay should be more closely tied to stock returns during the years warnings are issued.

Therefore, I expect that CEO bonus is more sensitive to stock returns when warnings are issued than when warnings are not issued.

Hypothesis 2a: Ceteris paribus, the bonus sensitivity to stock returns is higher for warning firms than for non-warning firms.

Based on the credibility concern of good news disclosure discussed in *Hypothesis 1a*, it is unclear if stock returns reflect the information disclosed in tip-offs. Therefore, I test the following non-directional hypothesis, stated in null form:

Hypothesis 2b: Ceteris paribus, firms' bonus sensitivity to returns is not associated with whether an earnings tip-off is issued.

2.2 Effect of Peer Firms' Warnings/Tip-offs on a Firm's Bonus-Performance Sensitivity

Research on RPE focuses on how peers' reported accounting performance and stock returns affect CEO compensation (Gibbons and Murphy 1990; Jenson and Murphy 1990; Janakiraman, Lambert, and Larcker 1992; Aggarwal and Samwick 1999; Garvey and Milbourn

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[10] Choi et al. (2010) define short-term forecasts as those made in the current fiscal year.
[11] Choi et al. (2010) study all earnings guidance, and warnings and tip-offs are just part of earnings guidance.

2003; Albuquerque 2009).[12] Another stream of literature studies the phenomenon of intra-industry information transfer, which is the effect of information disclosed by one industry member on the stock prices of other members (e.g., Foster 1981; Lang and Stulz 1992; Lang and Lundholm 1996a). However, this literature only looks at external users' reactions to the information transferred such as investors' reactions but not internal users' reactions such as boards of directors'. My study goes beyond peer firms' reported earnings on the stock returns of the firm in question and investigates whether peer firms' warnings/tip-offs affect the firm's CEO bonus-to-performance sensitivity, in addition to the above hypothesized effect of a firm's own warnings and tip-offs on its CEO's bonus-to-stock-returns sensitivity.

I first examine the association between CEO bonus-to-performance sensitivity and peer firms' warnings. Note first that there are two sub-groups among warning firms: (1) warning firms with warning peers, i.e., a few peers also issued earnings warnings in the same quarter, and (2) warning firms without warning peers. Peers are defined as firms in the same market size quartile and from the same industry.

Firms grant their CEOs bonuses after the fiscal year ends and after the financials are released. Based on hypotheses 1a and 2a, if warnings have incremental information beyond reported earnings and other financial numbers, the compensation committee of a firm may also consider the information content of its peer firms' warnings. Prior studies on information transfers from management forecast (Baginski 1987; Han, Wild and Ramesh 1989; Pyo and Lustgarten 1990) show that good (bad) news forecasts from a forecasting firm lead to a positive (negative) stock market reaction to non-forecasting firms in the same industry. A recent study by Kim, Lacina and Park (2008) pushes forward this line of research by documenting that

[12] Evidence that peers' accounting-based earnings and stock returns are used in compensation contract will be referred to as "traditional" RPE evidence hereafter.

information transfer can be positive or negative depending on the level of competiveness between a forecasting firm and a non-forecasting firm. These findings indicate that investors use information of peer firms' management forecast to assess a firm's value. In addition, Lang and Lundholm (1996a) show a negative (positive) relation between a firm's return during the industry earnings announcement (pre-earnings-announcement) window and its *peer* firms' earnings surprise. Based on these results, they draw the inference that information regarding the industry-wide component of future value arrives in the pre-announcement period. As such, as more and more peer firms issue warnings, it becomes clearer that the whole industry is not doing well. In other words, by issuing earnings warnings along with its peers, the firm's CEOs may be able to attribute the poor performance of his firm to the industry or the market and as a result, his bonus will be less sensitive to his firm's performance than it otherwise would be.

Moreover, there is evidence that compensation arrangements are indeed influenced by how outsiders perceive these arrangements (Bebchuk and Fried 2004). Investors, acting as one group of outsiders and potentially the most important outsiders, perceive warnings as a negative signal about the financial performance of the company. If warning firms are accompanied with warning peers, then the presence of warning peers provides the CEOs with a reason to justify the not-so-good performance. When warning firms do not have warning peers, they stand out. It is more difficult for them to blame external factors for their poor performance. This is consistent with the findings in Tse and Tucker (2010) that managers tend to time their warnings soon after their peers' warnings, but they do not time tip-offs. Therefore, Tse and Tucker (2010) infer that such behavior is motivated by managers' incentives to reduce their responsibility for earnings shortfalls. The third hypothesis is stated as follows:

Hypothesis 3a: Ceteris paribus, conditional on the decision to warn, bonus-to-stock-returns sensitivity for warning firms decreases as the number of warning peers increases.

Given the weak evidence of information content of tip-offs argued in hypotheses 1b and 2b and the non-result of timing of tip-offs documented in Tse and Tucker (2010), the following hypothesis is stated in null form:

Hypothesis 3b: Ceteris paribus, the number of peer firms providing tip-offs does not affect the pay-performance sensitivity for firms that tip off investors about the forthcoming positive earnings surprise.

2.3 Stock-Based Compensation and Option-Performance Sensitivity

Another important component of compensation is stock-based compensation. Contrary to cash-based compensation, stock-based compensation is designed to provide incentives to increase share price and to align managers' interests with shareholders' (Jensen and Meckling 1976 and Antle and Smith 1986). As discussed above, warnings signal that these firms are experiencing a bad time and the poor performance may persist into the future, indicating that the actions and the choices of CEOs are not well aligned with the welfare of shareholders.

As suggested by Jensen (1989), Mehran (1995) and Core, Holthausen, and Larcker (1999), monitoring functions by the board of directors, debt-holders, and institutional shareholders have an important impact on the performance of a firm. In addition, it is also argued that compensation contracts, the equity incentives in particular, could affect CEOs' action and have an impact on firm performance (Core et al. 2003). Consistent with this argument, Core and Larcker (2002) find that for a sample of firms that adopt "target ownership plans (plans to require minimum of amount of stock)", their performance improved significantly after CEOs increased their stock ownership as these firms had significantly lower level of equity holdings before adopting the plan. Hence, it is expected that compensation committees provide more option compensation during the years warnings are issued.[13]

In addition, prior studies have shown that managers opportunistically time their negative earnings guidance before option grant dates for firms with fixed award schedule, and time the option grant dates for firms with variable award schedule (Aboody and Kasznik 2000) to maximize option compensation. Furthermore, Aboody and Kasznik (2000) state: "boards of directors may allow this disclosure strategy as an implicit form of incentive compensation." Thus, compensation committees may increase the number of options or allow the above disclosure strategy to achieve the goal of increasing equity compensation. On the other hand, it is reasonable to expect that boards of directors increase equity incentive not only to adjust mangers' incentive to a more optimal level, but also to make up for the potential penalty on cash compensation and to avoid discouraging CEOs from issuing negative earnings guidance The preceding discussion leads to the following hypothesis:

Hypothesis 4: Ceteris paribus, warning firms experience an increase in their CEOs' option grants than non-warning firms .

As argued in hypothesis 2a, when warnings are issued, stock-returns reflect more information, which accounting-based earnings do not impound, and returns of warnings firms better reflect future earnings than do those of non-warning firms. Therefore, I expect that stock-based compensation will be more closely tied to stock-returns when warnings are issued. I state the following hypothesis in an alternative form,

Hypothesis 5: Ceteris paribus, the sensitivity of option grants to stock returns is higher for warning firms than for non-warning firms.

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[13] Bryan, Hwang, and Lilien (2000) document that restricted stock, due to its linear payoff function, is relatively inefficient in inducing risk-averse CEOs to accept risky but value-increasing investment projects. Additionally, restricted stock is not commonly used in compensation contract (Carter, Lynch, and Tuna 2007). Therefore, in this paper, I follow Cheng and Farber (2008) and focus on option compensation. In untabulated results, I also include restricted stock, and the conclusions are unchanged.

2.4 Effect of Peer firms' Warnings on a Firm's Option-Performance Sensitivity

Hypothesis 3a argues that when more and more peers issue warnings, (1) it indicates that the industry or the economy as a whole is not doing well; (2) CEOs are more likely to be able to attribute the poor performance to factors that are not under their control. This argument, combined with hypothesis 5, suggests that when there are a large number of warning peers, boards of directors may not grant as many stock options as they would otherwise because the poor performance is no longer indicative of CEOs' suboptimal incentive rather pertains to some common external factors. Stated differently, option grants become less sensitive to stock-based returns for warning firms with more warning peers than for warning firms with fewer warning peers. The hypothesis is stated as follows:

Hypothesis 6: Ceteris paribus, conditional on the decision to warn, the sensitivity of option grants to stock returns for warning firms decreases as the number of warning peers increases.

2.5 Rational for Choosing to Warn: Job Retention Hypothesis

Prior studies have documented some benefits of issuing bad news for firms such as deterring entry (Darrough and Stoughton 1990) and reduced litigation cost (Skinner 1997). Nevertheless, Darrough (1995) points out that most disclosure studies have not explicitly modeled incentives of managers themselves. As a first step toward empirically exploring *direct* benefits of issuing warnings for CEOs, I investigate whether CEOs are willing to voluntarily issue negative earnings guidance to help prevent job termination. Replacing a CEO is usually costly to shareholders because it involves a large amount of severance pay and uncertainty of the new hire's talent, so the impact of warnings on CEO turnover is expected to be different than on CEO pay.

Trueman (1986) suggests that management forecasts signal the manager's ability to anticipate economic environment changes and to adjust business plans accordingly. Management forecast accuracy can thereby be incorporated into the CEO retention decisions. Consistent with Trueman (1986), Lee et al. (2010) document that the absolute management forecast error is significantly positively associated with the probability of CEO turnover. However, they only measure accuracy of the first management forecast, ignoring the fact that CEOs may update their forecast by issuing warnings or tip-offs. CEOs issue warnings or tip-offs to update their previous forecasts with new information. If issuing warnings improves management forecast accuracy, it could reduce the probability of CEO turnover. In addition, Mercer (2005) finds that CEOs who disclose bad news timely experience an increased credibility among investors and this might have a positive effect on CEO turnover.

Therefore, the hypothesis is stated as:

Hypothesis 7: Ceteris paribus, the probability of CEO turnover decreases if a warning is issued.

3. Sample Selection and Descriptive Statistics

My sample is based on the intersection of the ExecuComp, First Call, I/B/E/S, and Compustat databases from 1996 to 2005. I start with firm year 1996 because the passage of the Private Securities Litigation Reform Act of 1995 changes the legal environment for firms disclosing forward-looking information. The sample period ends with 2005 because FAS123(R) takes effect from fiscal year after December 2005 and it changes the reporting rules for executive compensation. [14] I collect warnings/tip-offs from First Call Company Issued Guidance.

[14] The FASB issued FAS 123-R in December 2004, requiring the recognition of cost of the equity based compensation using fair value based measurement. This new regulation could result in increased compensation expenses, and firms may avoid this adverse effect by (1) avoiding new option grants; (2) accelerating the vesting of existing options; (3) shifting from stock option to restricted stock compensation (Carter, Lynch, and Tuna 2007). If

Consistent with warning studies by Kasznik and Lev (1995), Atiase, Supattarakul, and Tse (2006), Tucker (2007), and Tse and Tucker (2010), warnings are defined as negative earnings guidance (i.e., guidance that falls short of the existing market expectations) issued during the "confession window" (defined as the period between the beginning of the third month of a fiscal quarter and one day before earnings announcement date -- see figure 1) and likewise, tip-offs are defined as positive earnings guidance (i.e., guidance that exceeds the existing market expectations) issued during the same period.[15,16].

For warning firms, their control firms (non-warning firms) are chosen in a way similar to Tucker (2007). The non-warning firm years satisfy the following two requirements: (1) a firm does not warn during any quarter of a fiscal year; (2) within that year, there is at least one fiscal quarter during which the actual earnings are lower than analyst consensus forecast before the third fiscal month of the quarter (i.e., the confession window). This process yields a total of 6,947 firm-year observations with all necessary data from Compustat, First Call, I/B/E/S, and CRSP. Among all observations, 1,218 are warning observations and 5,729 are non-warning control observations. Table 1 presents the sample distribution for warning firms and non-warning control firms. All tests that are related to warning effects are based on this sample.

Similarly, I choose tip-offs that are issued during the confession window. The control sample includes all non-tip-off firms that satisfy the following two requirements: (1) a firm does not tip off investors of the forthcoming earnings during any quarter of a fiscal year; (2) within that year, there is at least one fiscal quarter during which the actual earnings are greater than the

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firms choose the first solution, they may increase the bonus grants in order to make up the total compensation. As a result, it could introduce systematic noise into my study.

[15] Positive and negative guidance are collected from First Call Company Issued Guidelines ("CIG") database. Tucker (2007) footnote 14 validates the accuracy of the classification of positive and negative guidance of CIG database.

[16] Guidance about annual earnings is treated as guidance for the fourth quarter. I also test all the hypotheses using the quarterly guidance and annual guidance separately, and the conclusions are similar.

existing analyst consensus forecast before the confession window. This process generates 494 tip-off firms and 9,028 control non-tip-off firms. The following tests that are related to tip-off effects are based on this sample.

Table 1, Panel A reports that firm years are distributed approximately evenly throughout the sample years and warning firms account for 18% of total sample firms. Panel B of Table 1 tabulates the top twenty industries with the largest number of warnings where industries are classified according to two-digit SIC code. It shows that almost all industries issue warnings although chemical industry, machinery, electronic equipment, business services and instruments are the industries where most warnings are issued. The non-warning firms are almost proportionally distributed as are warning firms. Table 1, Panel C describes the main variables used in the empirical tests. Compared to non-warning firms, warnings firms experience greater bonus reduction, lower ROA growth, and lower annual cumulative returns. In addition, they are more likely to miss last year's earnings, experience lower quarterly earnings surprises and lower sales growth. Overall, the summary statistics indicate that warnings firms perform, on average, worse than non-warnings firms. Table 2 presents the correlation matrix for main variables and for variables that affect the decision to warn.

In Table 3, Panel A, I report the sample distributions of tip-off issuers and non-tip-off issuers. There appears to be a trend of an increasing frequency of tip-offs during the sample period. The percentage of firms that tip off investors of upcoming positive earnings surprise increases from 1% in 1996 to 9% in 2002. Table 1, panel A also shows that the percentage of firms that issue warnings also peaked in 2002. Combined together, it is possible that the enactment of SOX in 2002 lead to the wave of voluntary disclosures. Comparing Panel A of Table 3 with Panel A of Table 1 reveals that firms are less likely to disclose good news than bad news, consistent with findings in Skinner (1994, 1997). Panel B of Table 3 lists top twenty industries with the highest number of tip-offs. It appears that industries that are frequent warning issuers are also frequent tip-off issuers. Panel C of Table 3 shows that tip-off issuers have greater bonus growth, greater ROA growth, higher stock returns, higher quarterly earnings surprise, and greater sales growth, and are more likely to beat last year's earnings. In general, tip-off firms outperform non-tip-off firms. Table 4 presents correlation matrix of variables used in testing tip-off effect.

The sample for testing the warning effect is also the initial sample for testing turnover hypothesis. Since ExcuComp does not specify the types of CEO turnover and the actual announcement of CEO turnover, I use the hand collected turnover data from Hazarika, Karpoff, and Nahata (2011). Because their turnover sample is from 1992-2004, I end up with 4,383 firm-year observations for testing turnover hypothesis. According to Hazarika et al. (2011), they search the Factiva and Lexis-Nexis databases to locate the announcement date for each turnover, and the reason for the CEOs' departure.[17] The descriptive statistics for turnover hypothesis testing are presented at section 4.6.

4. Research Design and Empirical Results

4.1 Testing the Effect of Warnings on CEO Bonus and Bonus-Performance Sensitivity

4.1.1 Research Design of Baseline Model

Hypotheses 1a examines whether warnings affect CEO bonus and hypotheses 2a predicts that warnings positively affect bonus sensitivity to stock returns, i.e. warnings are associated

[17] Please refer to Hazarika et al (2011) for the details on how forced and voluntary turnover are defined.

with stronger bonus-to-stock-returns sensitivity. To test Hypotheses 1a and 2a, I first estimate the following baseline model on a pooled cross-sectional, time-series basis:[18]

$$
\begin{aligned}
\Delta \ln(\mathrm{BONUS}_{it}) = \beta_0 &+ \beta_1 \Delta\mathrm{ROA}_{it} + \beta_2 \mathrm{RET}_{it} + \beta_3 \Delta\mathrm{ROA}_{it} \times \mathrm{WARN}_{it} + \beta_4 \mathrm{RET}_{it} \times \mathrm{WARN}_{it} \\
&+ \beta_5 \mathrm{WARN}_{it} + \beta_6 \mathrm{NEWS}_{it} + \beta_7 \mathrm{SUR\_MIN\_ADJ}_{it} + \beta_8 \Delta\mathrm{SALE}_{it} + \beta_9 \mathrm{LEV}_{it} \\
&+ \beta_{10} \mathrm{MB}_{it} + \beta_{11} \mathrm{TENURE}_{it} + \beta_{12} \mathrm{CHAIR}_{it} + \varepsilon_{it} \quad (1)
\end{aligned}
$$

The dependent variable is the change in natural logarithm of CEO bonus plus 1.[19] The main variable of interest is WARN, an indicator variable, which equals one when a firm issues a warning (warnings) in any quarter of the fiscal year, zero otherwise.

I control for both accounting-based return (ΔROA) and market-based return (RET) (Lambert and Larcker 1987; Sloan 1993). Following the literature, I further control for firm characteristics that are likely to affect CEO compensation and the pay-performance sensitivity, such as firm size (Smith and Watts, 1992; Farrell and Whidbee 2003), leverage (Leone, Wu, and Zimmerman 2006), market-to-book ratio (Leone et al. 2006), and two measures of CEO entrenchment (Core et al., 1999). In addition, Matsunaga and Park (2001) find that CEOs' annual bonus will be adversely affected if earnings fall short of earnings for the same quarter of last year for at least twice during the year. Therefore, I include NEWS (defined as 1 if this year's EPS excluding extraordinary items is lower than last year' EPS, zero otherwise) in order to account for the negative effect of missing an earnings benchmark on bonus.[20]

Warnings are issued when managers' expectation of forthcoming earnings is lower than the market consensus. Thus, to warn or not to warn becomes irrelevant when managers are expecting

[18] Two recent studies by Francis, Lennox, and Wang (2010) and Larcker and Rusticus (2010) raise the concern that self-selection models are sometimes sensitive to model specifications and the property of the instrument variables in the first stage. Both papers suggest that OLS results are more reliable when self-selection model is less robust. Therefore, I present both OLS and self-selection models for most of the hypothesis testing in this paper.

[19] One dollar is added to the amount of CEO bonus in order to avoid taking a natural logarithm of zero when CEOs are not granted any bonus in a given year.

[20] As reported in sensitivity tests, I include all the earnings benchmark variables used in Matsunaga and Park (2001) and the results remain qualitatively the same.

a positive earnings surprise. It is for this reason that my control sample for testing warning effect includes only firms that have experienced a negative earnings surprise in at least one quarter of that fiscal year. In addition, as another step to control for the factors that affect the decision to warn, I include SUR_MIN_ADJ, which is defined through two steps as follows. I first calculate the difference between actual EPS and the most recent consensus analyst forecast one day before the first day of the third month of a fiscal quarter (i.e., one day before the confession window), then scaled by the beginning quarter share price for each quarter of the year.[21] I then take the lowest quarterly value (i.e., the most negative earnings surprise) from the previous step because warnings are most likely to occur in the quarters where the surprise is most negative. This measure also addresses the concern that some firms may have previously provided guidance and the market consensus is similar to the management's expectation at the beginning of the warning window examined in the study. Leverage and market-to-book ratio are likely to affect pay-performance sensitivity because they are potentially related to firms' investment opportunity set (Leone et al. 2006). Thus, I control for LEV and MB, although I do not have a predicted sign for each of these two variables. In addition, following Albuquerque (2009), I expect CEO tenure (TENURE) to be negatively related to and chairmanship (CHAIR) to be positively related to bonus growth.

