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Internal and external discipline following securities class actions

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ABSTRACT

Companies are sometimes accused of misleading the market. The SEC can punish this with enforcement actions. Alternatively, shareholders can seek redress through a shareholder class action (SCA). Thus, using a sample of 416 securities class actions, this paper shows that SCAs are a catalyst to promote disciplinary takeovers, CEO turnover and pay-cuts, and harm CEOs' future job-prospects.
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1. Introduction

This paper examines what happens to the managers of companies that are accused of poor disclosure and of issuing misleading statements. CEOs, CFOs, and the companies they manage, might mislead the market by issuing false statements or by concealing value-relevant information. I hypothesize that a SCA highlights poor managerial ethics and governance. I predict that this signal elicits a negative reaction from the market, and induces internal discipline in the form of managerial job losses and pay cuts, and external discipline in the form of diminished managerial job-prospects and a susceptibility to disciplinary takeovers designed to remove inefficient managers. I find support for these predictions using a sample of 416 SCAs.

Two legal ramifications for misleading the market are a 'securities class action' (SCA) initiated by shareholders and a 'regulatory action' initiated by the SEC. The difference between SCAs and regulatory

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actions is important for two reasons: (1) The regulator initiates and funds a regulatory action. Shareholders initiate securities class actions, often at the suggestion of a lawyer. They often receive funding from an external litigation funder who funds the action in return for a share of the winnings.[1] Thus, SCAs may capture riskier cases that the regulator might ignore.[2] (2) The law on SCAs has received substantial criticism,[3] so it is unclear whether SCAs are currently an effective disciplinary mechanism.

There is some empirical evidence on the ramifications of regulatory actions. The literature on regulatory actions shows that (1) the market reacts negatively to regulatory actions (Karpoff and Lott, 1993; Bhagat et al., 1998) and (2) regulatory actions (as opposed to SCAs) can induce CEO turnover and pay cuts (Agrawal et al., 1999; Karpoff et al., 2008).

The literature on SCAs suggests that they may be an effective disciplinary mechanism. Some prior literature has examined the CEO characteristics that make securities class actions more likely (see for example Peng and Röell, 2008; Johnson et al., 2009b; Griffin et al., 2010; Jones and Wu, 2010). Interestingly, Helland (2006) find that directors suffer little reputational penalty if there is a SCA. However, Cheng et al. (2010) show that institutional shareholders can use SCAs as a monitoring mechanism and indicate that SCAs can precipitate changes in the company's board-structure (although they do not examine the implications of SCAs for CEOs/CFOs or whether they induce disciplinary takeovers). Gande and Lewis (2009) show that the market reacts negatively to SCAs (although the market does partially capitalize this before the SCA is filed). Niehaus and Roth (1999) show that the market reacts negatively to SCAs and that they precipitate CEO turnover. Thus, while there is some evidence that SCAs might encourage disciplinary action, it remains unclear whether SCAs influence CEOs' salaries or future job prospects, or make the company a target for a disciplinary takeover.

This paper addresses several gaps in the literature. I address four main gaps by analyzing whether the initiation[4] of a SCA (1) induces internal discipline in the form of job-losses for both CEOs and CFOs, (2) harms managers' future job prospects, (3) precipitates falls in managerial compensation, or (4) induces external discipline in the form of a disciplinary takeover. I also confirm prior findings that SCAs elicit a negative market reaction. I test these issues by examining a sample of 416 SCAs that occur between 1996 and 2007 and compare them to a control sample comprising 11,767 firm-year observations.

The results show that SCAs are met with a significant negative reaction from the market, significantly increase the likelihood that the CEO will suffer a pay cut or leave the company, and significantly increase the likelihood of receiving a disciplinary takeover bid.

These findings make several important contributions to the literature. First, they provide new insight into the internal and external governance following the initiation of a SCA. Second, they show that fraudulent conduct can induce disciplinary takeovers, highlighting the importance of the market for corporate control. Third, the results show that SCAs harm CEOs' job-prospects at other firms. Fourth, they show that boards are willing to perform their over-sight function by reducing the CEO's fixed salary compensation. Overall, the results help to further our understanding of the disciplinary implications of engaging in fraudulent conduct.

The balance of the paper proceeds as follows. Section 2 develops hypotheses and empirical predictions. Section 3 discusses the sample construction. Section 4 tests the threshold issue of whether the market reacts negatively to SCAs. Section 5 determines if turnover increases following litigation. Section 6 tests whether CEO and CFO compensation falls following securities litigation. Section 7 examines whether securities class actions make disciplinary takeovers more likely. Section 8 contains robustness tests, and Section 9 concludes.

[1] An example is the DQE Inc litigation, in which the lawyers obtained 33.3% of a USD 12 million settlement.

[2] See especially: Chen (2003), Chen et al. (2005). This problem is not unique to SCAs (see Weyers, 2010; Hertogh, 2010).

[3] See for example: Fox (2005, 2006), Langevoort (1996), Lev and de Villiers (1994), Humphery-Jenner (2011). Potential problems include the use of vague language, which allows the court to change its interpretation of the law over time (see Humphery-Jenner, 2009), and the imposition of unprincipled rules of causation (Fox, 2005, 2006).

[4] I focus on internal and external discipline following the announcement of a SCA. The focus on the announcement rather than the settlement is to (a) avoid any look-ahead bias and (b) to avoid any contamination arising from the effectiveness (or lack thereof) of either party's legal representation.

2. Hypothesis development and empirical predictions

The goal is to examine whether SCAs encourage internal or external discipline. A threshold issue is whether the market reacts negatively to the announcement of a SCA. This induces several predictions.

The threshold prediction is that securities class actions should be met with a negative market reaction. Prior literature shows that the market reacts negatively to shareholder class actions (Niehaus and Roth, 1999; Gande and Lewis, 2009; Bauer and Braun, 2010), prosecutions for criminal fraud (Karpoff and Lott, 1993) and SEC regulatory actions (Bhagat et al., 1998). The rationale is that poor disclosures and governance imply agency conflicts and poor managerial ethics. Thus, SCAs can signal both that the stock price is inflated and that the firm suffers from agency conflicts, poor governance, and lax ethics (Bailey et al., 2006). Securities fraud implies inadequate or misleading disclosure (Fox, 2005). This suggests that the market should react negatively to the announcement of a SCA.

The market should react negatively to a SCA even if the manager is likely to be disciplined. This is because (1) future disciplining is uncertain, (2) the occurrence of a SCA sheds doubt on the firm's reported performance and governance, and (3) the SCA implies that the current market value is based on false information; and thus, that the stock might be over-priced. Therefore, the threshold prediction (in Prediction 2.1) is that the market reacts negatively to the announcement of the securities class action.

Prediction 2.1. [Market Reaction Prediction] The firm's stock price decreases upon announcement of the securities class action.

I predict that SCAs will also encourage disciplinary actions.[5] The over-arching theory is that the occurrence of a SCA implies poor governance and managerial malfeasance. If the board (or the market for corporate control) functions properly, then it should discipline managers for this malfeasance. This induces several discipline-related hypotheses.

First, securities class actions should increase the likelihood of CEO and CFO turnover. Boards are less likely to remove strong-performing managers than they are to remove poorly performing managers (Murphy and Zimmerman, 1993; Kang and Shivdasani, 1995). Subsequently, Lehn and Zhao (2006) find that CEOs who make value-reducing takeovers are significantly more likely to be fired. Further, Kang (2008) and Tillman (2009) suggest that fraud-actions harm the firm's reputation. This implies that managers whose conduct invites SCAs should be more likely to be fired.

CFOs should also be more likely to be fired following securities class actions. This is for two reasons. (1) The two parties mainly responsible for financial disclosure are the CEO and the CFO (Arjoon, 2005). Both, CEOs and CFOs have fiduciary responsibilities vis-à-vis the firm (Indjejikian and Matejka, 2008). Subsequently, Tillman (2009) shows that (a) law suits name CFOs in 78% of cases and name CEOs in 90% of cases and (b) 94% of cases that name the CFO also name the CEO. (2) CEOs and CFOs generate close working ties. These ties might make it difficult to maintain a co-operative relationship with the CFO if the board dismisses the CEO in acrimonious circumstances (Kesner and Dalton, 1994; Shen and Cannella, 2002; Buettner et al., 2010). Therefore, SCAs should increase the likelihood of CFO dismissal, but should mainly do so when the CEO is also dismissed. This induces the prediction:

Prediction 2.2. [Managerial Turnover Prediction] A CEO and/or a CFO is more likely to leave a company in year $t + 1$ if there was a securities class action in year t. Firing should harm the manager's future job prospects.

Second, securities class actions should reduce CEO and CFO pay. The compensation literature indicates that CEO pay should be sensitive to performance (Jensen and Murphy, 1990; Crawford et al., 1995). Conduct inviting a regulatory action or a SCA is some evidence of poor performance.

[5] I note that Helland (2006) finds that board-members suffer no reputational penalty following a SCA. However, I focus on CEOs/CFOs, who are arguably more likely to be blamed for poor performance and malfeasance (following Boeker, 1992; Fredrickson et al., 1988; Haleblian and Rajagopalan, 2006). Thus, it is foreseeable that CEOs/CFOs might be disciplined even if standard board members might not be.

Subsequently, Persons (2006) suggests that SEC regulatory actions induce CEO pay cuts. This indicates that SCAs should similarly sound in pay reductions. To the extent that CFOs are also held responsible for releasing false information to the market, CFOs should also suffer pay cuts. A well functioning board should especially target reductions in fixed salary-based compensation, rather than stock-linked compensation, in order to avoid further misaligning shareholder-manger incentives (following Mehran, 1995; Kang et al., 2006). This induces Prediction 2.3.

Prediction 2.3. [Managerial Pay Prediction] Litigation in year t should increase the likelihood that the CEO's (and CFO's) pay is lower in year $t+1$.

Third, securities class actions should increase the likelihood of a 'disciplinary' takeover. A disciplinary takeover is one whose purpose is to remove inefficient managers or to address agency conflicts (Scharfstein, 1988; Martin and McConnell, 1991; Offenberg, 2009). While Agrawal and Jaffe (2003) find little evidence to support the claim that under-performing targets are subject to takeover bids, other literature finds that poor internal governance encourages disciplinary takeovers (see Shivdasani, 1993; Kini et al., 1995, 2004; John and Senbet, 1998). Behavior that induces a securities class action could evidence agency conflicts. Subsequently, firms that are subject to a securities class action in year t should be more likely to sustain a 'disciplinary' takeover bid in year $t+1$. This induces Prediction 2.4.

Prediction 2.4. [Disciplinary Takeover Prediction] A securities class action in year t increases the likelihood of a disciplinary takeover bid in year $t+1$.

