

Executive Pay and Shareholder Litigation*

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Abstract. The paper examines the impact of executive compensation on private securities litigation. We find that incentive pay in the form of options increases the probability of securities class action litigation, holding constant a wide range of firm characteristics. We further document that there is abnormal upward earnings manipulation during litigation class periods and that insiders exercise more options and sell more shares during class periods, but that this activity is largely driven by pre-existing option holdings of the managers. Our results suggest that option-based compensation may have the unintended side effect of giving executives an incentive to focus excessively on the short term share price.

JEL Classification: G30, G34, J33, K22, M41

1. Introduction

Price manipulation has recently become an increasingly topical area of financial economics. The bursting of the stock market bubble of the late 90s has brought to light a series of episodes in which companies have vastly overstated their

* We thank Donal Byard, Jonathan Berk, Patrick Bolton, Larry DuCharme, Gong Ning, Bronwyn Hall, Michelle Hanlon, David Hirshleifer, Armen Hovakimian, Shane Johnson, Andrew Karolyi, Hayne Leland, Ying Li, Paul H. Malatesta, Burton Malkiel, John Morgan, Doron Nissim, Theo Nijman, Mitchell Petersen, D. Shores, René Stulz, Siew Hong Teoh, Karen Wruck, Wei Xiong, Josef Zechner (the editor) and two anonymous referees for helpful comments and suggestions. We also benefited from the comments of participants in seminars at Studienzentrums Gerzensee-CEPR European Summer Symposium in Financial Markets, The Financial Intermediation Society Conference, Princeton University, Baruch College, Tilburg University, UC Berkeley, University of Hong Kong, Columbia University, Ohio State University, Northwestern University, University of Chicago, Boston College, Boston University, Washington University at Seattle, AFA and WFA 2005. We thank Susan French and Juan Carlos Sanchez for very helpful discussions of the litigation data. Lin Peng thanks the Eugene Lang Junior Faculty Research Fellowship and the PSC-CUNY Research Foundation for financial support. All errors remain our responsibility.

profitability and prospects to the investing public. Some recent observers attribute such instances of stock price manipulation to executive compensation that is too strongly linked to short-term indicators of performance. Former SEC chairman Arthur Levitt (2002, p. 111) describes the impact of the upsurge in the use of option-based compensation from the late 1990s onwards¹ as follows:

. . . the options craze created an environment that rewarded executives for managing the share price, not for managing the business. Options gave executives strong incentives to use accounting tricks to boost the share price on which their compensation depended.

Economists such as Baker et al. (1988) and Jensen and Murphy (1990) have long argued that a strong linkage between compensation and performance is essential for resolving the agency problem created by the separation of ownership and control. Stock and option grants are natural ways to align executives' interests with shareholder value, as they are responsive to performance information that is reflected in the share price. On the downside, they can create an incentive to manipulate the share price.

Our paper contributes to the empirical literature investigating whether the incentives provided by managerial compensation contracts do in fact lead to price manipulation. If executive pay is sensitive to short term performance measures such as share prices and earnings, it may lead executives to manipulate these measures. Our indicator of price manipulation is the incidence of shareholder class action lawsuit filings. Since the intention of the securities laws is to provide shareholders who transact at manipulated stock prices with a means for recovering their losses, the filing of a class action lawsuit is in principle a sign of such manipulation.

Our evidence supports the prediction that a high sensitivity of executive compensation to the short term share price encourages price manipulation. Firstly, we find that the option component in executive compensation is positively and significantly associated with the incidence of class action lawsuits, controlling for other factors such as firm and industry characteristics. Next, we examine whether there is any evidence that lawsuits are directed at companies that manipulate: analyzing a very specific form of manipulation, namely the overstating of reported earnings, we find that indeed there is evidence of upward manipulation during litigation class periods. We next document that option exercise and insider sales by the top executives are

¹ Hall and Murphy (2003) report that the value of stock option grants to CEOs of S&P 500 firms increased ninefold between 1992 and 2000, while other components of total compensation only tripled.

significantly higher during class periods but that their *ex-ante* option holdings are largely responsible for this. Lastly, we consider the aftermath of class action filings and verify that litigation class periods are, unsurprisingly, followed by abnormally low stock returns.