β_5 is the coefficient of interest when testing *H1a*. An insignificant β_5 suggests that warnings has no impact on CEO bonus, while $\beta_5 < 0$ ($\beta_5 > 0$) indicates a negative (positive) effect of issuing a warning on CEO bonus growth. As argued in *H2a*, warning firms' sensitivity of bonus to stock returns is expected to be higher than that of non-warning firms, or $\beta_4 > 0$.

[21] I measure analyst consensus forecast one day before the third month of the fiscal quarter because warnings are issued after the beginning of the third month of the fiscal quarter (the "confession window"). Therefore, this measure captures the difference between management and market expectations before the confession window.

In estimating equation (1), I follow Core, Guay, and Verrecchia (2003) so that my baseline model includes year indicators to account for the year-specific differences in the level of compensation, e.g., the time trend in annual pay (Murphy 1999), and industry indicators to control for unobserved variation in the CEO pay across industries, e.g., different demand for managerial talent across industries (Murphy 1999). In addition, because I estimate equation (1) using panel data, there may be within-firm error-term time-series correlations. Ignoring this serial correlation could lead to underestimated standard errors and overestimated t-statistics (Cameron and Trevedi 2005). Therefore, I estimate standard errors using Huber-White correction with clusters at the firm level.

4.1.2 Test Results of Baseline Model

Table 5 presents the baseline results for the fixed-effect model allowing the intercept to vary by both years and industries. Warnings have a negative effect on the change in CEO bonus (β_5 = -0.685 with p-value=0.000), indicating that CEO bonuses will be adversely affected if a warning is issued during that year. CEO bonuses are negatively affected presumably because compensation committees find that warning signals have information beyond the reported firm performance measures, and in particular, it signals potential long-term earnings losses. It may also be possible that the negative market reaction to warnings concerns compensation committees (Matsunaga and Park 2001) and CEOs' bonuses are reduced for this unfavorable situation. The prediction from *H2a* is that the change in bonus is more sensitive to stock returns when a warning is issued than when no warning is issued. I find support for *H2a* in the significantly positive coefficient on the interaction term RET*WARN (β_4 = 0.372 with p-value = 0.093). These results extend the argument in Lambert and Larcker (1987) in that stock returns become more useful in assessing agents' performance when stock returns are more informative about future firm performance.

Turning to control variables, both firm performance measures, ΔROA and RET, are significantly positively related to changes in bonus, consistent with prior findings in the compensation literature. The coefficient on ΔROA*WARN is insignificant at the conventional level, which suggests that warnings do not affect the sensitivity of bonus to accounting measures. Consistent with Matsunaga and Park (2001), CEO cash bonuses are penalized when current year's earnings fall below that of the previous years (β_6= -0.798 with p-value=0.000). I do not find a significant result on SUR_MIN_ADJ. It might be caused by its high correlation with other performance measures as Panel A of Table 2 shows that it has a significantly positive correlation with ΔROA, RET, and ΔSALE and a significantly negative correlation with NEWS. As expected, I find that an increase in sales leads to an increase in cash bonus, and consistent with Albuquerque (2009), I find that CEO pay growth is higher for less experienced CEOs.

4.1.3 Research Design of Self-Selection Model

The decision to warn or not to warn is discretionary. CEOs make this decision based on a number of considerations, which I later proxy with a series of variables, including firm characteristics. However, these variables may also affect CEO pay. In other words, without controlling for CEOs' "self-selection" as to warn or not to warn, the earlier findings could be driven by these variables or the unobserved variables that affect the decision to warn. Following Tucker (2007), I run two-stage Heckman (1979) model with separate Inverse Mills Ratios (IMR) for warning firms and non-warning firms (See model specification in Appendix A, Part 1). In the first stage, I estimate the following probit regression of the decision to warn:

$$\begin{aligned}\Pr(\text{WARN}_{\text{it}}=1)=\Phi(&\alpha_0+\alpha_1\text{RISK}_{\text{it}}+\alpha_2\text{LN\_MVE}_{\text{it}}+\alpha_3\text{UPDATE\_GUIDE}_{\text{it}}\\&+\alpha_4\text{PAST\_GUIDE}_{\text{it}}+\alpha_5\text{NUMEST}_{\text{it}}+\alpha_6\text{IOR}_{\text{it}}+\alpha_7\text{NEWS}_{\text{it}}\\&+\alpha_8\text{SUR\_MIN\_ADJ}+\alpha_9\text{MB}_{\text{it}}+\alpha_{10}\text{ROA\_STD}_{\text{it}}+\alpha_{11}\text{FD}_{\text{it}}+\varepsilon_{\text{it}})\qquad(2)\end{aligned}$$

In the second stage, I calculate IMRs for warning groups ($\frac{\phi(Z_{it}^{'}\gamma)}{\Phi(Z_{it}^{'}\gamma)}$) and non-warning groups ($\frac{-\phi(Z_{it}^{'}\gamma)}{1-\Phi(Z_{it}^{'}\gamma)}$) and update the baseline model by adding these two self-selection ratios:

$$\begin{aligned}\Delta\ln(\text{BONUS}_{\text{it}})=&\beta_0+\beta_1\Delta\text{ROA}_{\text{it}}+\beta_2\text{RET}_{\text{it}}+\beta_3\Delta\text{ROA}_{\text{it}}\times\text{WARN}_{\text{it}}+\beta_4\Delta\text{RET}_{\text{it}}\times\text{WARN}_{\text{it}}\\&+\beta_5\text{WARN}_{\text{it}}+\beta_6\text{NEWS}_{\text{it}}+\beta_7\text{SUR\_MIN\_ADJ}_{\text{it}}+\beta_8\Delta\text{SALE}_{\text{it}}+\beta_9\text{LEV}_{\text{it}}\\&+\beta_{10}\text{MB}_{\text{it}}+\beta_{11}\text{TENURE}_{\text{it}}+\beta_{12}\text{CHAIR}_{\text{it}}+\beta_{13}\text{IMR}_{\text{it}}*\text{WARN}_{\text{it}}\\&+\beta_{14}\text{IMR}_{\text{it}}*(1-\text{WARN}_{\text{it}})+\varepsilon_{\text{it}}\qquad(3)\end{aligned}$$

While equation (2) is also modeled in Tucker (2007), they are not identical. The main difference is that I estimate equation (2) using annual data, while Tucker's (2007) uses quarterly data. To control for general litigation risk, I include the predicted risk of being sued (RISK), the size of the firm (LN_MVE), and UPDATE_GUIDE to measure whether a firm has provided guidance before the third fiscal month of the quarter and the necessity for CEOs to update the previous guidance. CEOs' reputation concern may also affect their decision to warn. If a firm frequently issued guidance in the last year, it is more likely to warn if the performance is poor in the current year (PAST_GUIDE). A larger number of analysts (NUMEST) are likely to impose a more transparent information environment for a firm and managers may be more forthcoming (Lang and Lundholm 1996b). Two earnings performance measures are also included, NEWS and SUR_MIN_ADJ, as a firm is more likely to warn when it misses last year's earnings benchmark, and when the market consensus is much lower than the managers' expectation of the impending earnings. In addition, I include market-to-book ratio (MB) to differentiate growth firms from other firms. Earnings volatility (ROA_STD) is also included since Tucker (2007) shows that firms with more volatile earnings find less need to warn. In addition, I include the number of institutional holdings (IOR) because managers are more likely to issue earnings guidance when institutional holdings increase (Anilowski, Feng, and Skinner 2007). Heflin, Subramanyam, and Zhang (2003) report evidence that volume of firms' earnings-related forward-looking disclosures increases after the implementation of Regulation Fair Disclosure (hereafter Regulation FD). On the other hand, Wang (2007) demonstrates that firms that relied on private earnings guidance replace it with no guidance instead of public guidance after Regulation FD. Therefore, I introduce an indicator variable, FD, to account for this regulation effect, but do not assign an expected sign. In summary, I expect that positive relations between the probability to warn and the following variables: RISK, LN_MVE, UPDATE_GUIDE, PAST_GUIDE, NUMEST, IOR and NEWS. I expect negative relations between the probability to warn and SUR_MIN_ADJ, MB and ROA_STD. Variable definitions are presented in Table 6. All variables in equation (3) are defined as in equation (1).

4.1.4 Test Results of Self-Selection Model

Table 6 presents the first-stage probit analysis of the decision to warn. The overall model explanatory power is 10.1%, comparable to 9.15% in Tucker (2007). As expected, firms are more likely to warn if they have a higher probability of being sued, have previously issued guidance in the event quarter, frequently issued guidance in the last year, have more analysts following the firm, have higher institutional holding, have experienced an earnings shortfall, have suffered a bigger negative earnings surprise, and have lower earnings volatility. Consistent with Wang (2007), I find a negative sign on FD, although not significant, suggesting that a firm is less likely to issue warnings after Regulation FD. Contrary to the prediction, however, LN_MVE and MB are both significantly negative, suggesting that larger firms and growth firms tend not to warn.[22] A concurrent working paper by Lee et al. (2010), which uses a sample similar to my study, also shows a significant negative coefficient on firm size when predicting the decision to issue management guidance.

Table 7 reports the regression results after controlling for self-selection. All the variables that are significant in the baseline model remain significant except RET*WARN (p-value=0.115). In particular, the coefficient on WARN is still significantly negative, indicating that warnings have a significantly adverse impact on cash bonus. The coefficient on RET*WARN is positive as well, although not significant after adding self-selection terms for warning and non-warning groups.[23] The coefficient on self-selection term is an estimate of the product of the standard deviation of the error term in equation (1) and the correlation between the error term in equation (1) and the error in equation (2). The coefficient on the Inverse Mills ratio for warning firms (IMR*WARN) is significantly positive (β_{13} =0.814 with p-value=0.002), indicating that some unobserved factors that increase the likelihood of warning lead to an increase of bonus growth. One example of these unobserved factors could be CEOs' reputation. That is, this result suggests that a reputable CEO is more likely to issue warnings, all else equal, and the reputation is positively correlated with bonus growth. As a result, after controlling for this effect, the coefficient on WARN changed from -0.685 to -1.845. It appears that there is no self-selection effect on non-warnings groups (β_{14} has a p-value of 0.652).

4.2 Testing the Effect of Tip-Offs on CEO Bonus and Bay-Performance Sensitivity

[22] This may be caused by two reasons. (1) My sample firms are significantly larger than Tucker's (2007) as the median size of warning firms and non-warnings firms is \$1267.13 (432) millions and \$1634.00 (226) millions in my study (in her study). Evidence provided in Wang (2007) suggests that larger firms were more likely to provide *private* earnings guidance before Regulation FD was enacted. (2) My sample period has three more years in the post FD environment than Tucker (2007). Wang (2007) also shows that after Regulation FD, firms that used to rely more on private guidance stopped providing guidance rather than start to issue public guidance.

[23] I do not draw any conclusive inference here because this coefficient becomes significant with p-value=0.015 once I include RPE measures in table 11. I will discuss this change in significant levels in section 4.3.

4.2.1 Research Design of the Baseline Model

I test *H1b* and *H2b* by estimating the following model:

$$\begin{aligned}\Delta \ln(\text{BONUS}_{\text{it}}) = \beta_0 &+ \beta_1 \Delta\text{ROA}_{\text{it}} + \beta_2 \text{RET}_{\text{it}} + \beta_3 \Delta\text{ROA}_{\text{it}} \times \text{TIPOFF}_{\text{it}} + \beta_4 \text{RET}_{\text{it}} \times \text{TIPOFF}_{\text{it}} \\ &+ \beta_5 \text{TIPOFF}_{\text{it}} + \beta_6 \text{NEWS}_{\text{it}} + \beta_7 \text{SUR\_MAX\_ADJ}_{\text{it}} + \beta_8 \Delta\text{SALE}_{\text{it}} + \beta_9 \text{LEV}_{\text{it}} \\ &+ \beta_{10} \text{MB}_{\text{it}} + \beta_{11} \text{TENURE}_{\text{it}} + \beta_{12} \text{CHAIR}_{\text{it}} + \varepsilon_{\text{it}} \quad (4)\end{aligned}$$

While the baseline model for testing the effect of tip-offs on CEO bonus is similar to model (1), there are two key differences. First, model (1) runs on warning firms and non-warning control firms (i.e., firms that do not warn but their actual earnings are lower than consensus before the third fiscal month of a fiscal quarter) while model (4) uses tip-off firms and non-tip-off control firms (i.e., firms that do not tip off investors but their actual earnings are higher than consensus before the third fiscal month of a fiscal quarter). Secondly, NEWS is now defined as one if this year's EPS excluding extraordinary items is greater than last year's, zero otherwise; SUR_MAX_ADJ equals the highest quarterly value, among the four quarters of a year, of actual EPS minus the most recent consensus forecasts scaled by the beginning quarter share price before the third fiscal month of that quarter. All other variables are as defined in model (1).

4.2.2 Test Results of the Baseline Model

Table 8 reports the results for the regression analysis of the tip-off effects. First, the coefficient on TIPOFF is positive but insignificant (p-value=0.128). This finding, compared to the p-value (0.000) of WARN, adds to the extant literature that good news disclosure is less credible than bad news disclosure (Jenning, 1987; Hutton, Miller and Skinner, 2003; Rogers and Stocken, 2005). Neither of the coefficients on ROA*TIPOFF or RET*TIPOFF is significant, suggesting that pay-performance sensitivity is not systematically affected by tip-offs. All other variables' implications remain qualitatively similar to those in model (1).

4.2.3 Research Design of the Self-Selection Model

Since little research (to my knowledge) has directly modeled the decision to issue positive earnings guidance, I amend the above warning model (2) to take into account the factors related to good news disclosures.

First, Cao and Narayanamoorthy (2009) find that, unlike managers with bad news, managers with good news are not likely to issue forecasts, regardless of ex-ante litigation risk. In a similar vein, Brown, Hillegeist, and Lo (2005) find that the amount of news released by firms with good news is not associated with *ex ante* litigation risk. Therefore, I eliminate RISK in the model.

Second, prior studies by Verrecchia (1983) and Darrough (1993) show theoretically that the higher the proprietary information costs, the less likely managers will disclose information publicly. The level of R&D expenditures has been used as an empirical measure for proprietary information cost (King, Pownall, and Waymire 1990) and Wang (2007) finds that R&D expenditures negatively impact the decision to issue public earnings forecasts. I define R&D as annual R&D expenditures scaled by total assets at the beginning of the fiscal year and expect a negative sign on R&D.

Third, prior studies document that the quantity of earnings forecasts increases significantly before companies access capital market (Frankel, McNichols and Wilson 1995; Marquardt and Wiedman, 1998). I add an indicator variable (ISSUE), which is one when there is a public offering of either debt or equity in the current year or the following year, and zero otherwise. I predict a positive coefficient on ISSUE. All other variables are predicted the same as in model (2). I therefore estimate the following equation:

$$\begin{aligned}\mathrm{Pr}_{it}(\mathrm{TIPOFF}=1) = \Phi(&\alpha_0 + \alpha_1 \mathrm{LN\_MVE}_{it} + \alpha_2 \mathrm{UPDATE\_GUIDE}_{it} + \alpha_3 \mathrm{PAST\_GUIDE}_{it} \\ &+ \alpha_4 \mathrm{NUMEST}_{it} + \alpha_5 \mathrm{IOR}_{it} + \alpha_6 \mathrm{NEWS}_{it} + \alpha_7 \mathrm{SUR\_MAX\_ADJ} + \alpha_8 \mathrm{R\,\&\,D} \\ &+ \alpha_9 \mathrm{ISSUE} + \alpha_{10} \mathrm{MB}_{it} + \alpha_{11} \mathrm{ROA\_STD}_{it} + \alpha_{12} \mathrm{FD}_{it} + \varepsilon_{it}) \qquad (5)\end{aligned}$$

The second stage regression is to add the Inverse Mills ratios computed from model (5) above to the baseline model (4):

$$\begin{aligned}\Delta \ln(\text{BONUS}_{it}) = {} & \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} + \beta_4 \text{RET}_{it} \times \text{TIPOFF}_{it} \\ & + \beta_5 \text{TIPOFF}_{it} + \beta_6 \text{NEWS}_{it} + \beta_7 \text{SUR\_MAX\_ADJ}_{it} + \beta_8 \Delta\text{SALE}_{it} + \beta_9 \text{LEV}_{it} \\ & + \beta_9 \text{MB}_{it} + \beta_{11} \text{TENURE}_{it} + \beta_{10} \text{CHAIR}_{it} + \beta_{11} \text{IMR} * \text{TIPOFF} \\ & + \beta_{12} \text{IMR} * (1 - \text{TIPOFF}) + \varepsilon_{it} \qquad (6)\end{aligned}$$

4.2.4 Test Results of the Self-Selection Model

Estimation results of equation (5) are presented in Table 9. I find that a firm is more likely to tip off investors of impending positive earnings surprise if it is of a small size, issued management guidance earlier during any of the fiscal quarter, provided guidance more frequently in the last year, experienced an earnings increase from last year, and had a larger positive earnings surprise before the third month of the given quarter of the year. In addition, the negative coefficient (p-value=0.061) on R&D indicates that a firm is less likely to tip off if it has higher proprietary cost, consistent with findings in the prior literature. The coefficient on ISSUE is positive, as predicted, but not significant.

Table 10 summarizes the regression analysis of equation (6). As the coefficients on both Inverse Mills ratios (IMR*TIPOFF and IMR* (1-TIPOFF)) are insignificant, the self-selection factors do not impact the effect of tip-offs on bonus growth. Accordingly, as indicated by the coefficients on other independent variables, the implication of baseline the model remains the same. Most importantly, tip-off is not associated with bonus growth after controlling for potential self-selection bias.

4.3 Testing the Effect of Peer Firms' Warnings and Tip-Offs on a Firm's Bonus-Performance Sensitivity

4.3.1 Research Design

In the context of RPE, Holmstrom and Milgrom (1987) model the managers' compensation contract as a linear function of several variables. Denote x_1, x_2, and w as the performance of a firm, the aggregate performance of this firm's peers, and the compensation of this firm's manger, respectively. Then, $w = \alpha + \beta_1 x_1 + \beta_2 x_2$.[24] The weak form of RPE tests whether $\beta_2 < 0$ and the strong form RPE tests whether $\beta_2 / \beta_1 = -\rho$.[25] Equations (7) and (8) below test the traditional RPE (i.e., the effect of peers' accounting-based returns and stock returns) and the new evidence of RPE (i.e., the effect of peers' warnings (equation (7)) and tip-offs (equation (8)) on a firm's pay-performance sensitivity).[26]

$$\begin{aligned}\Delta \ln(\text{BONUS}_{it}) = {} & \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{WARN}_{it} + \beta_4 \text{RET}_{it} \times \text{WARN}_{it} \\ & + \beta_5 \Delta\text{ROA}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} + \beta_6 \text{RET}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} + \beta_7 \text{WARN}_{it} \\ & + \beta_8 \text{PEERW}_{it} + \beta_9 \text{RPE\_}\Delta\text{ROA} + \beta_{10} \text{RPE\_RET} + \beta_{11} \text{NEWS}_{it} + \beta_{12} \text{SUR\_MIN\_ADJ}_{it} \\ & + \beta_{13} \Delta\text{SALE}_{it} + \beta_{14} \text{LEV}_{it} + \beta_{15} \text{MB}_{it} + \beta_{16} \text{TENURE}_{it} + \beta_{17} \text{CHAIR}_{it} \\ & + \beta_{18} \text{IMR}_{it} * \text{WARN}_{it} + \beta_{19} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \qquad (7)\end{aligned}$$

$$\begin{aligned}\Delta \ln(\text{BONUS}_{it}) = {} & \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} + \beta_4 \text{RET}_{it} \times \text{TIPOFF}_{it} \\ & + \beta_5 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} \times \text{PEERT}_{it} + \beta_6 \text{RET}_{it} \times \text{TIPOFF}_{it} \times \text{PEERT}_{it} + \beta_7 \text{TIPOFF}_{it} \\ & + \beta_8 \text{PEERT}_{it} + \beta_9 \text{RPE\_}\Delta\text{ROA} + \beta_{10} \text{RPE\_RET} + \beta_{11} \text{NEWS}_{it} + \beta_{12} \text{SUR\_MIN\_ADJ}_{it} \\ & + \beta_{13} \Delta\text{SALE}_{it} + \beta_{14} \text{LEV}_{it} + \beta_{15} \text{MB}_{it} + \beta_{16} \text{TENURE}_{it} + \beta_{17} \text{CHAIR}_{it} \\ & + \beta_{18} \text{IMR}_{it} * \text{WARN}_{it} + \beta_{19} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \qquad (8)\end{aligned}$$

[24] To quote Holmstrom (1982, p336): "Theorem 8 suggests that sometimes an aggregate measure like the weighted average of peer performance [such as a weighted average of peer firms' accounting or market returns] will capture all the relevant information about the common uncertainty[such as economic downturn]." In addition, he elaborates that higher weight should be put on the performance of peer firms that have stronger performance correlations.