I note that there are two alternative hypothesis. First, (a) poorly performing managers are more likely to inspire a SCA, (b) poorly performing managers are more likely to be disciplined even if there is no SCA; and thus, (c) any SCA/discipline relation is merely a performance/discipline relation. I examine this alternative hypothesis in robustness tests by ensuring that the results hold in a propensity score matched sample and across industry adjusted ROA quartiles. Second, CEOs/CFOs may become scape-goats. I examine this in robustness tests by focusing on SCAs that induce a negative market reaction.[6]

3. Data and sample construction

The paper analyzes 416 securities class actions (SCAs) that occur between 1996 and 2007 and compares them to a control sample of non-litigated firms. I examine managerial turnover, pay-cuts, and disciplinary takeovers in year $t+1$ conditional on whether a class action is initiated against the firm in year t. I focus on disciplinary action within one year of the litigation announcement (if any) in order to avoid contamination from unrelated disciplinary actions. Using a control sample ameliorates any sample-selection bias that would arise if the sample only included firms that suffered a SCA. The class actions are law suits for issuing statements that the shareholders claim were false. The litigation data is from the Stanford Securities Class Action Clearing House. Firm-level data is from Compustat. Executive compensation data is from Execucomp. The sample excludes firms that lack Compustat or Execucomp data. I winsorize continuous variables at 1% to prevent outliers driving the results. Table 1 defines the variables. The subsequent sections explain the variables in detail.

The sample construction is as follows. For each year t there is the sample of all firms for which there is data in Compustat and Execucomp. For each firm i, the dummy variable $I(SCA_{i,t})$ equals one if a securities class action is initiated against it in year t. I typically suppress the subscripts except where it may cause confusion. In each year, there are two sets of firms: (1) those that sustain a securities class action and (2) those that do not. The models do not require the SCA to be successful. This is because the models analyze the relation between the initiation of a SCA in year t and disciplinary action in year $t+1$.

[6] I note that the results hold in the propensity score matched sample, the ROA sorts, and in models that only use negatively received SCAs.

Table 1
Variable definitions.

Variable	Definition	Source
Dependent or explained variables		
$CAR_{(\tau_1,\tau_2)}$	The firm's cumulative abnormal return from τ_1 days before the announcement of the SCA to τ_2 days after the announcement of the SCA. The abnormal return on day τ is the firm's actual return less that predicted by a market model estimated over 11 days before the announcement to 210 days before the announcement	CRSP
$BHAR_{(\tau_1,\tau_2)}$	The firm's cumulative abnormal return from τ_1 days before (or after) the announcement of the SCA to τ_2 days after the announcement of the SCA	CRSP
I(CEO Leaves$_{t+1}$)	An indicator variable that equals 1 if the CEO in year t is not the CEO in year $t+1$	Execucomp
I(CFO Leaves$_{t+1}$)	An indicator variable that equals 1 if the CFO in year t is not the CFO in year $t+1$	Execucomp
Departure$_{t+1}$	A categorical variables that equals 0 if neither the CEO nor the CFO leave, equals 1 if only the CEO leaves, equals 2 if only the CFO leaves, and equals 3 if both the CEO and the CFO leave. All departures must be within one year of the litigation announcement	Execucomp
I(Salary$_{t+1}$ < Salary$_t$)	An indicator variable that equals 1 if the manager's fixed compensation (salary) falls in year $t+1$. This is a dummy variable that equals one if $0 > [(\text{salary}_{t+1} - \text{salary}_t)/\text{salary}_t]$, where salary$_t$ is the manager's fixed salary compensation in year t	Execuomp
I(Bonus$_{t+1}$ < Bonus$_t$)	An indicator variable that equals 1 if the manager's bonus compensation (cf stock compensation) fallows in year $t+1$. This is a dummy variable that equals one if $0 > [(\text{bonus}_{t+1} - \text{bonus}_t)/\text{bonus}_t]$, where bonus$_t$ is the manager's bonus compensation in year t	Execucomp
I(Bid$_{t+1}$)	An indicator variable that equals 1 if the firm receives a takeover offer for 100% control in year $t+1$	SDC Platinum
I(Complete Bid$_{t+1}$)	An indicator variable that equals 1 if the firm receives a takeover offer for 100% control in year $t+1$ and the deal is subsequently completed	SDC Platinum
I(Hostile Bid$_{t+1}$)	An indicator variable that equals 1 if the firm receives a takeover offer for 100% control in year $t+1$, and SDC codes the deal as unsolicited or hostile	SDC Platinum
I(Hostile Complete Bid$_{t+1}$)	An indicator variable that equals 1 if the firm receives a takeover offer for 100% control in year $t+1$, the deal is subsequently completed, and SDC codes the deal as hostile or unsolicited	SDC Platinum
Independent variables		
I(SCA$_t$)	An indicator that equals one if the firm or the court announces a securities class action in that year. The source is the Stanford Securities clearing house	Stanford Securities Clearinghouse
HHI$_t$	The firm's Hirfindahl-Hishmann Index at the time of the litigation	Compustat
Tobin's Q$_t$	The firm's Tobin's Q in year t	Compustat
Stock Return$_t$	The industry adjusted market return computed over the year before the litigation. This is the firm's return less the average return in the firm's 4-digit SIC industry	CRSP
Stock Return Variance$_t$	I compute stock return volatility as the variance of the firm's daily CRSP stock return. The results also hold if I use a market-adjusted return (i.e. the firm's return less the return on the equally weighted market index)	CRSP
I(High Tech Firm$_t$)	An indicator that equals one if the firm is a 'high-tech' firm as defined in Loughran and Ritter (2004)	Compustat
ln(Assets$_t$)	The natural log of the firm's total assets (Compustat mnemonic: at) in year t	Compustat
OCF$_t$/Assets$_t$	The firm's operating performance in year t. The operating performance in a given year is the firm's operating cash flow (Compustat mnemonic: oibdp) divided by the firm's total assets (Compustat mnemonic: at)	Compustat
ROA$_t$	The firm's return on assets in year t. The return on assets is the firm's net income (Compustat mnemonic: ni) divided by the firm's total assets (Compustat mnemonic: at)	Compustat
Debt$_t$/Assets$_t$	The firm's leverage in year t. Leverage is the firm's long term debt (Compustat mnemonic: dltt) divided by its market value of assets. The market value of assets is assets less book equity plus market equity (in Compustat mnemonics: at − ceq + csho × prcc_c)	Compustat
FCF$_t$/Assets$_t$	The firm's free cash flows in year t divided by its assets in year t. Free cash flow is the operating cash flow less expenditures on interest, tax, and capex (in Compustat mnemonics: oibdp – xint – txt – capx)	Compustat

(*continued on next page*)

Table 1 (*continued*)

Variable	Definition	Source
$CAPEX_t/Sales_t$	The firm's capex intensity in year *t*. Capex intensity is the firm's expenditure on capex (Compustat mnemonic: capx) divided by its sales (Compustat mnemonic: sale)	Compustat
$I(SOX_t)$	An indicator that equals 1 if the observation post-dates the Sarbanes–Oxley Act	N/A
GIM_t	The firm's Gompers et al. (2003) index in year *t*	RiskMetrics/ IRRC
$\ln(\text{CEO Tenure}_t)$	The natural log of the number of years the CEO has been at the company in year *t*	Execucomp
$\ln(\text{CFO Tenure}_t)$	The natural log of the number of years the CFO has been at the company in year *t*	Execucomp
$\ln(\text{CEO Age}_t)$	The natural log of the CEO's age in year *t*	Execucomp
$\ln(\text{CFO Age}_t)$	The natural log of the CFO's age in year *t*	Execucomp
$\text{Incentive}_t/\text{Total}_t$ (CEO)	The proportion of the CEO's total compensation that is incentive based (i.e. stock-linked) in year *t*. In Execucomp codes this is $[(tdc2_t - salary_t)/ salary_t]$	Execucomp
$\text{Incentive}_t/\text{Total}_t$ (CFO)	The proportion of the CFO's total compensation that is incentive based (i.e. stock-linked) in year *t*. In Execucomp codes this is $[(tdc2_t - salary_t)/ salary_t]$	Execucomp
$\text{CEO Chair Duality}_t$	An indicator that equals 1 if the CEO is also the chairman of the board in year *t*	Execucomp
$\text{Insider Ownership}_t$	The percentage of the firm's shares that insiders (board-members) own in year *t*	Execucomp

Many SCAs settle several years after initiation.[7] Thus, focusing on successful SCAs imposes look-ahead bias and model-misspecification. Further, extending the window for disciplinary action from $t+1$ to (say) $t+4$, to give the litigation time to conclude, increases the risk of spurious correlation and contaminating factors driving the results.

The sample excludes any observations for which the CEO's age exceeds 70. This is because the literature generally classifies a departure as forced if the CEO is below a certain age, usually between 60 and 70 years old (see Murphy and Zimmerman, 1993; Huson et al., 2001; Jenter and Kanaan, forthcoming). I impose this restriction on all models in order to promote stability in the sample size.[8]

The total sample comprises 12,183 firm-year observations. This comprises 416 firm-years where there is a SCA, and 11,767 firm-year observations where there is no SCA. Table 2 contains sample composition by year. The number of class actions per year has increased over time. Class actions increased the most between 2001 and 2002, corresponding with the end of the tech-boom, and with the introduction of the Sarbanes–Oxley Act (SOX). This suggests that regression models should include year dummies to control for year effects, and should explicitly control for the introduction of SOX.

The key issues are then whether the market reacts negatively to SCAs, and if so, whether SCAs induce internal or external discipline. Thus, the following sections consider whether class actions (a) receive a negative market reaction (Section 4), (b) increase the likelihood of CEO turnover (Section 5), (c) reduce CEO pay (Section 6), and (d) induce disciplinary takeovers (Section 7). These sections discuss the dependent and independent variables in more detail.

4. Does the market react negatively to SCAs?

The threshold issue is whether the market reacts negatively to the announcement of a SCA. I predict that the market should react negatively to the announcement of a SCA even if SCAs precipitate disciplinary action on average. The main reasons are: (1) disciplinary actions are not certain, (2) even if the CEO/CFO is certain to be replaced, the CEO's/CFO's successor is not certain, (3) the SCA is a signal

[7] For example, the class action filed against Health South Corporation (ticker: HRC) in October 1998 settled in February 2006. Similarly, the action initiated against Xerox (ticker: XRC) in August 2000 settled in March 2008.

[8] Relaxing this assumption does not qualitatively change the results.

Table 2
Class actions by year. This table contains the sample composition by year. Column 1 contains the number of all firms in the sample. Column (2) contains the number of firms that sustain a class action in year $t \in \{1996, \ldots, 2007\}$. Column 3 contains the number of control firms in year $t \in \{1996, \ldots, 2007\}$.

Year	All (1)	SCA this year (2)	No SCA this year (3)
1996	886	9	877
1997	833	25	808
1998	1154	32	1122
1999	1083	40	1043
2000	1066	32	1034
2002	1193	60	1133
2003	1182	44	1138
2004	1240	62	1178
2005	1198	42	1156
2006	1207	29	1178
2007	1141	41	1100
Total	12,183	416	11,767

Table 3
Abnormal returns. This table contains abnormal returns. It considers the full sample of securities class actions (SCAs), and subsamples of SCAs that occur before SOX and after SOX. Panel A contains short-run cumulative abnormal returns (CARs) based upon an OLS estimation of the market model. Panel B contains buy and hold abnormal returns (BHARs).