[25] Beginning with Holmstrom (1982) and Holmstrom and Milgrom (1987), a stream of literature has developed RPE models. Empirical tests of RPE have been conducted in two different ways: strong form and weak form. However, the strong form test assumes that a firm's effort has no effect on the expected performance of its peer firms and this is hardly to be true because of the well-known strategic interaction among firms in the industry. As a result, consistent with the majority of RPE studies, I use the weak form test to examine how RFE affects the effect of warnings and tip-offs on CEO's bonus. Albuquerque (2009) surveys the empirical studies of RPE and finds that from 1986 to 2006, there is only one out of fourteen papers tests strong-form RPE. I searched the RPE literature and am only able to find one more paper by Janakiraman, Lambert and Larcker (1992) that examines the strong form RFE.

[26] WARN*PEERW, ΔROA*PEERW, and RET*PEERW are mechanically perfectly correlated with PEERW, ΔROA*WARN*PEERW, and RET*WARN*PEERW. Thus, WARN*PEERW, ΔROA*PEERW, and RET*PEERW are not included in model (7). Similarly, TIPOFF*PEERT, ΔROA*PEERT, and RET*PEERT are also excluded from model (8).

Following Albuquerque (2009), RPE_ΔROA is defined as the equally-weighted change in ROA portfolio of peer firms in the same two-digit SIC code and size quartile, excluding the firm itself. Similarly, RPE_RET is calculated as the equally-weighted cumulative stock return portfolio of peer firms in the same two-digit SIC code and size quartile, excluding the firm itself. PEERW and PEERT measures the number of peer firms that issue warnings and tip-offs respectively. The following three steps are taken to define PEERW and PEERT:

Step 1: Similar to Tucker (2007), a firm's fiscal quarter is relabeled to the calendar quarter with which it overlaps most.[27] This process, called calendarization, is to account for the fact that only two-thirds of firms in an industry end their fiscal quarters in the same month.

Step 2: I locate all warning firms within the peer group, defined as in Albuquerque (2009), which are in the same two-digit SIC code, same size quartile and same calendar quarter of the year.

Step 3: Since CEO cash compensation is annualized data, I convert quarterly warnings peers from step 2 to annual warnings peers as follows: (1) for a warning firm, the total number of warning peers (PEERW) is the aggregate number of unique peers during the year. To illustrate, if a firm issues a warning in the first quarter with two warning peers, firms A and B, and the third quarter with three peers, firms B, C, and D in a year, then four (A, B, C, and D) will be taken as the number of warning peers for that year; (2) the total number of warning peers is set to zero for all non-warning firms. The number of peers that issues tip-offs (PEERT) is defined likewise. All other variables are as defined previously.

With respect to warning firms, the sum of β_2 and β_4 ($\beta_2 + \beta_4$) measures the effect of bonus sensitivity to stock returns when a warning firm does not have warning peers. More

[27] For example, the third calendar quarter includes the fiscal quarters that end in August, September, and October of that year.

importantly, β_6 captures the incremental effect of warnings on the sensitivity of bonus to stock returns when a warning firm has one peer that also issues warnings. As the number of peer firms increases, the magnitude of such effect increases. *H3a* predicts that the more peers issuing warnings, the lower the bonus sensitivity to stock returns, suggesting $\beta_6 < 0$. In other words, *H3a* hypothesizes that as the number of peers goes up, the collateral damage on bonus reduction becomes smaller.

With respect to tip-off firms, the sum of β_2 and β_4 ($\beta_2 + \beta_4$) measures the effect of bonus sensitivity to stock returns and the sum of β_1 and β_3 ($\beta_1 + \beta_3$) measures the effect of bonus sensitivity to accounting-based returns when a warning firm does not have warning peers. The incremental effect of peers' tip-offs on the bonus sensitivity to accounting-based returns and stock returns are reflected on β_5 and β_6 respectively. I do not have predictions on these effects.

4.3.2 Test Results

For the sake of brevity, I only discuss the results of models controlling for self-selection since OLS results have the same inferences, although both results are presented in Table 11 and 12. Table 11 shows the testing results of *H3a*. First, I find the evidence of RPE in terms of the traditional RPE measure. Specifically, consistent with Gibbons and Murphy (1990), Janakiraman et al. (1992), and Albuquerque (2009), the coefficient on RPE_RET is significantly negative (β_{10} = -0.368 with p-value=0.006), providing evidence that peer firms' stock returns are filtered out from the CEO bonus. Not surprisingly, RPE_ΔROA is positive and significant as documented in Albuquerque (2009), indicating that accounting-based return is not used to filter out the noise or external shocks.[28] As predicted in *H2a*, after controlling for peer performance measures and self-selection, warnings affect the bonus sensitivity to stock returns as demonstrated by the significantly positive coefficient on RET*WARN (p-value=0.015). This indicates that CEO-bonus sensitivity to stock returns is higher for warning firms than for non-warning firms. Furthermore, the coefficient on RET*WARN*PEERW (β_6 =-0.173) is significantly negative (p-value=0.040), consistent with the prediction of *H3a*. The negative coefficient means that as more peer firms issue warnings, the compensation committees become more lenient towards CEOs because the warnings issued by peer firms indicate that there might be an industry-wide shock that leads to the negative earnings surprises.

Table 12 presents the results of the effect of peer firms' tip-offs on a firm's pay performance sensitivity. Once again, I find evidence that stock return is used in RPE ($\beta_{10} < 0$ with p-value= 0.001) and no evidence that accounting performance is used in RPE. The coefficients on ΔROA*TIPOFF (β_3) and RET*TIPOFF (β_4) are both insignificant (p-value=0.551 and 0.558), which indicates that tip-offs do not affect bonus sensitivity to accounting-based returns and stock returns. In addition, the insignificant results on ΔROA*TIPOFF*PEERT (β_5) and RET*TIPOFF*PEERT (β_6) suggest that peer firms' tip-offs have no effect on a firm's pay-performance sensitivity.

4.4 Testing the Effect of Warnings on CEO Option Grants and Option-Performance Sensitivity

4.4.1 Research Design

[28] Albuquerque (2009) offers a potential explanation of the positive coefficient on peer firms' change in ROA. She argues that accounting numbers are based on the principle of conservatism and therefore the external shocks are already removed.

I follow Cheng and Farber's (2008) specification to test the changes in option grants after warnings are issued. Similar to the test of the changes in CEO bonus, this test adopts a difference-in-difference approach where all variables are calculated as the difference between year T and T-1 except the variable of interest (WARN) issued in year T. I use three measures as proxies for the stock-based compensation award: natural logarithm of Black-Scholes value of annual option grant, natural logarithm of actual number of option grants, and ratio of the Black-Scholes value of option grants to the total annual compensation, denoted as ln(OPTION$), ln(OPTION#), and OPTION% respectively.[29] Control variables include CEO ownership (SHARES_OWN, EXERC_OPT), standard determinants of compensation (SIZE, BM, RD, RET), choice between cash compensation and equity compensation (CASH_CST, EARN_CST, CASH), and agency cost (LEV, RISK).

Prior studies find that when CEOs' equity holding is low, firms tend to award them more stocks and options (Core, and Guay 1999; Bryan et al. 2000). To measure CEO ownership, I use two proxies: the actual number of shares owned excluding options (SHARES_OWN) and the number of exercisable options (EXER_OPT), both of which are scaled by the number of outstanding shares.[30] As firm size increases, the business becomes more complex and it needs more talented CEOs requiring high compensation. In addition, larger firms are more difficult to monitor, and to reduce the potential agency conflict, firms tend to use more incentive compensation plan (Smith and Watts 1992; Core and Guay 1999). Thus, I include natural logarithm of sales as a measure of firm size (SIZE). Similarly, firms with greater growth

[29] To avoid taking natural logarithm of zero, I add 1 to both OPTION$, and OPTION# before taking natural logarithm.

[30] Options are excluded when calculating SHARES_OWN to avoid a mechanical relation between SHARES_OWN and the new option grants. I include the number of options (EXER_OPT) to account for the existing options granted in previous years. This variable is less likely to create a mechanical relation with the dependent variable because new options usually are not exercisable until several years later. Because Compustat includes new grants in the unexercisable, I do not include it as a control variable.

opportunities are likely to rely on incentive compensation to reduce information asymmetry between CEOs and shareholders and to reduce under-investment (Myers 1977; Smith and Watts 1992; Bryan et al. 2000). I include market-to-book (MB) and research and development expenditure (RD) as proxies for growth opportunities, but I make no prediction regarding the sign on RD because evidence on RD and stock-based compensation is mixed (Cheng and Farber 2008). CEO compensation is positively associated with performance measures, and I include stock returns (RET) to measure firm performance (Baber, Janakiraman, and Kang 1996).

Firms with cash constraints tend to use stock-based compensation more (Yermack 1995). To measure cash constraints, I use common and preferred dividends minus cash flows in investment activities minus cash flows from operating activities, divided by total assets (CASH_CSTR). During the sample period, firms are not required to recognize expenses when options are granted at the market value and consequently, firms of which earnings are lower than earnings threshold prefer to grant options for financial reporting purposes. Therefore, following Chen and Farber (2008), I also include earnings constraints (EARN_CSTR), measured as an indicator variable of operating loss, to account for the advantage of using option compensation over cash compensation. Guay (1999) argues that greater cash compensation reduces the need of using option grants to encourage CEOs to invest in risky and positive NPV projects because more cash compensation enables CEOs to better diversify their risks. I include total cash compensation divided by sales (CASH) as another control variable. However, the evidence on the relation between earnings constraints and option grants and the relation between cash compensation and option grants is not conclusive, so I do not assign signs for these two variables.

Lastly, Bryan et al. (2000) suggest that shareholders benefit from incentives-based compensation over debtholders, so highly-leveraged firms (greater shareholder-debtholder conflicts) will have incentives to reduce stock-based compensation. I measure leverage (LEV) as long-term debt over total assets. Idiosyncratic risk (RISK) is also added to the model because greater RISK means more difficult to monitor. RISK is measured as the standard deviation of the residual from the market model using weekly returns over the over 12 months. The model also includes year dummy and estimates the statistical significance using Huber/White robust standard errors to adjust for heteroscedasticity and within-firm time-series correlation. To test hypothesis 4 and 5, I estimate the following model after controlling for self-selection:

$$\begin{aligned}\Delta(\text{OPTION}_{it}) = {} & \beta_0 + \beta_1\text{WARN}_{it} + \beta_2\Delta\text{RET}_{it} \times \text{WARN}_{it} + \beta_3\Delta\text{SHARES\_OWN}_{it} + \beta_4\Delta\text{EXER\_OPT}_{it} \\ & + \beta_5\Delta\text{SIZE}_{it} + \beta_6\Delta\text{MB}_{it} + \beta_7\Delta\text{RD}_{it} + \beta_8\Delta\text{RET}_{it} + \beta_9\Delta\text{CASH\_CST}_{it} \\ & + \beta_{10}\Delta\text{EARN\_CST}_{it} + \beta_{11}\Delta\text{CASH}_{it} + \beta_{12}\Delta\text{LEV}_{it} + \beta_{13}\Delta\text{RISK}_{it} + \beta_{14}\text{IMR}_{it} * \text{WARN}_{it} \\ & + \beta_{15}\text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (9)\end{aligned}$$

Hypothesis 4 and 5 predict that both β_1 and β_2 are positive and significant, suggesting that warning firms tend to get more option grants than do non-warning firms.

4.4.2 Test Results of Self-Selection Model

Before I present the multivariate analysis**,** Table 13 shows descriptive statistics and correlation matrix for variables used in testing hypothesis 4 and 5. Because of the new data requirement, the sample size for testing option grants is reduced to 6,733 from 6,947 firm-year observations, but the sample distributions across years are about the same (Table 13, Panel A). Regarding the three measures of option grants, T-statistics indicate that they are not significantly different between warning firms and non-warning firms. As for control variables, it is shown that CEOs of warnings firms have greater increase in exercisable options (ΔEXER_OPT) and greater reduction in cash pay (ΔCASH). Compared to non-warning firms, warning firms also experience lower sales growth (ΔSIZE), smaller growth opportunities (ΔMB), and deeper reduced market returns (ΔRET). Moreover, warning firms become more cash constrained (ΔCASH_CST) and earnings constrained (ΔEARN_CST), and more leveraged (ΔLEV) and riskier (ΔRISK). The correlation matrix of these variables is documented in Panel C of Table 13.

Turning to the results of the regression analysis, Table 14 uses all three option grant measures to test whether warning firms grant more options than do non-warning firms. Specifically, coefficients on ln(OPTION$), ln(OPTION#), and OPTION% are 0.577 (p-value=0.054), 0.615 (p-value= 0.008) and 1.180 (p-value=0.004) respectively, suggesting that changes in the value of option grants, changes in the number of option grants, and changes in the percentage of compensation from stock options are all significantly higher for warning firms than for non-warning firms. The signs of the coefficient on ΔRET*WARN, however, are insignificant across all three measures for option grants, indicating that the sensitivity of option grants does not differ between warning firms and non-warning firms, counter to the hypothesized relation. In general, most control variables with predicted signs appear as expected. More specifically, compensation from stock options is greater for firms with lower level of CEO ownership, better performance, and less debt. The coefficients on IMR*WARN are all negative and significant at the conventional level, meaning that unobservable factors that lead managers to issue warnings negatively affect CEO option grants. Collectively, the results lend support to hypothesis 4 that warning firms tend to grant more options (ln(OPTION$), ln(OPTION#)) than do non-warning firms, and warning firms' compensation structure (OPTION%) changes toward more equity-based compensation than cash-based compensation. A word of caution seems appropriate regarding the inference of the option grants. Options can be granted anytime during the year. Hence, although I established an association, ideally, I would need to check whether the options are granted after warnings are issued to establish the causality. Option grant dates are not required to disclose, so I need to hand collect the duration and the expiration dates from proxy statement in order to infer the option grant dates.

4.5 Testing the Effect of Peer Firms' Warnings on a Firm's Option-Performance Sensitivity

4.5.1 Research Design

To test the effect of peer warnings on sensitivity of option grants to stock returns, I augment the previous model (9) by adding the number of peer firms that issue warnings (PEERW), and interact it with ΔRET (ΔRET*WARN*PEERW).[31] Consequently, the model is as follows:

$$\begin{aligned}\Delta(\text{OPTION}_{it}) = {} & \beta_0 + \beta_1 \text{WARN}_{it} + \beta_2 \Delta\text{RET}_{it} \times \text{WARN}_{it} + \beta_3 \Delta\text{RET}_{it} \times \text{WARN} \times \text{PEERW}_{it} \\ & + \beta_4 \text{PEERW}_{it} + \beta_5 \Delta\text{SHARES\_OWN}_{it} + \beta_6 \Delta\text{EXER\_OPT}_{it} + \beta_7 \Delta\text{SIZE}_{it} \\ & + \beta_8 \Delta\text{MB}_{it} + \beta_9 \Delta\text{RD}_{it} + \beta_{10} \Delta\text{RET}_{it} + \beta_{11} \Delta\text{CASH\_CST}_{it} + \beta_{12} \Delta\text{EARN\_CST}_{it} \\ & + \beta_{13} \Delta\text{CASH}_{it} + \beta_{14} \Delta\text{LEV}_{it} + \beta_{15} \Delta\text{RISK}_{it} + \beta_{16} \text{IMR}_{it} * \text{WARN}_{it} \\ & + \beta_{17} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (10)\end{aligned}$$

Hypothesis 6 predicts that among warning firms, the sensitivity of option grants to stock returns decreases as the number of warning peers increases. Therefore, I expect a negative coefficient on ΔRET*WARN*PEERW (β_3<0).

4.5.2 Test Results of Self-Selection Model

Table 15 presents the results of estimating equation (10). The relations between all three measures of option grants (the change in the natural logarithm of the value of option grants, the change in the natural logarithm of the number of option grants, and change in the percentage of compensation from option grants) and ΔRET*WARN*PEERW are all negative at p-value<0.01. Once again, the coefficient on ΔRET*WARN is insignificant for ln(OPTION$) and ln(OPTION#), suggesting that the sensitivity of option grants does not differ between warning

[31] As PEERW represents the number of *warning* peers, ΔRET*WARN*PEERW= ΔRET*PEERW. In untabulated results, I also include equal-weighted change in ROA and change in return of peer firms that are in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009). These two variables are insignificant, and all other results are qualitatively unaltered.

firms and non-warning firms. Nevertheless, the negative coefficient on ΔRET*WARN*PEERW means that holding returns constant and among warning firms, the ones that have more warning peers will get fewer option grants because more warning peers indicate an external effect beyond CEOs' control and the reason that boards of directors grant more options to incentivize CEOs becomes less appealing and more objectionable. All other inferences remain the same as discussed in the previous section.

4.6 Testing a Potential Benefit of Issuing Warnings: Reduced CEO Turnover

The results of first stage analysis of the decision to issue warnings show that there are a number of incentives for CEOs to issue warnings. To further validate the potential benefits of issuing warnings, I compare the litigation risk of warning firms and non-warning firms before the event year using my sample. Table 16, Panel A reports that the predicted litigation risk is significantly higher for warnings firms than for non-warning firms in the years before warnings are issued (z-stat=3.425), consistent with the argument in Skinner (1994, 1997) that firms voluntarily disclose bad news to reduce litigation risk.

I also compare the analyst forecast errors before and after the confession window for warning firms and non-warning firms. In Panel B, for 1,218 warnings firms, there are 1,486 individual quarterly warnings as some firms issue multiple warnings in a fiscal year. The mean analyst forecast error (SUR) before warnings and after warnings are -0.812 and -0.508 respectively, which is significantly different (t-stat=2.215). The forecast accuracy measured by the absolute value of forecast error (ABS(SUR)) shows supporting evidence that the forecast accuracy is significantly increased as well after warnings are issued because the absolute forecast error decreased from 0.815 to 0.527 (t-stat=-2.098). More intuitively, after warnings, 48.3% firms meet or beat analyst forecasts while only 3.7% do so if no warning was issued and the change in the frequency of meeting or beating analyst forecasts is statistically significant with t-stat=22.708. However, all these changes calculated for warning firms may not be due to warnings; it could be due to other systematic time trend. To control for that, I calculate the corresponding changes in analyst forecasts for non-warning firms and compare the changes for warning firms with those for non-warnings firms. Panel C of Table 16 shows that all three measures of changes significantly differ between warning firms and non-warning firms. In particular, comparing to quarters without warnings, those with warnings experience a significantly greater magnitude of decrease in negative earnings surprise (t-stat=3.861), increase in forecast accuracy (t-stsat=3.824), and increase in the frequency of meeting or beating analyst forecast (t-stat=13.348)[32]. In a nut shell, these descriptive statistics support the arguments in the previous literature that (1) CEOs issue warnings to reduce litigation risk and (2) by issuing warnings, CEOs are more likely to reduce analyst forecast errors (by guiding them downward) and increase the likelihood of avoiding negative earnings surprise.