Window	All		Pre-SOX		Post-SOX		Pre-SOX − Post-SOX	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A: Short-run CARs								
(−5, +5)	−0.077***	−0.028***	−0.102***	−0.035***	−0.062***	−0.022***	−0.040*	−0.013
(−3, +3)	−0.064***	−0.017***	−0.081***	−0.024***	−0.053***	−0.015***	−0.027	−0.009
(−1, +1)	−0.037***	−0.005***	−0.056***	−0.011***	−0.026***	−0.004***	−0.030**	−0.007
(−1, 0)	−0.035***	−0.007***	−0.057***	−0.015***	−0.023***	−0.003***	−0.034**	−0.012
(−0, +1)	−0.015***	−0.004**	−0.020**	−0.005	−0.012**	−0.004*	−0.008	−0.002
Panel B: Long-run BHARs								
(−5, +28)	−0.079***	−0.042***	−0.132***	−0.089***	−0.049***	−0.026***	−0.083***	−0.062*
(−5, +35)	−0.082***	−0.050***	−0.130***	−0.078***	−0.054***	−0.040***	−0.076**	−0.038
(−5, +200)	−0.129***	−0.070***	−0.207***	−0.204***	−0.084**	−0.021**	−0.123*	−0.183***
(−5, +250)	−0.178***	−0.088***	−0.284***	−0.220***	−0.117***	−0.048***	−0.168**	−0.171***
(−5, +300)	−0.184***	−0.146***	−0.306***	−0.273***	−0.113**	−0.061**	−0.193**	−0.212***

* Significance at 10%, using *t*-tests for means and signrank tests for medians.
** Significance at 5%, using *t*-tests for means and signrank tests for medians.
*** Significance at 1%, using *t*-tests for means and signrank tests for medians.

of some poor internal governance and management, this may signal poor managerial ethics and indicate that the firm's current price is based on inaccurate disclosure.

I analyze both the short-run and long-run price implications of a SCA. The proxy for the market's short-run reaction to the announcement is the cumulative abnormal return surrounding the announcement. The abnormal return on day t, denoted $AR_{i,t}$, is the firm's return on day t less the return predicted by an OLS estimation of the market model computed over the period 11-days before the announcement to 210 days before the announcement.[9] The cumulative abnormal return from τ_1 days before the announcement to τ_2 days after the announcement (denoted, $CAR_{i,(\tau_1,\tau_2)}$) is the sum of firm i's abnormal returns between days τ_1 and τ_2.

The proxy for persistence of any negative reaction is the buy and hold abnormal return. This is the compound actual return less the predicted return. The predicted return derives from an OLS estima-

[9] Section 8 ensures the results are robust to abnormal return specification.

tion of the market model. The compounding occurs from day τ_1 to day τ_2. The buy and hold abnormal return over the interval is denoted $BHAR_{i,(\tau_1,\tau_2)}$.

The results suggest that litigated firms have significantly negative CARs and BHARs. Table 3 contains the CARs and BHARs in Panel A and Panel B, respectively. The results show that the market reacts significantly and negatively to the announcement of a securities class action and this reaction persists long-term. This is consistent with the findings in Gande and Lewis (2009).

This negative reaction to securities class actions holds both before and after the implementation of SOX. CARs and BHARs are significant and negative in the pre-SOX and post-SOX sub-samples. However, the CARs are insignificantly more negative, and BHARs are significantly more negative, before the introduction of SOX than after the introduction of SOX.

There are two key explanations for the impact of SOX. First, the number of SCAs increased after 2002. Many of these are (arguably) frivolous (Coffee, 2006; Choi, 2007). Thus, the market might expect the SCA to yield minimal damages. This might reduce the market's reaction to the announcement of the SCA. Second, and alternatively, it may be that SOX improves firms' internal governance mechanisms (Ashbaugh-Skaife et al., 2007; Coates, 2007). This enables boards to discipline culpable managers. Thus, the board can limit value-destruction. Further, if SCAs precipitate a disciplinary takeover, they might imply the possibility of a takeover premium. The market might realize this; and thus, the market might react less negatively to SCAs that occur after SOX. This motivates further analysis of the implications of class actions for CEOs and CFOs.

5. Do securities class actions induce CEO and CFO turnover?

Dismissal is one way to punish CEOs and CFOs. Thus, the issue is whether litigation increases the likelihood that the CEO or CFO will leave the company immediately following the instigation of a securities class action.

5.1. Methodology

The first issue is whether securities class actions induce managerial turnover. The CEO is the key manager of interest. However, class actions might also induce turnover of other executives, such as the CFO.

There are two sets of models. The first set examines whether SCAs increase the likelihood that the CEO/CFO will leave the company. This induces three key models. The first two models, in Eqs. (1) and (2), are logit models that examine the log-likelihood of the CEO, or the CFO, leaving the company within a year of the class action.[10] The third model, in Eq. (3), is a multinomial logit model whose dependent variable examines the likelihood of neither the CEO nor CFO leaving, only the CEO leaving, only the CFO leaving, or both the CEO and CFO leaving. The study estimates the models for the full sample-period and for sub-samples both before and after the imposition of SOX. The model has the following general form:

$$\text{I(CEO Leaves}_{t+1}) = \alpha + \text{I(SCA}_t)\beta + \text{Controls}_t\gamma + u_t \quad (1)$$

$$\text{I(CFO Leaves}_{t+1}) = \alpha + \text{I(SCA}_t)\beta + \text{Controls}_t\gamma + u_t \quad (2)$$

$$\text{Departure}_{t+1} = \alpha + \text{I(SCA}_t)\beta + \text{Controls}_t\gamma + u_t \quad (3)$$

Here, I(CEO Leaves$_{t+1}$) is a dummy variable that equals 1 if the CEO at time t leaves the company in year $t+1$. Similarly, I(CFO Leaves$_{t+1}$) is an indicator that equals one if the CFO in year t leaves in year $t+1$. The variable Departure$_{t+1}$ is a categorical dependent variable that models the outcomes (1) neither the CEO nor the CFO leaves; (2) only the CEO leaves; (3) only the CFO leaves; and (4) both the CEO and the CFO leave. The variable I(SCA$_t$) is a binary variable that equals 1 if a SCA is initiated against firm i in year t. The term Controls$_t$ is a set of control variables, defined in Table 1, and discussed below. The terms α, β, and γ are regression coefficients, and u is the error term. The models control for year

[10] The results are robust to the choice of logit or probit model.

fixed-effects and cluster standard errors by 4-digit SIC code (following Petersen, 2009). To mitigate endogeneity, by construction, dependent variables post-date the variable I(SCA_t) and the control variables.

The second set of models set examines the likelihood that a CEO/CFO who leaves the company will fail to obtain another board or executive position. The issue is whether dismissal following a SCA harms the manager's job prospects. It does this if a manager who is fired is less likely to hold a board or CEO position in the future. These models replace the dependent variables in Eqs. (1) and (2) with a dummy that equals one if (a) the CEO (or CFO) is leaves the company, and (b) the CEO (or CFO) falls out of the Execucomp database. This is under-inclusive because CEOs and CFOs can obtain non-Execucomp employment (such as in private equity funds). Nonetheless, even if the fired manager obtains non-Execucomp employment, failing to obtain Execucomp employment is still a punishment because it removes an employment option.

The models control for governance and firm variables that might affect CEO turnover. Past performance might drive turnover. Strong past operating performance should reduce managerial turnover (Murphy and Zimmerman, 1993; Kang and Shivdasani, 1995). Proxies for this are the operating performance scaled by total assets ('OCF/Assets') and the return on assets ('ROA'). Similarly, strong stock performance should reduce CEO turnover (Kang and Shivdasani, 1995; Huson et al., 2001; Jenter and Kanaan, forthcoming). Proxies for this are the firm's Tobin's Q ('Tobin's Q') and the industry adjusted stock return over the prior year ('Stock Return').

CEO turnover might increase after SOX. Linck et al. (2009) find that after SOX, boards tend to have more outside directors, meet more frequently, and include more lawyers. This should improve internal governance and facilitate turnover. Therefore the models include a SOX dummy ('I(SOX)') that equals 1 if the observation post-dates SOX.

Several CEO and CFO characteristics might affect turnover. Performance based compensation should reduce turnover. This is because performance-based compensation positively correlates with performance (Jensen and Murphy, 1990), and strong performance reduces the likelihood of being fired (following Coughlan and Schmidt, 1985). Proxies for this are the percentage of total CEO, or CFO, compensation that is incentive-based, denoted 'Incentive/Total (CEO)' and 'Incentive/Total (CFO)', respectively.

Turnover might increase with internal managerial entrenchment (Goyal and Park, 2002; Lehn and Zhao, 2006). Proxies for this are the percentage of shares that insiders own ('Insider Ownership') and CEO-chairman duality ('CEO Chair Duality').

Tenure and age might influence turnover. Older managers might be more willing to accept redundancy packages and leave (see Weisbach, 1988; Milbourn, 2003; Lehn and Zhao, 2006). The natural logs of the CEO/CFO age control for this ('ln(CEO Age)'/'ln (CFO Age)'). Similarly, if long tenure represents CEO age, then it should increase turnover. However, tenure might also reduce turnover if it enables the manager to generate a power-base (Salancik and Meindl, 1984). Proxies for this are the natrual log of the CEO's/CFO's tenure ('ln(CEO Tenure)'/'ln(CFO Tenure)').

The presence of many anti-takeover provisions (ATPs) might indicate managerial entrenchment and an accommodating board (Faleye, 2007). This might reduce turnover. Therefore, the models control for the Gompers et al. (2003) index of 24-anti-takeover provisions ('GIM').[11]

Size and stability should influence turnover. Turnover should be lower at capital-insensitive (cf technology intensive) firms because these firms are less volatile and are easier to value. Proxies for this are the CAPEX intensity ('CAPEX/Sales') and a dummy for whether the firm is a high-tech firm as defined by Loughran and Ritter (2004) ('I(High Tech Firm)'). Similarly, managers of large firms might be entrenched (following Moeller et al., 2004). This might reduce turnover. A proxy for this is the natural log of the firm's total assets ('ln(Assets)').

High free cash flows might induce agency conflicts and sub-optimal investment (following Jensen, 1986). This might precipitate turnover. A proxy for this is the firm's free cash flow scaled by its total

[11] The ATP data is from IRRC (now RiskMetrics). IRRC only reports ATP data for 1990, 1993, 1995, 1998, 2000, 2002, 2004 and 2006. For years that IRRC does not report data, the study uses the data from the last available year. Section 8 ensures that the results are robust to ATP specification.

assets ('FCF/Assets'). Conversely, debt might ameliorate this agency conflict. A proxy for this is the firm's total debt divided by its total assets ('Debt/Assets').

Industry concentration might influence turnover. DeFond and Park (1999) suggest turnover is higher in competitive industries. Engel et al. (2003) find some evidence consistent with this. The models control for this by including the Herfindahl–Hirschman Index ('HHI').

Controlling for stock return variance in the year of the SCA indicator is important. I compute stock return volatility as the variance of the firm's daily CRSP stock return. The results also hold if I use a market-adjusted return (i.e. the firm's return less the return on the equally weighted market index). This is important because SCAs are associated with high stock-price volatility (the volatility potentially leading to the SCA). However, volatility could also be associated with poor CEO performance and dismissal.

5.2. Results

The sample characteristics are in Table 4. The univariate statistics show that CEOs are significantly more likely to leave the company if there was a SCA in the prior year. There is no univariate evidence

Table 4
Univariate statistics. This table contains univariate statistics (means). Column 1 contains statistics for firms that sustain a class action suit. Column 2 contains statistics for the control sample. Column 3 contains the difference between Column 1 and Column 2. Table 1 contains the variable definitions.

Variable	All (1)	$SCA_{i,t}$ (2)	No $SCA_{i,t}$ (3)	Difference (4) = (2) − (3)
Panel A: CEO and CFO turnover				
I(CEO $Leaves_{i,t+1}$)	0.059***	0.062***	0.057***	0.005***
I(CFO $Leaves_{i,t+1}$)	0.011***	0.019***	0.006***	0.014
Panel B: CEO and CFO salary reductions				
I(CEO $Salary_{t+1}$ < CEO $Salary_t$)	0.229***	0.331***	0.226***	0.106***
I(CEO $Bonus_{t+1}$ < CEO $Bonus_t$)	0.488***	0.671***	0.483***	0.188***
I(CFO $Salary_{t+1}$ < CFO $Salary_t$)	0.109***	0.198***	0.106***	0.091***
I(CFO $Bonus_{t+1}$ < CFO $Bonus_t$)	0.487***	0.725***	0.482***	0.243***
Panel C: Disciplinary takeover statistics				
I(Bid_{t+1})	0.019***	0.048***	0.018***	0.030***
I(Complete Bid_{t+1})	0.008***	0.024***	0.008***	0.016**
I(Hostile Bid_{t+1})	0.007***	0.022***	0.007***	0.015**
I(Hostile Complete Bid_{t+1})	0.002***	0.010**	0.001***	0.008*
Panel D: Control variables				
$Incentive_t/Total_t$ (CEO)	0.624***	0.577***	0.626***	−0.049***
CEO $Tenure_t$	6.165***	5.372***	6.193***	−0.821**
CEO Age_t	55.170***	54.366***	55.199***	−0.832***
$Incentive_t/Total_t$ (CFO)	0.227***	0.166***	0.230***	−0.064***
CFO $Tenure_t$	4.923***	5.510***	4.905***	0.605
CFO Age_t	49.120***	48.587***	49.139***	−0.552***
CEO Chair $Duality_t$	0.661***	0.620***	0.662***	−0.042*
Insider $Ownership_t$	0.035***	0.027***	0.035***	−0.008*
GIM_t	9.260***	9.077***	9.266***	−0.189
I(High Tech $Firm)_t$	0.162***	0.221***	0.160***	0.061***
HHI_t	0.335***	0.322***	0.336***	−0.013
Stock $Return_t$	−0.009***	−0.148***	−0.004***	−0.144***
Tobin's Q_t	1.996***	2.231***	1.988***	0.243***
$Debt_t/Assets_t$	0.141***	0.137***	0.141***	−0.004***
$Assets_t$	10972.840***	53131.720***	9482.396***	43649.324***
$OCF_t/Assets_t$	0.136***	0.120***	0.136***	−0.016**
ROA_t	0.035***	0.020***	0.036***	−0.015**
$FCF_t/Assets_t$	0.035***	0.030***	0.035***	−0.005
$CAPEX_t/Sales_t$	0.080***	0.073***	0.081***	−0.008

* Significance at 10%, for means using a *t*-test (Column 1 and Column 2) or difference in mean (for Column 3).
** Significance at 5%, for means using a *t*-test (Column 1 and Column 2) or difference in mean (for Column 3).
*** Significance at 1%, for means using a *t*-test (Column 1 and Column 2) or difference in mean (for Column 3).

Table 5
CEO and CFO turnover regressions. This table contains logit regressions that examine CEO and CFO turnover. Columns 1–3 examine the log-likelihood of the CEO leaving in year $t+1$. Columns 4–6 examine the log-likelihood of a CFO leaving in year $t+1$. Columns 1 and 4 examine the full sample; Columns 2 and 5 the sample from before SOX; and, columns 3 and 6 the sample from after SOX. The key independent variable is SCA, a dummy that equals one if the firm has a class action filed against it in year t. Table 1 contains the variable definitions. Brackets contain p-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable	I(CEO Leaves$_{t+1}$)			I(CFO Leaves$_{t+1}$)		
Sample	All (1)	Pre-SOX (2)	Post-SOX (3)	All (4)	Pre-SOX (5)	Post-SOX (6)
I(SCA)	1.368*** [0.000]	1.780*** [0.000]	1.212*** [0.000]	0.457 [0.257]	0.399 [0.470]	0.625 [0.497]
Stock Return Variance	62.911** [0.032]	88.881** [0.013]	35.347 [0.516]	10.105 [0.811]	−0.029 [1.000]	116.716 [0.452]
Board Size	0.533*** [0.000]	0.517*** [0.000]	0.605*** [0.000]	−0.131 [0.257]	−0.046 [0.700]	−0.462 [0.302]
I(SOX)	−0.055 [0.562]			−1.161*** [0.000]		
Insider Ownership (%)	0.163*** [0.000]	−1.919 [0.164]	0.171*** [0.000]	−2.074 [0.271]	−2.099 [0.363]	−1.598 [0.642]
Incentive/Total (CEO)	0.782*** [0.000]	−0.03 [0.908]	1.528*** [0.000]			
ln(CEO Tenure)	−1.191*** [0.000]	−1.322*** [0.000]	−1.102*** [0.000]			
ln(CEO Age)	0.786** [0.018]	1.400** [0.011]	0.35 [0.414]			
Incentive/Total (CFO)				2.959*** [0.000]	2.607*** [0.000]	3.762*** [0.000]
ln(CFO Tenure)				−0.411*** [0.001]	−0.693*** [0.001]	0.032 [0.846]
ln(CFO Age)				−0.117 [0.913]	−0.661 [0.624]	1.026 [0.627]
CEO Chair Duality	−0.658*** [0.000]	−0.645*** [0.000]	−0.663*** [0.000]	−0.323* [0.097]	−0.246 [0.271]	−0.43 [0.204]
GIM	0.035** [0.017]	0.029 [0.181]	0.037** [0.049]	−0.044 [0.165]	−0.037 [0.350]	−0.055 [0.323]
I(High Tech Firm)	0.013 [0.922]	−0.008 [0.978]	0.04 [0.824]	0.258 [0.389]	0.247 [0.496]	0.2 [0.658]

(*continued on next page*)

Table 5 (*continued*)

Dependent variable	I(CEO Leaves$_{t+1}$)			I(CFO Leaves$_{t+1}$)		
Sample	All	Pre-SOX	Post-SOX	All	Pre-SOX	Post-SOX
	(1)	(2)	(3)	(4)	(5)	(6)
HHI	−0.019	−0.012	−0.02	−0.225	0.068	−0.929
	[0.919]	[0.964]	[0.929]	[0.592]	[0.895]	[0.216]
Stock Return	−0.447***	−0.315	−0.621**	−1.341***	−1.417***	−1.101
	[0.006]	[0.180]	[0.011]	[0.000]	[0.007]	[0.107]
Tobin's Q	−0.109**	−0.027	−0.269***	−0.223**	−0.167	−0.383*
	[0.019]	[0.535]	[0.008]	[0.020]	[0.104]	[0.060]
Debt/Assets	1.388*	2.274*	0.709	3.626**	4.848***	0.243
	[0.067]	[0.083]	[0.564]	[0.044]	[0.006]	[0.961]
Tobin's Q × Debt/Assets	−0.579	−1.448	−0.03	−2.241	−3.276**	0.308
	[0.329]	[0.204]	[0.973]	[0.128]	[0.031]	[0.932]
ln(Assets)	−0.047*	0.024	−0.118***	−0.265***	−0.217***	−0.344***
	[0.096]	[0.635]	[0.002]	[0.000]	[0.008]	[0.008]
OCF/Assets	−1.255	−1.061	−0.527	−3.316**	−1.204	−7.524***
	[0.123]	[0.310]	[0.646]	[0.044]	[0.475]	[0.010]
ROA	−0.18	−1.094*	−0.091	0.071	−0.973	2.31
	[0.411]	[0.091]	[0.692]	[0.908]	[0.297]	[0.162]
FCF/Assets	1.255	2.567*	0.04	1.905	−0.14	6.192**
	[0.179]	[0.078]	[0.973]	[0.394]	[0.954]	[0.023]
CAPEX/Sales	0.057	0.365	−0.122	−0.086	−0.547	0.282
	[0.796]	[0.245]	[0.803]	[0.927]	[0.651]	[0.555]
Constant	−5.698***	−8.221***	−3.917**	−0.607	1.079	−5.57
	[0.000]	[0.000]	[0.022]	[0.884]	[0.835]	[0.505]
Observations	12,138	5019	7119	12,138	5019	7119
Model Wald χ^2	807.0975	284.3057	505.9274	264.3415	112.6994	248.7411
Pseudo R^2	18.87%	21.64%	18.22%	14.66%	10.47%	17.96%

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

Table 6
Multinomial logit regressions. This table contains multinomial logit regressions for CEO and CFO turnover. The base outcome is that neither the CEO nor the CFO are removed. Columns 1, 2, and 3 respectively examine the outcomes of both the CEO and CFO leaving, only the CEO leaving, and only the CFO leaving. The CEO and the CFO must be less than 70 years old. The main independent variable is SCA, a dummy that equals one if the firm has a class action filed against it in year t. Table 1 contains the variable definitions. Brackets contain p-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable	I(Both Leave$_{t+1}$) (1)	I(CEO Leaves$_{t+1}$) (2)	I(CFO Leaves$_{t+1}$) (3)
I(SCA)	2.341***	1.362***	−0.097
	[0.001]	[0.000]	[0.872]
Stock Return Variance	104.86	66.583**	−31.599
	[0.188]	[0.028]	[0.712]
Boardsize	0.456	0.564***	−0.164
	[0.159]	[0.000]	[0.202]
I(SOX)	−0.880*	0.135	−1.037***
	[0.093]	[0.222]	[0.000]
Insider Ownership (%)	−61.245**	0.159***	−1.174
	[0.036]	[0.000]	[0.498]
CEO Chair Duality	0.21	−0.666***	−0.379
	[0.718]	[0.000]	[0.109]
Incentive/Total (CEO)	0.627	0.706***	−1.622***
	[0.595]	[0.001]	[0.002]
ln(CEO Tenure)	−1.100***	−1.177***	0.004
	[0.000]	[0.000]	[0.972]
ln(CEO Age)	2.931	0.728**	−0.095
	[0.383]	[0.029]	[0.901]
Incentive/Total (CFO)	2.392***	0.042	3.606***
	[0.001]	[0.754]	[0.000]
ln(CFO Tenure)	−0.752***	−0.261***	−0.356***
	[0.001]	[0.000]	[0.007]
ln(CFO Age)	3.479	−0.094	−0.507
	[0.484]	[0.892]	[0.630]
GIM	−0.105	0.041***	−0.025
	[0.306]	[0.005]	[0.439]
I(High Tech Firm)	0.102	−0.002	0.285
	[0.868]	[0.986]	[0.351]
HHI	0.929	−0.094	−0.519
	[0.251]	[0.613]	[0.253]
Stock Return	−1.736**	−0.390**	−1.201***
	[0.030]	[0.018]	[0.008]
Tobin's Q	−0.606	−0.101**	−0.162*
	[0.224]	[0.032]	[0.097]
Debt/Assets	9.337	1.499*	2.847
	[0.144]	[0.052]	[0.113]
Tobin's Q × Debt/Assets	−7.808	−0.565	−1.348
	[0.182]	[0.349]	[0.357]
ln(Assets)	−0.555***	−0.041	−0.173**
	[0.000]	[0.150]	[0.037]
OCF/Assets	−1.65	−1.27	−3.156
	[0.637]	[0.135]	[0.102]
ROA	0.041	−0.228	0.415
	[0.964]	[0.301]	[0.696]