4.6.1 Research Design

The model for testing the turnover hypothesis is based on DeFond and Park (1999). I augment the model by adding controls for earnings losses, and CEO tenure. Specifically, I estimate the following model:

$$\begin{aligned}\Pr(\mathrm{TURN}_{it+1}) = \Phi(&\beta_0 + \beta_1 \mathrm{WARN}_{it} + \beta_2 \Delta\mathrm{ROA\_ADJ}_{it} + \beta_3 \mathrm{RET\_ADJ}_{it} + \beta_4 \mathrm{AGE\_63}_{it+1} \\ &+ \beta_5 \mathrm{AGE}_{it+1} + \beta_6 \mathrm{LOSS}_{it} + \beta_7 \mathrm{FE\_ADJ}_{it} + \beta_8 \mathrm{RETVAR}_{it} + \beta_9 \mathrm{TENURE}_{it} \\ &+ \beta_{10} \mathrm{HHI} + \beta_{11} \mathrm{IMR} \times \mathrm{WARN}_{it} + \beta_{12} \mathrm{IMR} \times (1 - \mathrm{WARN}_{it}) + \varepsilon_{it}) \qquad (11)\end{aligned}$$

Hypothesis 7 predicts a reduced probability of CEO-turnover after warnings are issued, i.e., β_1 <0. TURN equals one if there is a CEO change in the following year, and zero otherwise. I

[32] Matsumoto (2002) argues that managers guide analysts' forecasts downward in order to meet or beat expectations at the earnings announcement date. Examining whether warnings are issued to meet or beat expectation is beyond the scope of this study.

include all turnover firms, both forced turnovers and voluntary turnovers, in my main test. With regard to control variables, I use the adjusted accounting-based return and stock return to filter out industry peer effects (DeFond and Park 1999). In particular, ΔROA_ADJ and RET_ADJ are defined as ΔROA-RPE_ΔROA and RET-RPE_RET respectively where RPE_ΔROA and RPE_RET are as calculated in testing of *H3a*. The coefficients on both measures are expected to be negative. I also include CEO age (AGE) and age dummy (AGE_63) along with CEO tenure (TENURE) as control variables to capture the well-documented age effect on turnover (Murphy and Zimmerman 1993; DeFond and Park 1999). I expect the coefficients of all three variables to be positive.

Since prior research documents that one-year analyst forecast error captures the deviation of realized earnings from expectations and provides additional information regarding a CEO's ability (Puffer and Weintrop 1991; DeFond and Park 1999; Farrell and Whidbee 2003), I calculate the industry adjusted analyst forecast error (FE_ADJ) as the difference between the realized EPS for the previous year and the forecasted EPS at the beginning of the previous year and then scale it by the stock price at the beginning of the year. It is expected that FE_ADJ is negatively associated with TURN. Also, stock volatility (RETVAR) has been shown to be positively associated with the CEO retention decision (DeFond and Park 1999; Engel, Hayes and Wang 2003). I measure stock volatility as the variance of monthly returns during the 24-month period prior to the event year. Lastly, following DeFond and Park (1999), I include Herfindahl-Hirschman Index (HHI) as a control for industry competition. HHI is calculated as the mean of the sum of the squared market shares of all firms in a two-digit SIC industry over the past five years, and hence, the higher the value of HHI, the lower the industry competition, and the lower likelihood of turnover. Thus, I expect a negative coefficient on HHI.

4.6.2 Test Results of Self-Selection Model

I first present some descriptive statistics. Panel A of Table 17 reports that there are 4,383 firm-year observations after merging my initial sample with the turnover sample from Hazarika et al. (2011).[33] Turnover observations account for 11.04% of total observations. The cross-tabulation of the number of warning firms and the number of turnovers show that 10.34% of non-warnings firms experience CEO turnover, while 14.00% of warning firms experience CEO turnover. The two-sample proportion test is significant (Z-stat=3.047). As illustrated in Panel B, warning firms have lower adjusted accounting-based returns and stock returns, younger CEOs, lower adjusted earnings surprise, and higher stock volatility, and are more likely to experience an earnings loss and in a more concentrated industry.

I present the results of probit regressions of turnover decisions in Table 18.[34] I discuss the models with controls for self-selection first. As predicted in *H7*, the coefficient on WARN is negative (p-value=0.068), supporting the hypothesis that the turnover rate is attenuated by issuing warnings. To facilitate the interpretation of the coefficients, I also compute the marginal probability effect. The result shows that when everything else equal, the likelihood to be replaced will be *reduced* by 6.5 percentage points if a warning is issued in that year. As expected, the coefficients on AGE, AGE_63 are all significantly positive. In addition, incurring an earnings loss, having a lower earnings surprise, experiencing a stronger return volatility, and being in a more competitive industry in the previous year also leads to a higher probability of getting replaced. In addition, the coefficient on the self-selection term for warning groups is significant

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[33] The reduction of sample size is due to two main reasons. First, Hazarika et al. (2011) study the CEO turnover and earnings management, so they only collect CEO turnover information for the observations for which the earnings management information is available. Second, their sample period is until 2004.

[34] The sample size is further down to 3,705 because the merge sample has no turnover in year 2004. As a result, the 2004 firm-year observations are dropped due to no variation in the dependent variable.

and positive, suggesting that factors (unobservable bad news, for example) that lead to issuance of warnings increase the probability of CEOs loosing their jobs.

It is also worth mentioning that, without controlling for self-selection, the results show that the coefficient on WARN is positive (β_1 = 0.149 with p-value=0.019), suggesting that warnings firms tend to have a higher turnover rate. However, after controlling for self-selection, the effect becomes negative and marginally significant (p=0.068). This highlights the importance of controlling for self-selection when managers implement their discretion to decide whether to warn or not to warn.

5 Robustness Check

5.1 An Alternative Self-Selection Model Used in Fang (2005)

Although the model by Tucker (2007) above controls for self-selection, it restricts the bonus equation to carry the same β in equations (1) and (2) for the warning firms and no-warning firms. *Ex ante*, there is no reason to believe that the two types of firms should have the same compensation effect. Thus, relaxing the equality of β makes this model more general. Fang (2005) models the effect of investment bank reputation on bond pricing using separate second-stage yield models for reputable banks and less reputable banks. Model specification is presented in Appendix A, Part 2 and the empirical results are shown in Table 19. Panel A of Table 19 reports the results of second-stage regression for warning and non-warning firms respectively. The results do show some pronounced differences between warnings firms and non-warning firms. Stock returns (RET), not accounting-based returns (ΔROA), significantly affect bonus growth among warning firms, while both stock returns and accounting-based returns (ΔROA) significantly affect bonus growth for non-warning firms. This difference is consistent with *Hypothesis 2a* that bonus sensitivity to stock returns is higher for warning firms than for non-warning firms.

More importantly, Panel B demonstrates the warning effect for warning firms by comparing the actual change in bonus (Δln(BONUS)) with the hypothetical change in bonus had the firm chosen not to warn. The mean of actual change is -1.117, significantly lower than the hypothetical change of -0.330, suggesting that if the firm had not warned, their bonus reduction would have been smaller (t-stat=-9.26). As expected, Panel C shows that the actual change in bonus is significantly higher than the hypothetical value, meaning that CEO's bonus of a non-warning firm would have been reduced had the CEO issued warning (t-stat=-72.15). To summarize, the results are in line with the previous findings that issuing warnings has a negative effect on bonus growth.

5.2 Controlling for Earnings Benchmarks Used in Matsunaga & Park (2001)

Matsunaga and Park (2001) find evidence that CEO's bonus is negatively affected when the firm reports quarterly earnings below the analyst consensus forecast, or below the earnings for the same quarter of the prior year, for at least two quarters during the year. It is possible that warning firms are on average more likely to miss analyst forecasts, therefore the result of a negative effect of warnings on CEO bonus is driven by the fact that warning firms miss the benchmark documented in Matsunaga and Park (2001). To control for the correlated earnings benchmarks, I test *H1a, H2a,* and *H3a* including the six earnings-benchmark measures:

$$\begin{aligned}\Delta \ln(\text{BONUS}_{it}) = {} & \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{WARN}_{it} + \beta_4 \text{RET}_{it} \times \text{WARN}_{it} \\ & + \beta_5 \Delta\text{ROA}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} + \beta_6 \text{RET}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} \\ & + \beta_7 \text{PEERW}_{it} + \beta_8 \text{WARN}_{it} + \beta_9 \text{NEWS}_{it} + \beta_{10} \text{SUR\_MIN\_ADJ}_{it} \\ & + \beta_{11} \Delta\text{SALE}_{it} + \beta_{12} \text{LEV}_{it} + \beta_{13} \text{MB}_{it} + \beta_{14} \text{TENURE}_{it} + \beta_{15} \text{CHAIR}_{it} \\ & + \beta_{16} \text{RPE\_}\Delta\text{ROA} + \beta_{17} \text{RPE\_RET} + \beta_{18} \text{NEGFE1}_{it} + \beta_{19} \text{NEGFE2}_{it} \\ & + \beta_{20} \text{NEGFE3}_{it} + \beta_{21} \text{NEGFE4}_{it} + \beta_{22} \text{DECREASE1}_{it} + \beta_{23} \text{DECREASE2}_{it} \\ & + \beta_{24} \text{DECREASE3}_{it} + \beta_{25} \text{DECREASE4}_{it} + \beta_{26} \text{LOSS1}_{it} + \beta_{27} \text{LOSS2}_{it} \\ & + \beta_{28} \text{LOSS3}_{it} + \beta_{29} \text{LOSS4}_{it} + \beta_{30} \text{IMR}_{it} \times \text{WARN}_{it} \\ & + \beta_{31} \text{IMR}_{it} \times (1 - \text{WARN}_{it}) + \varepsilon_{it} \qquad (12)\end{aligned}$$

Table 20 presents the results of estimating model (12). Firstly, consistent with the findings in Matsunaga and Park (2001), the coefficients on NEGFE2, NEGFE3, NEGFE4, DECREASE2, DECREASE3, and DECREASE4 are all significantly negative, indicating that a CEO' bonus is reduced if his firm misses the quarterly analyst forecasts, or miss the same quarter's earnings from last year at least two quarters, for at least two quarters. Secondly, the coefficient on WARN (β_8 =-1.813 with p-value=0.000), RET*WARN (β_4 =0.658 with p-value=0.035), and RET*WARN*PEERW (β_6 =-0.154 with p-value=0.062) support the previous findings of *H1a, H2a* and *H3a* respectively. Another implication is that if a firm issues a warning and still misses analyst forecast for at least two quarters, then the compensation committee will impose double-penalty on the CEO's bonus.

5.3 An Alternative Turnover Measure

I also explore the potential driver of the reduced CEO turnover rate. To do that, I partition the sample into three groups: no turnover, voluntary turnover and forced turnover and then I implement multinomial logistic regression analysis. The results are reported in Table 21. Column 1 of Table 21 shows that WARN is significantly negatively related to the likelihood of voluntary CEO turnover. WARN is not, however, related to the likelihood of forced turnover as shown in Column 2. These results may be interpreted as CEOs who are more capable are more likely to issue warnings, and they are less likely to resign from their jobs. Meanwhile, directors' decision to force the CEO out is not affected by the issuance of warnings.

5.4 Effect of Warnings on Total Compensation

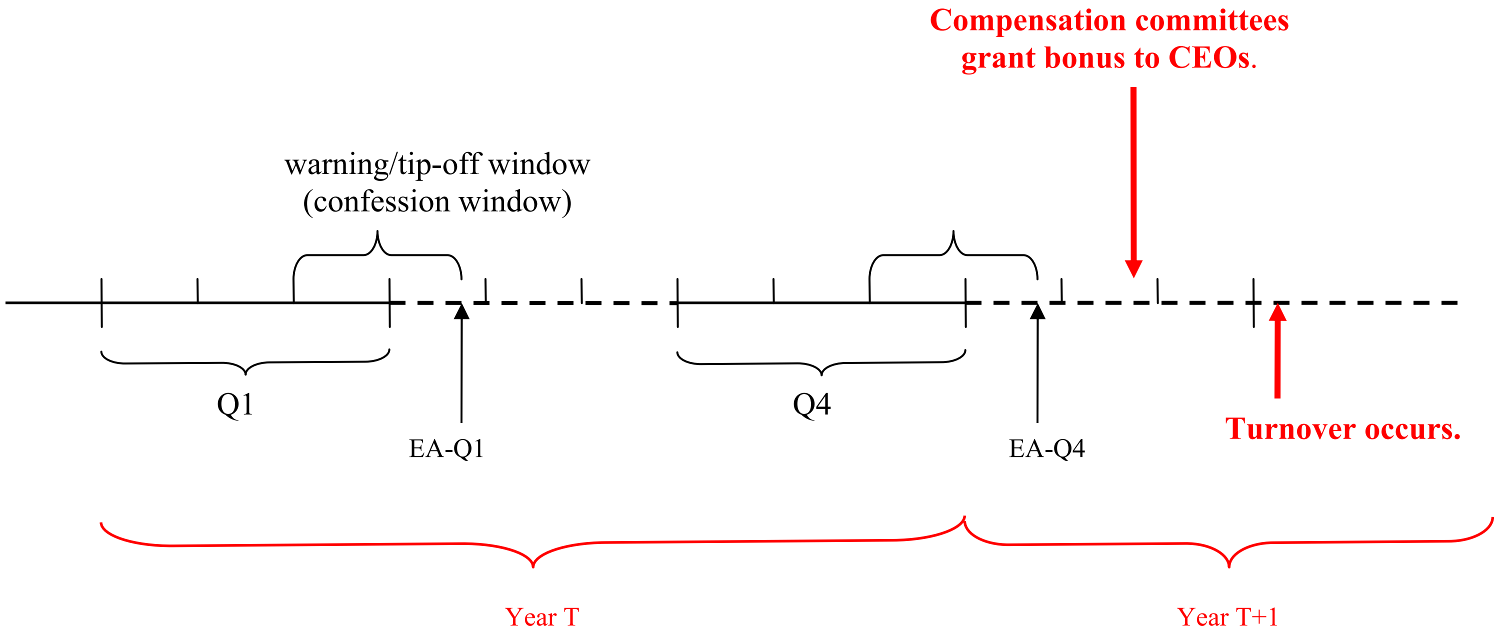
Previous sections have shown that CEOs of warning firms get penalized on bonus, but receive more from option grants. Then a question arises as to what would be the net effect of issuing a warning on CEO compensation. To answer this question, I test how warnings affect total compensation, which is the sum of salary, bonus, long-term incentive payouts, restricted stocks granted, the value of stock options granted, and all other compensation in a given year. *Ex ante*, I do not have a predicted sign for the coefficient on WARN. I use the model from testing the effect of warnings on bonuses, and the results are shown in Table 22. The coefficient on WARN is positive but insignificant, so it is possible that the reduced cash-based compensation is offset by the increased stock-based compensation. Nonetheless, it is worth emphasizing that the compensation structure moves towards stock-based compensation in the year warnings are issued.

6 Concluding Remarks

This study fills the void in the literature by empirically testing whether warnings and tip-offs affect CEO annual bonus, option grants, and CEO turnover. I find that warnings adversely affect CEO bonus and positively affect option grants. In particular, the percentage of compensation from option grants increases significantly for warnings firms than for non-warning control firms, indicating that boards of directors adjust the compensation structure toward an incentive-oriented compensation in the year warnings are issued. In addition, firms that issue warnings have a stronger bonus-to-stock-returns sensitivity than firms that do not issue warnings after controlling for performance measures, risks, governance measures. However, I do not find evidence that tip-offs affect CEO compensation. Consistent with, and incremental to RPE, I provide evidence that compensation contracts use peer firms' stock returns and the information content of warnings to filter out the systematic shock when evaluating CEOs' performance. Lastly, I argue and show that as a benefit of issuing warnings, the likelihood of CEO turnover is reduced when warnings are issued. Taken together, it appears that by issuing warnings, managers are willing to trade off bonus cuts for more option grants and better job security. The evidence provided also helps understand how boards of directors determine and adjust compensation structure for CEOs.

Figure 1

Timeline



Appendix A: Self-Selection Model Specifications

PART 1 Self-selection model following Tucker (2007)

Following Tucker (2007), self-selection of to warn or not to warn is modeled in the following system:

$$\Delta \text{Ln(bonus)}_{1i} = \alpha_1 + X_i\beta + \upsilon_{1i} \qquad \text{(data observed only when Warn}_\text{i}^* > 0) \qquad (1)$$
$$\Delta \text{Ln(bonus)}_{0i} = \alpha_0 + X_i\beta + \upsilon_{0i} \qquad \text{(data observed only when Warn}_\text{i}^* \leq 0) \qquad (2)$$
$$\text{Warn}_\text{i}^* = Z_i\gamma + \varepsilon_i \qquad (3)$$

Because both the error terms in (1) and (2) may be correlated with the error term in (3), the expected value of error terms are non-zero, violating OLS assumption. To solve this problem, it is necessary to write out the conditional expectation of the error term and include it in the (1) and (2) as follows:

$$E\left[\Delta \text{Ln(bonus)}_{1\text{i}} \middle| \text{warn}_\text{i} = 1\right] = \alpha_1 + X_i\beta + E(\upsilon_{1\text{i}} | \varepsilon_i > -Z_i\gamma) = \alpha_1 + X_i\beta + \sigma_{\varepsilon\upsilon_1}\frac{\phi(Z_i\gamma)}{\Phi(Z_i\gamma)} \qquad (4)$$
$$E\left[\Delta \text{Ln(bonus)}_{0\text{i}} \middle| \text{warn}_\text{i} = 0\right] = \alpha_0 + X_i\beta + E(\upsilon_{0\text{i}} | \varepsilon_i \leq -Z_i\gamma) = \alpha_0 + X_i\beta + \sigma_{\varepsilon\upsilon_0}\frac{-\phi(Z_i\gamma)}{1-\Phi(Z_i\gamma)} \qquad (5)$$

Lastly, combining (4) and (5) results in a single equation:

$$\Delta \text{Ln(bonus)}_\text{i} = \alpha_0 + \theta\text{Warn}_\text{i} + X_\text{i}\beta + \sigma_{\varepsilon\upsilon_1}\frac{\phi(Z_i\gamma)}{\Phi(Z_i\gamma)} + \sigma_{\varepsilon\upsilon_0}\frac{-\phi(Z_i\gamma)}{1-\Phi(Z_i\gamma)} + \omega_\text{i} \qquad (6)$$

where $\frac{\phi(Z_i\gamma)}{\Phi(Z_i\gamma)}$ is denoted as IMR $*$ Warn; $\frac{-\phi(Z_i\gamma)}{1-\Phi(Z_i\gamma)}$ is denoted as IMR * (1 - Warn).

PART 2 Self-selection model following Fang (2005)

Consistent with Fang (2005), I run equation (d) and (e) respectively and compute the warning effect using the following formula:

$$\Delta\text{Ln(bonus)}_{1\text{i}} - E\left[\Delta\text{Ln(bonus)}_{0\text{i}} \middle| \text{warn}_i^* > 0\right] \qquad \text{(g)}$$

Where the second term reflects the hypothetical change in bonus for a warning firm, had the firm not warned; the first term is the actual change in bonus for a warning firm. The hypothetical value is computed as follows:

$$E\left[\Delta\text{Ln(bonus)}_{0\text{i}} \middle| \text{warn}_i^* > 0\right] = \alpha_0 + X_i\beta_0 + \sigma_{0\varepsilon}\frac{\phi(Z_i\gamma)}{\Phi(Z_i\gamma)} \qquad (h)$$

To implement equation (h), I first run equation (d) and (e) separately to obtain β_0 and β_1.

$$E\left[\Delta\text{Ln(bonus)}_{1\text{i}} \middle| \text{warn}_\text{i} = 1\right] = \alpha_1 + X_i\beta + E(\upsilon_{1\text{i}} | \varepsilon_i > -Z_i\gamma) = \alpha_1 + X_i\beta_1 + \sigma_{\varepsilon\upsilon_1}\frac{\phi(Z_i\gamma)}{\Phi(Z_i\gamma)} \qquad \text{(d)}$$

$$E\left[\Delta\text{Ln(bonus)}_{0\text{i}} \middle| \text{warn}_\text{i} = 0\right] = \alpha_0 + X_i\beta + E(\upsilon_{0\text{i}} | \varepsilon_i \le -Z_i\gamma) = \alpha_0 + X_i\beta_0 + \sigma_{\varepsilon\upsilon_0}\frac{-\phi(Z_i\gamma)}{1-\Phi(Z_i\gamma)} \qquad \text{(e)}$$

Second, to compute the hypothetical value of warning firms, I multiply the variable values, including the inverse mills ratio ($\frac{\phi(Z_i\gamma)}{\Phi(Z_i\gamma)}$) of warning firms, by the coefficients from non-warning firms. Third, I compute the difference between the actual change in bonus for warning firms and the computed hypothetical value of change in bonus obtained from step 2. If the difference from (g) is negative (i.e., the hypothetical change is greater than actual change in bonus), it suggests that CEO bonus of a warning firm would have not been penalized had the firm chosen not to warn, supporting the hypothesis.

Appendix B: Probit Model of Litigation Risk

RISK on table A3 (model 2) is defined as the predicted value of litigation risk. The litigation risk model is based on the probit model used in Johnson et al. (2001), Rogers and Stocken (2005), and Tucker (2007). The litigation data are from 1996 to 2006 and obtained from Stanford Securities Class Action Clearinghouse website. RISK is set to 1 if the firm is a defendant in a class action lawsuit filed in that year, and zero otherwise; All the explanatory variables are measured in twelve-month period previous to the event year. The model was estimated using all Compustat firm years with sufficient information on CRSP during 1995 to 2005. [35] The results are presented in Table A.

[35] For example, if a firm is sued on 2/1/1997, then risk=1 in year 1997, and all independent variables are measured during the calendar year of 1996. Then it is matched to fiscal year of 1997 for warning estimation.

Table A: Probit Model of Litigation Risk

$$\Pr(\text{RISK}_{it+1}=1)=\Phi(\alpha_0+\alpha_1\text{LN\_SIZE}_{it}+\alpha_2\text{TURNOVER}_{it}+\alpha_3\text{BETA}_{it}+\alpha_4\text{CUMRET}_{it}$$
$$+\alpha_5\text{STDRET}_{it}+\alpha_6\text{MINRET}_{it}+\alpha_7\text{BIO}_{it}+\alpha_8\text{COMPUTER}_{it}$$
$$+\alpha_9\text{ELECTRONICS}+\alpha_{10}\text{RETAIL}_{it}+\alpha_{11}\text{SOFTWARE}_{it}+\varepsilon_{it+1})$$

	Coef.	Robust** Std. Err.	P-value***
Intercept	-5.235	0.097	0.000
LN_SIZE	0.206	0.007	0.000
TURNOVER	0.003	0.001	0.001
BETA	0.171	0.018	0.000
CUMRET	-0.153	0.018	0.000
STDRET	5.223	0.690	0.000
MINRET	-1.455	0.143	0.000
BIO	0.104	0.047	0.026
COMPUTER	0.158	0.062	0.010
ELECTRONICS	0.027	0.044	0.537
RETAIL	-0.016	0.051	0.752
SOFTWARE	0.217	0.038	0.000
Pseudo R^2		0.145	
Number of obs		61,010	

*Variable definitions:

RISK = if the firm is a defendant in a class action lawsuit filed in that year, zero otherwise;
LN_SIZE = natural logarithm of average daily market value of equity over 12 months before the event year;
TURNOVER = average daily trading volume deflated by the number of shares outstanding over 12 months before the even year;
BETA = slope coefficient from regressing daily stock returns on the market returns downloaded from CRSP over 12 months before the even year;
CUMRET = sum of daily raw returns over 12 months before the even year;
STDRET = standard deviation of daily raw returns over 12 months before the even year;
MINRET = minimum daily raw returns over 12 months before the even year;
BIO = 1 if the firm is operated in bio-technology industry (SIC 2833-2836), zero otherwise;
COMPUTER = 1 if the firm is operated in computer hardware industry (SIC 3570-3577), zero otherwise;
ELECTRONICS = 1 if the firm is operated in electronics industry (SIC 3600-3674), zero otherwise;
RETAIL = 1 if the firm is operated in retail industry (SIC 5200-5961), zero otherwise;
SOFTWARE = 1 if the firm is operated in computer software industry (SIC 7371-7379), zero otherwise;

**:The standard errors are adjusted for heteroscedasticity.

***:P-values are based on two-tailed tests.

TABLE 1: Sample Distribution and Descriptive Statatics for Testing Warning Effect

Panel A: Number of Observations by Year

Year	Warning Firms	Non-warning Control Firms	Total	Percentage of Warning firms
1996	59	546	605	10%
1997	70	653	723	10%
1998	128	612	740	17%
1999	127	574	701	18%
2000	140	527	667	21%
2001	182	537	719	25%
2002	142	429	571	25%
2003	145	602	747	19%
2004	120	609	729	16%
2005	105	640	745	14%
Total	1,218	5,729	6,947	18%

Panel B: Top 20 Industries with the largest Number of Warnings

	Warning Firms		Non-Warning Firms		Total	
Industry	#	%	#	%	#	%
Chemical and Allied Products	90	7.4%	416	7.3%	506	7.3%
Industrial Machinery & Equipment	86	7.1%	322	5.6%	408	5.9%
Electronic & Other Electric Equipment	81	6.7%	396	6.9%	477	6.9%
Business Services	63	5.2%	376	6.6%	439	6.3%
Instruments & Related Products	58	4.8%	253	4.4%	311	4.5%
Stone, Clay, & Glass Products	52	4.3%	118	2.1%	170	2.4%
Food & Kindred Products	39	3.2%	158	2.8%	197	2.8%
Apparel & Accessory Stores	39	3.2%	64	1.1%	103	1.5%
Transportation Equipment	38	3.1%	149	2.6%	187	2.7%
Wholesale Trade- Durable Goods	37	3.0%	122	2.1%	159	2.3%
Paper & Allied Products	33	2.7%	140	2.4%	173	2.5%
Printing & Publishing	33	2.7%	102	1.8%	135	1.9%
Insurance Carriers	32	2.6%	230	4.0%	262	3.8%
Textile Mill Products	31	2.5%	40	0.7%	71	1.0%
Electric, Gas, & Sanitary Services	31	2.5%	508	8.9%	539	7.8%
Eating & Drinking Places	27	2.2%	104	1.8%	131	1.9%
Depository Institutions	26	2.1%	353	6.2%	379	5.5%
Fabricated Metal Products	25	2.1%	78	1.4%	103	1.5%
Rubber & Miscellaneous Plastics Products	23	1.9%	48	0.8%	71	1.0%
Miscellaneous Retail	23	1.9%	88	1.5%	111	1.6%
Other	351	28.8%	1,664	29.0%	2,015	29.0%
Total	1,218	100%	5,729	100%	6,947	100%

Table 1 (continued)

Panel C: Descriptive Statistics

	FULL SAMPLE					Warning Sample		Non-warning Control Sample		Between sample (Warnings-Non-warnings)	
	N=6,947					N=1,218		N=5,729			
	Mean	Median	Q1	Q3	Std. Dev	Mean	Median	Mean	Median	T-stat	Z-stat
Δln(BONUS)	-0.169	0.000	-0.393	0.381	2.755	-1.117	-0.229	0.032	0.026	-13.390	-16.452
ΔROA	-0.011	-0.002	-0.027	0.011	0.075	-0.028	-0.016	-0.008	-0.001	-8.679	-14.298
RET	0.093	0.058	-0.169	0.294	0.415	-0.075	-0.094	0.129	0.094	-15.870	-17.051
NEWS	0.493	0.000	0.000	1.000	0.500	0.649	1.000	0.460	0.000	12.114	11.989
SUR_MIN_ADJ	-0.008	-0.003	-0.007	-0.001	0.017	-0.012	-0.006	-0.007	-0.002	-8.481	-21.445
ΔSALE	0.085	0.073	-0.003	0.165	0.209	0.056	0.052	0.091	0.077	-5.318	-6.338
LEV	0.239	0.237	0.095	0.354	0.170	0.234	0.237	0.240	0.237	-1.208	-0.699
MB	3.143	2.266	1.572	3.593	3.052	2.932	2.224	3.188	2.275	-2.660	-1.769
TENURE	1.851	1.792	1.386	2.398	0.794	1.832	1.792	1.855	1.792	-0.900	-0.731
CHAIR	0.944	1.000	1.000	1.000	0.230	0.933	1.000	0.947	1.000	-1.920	-1.920

Variable definitions:

BONUS	=	$1 plus bonus from Compustat Execucomp;
ROA	=	earnings before interest, taxes, depreciation and amortization divided by the beginning-year book value of total assets;
RET	=	cumulative monthly raw return from CRSP during the fiscal year;
NEWS	=	1 if this year's EPS excluding extraordinary items is lower than last year's EPS excluding extraordinary items, zero otherwise from Compustat;
SUR_MIN_ADJ	=	I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the lowest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the most lowest;
ΔSALE	=	change in natural logarithm of sales from the prior year;
LEV	=	debt divided by total assets measured at the beginning of the fiscal year;
MB	=	market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;
TENURE	=	Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;
CHAIR	=	1 if the CEO is the board chair, zero otherwise.

Table 2 Pearson Correlation Matrix of Variables Used in Testing Warning Effect

Panel A: Correlation coefficients between main variables

	Δln(BONUS)	ΔROA	RET	WARN	NEWS	SUR_MIN_ADJ	ΔSALE	LEV	MB	TENURE
ΔROA	0.217									
	(0.000)									
RET	0.237	0.257								
	(0.000)	(0.000)								
WARN	-0.159	-0.104	-0.187							
	(0.000)	(0.000)	(0.000)							
NEWS	-0.242	-0.490	-0.179	0.144						
	(0.000)	(0.000)	(0.000)	(0.000)						
SUR_MIN_ADJ	0.084	0.154	0.181	-0.101	-0.153					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
ΔSALE	0.103	0.169	0.157	-0.064	-0.145	0.195				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
LEV	0.026	0.082	-0.004	-0.015	-0.014	-0.063	0.010			
	(0.034)	(0.000)	(0.728)	(0.227)	(0.248)	(0.000)	(0.408)			
MB	-0.037	-0.046	-0.078	-0.032	-0.008	0.130	0.161	-0.070		
	(0.002)	(0.000)	(0.000)	(0.008)	(0.529)	(0.000)	(0.000)	(0.000)		
TENURE	-0.039	-0.016	0.005	-0.011	0.040	0.011	0.087	-0.060	0.009	
	(0.001)	(0.181)	(0.706)	(0.368)	(0.001)	(0.355)	(0.000)	(0.000)	(0.461)	
CHAIR	0.030	0.026	0.038	-0.023	-0.020	0.022	-0.006	0.012	-0.025	0.015
	(0.013)	(0.029)	(0.001)	(0.055)	(0.104)	(0.073)	(0.636)	(0.307)	(0.038)	(0.208)

Panel B: Correlation coefficients between variables that determine the decision to warn

	WARN	RISK	LN_MVE	UPDATE_GUIDE	PAST_GUIDE	NUMEST	IOR	NEWS	SUR_MIN_ADJ	MB
RISK	0.022									
	(0.065)									
LN_MVE	-0.054	0.677								
	(0.000)	(0.000)								
UPDATE_GUIDE	0.211	0.133	0.158							
	(0.000)	(0.000)	(0.000)							
PAST_GUIDE	0.174	0.086	0.125	0.577						
	(0.000)	(0.000)	(0.000)	(0.000)						
NUMEST	0.006	0.596	0.662	0.156	0.161					
	(0.606)	(0.000)	(0.000)	(0.000)	(0.000)					
IOR	0.102	0.087	0.080	0.168	0.179	0.195				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
NEWS	0.144	0.057	-0.030	0.011	-0.020	-0.026	-0.004			
	(0.000)	(0.000)	(0.012)	(0.383)	(0.101)	(0.034)	(0.750)			
SUR_MIN_ADJ	-0.101	0.037	0.266	0.083	0.068	0.165	0.081	-0.153		
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
MB	-0.032	0.391	0.306	0.063	0.018	0.249	0.026	-0.008	0.130	
	(0.008)	(0.000)	(0.000)	(0.000)	(0.146)	(0.000)	(0.031)	(0.529)	(0.000)	
ROA_STD	-0.004	0.175	-0.181	-0.053	-0.036	0.036	-0.011	0.064	-0.205	0.125
	(0.732)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.363)	(0.000)	(0.000)	(0.000)
FD	0.075	0.0937	0.0346	0.2905	0.323	0.1116	0.2213	-0.0101	-0.0105	-0.045
	(0.000)	(0.000)	0.004	(0.000)	(0.000)	(0.000)	(0.000)	(0.400)	(0.382)	(0.000)

Table 2 (continued):

Variable Definitions:

Variables in Panel A are defined as in Table 1.

RISK	=	predicted value of the likelihood of being sued (see appendix B);
LN_MVE	=	natural logarithm of market value of equity measured at the beginning of the fiscal year;
UPDATE_GUIDE	=	1 if a firm has issued earning forecast before the third fiscal month of any fiscal quarter, zero otherwise;
PAST_GUIDE	=	number of earnings guidance issued by a firm in the previous fiscal year;
NUMEST	=	average number of analysts whose earnings forecasts are included in the most recent consensus compiled before the third month of the fiscal quarters during the fiscal year;
IOR	=	number of institutional holdings divided by total number of shares outstanding measured at the beginning of the fiscal year;
NEWS	=	1 if this year's EPS excluding extraordinary items is lower than last year's EPS excluding extraordinary items, zero otherwise from Compustat;
SUR_MIN_ADJ	=	I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the lowest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is most lowest;
MB	=	market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;
ROA_STD	=	standard deviation of ROA during the past four fiscal years;
FD	=	1 if fiscal year-end date is after 01/10/ 2000 the date the Regulation Fair Disclosure takes effect.

P-values are based on two-tailed significant level and put in parentheses.

TABLE 3: Sample Distribution and Descriptive Statatics for Testing Tip-Off Effect

Panel A: Number of Observations by Year

Year	Tip-Off Firms	Non-Tip-Off Control Firms	Total	Percentage of tip-off firms
1996	13	881	894	1%
1997	27	851	878	3%
1998	32	830	862	4%
1999	37	882	919	4%
2000	50	879	929	5%
2001	55	874	929	6%
2002	68	728	796	9%
2003	56	1038	1094	5%
2004	96	1043	1139	8%
2005	60	1022	1082	6%
Total	494	9,028	9,522	5%

Panel B: Top 20 Industries with the largest Number of Tip-offs

	Tip-Off Firms		Non-Tip-Off Firms		Total	
Industry	#	%	#	%	#	%
Industrial Machinery & Equipment	42	8.5%	568	6.3%	610	6.4%
Chemical & Allied Products	41	8.3%	621	6.9%	662	7.0%
Electronic & Other Electric Equipment	39	7.9%	698	7.7%	737	7.7%
Apparel & Accessory Stores	32	6.5%	125	1.4%	157	1.6%
Electric, Gas, & Sanitary Services	29	5.9%	593	6.6%	622	6.5%
Business Services	29	5.9%	837	9.3%	866	9.1%
Food & Kindred Products	22	4.5%	216	2.4%	238	2.5%
Primary Metal Industries	18	3.6%	172	1.9%	190	2.0%
Wholesale Trade- Durable Goods	17	3.4%	191	2.1%	208	2.2%
Instruments & Related Products	16	3.2%	413	4.6%	429	4.5%
Miscellaneous Retail	15	3.0%	161	1.8%	176	1.8%
Oil & Gas Extraction	14	2.8%	259	2.9%	273	2.9%
Transportation Equipment	13	2.6%	252	2.8%	265	2.8%
Printing & Publishing	11	2.2%	183	2.0%	194	2.0%
Furniture & Homefurnishings Stores	10	2.0%	52	0.6%	62	0.7%
Paper & Allied Products	9	1.8%	150	1.7%	159	1.7%
General Merchandise Stores	9	1.8%	113	1.3%	122	1.3%
Eating & Drinking Places	9	1.8%	175	1.9%	184	1.9%
Depository Institutions	9	1.8%	499	5.5%	508	5.3%
Furniture & Fixtures	8	1.6%	67	0.7%	75	0.8%
Other	102	20.6%	2,683	29.7%	2,785	29.2%
Total	494	100.0%	9,028	100.0%	9,522	100.0%

Table 3 (continued):

Panel C: Descriptive Statistics

	FULL SAMPLE					Tip-Off Sample		Non-Tip-Off Control Sample		Between sample (Tip-Off minus Non-Tip-Off)	
	N=9,522					N=494		N=9,028			
	Mean	Median	Q1	Q3	Std. Dev	Mean	Median	Mean	Median	T-stat	Z-stat
Δln(BONUS)	0.253	0.105	-0.122	0.530	2.470	0.862	0.328	0.220	0.095	5.637	8.865
ΔROA	0.003	0.002	-0.014	0.022	0.081	0.020	0.014	0.002	0.002	4.716	8.339
RET	0.224	0.153	-0.073	0.422	0.510	0.358	0.257	0.216	0.149	6.049	6.526
NEWS	0.613	1.000	0.000	1.000	0.487	0.757	1.000	0.605	1.000	6.763	6.748
SUR_MAX_ADJ	0.004	0.002	0.001	0.005	0.007	0.006	0.004	0.004	0.002	6.404	13.047
ΔSALE	0.117	0.096	0.020	0.200	0.208	0.148	0.124	0.116	0.094	3.324	4.188
LEV	0.226	0.218	0.067	0.344	0.176	0.232	0.235	0.226	0.216	0.746	1.186
MB	3.343	2.367	1.597	3.867	3.434	3.121	2.254	3.356	2.379	-1.478	-1.727
TENURE	1.843	1.792	1.386	2.398	0.796	1.807	1.792	1.844	1.792	-1.009	-1.151
CHAIR	0.943	1.000	1.000	1.000	0.232	0.943	1.000	0.943	1.000	0.013	0.013

Variable definitions:

BONUS	=	$1 plus bonus from Compustat Execucomp;
ROA	=	earnings before interest, taxes, depreciation and amortization divided by the beginning-year book value of total assets;
RET	=	cumulative monthly raw return from CRSP during the fiscal year;
NEWS	=	1 if this year's EPS excluding extraordinary items is greater than last year's EPS excluding extraordinary items, zero otherwise from Compustat;
SUR_MAX_ADJ	=	I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the highest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the largest;
ΔSALE	=	change in natural logarithm of sales from the prior year;
LEV	=	debt divided by total assets measured at the beginning of the fiscal year;
MB	=	market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;
TENURE	=	Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;
CHAIR	=	1 if the CEO is the board chair, zero otherwise.