(*continued on next page*)

Table 6 (*continued*)

Dependent variable	I(Both Leave$_{t+1}$) (1)	I(CEO Leaves$_{t+1}$) (2)	I(CFO Leaves$_{t+1}$) (3)
FCF/Assets	−0.895	1.533	2.255
	[0.860]	[0.112]	[0.463]
CAPEX/Sales	0.664***	0.054	−0.948
	[0.005]	[0.822]	[0.453]
Constant	−25.204	−4.962*	0.936
	[0.345]	[0.090]	[0.852]
Observations		*** 12,133	
Wald χ^2 Stat		2671.377	
Pseudo R^2		18.91%	

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

that CFOs are more likely to leave the company. However, the results also show significant differences in the control variables. This suggests that analysis within a multivariate framework is necessary.

Table 5 examines the likelihood that a CEO will leave the company. Columns 1–3 examine CEO turnover; Columns 4–6 examine CFO turnover. The key result is that CEOs, but not CFOs, are more likely to leave the firm in year $t + 1$ if there was a SCA in year t. These results hold both before and after the imposition of SOX.

The control variables yield some interesting results. First and unsurprisingly, older CEOs/ CFOs are more likely to leave the company at any given time. Second, ATPs, as proxied by the Gompers et al. (2003) index, do not consistently reduce CFO turnover. However, this is unsurprising since ATPs are not designed to protect managers from internal discipline. Third, longer-serving CEOs and CFOs are less likely to leave the company, supporting the theory that long-serving managers are able to generate a power base.

The multinomial logit results are in Table 6. The base case is that neither the CEO nor the CFO are fired in year $t + 1$. The results show that litigation in the past year significantly increases the likelihood that (a) the CEO alone will leave the company or (b) both the CEO and the CFO will leave. SCAs do not increase the likelihood that the CFO alone will leave. This is consistent with prior literature that shows (a) CEOs are named in more securities actions than are CFOs (Tillman, 2009), (b) CEOs are the primary people in charge and that CEOs are primarily blamed for poor performance even if they are not soley responsible (see Dezso, 2009; Walker and Wang, 2010).

Table 7 examines the likelihood that a CEO who leaves is also unable to obtain a future board or managerial position. Table 8 focuses on CFOs. The dependent variable in Columns 1–3 is an indicator that equals one if the CEO (in Table 7), or CFO (in Table 8), in year t leaves the company by the end of year $t + 1$ and also falls out of Execucomp. Column 4 examines the likelihood that the CEO (Table 7) or CFO (Table 8) in year t leaves Execucomp conditional on leaving the firm in year $t + 1$. The results in Columns 1–4 indicate that if a SCA is initiated against the firm in year t and the CEO is fired, then he/she is significantly less likely to obtain another board or executive position. There is no such evidence for CFOs. This suggests that SCAs do have future career repercussions for CEOs, but possibly not for CFOs.

Taken together, these results show: First, CEOs are significantly more likely to leave a company in year $t + 1$ if their company suffered a SCA in year t. Second, CFOs are more likely to leave the company but only if the CEO also leaves the company. Third, leaving the company after the announcement of a SCA does harm CEO's future job prospects.

6. Do securities class actions reduce the CEO's and the CFO's income?

Firms may punish managers by reducing their compensation (Coughlan and Schmidt, 1985). This should particularly involve a reduction in fixed salary-based compensation because reducing

Table 7
CEO post-turnover employment. This table contains logit regressions that examine the likelihood that a fired CEO fails to obtain another board or executive position. The dependent variable in Columns 1–3 is a dummy that equals one if the CEO in year t (a) leaves the company by the end of year $t+1$ and (b) drops out of Execucomp. Column 4 examines the likelihood that the CEO leaves execucomp conditional on the CEO leaving the company by year $t+1$. The key independent variable is SCA, a dummy that equals one if the firm has a class action filed against it in year t. Table 1 contains the variable definitions. Brackets contain p-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable	I(CEO Leaves Co & Execucomp)			I(CEO Leaves Execucomp |CEO Leaves Co)
Sample period	All	Pre-SOX	Post-SOX	All
I(SCA)	1.556***	1.727***	1.494***	0.790***
	[0.000]	[0.000]	[0.000]	[0.008]
Stock Return Variance	120.302***	155.014***	99.186	171.822***
	[0.001]	[0.000]	[0.107]	[0.008]
Boardsize	0.422***	0.336***	0.532***	0.042
	[0.000]	[0.000]	[0.000]	[0.701]
I(SOX)	−0.112			−0.057
	[0.486]			[0.809]
Insider Ownership (%)	0.207***	−1.358	0.213***	0.802
	[0.000]	[0.442]	[0.000]	[0.543]
Incentive/Total (CEO)	1.544***	0.766*	2.340***	1.097***
	[0.000]	[0.098]	[0.000]	[0.003]
ln(CEO Tenure)	−0.429***	−0.570***	−0.318***	1.192***
	[0.000]	[0.000]	[0.001]	[0.000]
ln(CEO Age)	3.635***	4.969***	2.693***	5.618***
	[0.000]	[0.000]	[0.000]	[0.000]
CEO Chair Duality	−1.037***	−1.097***	−0.984***	−0.466**
	[0.000]	[0.000]	[0.000]	[0.023]
GIM	0.037	0.012	0.049	0.013
	[0.164]	[0.770]	[0.163]	[0.747]
I(High Tech Firm)	0.029	−0.067	0.063	0.378
	[0.887]	[0.883]	[0.820]	[0.110]
HHI	0.241	−0.016	0.402	0.325
	[0.355]	[0.971]	[0.202]	[0.388]
Stock Return	−0.531**	−0.481	−0.577	0.158
	[0.044]	[0.265]	[0.128]	[0.530]
Tobin's Q	−0.101	−0.071	−0.177	−0.029
	[0.213]	[0.480]	[0.275]	[0.804]
Debt/Assets	2.581**	3.100*	2.525	0.929
	[0.039]	[0.062]	[0.214]	[0.554]
Tobin's Q × Debt/Assets	−1.479	−2.503*	−1.094	−0.192
	[0.136]	[0.096]	[0.453]	[0.871]
ln(Assets)	−0.167***	−0.056	−0.262***	−0.263***
	[0.001]	[0.518]	[0.000]	[0.000]
OCF/Assets	−2.901**	−1.725	−3.331	−3.273*
	[0.030]	[0.324]	[0.167]	[0.063]
ROA	−0.128	−0.177	−0.109	0.68
	[0.706]	[0.905]	[0.741]	[0.406]
FCF/Assets	2.328	2.542	2.054	2.915
	[0.156]	[0.293]	[0.442]	[0.143]
CAPEX/Sales	0.149	0.584	−0.129	1.028
	[0.694]	[0.311]	[0.928]	[0.167]

(*continued on next page*)

Table 7 (*continued*)

Dependent variable	I(CEO Leaves Co & Execucomp)			I(CEO Leaves Execucomp |CEO Leaves Co)
Sample period	All	Pre-SOX	Post-SOX	All
Constant	−18.123*** [0.000]	−23.282*** [0.000]	−14.656*** [0.000]	−22.789*** [0.000]
Observations	12,138	5019	7119	714
Model Wald χ^2	323.7234	165.6782	246.4905	166.6508
Pseudo R^2	11.28%	13.25%	11.34%	23.83%

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

incentive–compensation might further dis-align managers' and shareholders' incentives (following Mehran, 1995; Kang et al., 2006).

6.1. Methodology

The goal is to determine if the CEO's or the CFO's compensation falls following the initiation of a securities class action. The compensation has two presently relevant components: a fixed salary and a performance bonus. Compensation can also involve stock grants. However, it is unclear whether boards should reduce stock grants following a SCA; reducing stock grants is a punishment, but it also reduces the alignment of managers' and shareholders' incentives. Thus, this paper focuses on the prediction that a well-functioning board should penalize CEOs or CFOs by reducing their fixed compensation and performance bonus.

Logit regressions examine whether the CEO's, or the CFO's, compensation falls after the initiation of litigation. The models examine the log-likelihood that (1) the fixed compensation falls or (2) the bonus compensation falls. Data on compensation is from Execucomp. The general form regressions are in Eqs. (4) and (5).

$$\mathrm{I}(\mathrm{Salary}_{t+1} < \mathrm{Salary}_t) = \alpha + \mathrm{I}(\mathrm{SCA}_t)\beta + \mathrm{Controls}_t\vartheta + \eta_t \tag{4}$$

$$\mathrm{I}(\mathrm{Bonus}_{t+1} < \mathrm{Bonus}_t) = \alpha + \mathrm{I}(\mathrm{SCA}_t)\beta + \mathrm{Controls}_t\vartheta + \eta_t \tag{5}$$

Here, $\mathrm{I}(\mathrm{Salary}_{t+1} < \mathrm{Salary}_t)$ is an indicator that equals one if the CEO's (or CFO's) fixed compensation is lower in year $t+1$ than in year t. Similarly, $\mathrm{I}(\mathrm{Bonus}_{t+1} < \mathrm{Bonus}_t)$ is an indicator that equals one if the CEO's (or CFO's) bonus compensation is lower in year $t+1$ than it was in year t. The variable $\mathrm{I}(\mathrm{SCA}_t)$ is a dummy that equals 1 if a SCA is initiated against firm i in year t, and $\mathrm{Controls}_t$ represents the controls. The terms α,β, and ϑ are regression coefficients, and η is the error term. All models use year fixed effects and standard errors clustered by 4-digit SIC code.

The control variables are variables that might affect executive compensation. The Sarbanes–Oxley Act might influence executive compensation. Narayanan and Seyhun (2005) suggest that SOX reduced managerial influence the grant-date of securities. Further, Cohen et al. (2009) find that SOX reduced the level of compensation tied to managerial risk-taking. Thus, the compensation models include 'SOX', a dummy that equals 1 if the observation post-dates SOX.

Age and tenure should influence compensation. Ryan and Wiggins (2001) find a positive relation between the use of cash bonuses and CEO age. Further, Milbourn (2003) finds a negative relation between stock-incentives and CEO age. Thus, the models include the natural log of the CEO's and CFO's age, denoted 'ln(CEO Age)' and 'ln(CFO Age)', respectively. Similarly, long-serving managers have higher pay and more control over their pay (Finkelstein and Hambrick, 1988; Hill and Phan, 1991). Thus, the models include the natural log of the number of years that the CEO, or CFO, has been with the corporation (denoted 'ln(CEO Tenure)', and 'ln(CFO Tenure)').

Managers are more likely to have higher pay if they have greater control over the board (Boyd, 1994). They have greater control over the board if they are also the chairperson of the board. However,

Table 8
CFO post-turnover employment. This table contains logit regressions that examine the likelihood that a fired CFO fails to obtain another board or executive position. The dependent variable in Columns 1–3 is a dummy that equals one if the CFO in year t (a) leaves the company by the end of year $t+1$ and (b) drops out of Execucomp. Column 4 examines the likelihood that the CFO leaves execucomp conditional on the CFO leaving the company by year $t+1$. The key independent variable is SCA, a dummy that equals one if the firm has a class action filed against it in year t. Table 1 contains the variable definitions. Brackets contain p-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable	I(CFO Leaves Co & Execucomp)			I(CFO Leaves Execucomp |CFO Leaves Co)
Sample period	All	Pre-SOX	Post-SOX	All
I(SCA)	0.334	0.046	0.046	−0.562
	[0.513]	[0.953]	[0.953]	[0.617]
Stock Return Variance	−0.029	−29.433	−29.433	−0.862
	[1.000]	[0.734]	[0.734]	[0.998]
Boardsize	−0.143	−0.074	−0.074	−0.029
	[0.314]	[0.627]	[0.627]	[0.900]
I(SOX)	−1.163***			0.207
	[0.000]			[0.771]
Insider Ownership (%)	−2.793	−3.055	−3.055	−3.606
	[0.284]	[0.351]	[0.351]	[0.381]
Incentive/Total (CFO)	2.821***	2.678***	2.678***	−1.402
	[0.000]	[0.000]	[0.000]	[0.200]
ln(CFO Tenure)	−0.265*	−0.464**	−0.464**	0.332
	[0.058]	[0.036]	[0.036]	[0.533]
ln(CFO Age)	1.46	1.532	1.532	10.462**
	[0.220]	[0.203]	[0.203]	[0.044]
CEO Chair Duality	−0.117	−0.085	−0.085	1.110**
	[0.594]	[0.741]	[0.741]	[0.027]
GIM	−0.035	−0.032	−0.032	0.058
	[0.334]	[0.483]	[0.483]	[0.654]
I(High Tech Firm)	0.15	−0.004	−0.004	−0.783
	[0.636]	[0.993]	[0.993]	[0.176]
HHI	0.071	0.275	0.275	1.874*
	[0.879]	[0.650]	[0.650]	[0.078]
Stock Return	−1.720***	−1.641***	−1.641***	−1.311*
	[0.000]	[0.000]	[0.000]	[0.064]
Tobin's Q	−0.246**	−0.159	−0.159	0.04
	[0.024]	[0.152]	[0.152]	[0.864]
Debt/Assets	4.136*	5.873***	5.873***	−1.841
	[0.054]	[0.004]	[0.004]	[0.692]
Tobin's Q × Debt/Assets	−2.634	−4.482**	−4.482**	1.507
	[0.151]	[0.015]	[0.015]	[0.690]
ln(Assets)	−0.268***	−0.207**	−0.207**	−0.021
	[0.001]	[0.039]	[0.039]	[0.910]
OCF/Assets	−2.163	−1.375	−1.375	−3.37
	[0.335]	[0.622]	[0.622]	[0.393]
ROA	0.032	−1.289	−1.289	−0.481
	[0.948]	[0.202]	[0.202]	[0.913]
FCF/Assets	−0.646	−1.226	−1.226	−0.405
	[0.832]	[0.771]	[0.771]	[0.931]
CAPEX/Sales	−2.336	−2.183	−2.183	−2.422
	[0.168]	[0.331]	[0.331]	[0.323]

(*continued on next page*)

Table 8 (*continued*)

Dependent variable	I(CFO Leaves Co & Execucomp)			I(CFO Leaves Execucomp |CFO Leaves Co)
Sample period	All	Pre-SOX	Post-SOX	All
Constant	−7.316	−8.003*	−8.003*	−40.082**
	[0.105]	[0.071]	[0.071]	[0.044]
Observations	12,138	5019	5019	134
Model Wald χ^2	251.8357	146.5361	146.5361	49.7279
Pseudo R^2	13.68%	10.34%	10.34%	18.01%

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

prior evidence finds weak (Conyon and Peck, 1998) or insignificant (Ryan and Wiggins, 2001) relation between duality and compensation. Nonetheless, the models include 'CEO Chair Duality', a dummy that equals 1 if the CEO is also the chairperson.

Managerial entrenchment should increase compensation. Bebchuk et al. (2002) suggest that managerial entrenchment could facilitate rent-extraction and agency conflicts. Subsequently, Core et al. (1999) find that proxies for agency conflicts increase CEO compensation, and Borokhovich et al. (1997) find that ATPs enable managers to sustain super-normal compensation levels. Thus, the models include the Gompers et al. (2003) index, 'GIM', as a proxy for poor governance.[12]

Product-market competition should influence pay. Cuñat and Guadalupe (2005) and Karuna (2007) find that product market competition increases pay sensitivity. Thus, the models include the Herfindahl–Hirschman Index ('HHI').

The firm's performance should influence the level of compensation (Jensen and Murphy, 1990) and the structure thereof (Mehran, 1995). Thus, the models include four measures of performance, Tobin's Q ('Tobin's Q'), the return on assets ('ROA'), the operating performance (OCF/Assets) and the industry adjusted stock return ('Stock Return').

Compensation should increase with firm size. There are two possible reasons. First, the agency explanation is that firm-size increases managerial entrenchment, which increases agency conflicts (Moeller et al., 2004; Humphery-Jenner and Powell, 2011). Agency conflicts of managerial entrenchment give CEOs additional power, which they can use to increase compensation (following Borokhovich et al., 1997). Second, the non-agency explanation is that larger firms are more difficult to manage. The added complexity should induce higher pay (following Finkelstein and Hambrick, 1989; Rose and Shepard, 1997). Supporting either theory, prior evidence shows a positive relation between firm size and CEO compensation (see Kostiuk, 1990; Zhou, 2000; Baker and Hall, 2004). Therefore, the models include the natural log of the firm's total assets ('ln(Assets)').

The level of free cash flow should influence CEO compensation. High free cash flows ('FCF/Assets') should induce Jensen (1986) type agency conflicts. These agency conflicts should increase overall compensation, and should increase the proportion of compensation that comes from fixed salary rather than incentives. Subsequently, Bryan et al. (2000) find a negative relation between free cash flows and the level of incentive compensation.

The level of capital expenditure, and conversely, the preference for technology, has an ambiguous impact on pay. Arguably, high levels of capital expenditure should increase CEO pay since they should increase firm-size (following Baber et al., 1996). However, other evidence suggests that 'risky' investment, such as technology investment, is positively related to option-based compensation (Ryan and Wiggins, 2001). This suggests that the level CAPEX or technology might influence the level of pay; however, it might influence incentive-compensation and fixed-compensation differently. The dummy 'I(High Tech Firm)' controls for whether the firm operates in a high-tech industry, as defined in Loughran and Ritter (2004), and the variable 'CAPEX/Sales' controls for the level of capital expenditure.

[12] As with the managerial turnover models, these models are robust to the choice of ATP index, holding in models that use the Bebchuk et al. (2009) 6-provision index, the presence of a poison pill, or the presence of a classified board.

Table 9
CEO compensation regressions. This table contains logit regressions for the CEO's compensation, where the dependent variables relate to whether the CEO's fixed or bonus compensation decreases. Columns 1 and 2 examine the full sample period; Columns 3 and 4 examine the pre-SOX period and Columns 5 and 6 examine the post-SOX period. The dependent variable in Columns 1, 3, and 5 is an indicator that equals one if the CEO's fixed compensation decreases. The dependent variable in Columns 2, 4, and 6 is an indicator that equals one if the CEO's bonus compensation (excluding vesting or exercised options) decreases. Table 1 contains the variable definitions. Brackets contain *p*-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable Sample period	I($Salary_{t+1}$ < $Salary_t$) All (1)	I($Bonus_{t+1}$ < $Bonus_t$) All (2)	I($Salary_{t+1}$ < $Salary_t$) Pre-SOX (3)	I($Bonus_{t+1}$ < $Bonus_t$) Pre-SOX (4)	I($Salary_{t+1}$ < $Salary_t$) Post-SOX (5)	I($Bonus_{t+1}$ < $Bonus_t$) Post-SOX (6)
I(SCA)	0.205*	0.615***	0.193	0.715***	0.188	0.575***
	[0.055]	[0.000]	[0.336]	[0.003]	[0.184]	[0.001]
Stock Return Variance	158.802***	294.572***	120.892**	357.892***	214.304***	237.437***
	[0.000]	[0.000]	[0.028]	[0.000]	[0.000]	[0.001]
Boardsize	0.197***	−0.057**	0.147***	−0.012	0.267***	−0.100**
	[0.000]	[0.036]	[0.000]	[0.733]	[0.000]	[0.013]
I(SOX)	0.074	0.464***				
	[0.219]	[0.000]				
Insider Ownership (%)	2.616***	1.628***	2.679***	1.955***	2.533***	1.287**
	[0.000]	[0.001]	[0.000]	[0.001]	[0.000]	[0.018]
ln(CEO Tenure)	−0.153***	−0.135***	−0.245***	−0.168***	−0.090**	−0.106***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.019]	[0.001]
ln(CEO Age)	−0.276***	−0.322***	−0.384***	−0.225***	−0.225***	−0.391***
	[0.000]	[0.000]	[0.000]	[0.001]	[0.003]	[0.000]
CEO Chair Duality	−0.406*	−0.034	−0.48	−0.206	−0.336	0.155
	[0.095]	[0.867]	[0.184]	[0.513]	[0.263]	[0.572]
GIM	−0.031***	−0.030***	−0.017	−0.028**	−0.038***	−0.029***
	[0.005]	[0.001]	[0.279]	[0.030]	[0.009]	[0.008]
I(High Tech Firm)	0.14	0.027	0.048	−0.067	0.187	0.07
	[0.142]	[0.746]	[0.619]	[0.507]	[0.173]	[0.538]
HHI	0.088	0.213*	0.061	0.072	0.126	0.295**
	[0.549]	[0.056]	[0.747]	[0.657]	[0.465]	[0.038]
Stock Return	−0.023	−0.930***	−0.098	−1.005***	0.095	−0.840***
	[0.722]	[0.000]	[0.355]	[0.000]	[0.294]	[0.000]
Tobin's Q	−0.016	−0.107***	−0.019	−0.114***	0.012	−0.103***
	[0.456]	[0.000]	[0.446]	[0.000]	[0.768]	[0.007]
Debt/Assets	0.487	0.41	1.391**	1.065*	−0.206	−0.064

(*continued on next page*)

Table 9 (*continued*)