Table 4 Pearson Correlation Matrix of Variables Used in Testing Tip-Off Effect

Panel A: Correlation coefficients between main variables

	Δln(BONUS)	ΔROA	RET	TIPOFF	NEWS	SUR_MIN_ADJ	ΔSALE	LEV	MB	TENURE
ΔROA	0.205									
	(0.000)									
RET	0.210	0.252								
	(0.000)	(0.000)								
TIPOFF	0.058	0.048	0.062							
	(0.000)	(0.000)	(0.000)							
NEWS	0.212	0.461	0.143	0.069						
	(0.000)	(0.000)	(0.000)	(0.000)						
SUR_MAX_ADJ	0.055	0.082	0.056	0.066	0.035					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)					
ΔSALE	0.094	0.185	0.201	0.034	0.118	-0.088				
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)				
LEV	0.032	0.038	-0.015	0.008	0.033	0.112	-0.018			
	(0.002)	(0.000)	(0.140)	(0.456)	(0.001)	(0.000)	(0.080)			
MB	-0.047	-0.021	-0.068	-0.015	-0.040	-0.162	0.188	-0.119		
	(0.000)	(0.044)	(0.000)	(0.139)	(0.000)	(0.000)	(0.000)	(0.000)		
TENURE	-0.036	-0.033	0.015	-0.010	-0.032	-0.025	0.090	-0.056	0.021	
	(0.001)	(0.001)	(0.134)	(0.313)	(0.002)	(0.014)	(0.000)	(0.000)	(0.037)	
CHAIR	-0.006	-0.001	-0.004	0.000	0.008	-0.008	-0.015	0.020	-0.022	0.018
	(0.579)	(0.940)	(0.686)	(0.989)	(0.430)	(0.411)	(0.146)	(0.051)	(0.031)	(0.080)

Panel B: Correlation coefficients between variables that determine the decision to tip off

	TIPOFF	LN_MVE	UPDATE_GUIDE	PAST_GUIDE	NUMEST	IOR	NEWS	SUR_MAX_ADJ	R&D	ISSUE
LN_MVE	-0.003									
	(0.760)									
UPDATE_GUIDE	0.122	0.167								
	(0.000)	(0.000)								
PAST_GUIDE	0.164	0.155	0.590							
	(0.000)	(0.000)	(0.000)							
NUMEST	0.019	0.679	0.177	0.191						
	(0.068)	(0.000)	(0.000)	(0.000)						
IOR	0.040	0.107	0.206	0.215	0.212					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
NEWS	0.069	-0.024	-0.002	0.029	0.000	-0.018				
	(0.000)	(0.020)	(0.845)	(0.005)	(0.998)	(0.088)				
SUR_MAX_ADJ	0.066	-0.275	-0.103	-0.065	-0.191	-0.141	0.035			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)			
R&D	-0.020	-0.080	-0.022	-0.036	0.086	-0.019	-0.062	0.122		
	(0.047)	(0.000)	(0.032)	(0.001)	(0.000)	(0.064)	(0.000)	(0.000)		
ISSUE	-(0.011)	(0.310)	-(0.001)	-(0.018)	(0.127)	-(0.075)	-(0.005)	-(0.051)	-0.1553	
	(0.298)	(0.000)	(0.951)	(0.079)	(0.000)	(0.000)	(0.621)	(0.000)	0	
MB	-0.015	0.275	0.043	0.015	0.228	0.043	-0.040	-0.162	0.213	-0.008
	(0.139)	(0.000)	(0.000)	(0.147)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	0.4368
ROA_STD	-0.012	-0.173	-0.053	-0.053	0.039	-0.027	-0.045	0.204	0.472	-0.153
	(0.259)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.000)	(0.000)
FD	0.071	0.0609	0.3347	0.3367	0.1379	0.2328	0.0256	0.0636	0.0202	-0.0876
	(0.000)	(0.000)	0	(0.000)	(0.000)	(0.000)	(0.013)	(0.000)	(0.048)	(0.000)

Table 4 (continued):

Variable Definitions:

Variables in Panel A are defined as in Table 3.

LN_MVE =	natural logarithm of market value of equity measured at the beginning of the fiscal year;
UPDATE_GUIDE =	1 if a firm has issued earning forecast before the third fiscal month of any fiscal quarter, zero otherwise;
PAST_GUIDE =	number of earnings guidance issued by a firm in the previous fiscal year;
NUMEST =	average number of analysts whose earnings forecasts are included in the most recent consensus compiled before the third month of the fiscal quarters during the fiscal year;
IOR =	number of institutional holdings divided by total number of shares outstanding measured at the beginning of the fiscal year;
NEWS =	1 if this year's EPS excluding extraordinary items is greater than last year's EPS excluding extraordinary items, zero otherwise from Compustat;
SUR_MAX_ADJ =	I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the highest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the largest;
R&D =	R&D expenditures scaled by total assets;
ISSUE =	1 if there is a pulic offering of debt or equity in the current or the following fiscal year;
MB =	market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;
ROA_STD =	standard deviation of ROA during the past four fiscal years;
FD =	1 if fiscal year-end date is after 01/10/ 2000 the date the Regulation Fair Disclosure takes effect.

P-values are based on two-tailed significant level and put in parentheses.

Table 5: Testing the Relation between Change in CEO Bonus and Warnings

$$\Delta \ln(\text{BONUS}_{it}) = \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{WARN}_{it} + \beta_4 \text{RET}_{it} \times \text{WARN}_{it} + \beta_5 \text{WARN}_{it} + \beta_6 \text{NEWS}_{it} + \beta_7 \text{SUR\_MIN\_ADJ}_{it} + \beta_8 \Delta\text{SALE}_{it} + \beta_9 \text{LEV}_{it} + \beta_{10} \text{MB}_{it} + \beta_{11} \text{TENURE}_{it} + \beta_{12} \text{CHAIR}_{it} + \varepsilon_{it} \quad (1)$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		0.248	0.166	0.134
ΔROA	+	2.588	0.567	0.000
RET	+	1.164	0.094	0.000
ΔROA*WARN		0.100	1.409	0.943
RET*WARN	+	0.372	0.280	0.093
WARN		-0.685	0.097	0.000
NEWS	−	-0.798	0.076	0.000
SUR_MIN_ADJ	+	0.046	2.313	0.492
ΔSALE	+	0.729	0.175	0.000
LEV		0.294	0.179	0.101
MB		-0.027	0.010	0.006
TENURE	−	-0.135	0.035	0.000
CHAIR	+	0.182	0.113	0.054
Year dummy			yes	
Industry dummy			yes	
adj_R²			0.121	
Number of obs			6,947	

[1]Variable definitions:

BONUS = $1 plus bonus from Compustat Execucomp;

ROA = earnings before interest, taxes, depreciation and amortization divided by the beginning-year book value of total assets;

RET = cumulative monthly raw return from CRSP during the fiscal year;

WARN = 1 if a firm issues an earnings warning after the beginning of the third fiscal month and before the quarterly earnings announcement date in any quarter of the fiscal year, zero otherwise;

NEWS = 1 if this year's EPS excluding extraordinary items is lower than last year's EPS excluding extraordinary items, zero otherwise from Compustat;

SUR_MIN_ADJ = I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the lowest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the most lowest;

ΔSALE = change in natural logarithm of sales from the prior year;

LEV = debt divided by total assets measured at the beginning of the fiscal year;

MB = market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;

TENURE = Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;

CHAIR = 1 if the CEO is the board chair, zero otherwise;

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 6:First Stage Probit Analysis of the Choice to Issue Warnings

$$\Pr(WARN_{it}=1)=\Phi(\alpha_0+\alpha_1 RISK_{it}+\alpha_2 LN\_MVE_{it}+\alpha_3 UPDATE\_GUIDE_{it}$$
$$+\alpha_4 PAST\_GUIDE_{it}+\alpha_5 NUMEST_{it}+\alpha_6 IOR_{it}+\alpha_7 NEWS_{it}$$
$$+\alpha_8 SUR\_MIN\_ADJ+\alpha_9 MB_{it}+\alpha_{10} ROA\_STD_{it}+\alpha_{11} FD_{it}+\varepsilon_{it}) \quad (2)$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		-0.803	0.156	0.000
RISK	+	3.336	0.664	0.000
LN_MVE	+	-0.163	0.021	0.000
UPDATE_GUIDE	+	0.551	0.047	0.000
PAST_GUIDE	+	0.030	0.006	0.000
NUMEST	+	0.008	0.004	0.031
IOR	+	0.609	0.106	0.000
NEWS	+	0.406	0.038	0.000
SUR_MIN_ADJ	−	-6.591	0.994	0.000
MB	+	-0.011	0.007	0.051
ROA_STD	−	-1.529	0.351	0.000
FD		-0.062	0.042	0.145
Pseudo R^2		0.101		
Number of obs		6,947		

[1]Variable definitions:

WARN = 1 if a firm issues an earnings warning after the beginning of the third fiscal month and before the quarterly earnings announcement date in any quarter of the fiscal year, zero otherwise;

RISK = predicted value of the likelihood of being sued (see appendix);

LN_MVE = natural logarithm of market value of equity measured at the beginning of the fiscal year;

SUR_MIN_ADJ = I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the lowest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is most lowest;

UPDATE_GUIDE = 1 if a firm has issued earning forecast before the third fiscal month of any fiscal quarter, zero otherwise;

PAST_GUIDE = number of earnings guidance issued by a firm in the previous fiscal year;

NUMEST = average number of analysts whose earnings forecasts are included in the most recent consensus compiled before the third month of the fiscal quarters during the fiscal year;

IOR = number of institutional holdings divided by total number of shares outstanding measured at the beginning of the fiscal year;

NEWS = 1 if this year’s EPS excluding extraordinary items is lower than last year’s EPS excluding extraordinary items, zero otherwise from Compustat;

MB = market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;

ROA_STD = standard deviation of ROA during the past four fiscal years;

FD = 1 if fiscal year-end date is after 01/10/ 2000 the date the Regulation Fair Disclosure takes effect.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 7: Testing the Relation between Change in CEO bonus and Warnings after Controllingfor Self-Selection

$$\Delta \ln(\mathrm{BONUS}_{it}) = \beta_0 + \beta_1 \Delta\mathrm{ROA}_{it} + \beta_2 \mathrm{RET}_{it} + \beta_3 \Delta\mathrm{ROA}_{it} \times \mathrm{WARN}_{it} + \beta_4 \mathrm{RET}_{it} \times \mathrm{WARN}_{it} + \beta_5 \mathrm{WARN}_{it} + \beta_6 \mathrm{NEWS}_{it} + \beta_7 \mathrm{SUR\_MIN\_ADJ}_{it} + \beta_8 \Delta\mathrm{SALE}_{it} + \beta_9 \mathrm{LEV}_{it} + \beta_{10} \mathrm{MB}_{it} + \beta_{11} \mathrm{TENURE}_{it} + \beta_{12} \mathrm{CHAIR}_{it} + \beta_{13} \mathrm{IMR}_{it} * \mathrm{WARN}_{it} + \beta_{14} \mathrm{IMR}_{it} * (1 - \mathrm{WARN}_{it}) + \varepsilon_{it} \quad (3)$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		0.232	0.173	0.180
ΔROA	+	2.700	0.568	0.000
RET	+	1.166	0.095	0.000
ΔROA*WARN		-0.891	1.448	0.539
RET*WARN	+	0.334	0.278	0.115
WARN		-1.845	0.394	0.000
NEWS	−	-0.743	0.081	0.000
SUR_MIN_ADJ	+	-0.717	2.365	0.381
ΔSALE	+	0.737	0.176	0.000
LEV		0.304	0.179	0.090
MB		-0.029	0.010	0.003
TENURE	−	-0.134	0.035	0.000
CHAIR	+	0.175	0.113	0.061
IMR*WARN		0.814	0.260	0.002
IMR*(1-WARN)		0.117	0.259	0.652
Year dummy			yes	
Industry dummy			yes	
adj_R²			0.122	
Number of obs			6,947	

[1]Variable definitions:

BONUS = $1 plus bonus from Compustat Execucomp. ;

ROA = earnings before interest, taxes, depreciation and amortization divided by the beginning-year book value of total assets;

RET = cumulative monthly raw return from CRSP during the fiscal year;

WARN = 1 if a firm issues an earnings warning after the beginning of the third fiscal month and before the quarterly earnings announcement date in any quarter of the fiscal year, zero otherwise;

NEWS = 1 if this year's EPS excluding extraordinary items is lower than last year's EPS excluding extraordinary items, zero otherwise from Compustat;

SUR_MIN_ADJ = I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the lowest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is most lowest;

ΔSALE = change in natural logarithm of sales from the prior year;

LEV = debt divided by total assets measured at the beginning of the fiscal year;

MB = market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;

TENURE = Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;

CHAIR = 1 if the CEO is the board chair, zero otherwise;

IMR = see model specification in Appendix A, part 1.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 8: Relation between Change in CEO bonus and Tip-Offs

$$\Delta \ln(\text{BONUS}_{it}) = \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} + \beta_4 \text{RET}_{it} \times \text{TIPOFF}_{it} + \beta_5 \text{TIPOFF}_{it} + \beta_6 \text{NEWS}_{it} + \beta_7 \text{SUR\_MAX\_ADJ}_{it} + \beta_8 \Delta\text{SALE}_{it} + \beta_9 \text{LEV}_{it} + \beta_{10} \text{MB}_{it} + \beta_{11} \text{TENURE}_{it} + \beta_{12} \text{CHAIR}_{it} + \varepsilon_{it} \quad (4)$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		-0.160	0.134	0.231
ΔROA	+	2.471	0.430	0.000
RET	+	0.812	0.060	0.000
ΔROA*TIPOFF		-0.121	1.888	0.949
RET*TIPOFF		0.187	0.227	0.410
TIPOFF		0.237	0.156	0.128
NEWS	+	0.678	0.059	0.000
SUR_MAX_ADJ	+	9.457	3.727	0.006
ΔSALE	+	0.538	0.140	0.000
LEV		0.290	0.138	0.035
MB		-0.020	0.007	0.004
TENURE	−	-0.097	0.027	0.000
CHAIR	+	-0.062	0.086	0.236
Year dummy			yes	
Industry dummy			yes	
adj_R[2]			0.092	
Number of obs			9,522	

[1]Variable definitions:

BONUS = $1 plus bonus from Compustat Execucomp. ;

ROA = earnings before interest, taxes, depreciation and amortization divided by the beginning-year book value of total assets;

RET = cumulative monthly raw return from CRSP during the fiscal year;

TIPOFF = 1 if a firm issues a positive earnings guidance after the beginning of the third fiscal month and before the quarterly earnings announcement date in any quarter of the fiscal year, zero otherwise;

NEWS = 1 if this year's EPS excluding extraordinary items is greater than last year's EPS excluding extraordinary items, zero otherwise from Compustat;

SUR_MAX_ADJ = I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the highest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the largest;

ΔSALE = change in natural logarithm of sales from the prior year;

LEV = debt divided by total assets measured at the beginning of the fiscal year;

MB = market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;

TENURE = Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;

CHAIR = 1 if the CEO is the board chair, zero otherwise;

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 9:First Stage Probit Analysis of the Choice to Issue Tip-Offs

$$\Pr_{it}(\text{TOPOFF}=1)=\Phi(\alpha_0+\alpha_1\text{LN\_MVE}_{it}+\alpha_2\text{UPDATE\_GUIDE}_{it}+\alpha_3\text{PAST\_GUIDE}_{it}$$
$$+\alpha_4\text{NUMEST}_{it}+\alpha_5\text{IOR}_{it}+\alpha_6\text{NEWS}_{it}+\alpha_7\text{SUR\_MAX\_ADJ}+\alpha_8\text{R \& D}$$
$$+\alpha_9\text{ISSUE}+\alpha_{10}\text{MB}_{it}+\alpha_{11}\text{ROA\_STD}_{it}+\alpha_{12}\text{FD}_{it}+\varepsilon_{it})\qquad(5)$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		-2.053	0.172	0.000
LN_MVE	+	-0.040	0.022	0.037
UPDATE_GUIDE	+	0.316	0.058	0.000
PAST_GUIDE	+	0.045	0.006	0.000
NUMEST	+	0.006	0.005	0.110
IOR	+	0.132	0.127	0.150
NEWS	+	0.298	0.050	0.000
SUR_MAX_ADJ	+	20.266	2.383	0.000
R&D	−	-0.771	0.496	0.061
ISSUE	+	0.004	0.055	0.472
MB	+	0.003	0.007	0.161
ROA_STD	−	-0.418	0.437	0.170
FD		0.023	0.055	0.340
Pseudo R^2		0.081		
Number of obs		9,522		

[1]Variable definitions:

TIPOFF = 1 if a firm issues a positive earnings guidance after the beginning of the third fiscal month and before the quarterly earnings announcement date in any quarter of the fiscal year, zero otherwise;

LN_MVE = natural logarithm of market value of equity measured at the beginning of the fiscal year;

SUR_MAX_ADJ = I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the highest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the largest;

UPDATE_GUIDE = 1 if a firm has issued earning forecast before the third fiscal month of any fiscal quarter, zero otherwise;

PAST_GUIDE = number of earnings guidance issued by a firm in the previous fiscal year;

NUMEST = average number of analysts whose earnings forecasts are included in the most recent consensus compiled before the third month of the fiscal quarters during the fiscal year;

IOR = number of institutional holdings divided by total number of shares outstanding measured at the beginning of the fiscal year;

NEWS = 1 if this year's EPS excluding extraordinary items is greater than last year's EPS excluding extraordinary items, zero otherwise from Compustat;

RD = R&D expenditures scaled by total assets;

ISSUE = 1 if there is a pulic offering of debt or equity in the current or the following fiscal year;

MB = market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;

ROA_STD = standard deviation of ROA during the past four fiscal years;

FD = 1 if fiscal year-end date is after 01/10/ 2000 the date the Regulation Fair Disclosure takes effect;

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 10: Testing the Relation between Change in CEO bonus and Tip-Offs after Controlling for Self-Selection

$$\Delta \ln(\text{BONUS}_{it}) = \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} + \beta_4 \text{RET}_{it} \times \text{TIPOFF}_{it} + \beta_5 \text{TIPOFF}_{it} + \beta_6 \text{NEWS}_{it} + \beta_7 \text{SUR\_MAX\_ADJ}_{it} + \beta_8 \Delta\text{SALE}_{it} + \beta_9 \text{LEV}_{it} + \beta_9 \text{MB}_{it} + \beta_{11} \text{TENURE}_{it} + \beta_{10} \text{CHAIR}_{it} + \beta_{11} \text{IMR} * \text{TIPOFF} + \beta_{12} \text{IMR} * (1 - \text{TIPOFF}) + \varepsilon_{it} \quad (6)$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		-0.151	0.134	0.259
ΔROA	+	2.482	0.431	0.000
RET	+	0.812	0.060	0.000
ΔROA*TIPOFF		-0.452	1.873	0.809
RET*TIPOFF		0.175	0.225	0.437
TIPOFF		0.890	0.677	0.189
NEWS	+	0.681	0.061	0.000
SUR_MAX_ADJ	+	9.696	3.811	0.006
ΔSALE	+	0.537	0.141	0.000
LEV		0.291	0.138	0.035
MB		-0.020	0.007	0.004
TENURE	−	-0.097	0.027	0.000
CHAIR	+	-0.063	0.086	0.231
IMR*TIPOFF		-0.347	0.343	0.311
IMR*(1-TIPOFF)		0.146	0.381	0.701
Year dummy			yes	
Industry dummy			yes	
adj_R²			0.092	
Number of obs			9,522	

[1]Variable definitions:

BONUS = $1 plus bonus from Compustat Execucomp. ;

ROA = earnings before interest, taxes, depreciation and amortization divided by the beginning-year book value of total assets;

RET = cumulative monthly raw return from CRSP during the fiscal year;

TIPOFF = 1 if a firm issues a positive earnings guidance after the beginning of the third fiscal month and before the quarterly earnings announcement date in any quarter of the fiscal year, zero otherwise;

NEWS = 1 if this year's EPS excluding extraordinary items is greater than last year's EPS excluding extraordinary items, zero otherwise from Compustat;

SUR_MAX_ADJ = I first calculate the difference between actual EPS and the most recent consensus analyst forecast a month before the fiscal quarter end date scaled by the beginning quarter share price for each quarter of the year; I then take the highest value of the scaled difference because warnings are likely to occur in the quarters where the surprise is the largest;

ΔSALE = change in natural logarithm of sales from the prior year;

LEV = debt divided by total assets measured at the beginning of the fiscal year;

MB = market value of equity divided by the book value of common equity measured at the beginning of the fiscal year;

TENURE = Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;

CHAIR = 1 if the CEO is the board chair, zero otherwise;

IMR = see model specification in Appendix A, part 1.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 11: Analysis of Change in CEO bonus and Peer Firms' Warnings

$$\begin{aligned}\Delta \ln(\text{BONUS}_{it}) = \beta_0 &+ \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{WARN}_{it} + \beta_4 \text{RET}_{it} \times \text{WARN}_{it} \\ &+ \beta_5 \Delta\text{ROA}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} + \beta_6 \text{RET}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} + \beta_7 \text{WARN}_{it} \\ &+ \beta_8 \text{PEERW}_{it} + \beta_9 \text{RPE\_}\Delta\text{ROA} + \beta_{10} \text{RPE\_RET} + \beta_{11} \text{NEWS}_{it} + \beta_{12} \text{SUR\_MIN\_ADJ}_{it} \\ &+ \beta_{13} \Delta\text{SALE}_{it} + \beta_{14} \text{LEV}_{it} + \beta_{15} \text{MB}_{it} + \beta_{16} \text{TENURE}_{it} + \beta_{17} \text{CHAIR}_{it} \\ &+ \beta_{18} \text{IMR}_{it} * \text{WARN}_{it} + \beta_{19} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (7)\end{aligned}$$

Independent Variables[1]	Predicted Sign	no control for self-selection Coef.	Robust Std. Err[2]	P-value[3]	control for self-selection Coef.	Robust Std. Err[2]	P-value[3]
Intercept		0.316	0.167	0.059	0.296	0.174	0.089
ΔROA	+	2.515	0.568	0.000	2.624	0.569	0.000
RET	+	1.233	0.102	0.000	1.235	0.102	0.000
ΔROA*WARN		1.162	1.865	0.533	0.038	1.911	0.984
RET*WARN	+	0.834	0.360	0.011	0.778	0.359	0.015
ΔROA*WARN*PEERW		-0.248	0.351	0.480	-0.192	0.353	0.585
RET*WARN*PEERW	−	-0.182	0.099	0.034	-0.173	0.099	0.040
WARN		-0.703	0.125	0.000	-1.773	0.407	0.000
PEERW		0.008	0.039	0.839	0.012	0.038	0.745
RPE_ΔROA		2.560	1.018	0.012	2.440	1.021	0.017
RPE_RET	−	-0.374	0.145	0.005	-0.368	0.145	0.006
NEWS	+	-0.786	0.076	0.000	-0.740	0.082	0.000
SUR_MIN_ADJ	+	-0.154	2.291	0.474	-0.805	2.345	0.366
ΔSALE	+	0.712	0.174	0.000	0.720	0.174	0.000
LEV		0.295	0.179	0.100	0.304	0.179	0.091
MB		-0.027	0.010	0.006	-0.029	0.010	0.004
TENURE	−	-0.133	0.035	0.000	-0.132	0.035	0.000
CHAIR	+	0.190	0.113	0.047	0.183	0.113	0.053
IMR*WARN					0.750	0.261	0.004
IMR*(1-WARN)					0.081	0.259	0.754
Year dummy			yes			yes	
Industry dummy			yes			yes	
adj_R^2			0.124			0.125	
Number of obs			6,947			6,947	

[1]Variable definitions:

PEERW = number of peers firms that issued warning during the year. see section 4.3 "four steps taken to define PEERW and PEERT";

RPE_ΔROA = equal-weighted change in ROA of peer firms that are in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009);

RPE_RET = equal-weighted return of peer firms that are in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009);

All other variables are as defined in Table 7.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 12: Analysis of Change in CEO bonus and Peer Firms' Tip-Offs

$$\Delta \ln(\text{BONUS}_{it}) = \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} + \beta_4 \text{RET}_{it} \times \text{TIPOFF}_{it}$$
$$+ \beta_5 \Delta\text{ROA}_{it} \times \text{TIPOFF}_{it} \times \text{PEERT}_{it} + \beta_6 \text{RET}_{it} \times \text{TIPOFF}_{it} \times \text{PEERT}_{it} + \beta_7 \text{TIPOFF}_{it}$$
$$+ \beta_8 \text{PEERT}_{it} + \beta_9 \text{RPE\_}\Delta\text{ROA} + \beta_{10} \text{RPE\_RET} + \beta_{11} \text{NEWS}_{it} + \beta_{12} \text{SUR\_MAX\_ADJ}_{it}$$
$$+ \beta_{13} \Delta\text{SALE}_{it} + \beta_{14} \text{LEV}_{it} + \beta_{15} \text{MB}_{it} + \beta_{16} \text{TENURE}_{it} + \beta_{17} \text{CHAIR}_{it}$$
$$+ \beta_{18} \text{IMR}_{it} * \text{WARN}_{it} + \beta_{19} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (8)$$

Independent Variables[1]	Predicted Sign	no control for self-selection			control for self-selection		
		Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]
Intercept		-0.073	0.135	0.587	-0.066	0.135	0.626
ΔROA	+	2.376	0.430	0.000	2.388	0.431	0.000
RET	+	0.880	0.064	0.000	0.880	0.064	0.000
ΔROA*TIPOFF		1.706	2.265	0.452	1.341	2.251	0.551
RET*TIPOFF		0.168	0.266	0.527	0.155	0.265	0.558
ΔROA*TIPOFF*PEERT		-0.938	0.591	0.113	-0.902	0.592	0.128
RET*TIPOFF*PEERT		0.007	0.124	0.955	0.009	0.125	0.943
TIPOFF		0.195	0.190	0.306	0.839	0.710	0.238
PEERT		0.035	0.071	0.619	0.026	0.072	0.715
RPE_ΔROA		2.497	0.713	0.000	2.493	0.712	0.000
RPE_RET	−	-0.381	0.111	0.001	-0.382	0.111	0.001
NEWS	+	0.670	0.058	0.000	0.671	0.061	0.000
SUR_MAX_ADJ	+	9.434	3.724	0.006	9.528	3.812	0.007
ΔSALE	+	0.525	0.139	0.000	0.523	0.140	0.000
LEV		0.291	0.137	0.034	0.291	0.138	0.035
MB		-0.019	0.007	0.006	-0.019	0.007	0.007
TENURE	−	-0.097	0.027	0.000	-0.097	0.027	0.000
CHAIR	+	-0.064	0.086	0.229	-0.066	0.086	0.224
IMR*TIPOFF					-0.334	0.346	0.334
IMR*(1-TIPOFF)					0.097	0.379	0.797
Year dummy			yes			yes	
Industry dummy			yes			yes	
adj_R²			0.094			0.094	
Number of obs			9,522			9,522	

[1]Variable definitions:

PEERT = number of peer firms that issued tip-offs during the year. see section 4.3 "four steps taken to define PEERW and PEERT";

RPE_ΔROA = equal-weighted change in ROA portfolio of peer firms in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009);

RPE_RET = equal-weighted cumulative return portfolio of peer firms in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009);

All other variables are as defined in Table 10.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

TABLE 13: Sample Distribution and Descriptive Statatics for Testing Stock-based Compensation Hypothesis

Panel A: Number of Observations by Year

Year	Warning Firms	Non-warning Control Firms	Total	Percentage of Warning firms
1996	54	504	558	10%
1997	67	641	708	9%
1998	120	585	705	17%
1999	124	555	679	18%
2000	135	510	645	21%
2001	177	523	700	25%
2002	140	414	554	25%
2003	142	589	731	19%
2004	119	602	721	17%
2005	104	628	732	14%
Total	1,182	5,551	6,733	18%

Panel B: Descriptive Statistics

	FULL SAMPLE					Warning Sample		Non-warning Control Sample		Between sample (Warnings-Non-warnings)	
	N=6,733					N=1,182		N=5,551			
	Mean	Median	Q1	Q3	Std. Dev	Mean	Median	Mean	Median	T-stat	Z-stat
Δln(OPTION$)	-0.012	0.000	-0.390	0.541	3.319	-0.161	0.000	0.019	0.000	-1.692	-3.261
Δln(OPTION#)	0.006	0.000	-0.322	0.525	2.376	-0.095	0.000	0.028	0.000	-1.617	-1.745
Δ(OPTION%)	-0.154	0.000	-0.446	0.461	3.477	-0.112	0.000	-0.163	0.000	0.450	1.838
ΔSHARES_OWN	-3.844	0.016	-0.680	0.435	15.150	-4.065	0.019	-3.797	0.015	-0.553	1.063
ΔEXER_OPT	0.741	0.522	-0.002	1.881	3.934	1.074	0.817	0.670	0.472	3.209	5.468
ΔSIZE	0.083	0.073	-0.003	0.164	0.207	0.055	0.051	0.089	0.077	-5.255	-6.352
ΔMB	-0.228	-0.055	-0.574	0.367	2.193	-0.502	-0.290	-0.170	-0.012	-4.735	-11.941
ΔRD	0.000	0.000	0.000	0.000	0.013	0.001	0.000	0.000	0.000	0.749	1.328
ΔRET	-0.091	-0.072	-0.396	0.259	0.680	-0.217	-0.187	-0.064	-0.050	-7.053	-8.295
ΔCASH_CST	-0.031	-0.008	-0.082	0.050	0.164	-0.018	-0.006	-0.034	-0.008	3.089	1.834
ΔEARN_CST	0.013	0.000	0.000	0.000	0.249	0.029	0.000	0.010	0.000	2.369	2.364
ΔCASH	-0.062	-0.012	-0.165	0.085	0.619	-0.152	-0.061	-0.043	-0.005	-5.511	-9.693
ΔLEV	0.005	0.000	-0.024	0.023	0.070	0.011	0.000	0.004	0.000	3.139	3.079
ΔRISK	-0.001	-0.001	-0.010	0.008	0.017	0.001	0.000	-0.001	-0.001	4.537	3.588

Panel C: Pearson correlation matrix of main variables

	Δln(OPTION$)	Δln(OPTION#)	Δ(OPTION%)	ΔSHARES_OWN	ΔEXER_OPT	ΔSIZE	ΔMB	ΔRD	ΔRET	ΔCASH_CST	ΔEARN_CST	ΔCASH
Δln(OPTION#)	0.965											
	(0.000)											
Δ(OPTION%)	0.464	0.462										
	(0.000)	(0.000)										
ΔSHARES_OWN	-0.040	-0.040	-0.037									
	(0.001)	(0.001)	(0.002)									
ΔEXER_OPT	-0.065	-0.061	-0.078	0.046								
	(0.000)	(0.000)	(0.000)	(0.000)								
ΔSIZE	0.017	0.003	0.010	-0.044	-0.104							
	(0.176)	(0.833)	(0.409)	(0.000)	(0.000)							
ΔMB	0.005	0.000	-0.004	0.022	0.022	-0.036						
	(0.657)	(0.972)	(0.759)	(0.073)	(0.071)	(0.003)						
ΔRD	-0.025	-0.020	-0.045	-0.003	0.047	-0.059	0.023					
	(0.043)	(0.107)	(0.000)	(0.778)	(0.000)	(0.000)	(0.060)					
ΔRET	0.014	0.034	-0.068	0.020	-0.025	-0.118	0.387	-0.063				
	(0.264)	(0.006)	(0.000)	(0.102)	(0.037)	(0.000)	(0.000)	(0.000)				
ΔCASH_CST	-0.016	-0.022	0.019	0.005	-0.010	0.005	-0.007	0.038	-0.037			
	(0.203)	(0.069)	(0.129)	(0.658)	(0.427)	(0.688)	(0.570)	(0.002)	(0.002)			
ΔEARN_CST	-0.029	-0.007	0.025	-0.019	0.010	-0.180	0.002	0.104	-0.033	0.099		
	(0.019)	(0.553)	(0.038)	(0.125)	(0.414)	(0.000)	(0.865)	(0.000)	(0.006)	(0.000)		
ΔCASH	0.006	0.017	-0.146	0.008	0.040	-0.349	0.089	-0.019	0.215	0.023	-0.007	
	(0.650)	(0.156)	(0.000)	(0.528)	(0.001)	(0.000)	(0.000)	(0.122)	(0.000)	(0.056)	(0.547)	
ΔLEV	-0.025	-0.016	0.000	0.019	0.040	0.006	0.064	0.013	-0.015	-0.086	0.053	-0.068
	(0.044)	(0.196)	(0.991)	(0.124)	(0.001)	(0.627)	(0.000)	(0.290)	(0.211)	(0.000)	(0.000)	(0.000)
ΔRISK	0.018	0.041	0.046	0.002	-0.017	0.053	-0.101	-0.003	-0.095	0.046	0.092	-0.068
	(0.138)	(0.001)	(0.000)	(0.858)	(0.162)	(0.000)	(0.000)	(0.796)	(0.000)	(0.000)	(0.000)	(0.000)

Variable Definitions:

ln(OPTION$) = natural logarithm of 1 plus the Black-Scholes value of annual option-based compensation;
ln(OPTION#) = natural logarithm of 1 plus the number of the annual option grants;
OPTION% = Black-Scholes value of annual option-based compensation divided by annual total compesnation;
SHARES_OWN = CEO's ownership in shares (options excluded) divided by number of outstanding shares;
EXER_OPT = CEO's exercisable options in shares divided by number of outstanding shares;
SIZE = natural logarithm of sales;
MB = market value of assets divided by book value;
RD = resaerch and development expenses;
RET = acccumulated 12-month stock returns;
CASH_CST = common and preferred dividends minus net cash flow from investment activities minus net cash flow from operating activities, then divided by total assets;
EARN_CST = 1 if there is an operating earnings loss; 0 otherwize;
CASH = sum of annual salary and bonus divided by sales;
LEV = long-term assets divided by total assets;
RISK = standard deviation of the residual from the market model using weekly reuturns over past 12 months.

P-values are based on two-tailed significant level and put in parentheses.

Table 14: Testing the Relation between Change in CEO Option Grants and Warnings after Controlling for Self-Selection

$$\begin{aligned}\Delta(\text{OPTION}_{it}) = \beta_0 &+ \beta_1 \text{WARN}_{it} + \beta_2 \Delta\text{RET}_{it} \times \text{WARN}_{it} + \beta_3 \Delta\text{SHARES\_OWN}_{it} + \beta_4 \Delta\text{EXER\_OPT}_{it} \\ &+ \beta_5 \Delta\text{SIZE}_{it} + \beta_6 \Delta\text{MB}_{it} + \beta_7 \Delta\text{RD}_{it} + \beta_8 \Delta\text{RET}_{it} + \beta_9 \Delta\text{CASH\_CST}_{it} \\ &+ \beta_{10} \Delta\text{EARN\_CST}_{it} + \beta_{11} \Delta\text{CASH}_{it} + \beta_{12} \Delta\text{LEV}_{it} + \beta_{13} \Delta\text{RISK}_{it} + \beta_{14} \text{IMR}_{it} * \text{WARN}_{it} \\ &+ \beta_{15} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (9)\end{aligned}$$

Dependent Variables	Predicted Sign	Δln(OPTION$)			Δln(OPTION#)			ΔOPTION%		
Independent Variables[1]		Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]
Intercept		0.278	0.150	0.063	0.144	0.107	0.177	0.175	0.127	0.169
WARN	+	0.577	0.359	0.054	0.615	0.259	0.009	1.180	0.437	0.004
ΔRET*WARN	+	-0.139	0.168	0.204	-0.048	0.124	0.348	-0.261	0.203	0.100
ΔSHARES_OWN	−	-0.008	0.003	0.003	-0.005	0.002	0.002	-0.008	0.003	0.006
ΔEXER_OPT	−	-0.051	0.014	0.000	-0.035	0.010	0.000	-0.065	0.016	0.000
ΔSIZE	+	0.009	0.243	0.485	-0.028	0.177	0.438	-1.095	0.321	0.001
ΔMB	+	0.006	0.025	0.410	-0.009	0.019	0.311	0.052	0.031	0.048
ΔRD		-3.796	2.910	0.192	-2.009	2.230	0.368	-14.307	4.711	0.002
ΔRET	+	0.120	0.090	0.092	0.157	0.067	0.010	-0.197	0.110	0.037
ΔCASH_CST	+	-0.143	0.265	0.295	-0.226	0.194	0.122	0.378	0.291	0.098
ΔEARN_CST		-0.370	0.195	0.058	-0.117	0.147	0.425	0.151	0.238	0.527
ΔCASH		0.030	0.093	0.747	0.058	0.065	0.379	-0.860	0.117	0.000
ΔLEV	−	-1.140	0.689	0.049	-0.488	0.501	0.165	-0.980	0.725	0.089
ΔRISK	+	-1.924	3.088	0.267	1.901	2.264	0.201	4.596	3.731	0.109
IMR*WARN		-0.504	0.257	0.05	-0.461	0.186	0.013	-0.935	0.317	0.003
IMR*(1-WARN)		-0.128	0.281	0.648	-0.314	0.198	0.113	-0.179	0.303	0.555
Year dummy			yes			yes			yes	
Industry dummy			yes			yes			yes	
adj_R^2			0.015			0.017			0.045	
Number of obs			6,733			6,733			6,733	

[1]Variable definitions: All variables are as defined in Table 13 and IMR are obtained from first-stage self-selection model (2) in Table 6.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 15: Analysis of Change in CEO Option Grants and Peer Firms' Warnings

$$\begin{aligned}\Delta(\text{OPTION}_{it}) = {} & \beta_0 + \beta_1 \text{WARN}_{it} + \beta_2 \Delta\text{RET}_{it} \times \text{WARN}_{it} + \beta_3 \Delta\text{RET}_{it} \times \text{WARN} \times \text{PEERW}_{it} \\ & + \beta_4 \text{PEERW}_{it} + \beta_5 \Delta\text{SHARES\_OWN}_{it} + \beta_6 \Delta\text{EXER\_OPT}_{it} + \beta_7 \Delta\text{SIZE}_{it} \\ & + \beta_8 \Delta\text{MB}_{it} + \beta_9 \Delta\text{RD}_{it} + \beta_{10} \Delta\text{RET}_{it} + \beta_{11} \Delta\text{CASH\_CST}_{it} + \beta_{12} \Delta\text{EARN\_CST}_{it} \\ & + \beta_{13} \Delta\text{CASH}_{it} + \beta_{14} \Delta\text{LEV}_{it} + \beta_{15} \Delta\text{RISK}_{it} + \beta_{16} \text{IMR}_{it} * \text{WARN}_{it} \\ & + \beta_{17} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (10)\end{aligned}$$

Dependent Variables	Predicted Sign	Δln(OPTION$)			Δln(OPTION#)			ΔOPTION%		
Independent Variables[1]		Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]
Intercept		0.278	0.150	1.860	0.144	0.107	1.350	0.175	0.127	1.380
WARN	+	0.637	0.372	0.044	0.649	0.267	0.008	1.318	0.441	0.002
ΔRET*WARN	+	0.128	0.200	0.261	0.147	0.148	0.160	0.338	0.245	0.084
ΔRET*WARN*PEERW	−	-0.095	0.038	0.006	-0.069	0.027	0.006	-0.214	0.054	0.000
PEERW		-0.027	0.036	0.449	-0.016	0.025	0.527	-0.061	0.039	0.114
ΔSHARES_OWN	−	-0.008	0.003	0.002	-0.006	0.002	0.002	-0.008	0.003	0.005
ΔEXER_OPT	−	-0.050	0.014	0.000	-0.035	0.010	0.000	-0.064	0.016	0.000
ΔSIZE	+	0.008	0.244	0.487	-0.028	0.178	0.438	-1.098	0.321	0.001
ΔMB	+	0.007	0.025	0.393	-0.009	0.019	0.327	0.055	0.031	0.040
ΔRD		-3.977	2.908	0.172	-2.141	2.227	0.336	-14.711	4.705	0.002
ΔRET	+	0.120	0.090	0.093	0.156	0.067	0.010	-0.199	0.110	0.036
ΔCASH_CST	+	-0.152	0.265	0.284	-0.233	0.193	0.115	0.359	0.291	0.108
ΔEARN_CST		-0.368	0.195	0.060	-0.115	0.147	0.433	0.155	0.240	0.518
ΔCASH		0.029	0.093	0.753	0.057	0.065	0.382	-0.862	0.118	0.000
ΔLEV	−	-1.094	0.690	0.057	-0.454	0.501	0.183	-0.875	0.732	0.116
ΔRISK	+	-1.908	3.084	0.268	1.912	2.261	0.199	4.633	3.727	0.107
IMR*WARN		-0.508	0.257	0.048	-0.463	0.186	0.013	-0.945	0.311	0.002
IMR*(1-WARN)		-0.129	0.281	0.648	-0.314	0.198	0.113	-0.180	0.303	0.553
Year dummy			yes			yes			yes	
Industry dummy			yes			yes			yes	
adj_R^2			0.016			0.017			0.048	
Number of obs			6,733			6,733			6,733	

[1]Variable definitions:

PEERW = number of peers firms that issued warning during the year. see section 4.3 "four steps taken to define PEERW";

All other variables are as defined in Table 13 and IMR are obtained from first-stage self-selection model (2) in Table 6.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 16: Validation of the Litigation Risk Related and Analyst Forecast Related Incentives of Issuing Warnings

Panel A: Comparison of predicted litigation risk between warning firms and non-warning firms

	Warning Firms		Non-warning Firms		Between sample (Warnings minus Non-warnings)	
	N=1,218		N=5,729			
	Mean	Median	Mean	Median	T-test	Z-test
Predicted RISK	0.050	0.036	0.048	0.034	1.858	3.425

Panel B: Comparison of earnings surprise before and after confession window

	Warning Quarters[1]			Non-Warning Quarters[2]		
	N=1,486			N=10,641		
	Before Warnings	After Warnings	Matched Pair T-test (After minus Before)	Before Confession Window	After Confession Window	Matched Pair T-test (After minus Before)
	Mean	Mean		Mean	Mean	
SUR	-0.812	-0.508	2.215	-0.163	-0.098	5.071
ABS(SUR)	0.815	0.527	-2.098	0.163	0.111	-4.079
MEET	0.037	0.483	22.708	0	0.278	63.944

Panel C: Comparison of change in earnings surprise between warning sample and non-warning sample

	Warning Quarters		Non-warning Quarters		Between sample (Warning minus Non-warning)	
	N=1,486		N=10,641			
	Mean	Median	Mean	Median	T-test	Z-test
ΔSUR[3]	0.304	0.06	0.065	0.01	3.861	28.288
ΔABS(SUR)	-0.288	-0.05	-0.052	-0.01	3.824	28.201
ΔMEET	0.446	0	0.278	0	13.348	13.252

Note:

[1]: Warning Quarters include all quarters when warnings are issued by warning firms. Because a warning-firm may have issued multiple warnings during a fiscal year, that is why the number of quarterly warnings is greater than the number of warning firms in Panel A.