Dependent variable Sample period	I(Salary$_{t+1}$ < Salary$_t$) All (1)	I(Bonus$_{t+1}$ < Bonus$_t$) All (2)	I(Salary$_{t+1}$ < Salary$_t$) Pre-SOX (3)	I(Bonus$_{t+1}$ < Bonus$_t$) Pre-SOX (4)	I(Salary$_{t+1}$ < Salary$_t$) Post-SOX (5)	I(Bonus$_{t+1}$ < Bonus$_t$) Post-SOX (6)
	[0.367]	[0.358]	[0.050]	[0.073]	[0.778]	[0.911]
Tobin's Q × Debt/Assets	−0.345	−0.541*	−1.169**	−0.814**	0.195	−0.368
	[0.390]	[0.067]	[0.036]	[0.041]	[0.716]	[0.329]
ln(Assets)	0.105***	−0.028	0.089**	−0.045*	0.126***	−0.01
	[0.000]	[0.105]	[0.012]	[0.091]	[0.000]	[0.660]
OCF/Assets	−1.617***	1.304***	−1.154	2.436***	−2.084***	0.751
	[0.003]	[0.005]	[0.156]	[0.003]	[0.005]	[0.279]
ROA	−0.152	−0.262	0.059	−0.801	−0.138	−0.146
	[0.626]	[0.496]	[0.904]	[0.249]	[0.699]	[0.699]
FCF/Assets	0.473	−1.931***	−0.428	−2.322***	1.117	−1.672**
	[0.368]	[0.002]	[0.573]	[0.004]	[0.188]	[0.048]
CAPEX/Sales	−0.155	−0.434	0.018	−0.572*	−0.373	−0.356
	[0.265]	[0.295]	[0.941]	[0.056]	[0.245]	[0.489]
Constant	0.313	1.304	0.946	1.84	−0.294	1.011
	[0.739]	[0.114]	[0.489]	[0.137]	[0.805]	[0.363]
Observations	11,424	11,424	4708	4708	6716	6716
Model Wald χ^2	287.5295	488.3078	183.9913	302.9649	190.4777	202.9
Pseudo R^2	3.80%	4.89%	4.04%	5.71%	4.22%	3.29%

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

Table 10
CFO Compensation regressions. This table contains logit regressions where the dependent variables relate to decreases in the CFO's fixed or bonus compensation. Columns 1 and 2 examine the full sample period; Columns 3 and 4 examine the pre-SOX period and Columns 5 and 6 examine the post-SOX period. The dependent variable in Columns 1, 3, and 5 is an indicator that equals one if the CFO's fixed compensation decreases. The dependent variable in Columns 2, 4, and 6 is an indicator that equals one if the CFO's bonus compensation (excluding vesting or exercised options) decreases. Table 1 contains the variable definitions. Brackets contain *p*-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable Sample period	$I(Salary_{t+1} < Salary_t)$ All (1)	$I(Bonus_{t+1} < Bonus_t)$ All (2)	$I(Salary_{t+1} < Salary_t)$ Pre-SOX (3)	$I(Bonus_{t+1} < Bonus_t)$ Pre-SOX (4)	$I(Salary_{t+1} < Salary_t)$ Post-SOX (5)	$I(Bonus_{t+1} < Bonus_t)$ Post-SOX (6)
I(SCA)	0.164 [0.249]	0.641** [0.035]	0.011 [0.954]	0.607* [0.057]	0.585** [0.033]	1.086* [0.081]
Stock Return Variance	209.685*** [0.001]	374.187*** [0.005]	291.884*** [0.000]	435.757*** [0.003]	35.427 [0.640]	24.896 [0.799]
Boardsize	0.155*** [0.000]	0.089* [0.057]	0.072* [0.087]	0.100** [0.038]	0.368*** [0.000]	−0.035 [0.768]
I(SOX)	1.246*** [0.000]	2.853*** [0.000]				
Insider Ownership (%)	0.358 [0.471]	−0.011 [0.858]	0.644 [0.255]	0.272 [0.652]	0.234 [0.702]	−0.018 [0.587]
ln(CFO Tenure)	0.256*** [0.000]	−0.037 [0.662]	−0.475*** [0.000]	−0.376*** [0.000]	0.391*** [0.000]	0.386*** [0.000]
ln(CFO Age)	0.101* [0.096]	−0.031 [0.721]	−0.032 [0.731]	−0.076 [0.431]	0.202*** [0.007]	0.119 [0.560]
CEO Chair Duality	−7.431*** [0.000]	−1.911** [0.032]	−0.255 [0.750]	0.325 [0.695]	−18.447*** [0.000]	−10.920*** [0.000]
GIM	0.009 [0.378]	−0.009 [0.528]	−0.009 [0.513]	−0.024 [0.119]	0.013 [0.328]	0.052 [0.171]
I(High Tech Firm)	−0.044 [0.630]	−0.073 [0.540]	−0.365** [0.015]	−0.23 [0.111]	0.231** [0.034]	0.471 [0.243]
HHI	−0.440*** [0.001]	−0.261* [0.092]	−0.262 [0.132]	−0.22 [0.206]	−0.654*** [0.001]	−0.427 [0.224]
Stock Return	0.321*** [0.009]	−0.502*** [0.000]	0.172 [0.137]	−0.572*** [0.000]	0.987*** [0.001]	0.523 [0.298]
Tobin's Q	0.090*** [0.002]	−0.029 [0.307]	0.065** [0.034]	−0.055* [0.076]	0.156*** [0.005]	0.344** [0.030]
Debt/Assets	1.922*** [0.000]	1.629*** [0.007]	0.960* [0.083]	1.288** [0.045]	1.763* [0.083]	2.016 [0.308]

(*continued on next page*)

Table 10 (*continued*)

Dependent variable Sample period	$I(Salary_{t+1} < Salary_t)$ All (1)	$I(Bonus_{t+1} < Bonus_t)$ All (2)	$I(Salary_{t+1} < Salary_t)$ Pre-SOX (3)	$I(Bonus_{t+1} < Bonus_t)$ Pre-SOX (4)	$I(Salary_{t+1} < Salary_t)$ Post-SOX (5)	$I(Bonus_{t+1} < Bonus_t)$ Post-SOX (6)
Tobin's Q × Debt/Assets	−0.882***	−1.077***	−0.45	−0.925**	−0.295	−0.878
	[0.009]	[0.005]	[0.294]	[0.028]	[0.696]	[0.541]
ln(Assets)	0.001	0.005	0.125***	0.060*	−0.130***	−0.210***
	[0.968]	[0.870]	[0.000]	[0.088]	[0.000]	[0.001]
OCF/Assets	−0.837	1.576**	−0.519	2.028**	−1.674*	−2.894
	[0.151]	[0.037]	[0.457]	[0.016]	[0.069]	[0.132]
ROA	−1.121**	−1.326**	0.321	−0.927	−3.247***	−2.589
	[0.014]	[0.038]	[0.460]	[0.159]	[0.000]	[0.330]
FCF/Assets	2.233***	−0.14	1.306	−0.719	3.799***	4.885**
	[0.000]	[0.854]	[0.107]	[0.442]	[0.000]	[0.016]
CAPEX/Sales	0.072	−0.258	0.366	0.094	0.01	−0.439**
	[0.749]	[0.161]	[0.274]	[0.775]	[0.972]	[0.030]
Constant	28.597***	8.422**	0.868	−0.22	73.325***	46.894***
	[0.000]	[0.017]	[0.780]	[0.945]	[0.000]	[0.000]
Observations	12,004	12,004	4924	4924	7080	7080
Model Wald χ^2	1113.192	750.2483	70.8693	103.552	664.3864	181.042
Pseudo R^2	11.64%	19.03%	2.43%	3.18%	19.05%	12.18%

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

Table 11
Disciplinary takeover regressions. This table contains logit regressions that examine the probability of being acquired. The dependent variables in Columns 1–4 are indicators that equal one if (1) the firm receives a bid in year $t+1$, (2) the firm receives a bid and the deal is subsequently completed, (3) the firm receives a bid and SDC classifies the bid as unsolicited or hostile, and (4) the firm receives a bid, that bid is unsolicited or hostile, and the deal is subsequently completed. In all cases, the bid must be for 100% control. Table 1 contains the variable definitions. Brackets contain p-values calculated using robust standard errors clustered by industry. All models contain year dummies.

Dependent variable	I(Bid$_{t+1}$)	I(Complete Bid$_{t+1}$)	I(Hostile Bid$_{t+1}$)	I(Hostile Complete Bid$_{t+1}$)
	(1)	(2)	(3)	(4)
I(SCA)	1.036***	1.494***	1.043**	2.096***
	[0.000]	[0.000]	[0.012]	[0.004]
Stock Return Variance	26.511	−362.351*	60.654	−277.7
	[0.522]	[0.052]	[0.150]	[0.185]
Boardsize	−0.093	−0.118	0.012	−0.121
	[0.288]	[0.391]	[0.912]	[0.562]
I(SOX)	0.063	−0.542	−0.002	−1.563
	[0.845]	[0.237]	[0.997]	[0.113]
Incentive/Total (CEO)	0.112	0.26	0.289	−0.248
	[0.699]	[0.548]	[0.525]	[0.810]
Insider Ownership (%)	1.176	0.821	−0.01	0.138
	[0.171]	[0.540]	[0.944]	[0.966]
ln(CEO Tenure)	−0.012	−0.086	0.058	−0.148
	[0.887]	[0.479]	[0.619]	[0.557]
CEO Chair Duality	−0.403**	−0.489**	−0.547**	−0.950**
	[0.015]	[0.033]	[0.036]	[0.036]
ln(CEO Age)	−0.741	−1.007	−0.919	−0.209
	[0.210]	[0.321]	[0.283]	[0.925]
GIM	0.069**	0.091**	0.036	0.04
	[0.010]	[0.016]	[0.354]	[0.640]
I(High Tech Firm)	−0.037	−0.207	0.537	0.048
	[0.891]	[0.590]	[0.102]	[0.938]
HHI	−0.601	−0.91	0.006	0.484
	[0.134]	[0.138]	[0.990]	[0.582]
Stock Return	0.233	0.699***	0.265	0.728
	[0.120]	[0.000]	[0.311]	[0.151]
Tobin's Q	0.022	0.06	−0.061	0.083
	[0.808]	[0.557]	[0.666]	[0.473]
Debt/Assets	2.529*	2.101	2.319	0.386
	[0.077]	[0.145]	[0.311]	[0.925]
Tobin's Q × Debt/Assets	−1.09	−0.344	−0.935	0.385
	[0.275]	[0.726]	[0.573]	[0.880]
ln(Assets)	0.217***	0.155*	0.377***	0.405***
	[0.000]	[0.058]	[0.000]	[0.002]
OCF/Assets	0.627	0.673	4.528*	−0.721
	[0.697]	[0.806]	[0.054]	[0.893]
ROA	−0.546**	0.932	−0.633	−0.128
	[0.046]	[0.674]	[0.405]	[0.956]
FCF/Assets	0.645	−2.032	−1.216	4.173
	[0.681]	[0.373]	[0.644]	[0.491]
CAPEX/Sales	0.205	−0.244	−1.482	−0.155
	[0.436]	[0.747]	[0.234]	[0.943]

(*continued on next page*)

Table 11 (*continued*)

Dependent variable	I(Bid$_{t+1}$)	I(Complete Bid$_{t+1}$)	I(Hostile Bid$_{t+1}$)	I(Hostile Complete Bid$_{t+1}$)
Constant	−3.033	−1.806	−5.121	−7.439
	[0.188]	[0.658]	[0.105]	[0.375]
Observations	12,138	12,138	12,138	7391
Model Wald χ^2	177.7979	106.8549	203.9905	147.6671
Pseudo R^2	6.70%	8.46%	8.71%	11.23%

* Significance at 10%.
** Significance at 5%.
*** Significance at 1%.