[2]: Non-warning Quarters are quarters that experice a negative earnings surprise before the confession window but did not warn by non-warning firms. Because a non-warning firm could have multiple non-warning quarters during a fiscal year, that is why the number of quarterly non-warnings is greater than the number of non-warning firms in Panel A.

[3]Δ: After-warnings (After-confession-window) value minus before-warnings (before-confession-window) value for warnings and non-warnings respectively;

Variable Definitions:

Predicted RISK =	Predicted value of litigation risk. See Appendix B for computation details;
SUR =	SUR before warnings and before confession window is actual EPS minus the most recent consensus analyst forecast measured at one day before the confession window; SUR after warnings and after confession window is actual EPS minus the most consensus analysts forecast measured at the earnings annoucement date;
ABS(SUR) =	Absolute value of SUR;
MEET =	1 if SUR<=0 and zero otherwise.

TABLE 17: Sample Distribution and Descriptive Statatics for Testing Turnover Hypothesis

Panel A: Crosstabulation of Number of Warnings vs. Turnovers

Turnover	Warning Sample	Non-warning Control Sample	Total
TURN=0	725	3,174	3,899
	86.00%	**89.66%**	88.96%
TURN=1	118	366	484
	14.00%	**10.34%**	11.04%
	843	3,540	4,383
Total	100%	100%	100%
Test of two-sample turnover rate: Z=3.0469			

Panel B: Descriptive Statistics

	FULL SAMPLE					Warning Sample		Non-warning Control Sample		Between sample (Warnings-Non-warnings)	
	N=4,383					N=843		N=3,540			
	Mean	Median	Q1	Q3	Std. Dev	Mean	Median	Mean	Median	T-stat	Z-stat
TURN	0.110	0.000	0.000	0.000	0.313	0.140	0.000	0.103	0.000	3.049	3.046
ΔROA_ADJ	-0.010	-0.001	-0.032	0.025	0.119	-0.026	-0.015	-0.006	0.001	-4.292	-8.732
RET_ADJ	-0.033	-0.054	-0.266	0.169	0.474	-0.192	-0.176	0.004	-0.028	-10.957	-12.288
AGE_63	0.073	0.000	0.000	0.000	0.260	0.082	0.000	0.071	0.000	1.128	1.128
AGE	55.803	56.000	51.000	61.000	7.196	55.543	56.000	55.864	56.000	-1.145	-1.189
LOSS	0.189	0.000	0.000	0.000	0.392	0.214	0.000	0.183	0.000	2.012	2.011
FE_ADJ	-0.008	0.000	-0.012	0.007	0.044	-0.020	-0.007	-0.005	0.001	-8.755	-15.260
RETVAR	0.021	0.012	0.006	0.024	0.029	0.021	0.015	0.021	0.011	0.535	6.106
TENURE	1.865	1.792	1.386	2.398	0.770	1.833	1.792	1.872	1.792	-1.316	-1.273
HHI	0.073	0.050	0.038	0.085	0.069	0.081	0.056	0.071	0.049	3.987	6.177

Variable definitions:

TURN	=	1 if there is a turnover, zero otherwise;
ΔROA_ADJ	=	the difference between ΔROA and RPE_ΔROA for the previous fiscal year where RPE_ΔROA are equal-weighted change in ROA of peer firms that are in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009);
RET_ADJ	=	the difference between RET and RPE_RET for the previous fiscal year where RPE_RET are equal-weighted return of peer firms that are in the same two-digit SIC and size quartile, excluding the own firm, as defined in Albuquerque (2009);
AGE_63	=	1 if CEO is at least 63 years of age during the event year, zero otherwise;
AGE	=	age of the CEO measured at the year of turnover during the event year;
LOSS	=	1 if the firm experience an earnings loss the year prior to the event;
FE_ADJ	=	the difference between the realized EPS for the previous year and the forecasted EPS at the beginning of the previous year and then scaled by the stock price at the beginning of the year;
RETVAR	=	the variance of stock returns during the 24 months prior to the event year;
TENURE	=	Natural logarithm of 1 plus CEO tenure which is the difference between the year the CEO assumed the office and the current fiscal year;
HHI	=	Herfindahl-Hirschman index is the mean of the sum of the squared market shares (in percentage) of all firms in an industry (2-digit SIC), computed over the five years prior to the event year.

Table 18: Analysis of the Reduced Turnover for Warning Firms

$$\Pr(\text{TURN}_{it+1}) = \Phi(\beta_0 + \beta_1 \text{WARN}_{it} + \beta_2 \Delta\text{ROA\_ADJ}_{it} + \beta_3 \text{RET\_ADJ}_{it} + \beta_4 \text{AGE\_63}_{it+1} + \beta_5 \text{AGE}_{it+1} + \beta_6 \text{LOSS}_{it} + \beta_7 \text{FE\_ADJ}_{it} + \beta_8 \text{RETVAR}_{it} + \beta_9 \text{TENURE}_{it} + \beta_{10} \text{HHI} + \beta_{11} \text{IMR} \times \text{WARN}_{it} + \beta_{12} \text{IMR} \times (1 - \text{WARN}_{it}) + \varepsilon_{it}) \quad (11)$$

		no control for self-selection				control for self-selection			
Independent Variables[1]	Predicted Sign	Coef.	Robust Std. Err[2]	P-value[3]	Marginal Effect	Coef.	Robust Std. Err[2]	P-value[3]	Marginal Effect
Intercept		-3.268	0.267	0.000		-3.265	0.273	0.000	
WARN	−	0.149	0.071	0.019	0.028	-0.429	0.288	0.068	-0.065
ΔROA_ADJ	−	0.041	0.241	0.433	0.007	0.000	0.242	0.500	0.000
RET_ADJ	−	-0.126	0.076	0.050	-0.023	-0.130	0.077	0.046	-0.023
AGE_63	+	0.014	0.099	0.443	0.003	0.023	0.100	0.409	0.004
AGE	+	0.038	0.005	0.000	0.007	0.038	0.005	0.000	0.007
LOSS	+	0.188	0.079	0.009	0.036	0.195	0.079	0.007	0.038
FE_ADJ	−	-0.738	0.691	0.143	-0.133	-0.843	0.692	0.112	-0.151
RETVAR	+	0.916	0.972	0.173	0.165	0.881	0.978	0.184	0.158
TENURE	+	-0.021	0.037	0.284	-0.004	-0.020	0.037	0.290	-0.004
HHI	−	-1.185	0.500	0.009	-0.213	-1.198	0.498	0.008	-0.215
IMR*WARN						0.411	0.196	0.036	0.074
IMR*(1-WARN)						0.072	0.216	0.739	0.013
Year dummy		yes				yes			
Pseudo R^2		0.053				0.054			
Number of obs		3,705				3,705			

[1]Variable definitions:

All variables are as defined in Table 17.

[2]:The standard errors are adjusted for heteroscedasticity.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 19 : Actual vs. Hypothetical Changes in Bonus: Warning Effect

$$\Delta \ln(\text{BONUS}_{it}) = \beta_0 + \beta_1 \Delta \text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \text{NEWS}_{it} + \beta_4 \text{SUR\_MIN\_ADJ}_{it} + \beta_5 \Delta \text{SALE}_{it} + \beta_6 \text{LEV}_{it} + \beta_7 \text{MB}_{it} + \beta_8 \text{TENURE}_{it} + \beta_9 \text{CHAIR}_{it} + \beta_{10} \text{IMR}_{it} + \varepsilon_{it} \quad (8)$$

Panel A: Second stage estimation results for warning and no-warning groups

	WARN=1			WARN=0		
Independent Variables[1]	Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]
Intercept	-2.562	0.832	0.002	0.240	0.190	0.207
ΔROA	1.273	1.551	0.412	2.786	0.573	0.000
RET	1.679	0.315	0.000	1.150	0.095	0.000
NEWS	-0.894	0.242	0.000	-0.706	0.088	0.000
SUR_MIN_ADJ	-7.277	4.525	0.108	1.103	2.771	0.691
ΔSALE	0.873	0.548	0.112	0.734	0.187	0.000
LEV	-0.341	0.667	0.610	0.385	0.194	0.048
MB	-0.022	0.035	0.538	-0.028	0.010	0.006
TENURE	0.164	0.113	0.146	-0.195	0.039	0.000
CHAIR	-0.555	0.349	0.113	0.313	0.131	0.017
IMR	1.093	0.347	0.002	0.055	0.265	0.836
Year dummy		yes			yes	
Industry dummy		yes			yes	
adj_R²		0.102			0.102	
Number of obs		1,218			5,729	

Panel B: comparison for firms that issue warnings (N=1,218)

	Actual	Hypothetical[a]
ΔLn(Bonus)	-1.117	-0.330
	T-statistics: -9.2566	

Panel C: comparison for firms that do not issue warnings (N=5,729)

	Actual	Hypothetical[a]
ΔLn(Bonus)	0.032	-2.403
	T-statistics: -72.1462	

[1]Variable definitions: all variables are defined as in table 7.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on two-tailed test since no particular predictions are made for warning vs. non-warning firms.

[a]Hypothetical value is computed based on formula derived in Appendix A, part 2.

Table 20: Analysis of Change in CEO Bonus and Warnings after Controlling for Matsunaga and Park (2001)

$$\begin{aligned}\Delta \ln(\text{BONUS}_{it}) = {} & \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{WARN}_{it} + \beta_4 \text{RET}_{it} \times \text{WARN}_{it} \\ & + \beta_5 \Delta\text{ROA}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} + \beta_6 \text{RET}_{it} \times \text{WARN}_{it} \times \text{PEERW}_{it} \\ & + \beta_7 \text{PEERW}_{it} + \beta_8 \text{WARN}_{it} + \beta_9 \text{NEWS}_{it} + \beta_{10} \text{SUR\_MIN\_ADJ}_{it} \\ & + \beta_{11} \Delta\text{SALE}_{it} + \beta_{12} \text{LEV}_{it} + \beta_{13} \text{MB}_{it} + \beta_{14} \text{TENURE}_{it} + \beta_{15} \text{CHAIR}_{it} \\ & + \beta_{16} \text{RPE\_}\Delta\text{ROA} + \beta_{17} \text{RPE\_RET} + \beta_{18} \text{NEGFE1}_{it} + \beta_{19} \text{NEGFE2}_{it} \\ & + \beta_{20} \text{NEGFE3}_{it} + \beta_{21} \text{NEGFE4}_{it} + \beta_{22} \text{DECREASE1}_{it} + \beta_{23} \text{DECREASE2}_{it} \\ & + \beta_{24} \text{DECREASE3}_{it} + \beta_{25} \text{DECREASE4}_{it} + \beta_{26} \text{LOSS1}_{it} + \beta_{27} \text{LOSS2}_{it} \\ & + \beta_{28} \text{LOSS3}_{it} + \beta_{29} \text{LOSS4}_{it} + \beta_{30} \text{IMR}_{it} \times \text{WARN}_{it} \\ & + \beta_{31} \text{IMR}_{it} \times (1 - \text{WARN}_{it}) + \varepsilon_{it} \qquad (12)\end{aligned}$$

Independent Variables[1]	Predicted Sign	no control for self-selection			control for self-selection		
		Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]
Intercept		0.506	0.176	0.004	0.508	0.182	0.005
ΔROA	+	2.089	0.563	0.000	2.196	0.564	0.000
RET	+	1.108	0.101	0.000	1.106	0.101	0.000
ΔROA*WARN		1.002	1.812	0.581	-0.161	1.854	0.931
RET*WARN	+	0.717	0.363	0.024	0.658	0.362	0.035
ΔROA*WARN*PEERW		-0.152	0.347	0.660	-0.096	0.348	0.783
RET*WARN*PEERW	−	-0.164	0.101	0.052	-0.154	0.100	0.062
PEERW		0.025	0.038	0.512	0.029	0.037	0.432
WARN		-0.653	0.125	0.000	-1.813	0.411	0.000
NEWS	−	-0.515	0.080	0.000	-0.458	0.086	0.000
SUR_MIN_ADJ	+	-1.519	2.587	0.279	-2.520	2.693	0.175
ΔSALE	+	0.343	0.178	0.027	0.349	0.178	0.025
LEV		0.328	0.181	0.070	0.337	0.181	0.063
MB		-0.035	0.010	0.001	-0.037	0.010	0.000
TENURE	−	-0.120	0.035	0.001	-0.119	0.035	0.001
CHAIR	+	0.199	0.113	0.039	0.193	0.113	0.044
RPE_ΔROA		2.128	1.014	0.036	2.005	1.016	0.025
RPE_RET	−	-0.294	0.144	0.021	-0.286	0.144	0.024
NEGFE1		-0.020	0.083	0.404	-0.028	0.082	0.369
NEGFE2	−	-0.313	0.095	0.001	-0.326	0.094	0.001
NEGFE3	−	-0.276	0.119	0.010	-0.298	0.118	0.006
NEGFE4	−	-0.428	0.182	0.010	-0.467	0.184	0.006
DECREASE1		0.128	0.079	0.052	0.118	0.079	0.068
DECREASE2	−	-0.227	0.100	0.012	-0.228	0.100	0.011
DECREASE3	−	-0.646	0.125	0.000	-0.644	0.125	0.000
DECREASE4	−	-0.994	0.141	0.000	-0.993	0.142	0.000
LOSS1		0.210	0.132	0.112	0.219	0.131	0.095
LOSS2		0.137	0.170	0.421	0.132	0.170	0.436
LOSS3		0.224	0.226	0.323	0.201	0.228	0.378
LOSS4		0.541	0.184	0.003	0.519	0.186	0.005
IMR*WARN					0.801	0.262	0.002
IMR*(1-WARN)					0.136	0.262	0.603
Year dummy			yes			yes	
Industry dummy			yes			yes	
adj_R²			0.139			0.140	
Number of obs			6,947			6,947	

[1]Variable definitions:

NEGFE(J) = 1 if earnings are below the consensus analyst forecast for J quarters during the fisacl year, zero otherwise:

DECREASE(J) = 1 if earnings are below earnings for the same quarter for the previous year for J quarters during the fiscal year, zero otherwise;

LOSS(J) = 1 if earnings are below zero for J quarters during the fiscal year, zero otherwise;

All other variables are as defined in Table 7.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 21: Multinomial Logistic Analysis of the Forced Turnover vs. Voluntary Turnover When Warnings are Issued

		voluntary turnover			forced turnover		
Independent Variables[1]	Predicted Sign	Coef.	Robust Std. Err[2]	P-value[3]	Coef.	Robust Std. Err[2]	P-value[3]
Intercept		-6.938	0.563	0.000	-4.014	1.175	0.001
WARN	−	-1.211	0.637	0.029	0.398	0.893	0.328
ΔROA_ADJ	−	0.382	0.581	0.256	-0.646	0.546	0.119
RET_ADJ	−	-0.118	0.166	0.240	-1.026	0.284	0.000
AGE_63	+	0.177	0.180	0.163	-13.669	0.238	0.000
AGE	+	0.085	0.010	0.000	0.004	0.018	0.419
LOSS	+	0.277	0.169	0.050	0.698	0.281	0.007
FE_ADJ	−	-1.407	1.360	0.151	-2.168	2.005	0.140
RETVAR	+	0.837	2.025	0.340	-2.744	4.526	0.272
TENURE	+	0.041	0.075	0.293	-0.571	0.172	0.001
HHI	−	-2.553	1.166	0.015	-3.397	1.752	0.027
IMR*WARN		0.953	0.426	0.025	0.371	0.600	0.537
IMR*(1-WARN)		0.348	0.454	0.442	-1.102	0.954	0.248
Year dummy			yes			yes	
Number of turnovers			350			77	
Number of obs				3,705			
Pseudo R^2				0.079			

[1]Variable definitions:

The dependent variable takes a value of 2 if the turnover is forced, 1 if the turnover is voluntary and zero otherwise. All other variables are as defined in Table 17.

[2]:The standard errors are adjusted for heteroscedasticity.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

Table 22: Testing the Relation between Change in CEO Total Compensation and Warnings

$$\begin{aligned}\Delta \ln(\text{TOTAL}_{it}) = {} & \beta_0 + \beta_1 \Delta\text{ROA}_{it} + \beta_2 \text{RET}_{it} + \beta_3 \Delta\text{ROA}_{it} \times \text{WARN}_{it} + \beta_4 \Delta\text{RET}_{it} \times \text{WARN}_{it} \\ & + \beta_5 \text{WARN}_{it} + \beta_6 \text{NEWS}_{it} + \beta_7 \text{SUR\_MIN\_ADJ}_{it} + \beta_8 \Delta\text{SALE}_{it} + \beta_9 \text{LEV}_{it} \\ & + \beta_{10} \text{MB}_{it} + \beta_{11} \text{TENURE}_{it} + \beta_{12} \text{CHAIR}_{it} + \beta_{13} \text{IMR}_{it} * \text{WARN}_{it} \\ & + \beta_{14} \text{IMR}_{it} * (1 - \text{WARN}_{it}) + \varepsilon_{it} \quad (3)\end{aligned}$$

Independent Variables[1]	Predicted Sign	Coefficient	Robust Std Err[2]	P-value[3]
Intercept		0.094	0.052	0.073
ΔROA	+	-0.251	0.203	0.109
RET	+	0.308	0.034	0.000
ΔROA*WARN		0.694	0.481	0.149
RET*WARN	+	-0.102	0.083	0.109
WARN		0.152	0.105	0.147
NEWS	−	-0.066	0.024	0.003
SUR_MIN_ADJ	+	2.225	0.741	0.002
ΔSALE	+	0.175	0.055	0.001
LEV		-0.040	0.055	0.465
MB		0.001	0.004	0.733
TENURE	−	-0.003	0.011	0.397
CHAIR	+	0.020	0.034	0.277
IMR*WARN		-0.145	0.069	0.035
IMR*(1-WARN)		-0.077	0.078	0.328
Year dummy		yes		
Industry dummy		yes		
adj_R²		0.042		
Number of obs		6,947		

[1]Variable definitions:

TOTAL = $ 1 plus the sum of salary, bonus, long-term incentive payouts, restricted stocks granted during the year, the value of stock options granted, and all other compensation from Compustat Execucomp.

All other variables are as defined in Table 7.

[2]:The standard errors are adjusted for heteroscedasticity and clustered by firm.

[3]:P-values are based on one-tailed for variables with predicted signs and two-tailed for variables without predicted signs.

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