I also control for the firm's stock return variance. The rationale is that if the salary is equity-linked, or incentive-based, it can be sensitive to the firm's stock price.

6.2. Results

The univariate results, in Table 4, suggest that pay cuts in year $t + 1$ are significantly more likely if a SCA is initiated in year t. The CEO logit results are in Table 9. The key finding is that fixed salaries and bonuses in year $t + 1$ are likely to be lower if there was a SCA in year t. Because reductions in salary are the most important type of compensation–penalty, this suggests that boards do perform their oversight function. Supporting this, insider ownership, CEO age, and CEO tenure and large firm-size do not protect CEOs from reductions in fixed-compensation. The size-result in particular is consistent with the Offenberg (2009) finding that large size does not effectively insulate managers from disciplinary takeovers. Nonetheless, poor governance in the form of ATPs does protect CEOs from salary reductions. An interesting result is that firm-size does not prevent salary reductions. The CFO compensation results are in Table 10. The CFO results largely echo the CEO results.

Overall, these results, coupled with the CEO/CFO turnover results, show that boards can effectively internally discipline poor performing managers. However, if the market perceives persistent agency conflicts, then a disciplinary takeover may occur.

7. Do securities class actions increase the chances of a disciplinary takeover?

Takeovers are one way to exert external discipline upon poorly performing managers and boards. Thus, the issue is whether a SCA in year t increases the likelihood of a disciplinary takeover in year $t + 1$. There is a possibility that managers might make false statements precisely to encourage (or discourage) a takeover. To address this, the study requires that the takeover bid post-date the announcement of the SCA. It is implausible that a class action would encourage a friendly takeover or promote superior deal terms.

The models examine four possible definitions of a disciplinary takeover attempt: (1) A mere bid for 100% of the company; (2) a completed bid for the company; (3) a hostile or unsolicited bid for the company; or (4) a hostile or unsolicited bid for the company that is subsequently completed. The first two follow Offenberg (2009). The second two follow the logic that the purpose of a disciplinary takeover is to replace the manager, and this is likely to induce hostility (see Martin and McConnell, 1991). The general regression equation is:

$$\mathrm{TO}_{t+1} = \alpha + \mathrm{I}(\mathrm{SCA}_t)\beta + \mathrm{Controls}_t\gamma + u_t \tag{6}$$

The dependent variable, TO_{t+1} is variously an indicator that (1) the company receives a takeover bid in year $t + 1$ (denoted, Bid$_{t+1}$), (2) the company receives a bid that is subsequently completed (denoted Complete Bid$_{t+1}$), (3) the company receives a bid that SDC classifies as hostile or unsolicited (Hostile Bid$_{t+1}$), or (4) the company receives a bid that is hostile or unsolicited, and that is subsequently completed (Hostile Complete Bid$_{t+1}$). In all cases the bid must be for 100% control of the company. The takeover event data is from SDC. A deal is hostile if SDC records the takeover attempt as 'unsolicited' or 'hostile'. The key independent variable I(SCA$_t$) is an indicator of a securities class action being initiated in year t.

The control variables are variables standard in the takeover prediction literature (see Powell, 1997, 2001, 2004; Brar et al., 2009). Specifically the models control for firm-level variables such as the firm's size (variable: 'ln(Assets)'); Tobin's Q ('Tobin's Q'); leverage ('Debt/Assets'); accounting operating performance ('OCF/Assets') and return on assets ('ROA'); industry adjusted stock return ('Stock Return'); free cash flow ('FCF/Assets'); CAPEX intensity ('CAPEX/Sales'); whether the firm is in a high-tech industry ('I(High Tech Firm)'); and, the concentration of the firm's industry as proxied by the Herfindahl–Hirschman index ('HHI'). Further, since the purpose is to examine disciplinary takeovers, the models also control for the CEO's tenure ('CeoTenure'); CEO-chairman duality ('CEO Chair Duality'); the CEO's age ('CEO Age'); the level of incentive compensation ('Incentive/Total (CEO)'); the Gompers et al. (2003) governance index; the level of insider ownership ('Insider Ownership'); and, the firm's stock return variance.

The univariate results in Table 4 suggest that a firm is significantly more likely to receive a disciplinary takeover bid in year $t + 1$ if a SCA was initiated in year t. The logit results are in Table 11. The important result is that a firm is significantly more likely to receive a disciplinary takeover bid if it was sued under a securities class action in the prior year. This holds for all four definitions of a disciplinary takeover.

The control variables indicate that ATPs do not effectively deter a disciplinary takeover (GIM is positive and significant in Columns 1 and 2). While this appears anomalous, it is consistent with Comment and Schwert (1995). Further, consistent with Offenberg (2009), large size does not effectively entrench managers. Interestingly, CEO-chair duality reduces the likelihood of receiving a takeover bid (in Columns 1, 3, and 4). However, this may merely reflect the prevalence of CEO-chair duality (featuring 67.6% of the sample).

Overall, these results, coupled with the pay-cut and turnover results, show that SCAs can encourage in internal and external discipline.

8. Robustness

This section ensures that the results are robust to model specification issues. Most results are unreported but are available on request. First, the results are robust to the specification anti-takeover provisions. The results hold in models that replace GIM with the presence of a staggered board (following Bebchuk and Cohen, 2005), the Bebchuk et al. (2009) 6-provision index, or a dummy to reflect the presence of a poison pill.

Second, the results are robust to other control variables and to multicollinearity issues. The results hold in models that (a) replace log tenure and log age with the actual tenure and actual age; (b) control for the lagged natural log of the CEO's total compensation, salary, or incentive compensation instead of the percentage of total compensation that is incentive based; and (c) control for the size of the board (instead of or in addition to the percentage of directors who are insiders). The results on the SCA indicator also hold when I exclude insignificant variables and when I control for only one of FCF/Assets, OCF/Assets, or ROA.

Third, the results are robust to industry effects. The reported models use year dummies and standard errors clustered by 4-digit SIC industry (following Petersen, 2009). However, Johnson et al. (2009a) suggests that governance-based results can be sensitive to the specificity of the industry-classification. Thus, the robustness tests ensure the results hold for (a) models that cluster by year and industry instead of using year dummies and (b) models that cluster standard errors by 2-digit and 3-digit SIC industry code.

Fourth, the logit results are robust to other model specifications. The results hold in logit and probit models. Logit models are more robust to deviations from the Probit's normality assumption (following Nelder and Wedderburn, 1972; Hagle and Mitchell, 1992). Nonetheless, the results are not sensitive to modeling technique.

Fifth, the returns results are robust to the definition of abnormal returns. Thin trading can cause biased and inconsistent estimates of market model parameters (Dimson, 1979; Dimson and Marsh, 1983; Cowan, 1992; Cowan and Sergeant, 1996). To control for thin trading and non-synchronious trading, the paper also uses Scholes–Williams estimates (following Scholes and Williams, 1977). To

control for auto-regressive and heteroscedastic returns, the paper also uses and GARCH(1, 1) and EGARCH(1, 1) estimates of the market model (following Fatum and Hutchison, 2003; Mckenzie et al., 2004; Rayhorn et al., 2007). The results hold in these specifications.

Sixth, I take some measures to mitigate sample-selection and pre-performance issues. I acknowledge that there is no perfect way to control for endogeneity. However, sub-sample testing is one way reduce concerns that sample selection issues drive the results. One possibility is that poorly performing managers make SCAs. Poorly performing managers are more likely to be disciplined whether or not there is a SCA. Thus, the SCA/discipline relation may merely be a performance/discipline relation. I control for this in two ways:

The first method re-runs the regressions in industry adjusted ROA quartiles (similarly to Frakes, 2007). The goal is to ensure that the results are not sensitive to firm performance and that CEO/CFO discipline does not merely capture disciplinary action for poor prior performance. I do not report the results, but they are available on request. I find that (a) the results largely hold in all quartiles and (b) are marginally stronger in high-performance quartiles. This implies that strongly performing firms are more likely to discipline misconduct, and that post-SCA CEO/CFO discipline is unlikely to reflect poor prior performance.

The second method uses propensity score matching.[13] The process is: (1) Run a logit model to predict the likelihood that a firm receives a SCA in year t as a function of variables from year $t-1$. (2) Use the logit results to estimate a propensity score.[14] (3) For the sample of firms that do receive a SCA in year t construct both a 90% confidence interval for the propensity scores (i.e. find the 5% and 95% cut-offs) and a 50% confidence interval for propensity scores (i.e. from 25% to 75%). (4) Let the final sample comprise only firms that receive a SCA in year t or have a propensity score within this 90% (or 50%) interval. The (unreported) results hold in both propensity score restricted samples. This provides some confidence that sample-selection issues do not drive the results.

Seventh, I ensure that the results hold for SCAs that receive a negative market reaction. It is interesting to ensure that the results hold for SCAs to which the market reacts negatively (rather than just the occurrence of a SCA per se). Thus, I replace the SCA dummy with an indicator that equals one if the firm receives a SCA in year t and the market reacts negatively to it, denoted 'I(Negative SCA)'. The results for the I(Negative SCA) variable echo those for the I(SCA) variable.

Eighth, I ensure that coincidental regulatory actions do not drive the results. I do this in two ways: (1) I remove all firms from the sample that experience both a SCA and a regulatory action (the regulatory action can occur at any time in the sample period). The results hold in this sample. (2) I include a dummy variable that equals one if the firm receives both a regulatory action and a SCA. This variable does not qualitatively change the coefficient on the I(SCA) indicator.

9. Conclusion

This paper examines the ramifications of being sued for misleading the market. The results show that if a firm receives a class action suit for misleading the market, then the CEO and CFO are more likely to be fired or to suffer a pay-cut, and the firm is more likely to sustain a disciplinary takeover. These results are robust to other board, CEO, CFO, and corporate characteristics that might explain the pay, turnover, and takeover findings.

The results have corporate and policy implications. They show that the law on false statements is functional from a practical perspective. Managers are disciplined following securities class actions, suffering an increased chance of pay cuts and dismissal. Further, securities class actions precipitate disciplinary takeovers. Therefore, this paper supports the findings in Karpoff et al. (2008), and shows that poor disclosure does promote discipline through both internal and external channels.

[13] For some use of this see: Dehejia and Wahba (2002), Desyllas and Hughes (2010), Egger et al. (2010).

[14] For a logit model this is $\exp\mathbf{x}\beta/(1+\exp\mathbf{x}\beta)$.

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