Our findings add to a growing recent literature on compensation-related incentives and malfeasance. Existing studies limit their attention to measures of accounting manipulation such as discretionary accruals or earnings restatements, or SEC enforcement actions. Expanding the focus to include securities class action litigation is important for a number of reasons.

First, there is the question of whether accounting manipulation imposes a cost on shareholders or simply furthers their interests. For example, it may be value-enhancing to “meet” performance benchmarks that facilitate access to cheaper debt. But when manipulation attracts shareholder litigation, there is a clear presumption that it has had a material impact on the stock price and has been harmful to at least some shareholders. Second, securities violations need not involve accounting manipulation. Any stock price manipulation, whether stemming from accounting violations or from other misleading disclosures, is a cause for concern.² Private securities litigation potentially captures a broader set of fraudulent activities than just accounting fraud.³

Naturally, there is the concern that class action litigation is not always merit-based. The Private Securities Litigation Reform Act of 1995 (PSLRA 1995) was expressly designed to discourage frivolous securities litigation,⁴ and Johnson et al. (2002) find that the suits have become more merit based

² As an example of a class action filing centered on non-accounting manipulation, Advanced Fibre Communications was accused in 1998 of publicly stating that GTE was their biggest client and responsible for its growth without mentioning that they had lost the GTE contract, amongst other things. The case was later settled for \$20 million. Another example is Metromedia Fiber Network, which in early 2001 trumpeted its receipt of a \$350 million credit facility from Citicorp. But it failed to mention that the credit line was contingent on the receipt of a further \$287.5 million in additional commitments from other lenders and that it was experiencing difficulty obtaining such commitments, significantly delaying the development of its fiber optic network.

³ For example, our sample of private securities litigation targets subsumes virtually all of the SEC accounting and enforcement action cases for the period of 1996–2002 listed by Erickson et al. (2006), but the number of litigation targets is substantially larger.

⁴ Ways in which it has made such litigation more onerous are: a requirement that the lead plaintiff be the “most adequate plaintiff” (discouraging “professional plaintiffs” who make small investments in many companies and lend their names to securities lawyers, in return for a fee, whenever there are stock price swings), procedural obstacles, the shifting of defendants’ attorneys’ fees to the plaintiff if the complaint lacks substantial legal or factual support, limits on attorneys’ fees, full and detailed disclosure of any settlement, and reduced liability for unknowing violators (such as outside directors). In 1998 Congress curtailed jurisdiction shopping by requiring that class actions involving allegations of securities fraud be brought exclusively in federal, not state, courts. In addition, a landmark Supreme Court decision in 1994

since then. Our study focuses on lawsuits filed between PSLRA 1995 and the Sarbanes-Oxley Act of 2002.

Our results have implications for the design of executive compensation contracts. In principle, the objective of such contracts should be to maximize long-term shareholder value. Incentive pay is a valuable device for aligning the interests of managers and shareholders, and the stock price is more forward looking than accounting benchmarks, making stock and option awards an important part of optimal compensation (Holmstrom and Tirole, 1993). However, until recently the theories on optimal remuneration have generally ignored the possibility that the stock price and other performance measures can be manipulated or falsified;⁵ it is becoming increasingly clear that this is a key issue. Our work contributes to the growing body of evidence suggesting that options in their current form indeed provide incentives to target the short-term share price in ways that are not necessarily value-enhancing: manipulating performance measures such as accounting yardsticks and publicly disclosed price-sensitive information. These findings suggest that the benefits of option based incentives should be weighed against these side effects in designing the optimal incentive contract. As suggested by Bolton et al. (2006), longer vesting periods and deferral of compensation may alleviate the problem.

Our findings also shed light on the role of private class action litigation. Private class action litigation is an important disciplinary mechanism that distinguishes the U.S. capital markets from most others.⁶ U.S. laws prohibit insider trading and emphasize the duty of managers to disclose information to shareholders in a timely and accurate fashion. Much of the enforcement of these laws occurs through private litigation rather than direct action by the SEC (Dunbar and Juneja, 1994). However, some see such litigation as a major nuisance. Our paper contributes to this debate by examining the determinants of litigation and the evidence of related managerial self-dealing. We find that the litigation class periods are associated with upward earnings manipulation, high insider sales and options exercise, and the underlying incentives for these activities, suggesting that the lawsuits are not entirely frivolous.

Relative to the literature on the determinants of securities litigation, what is new and different about our work is the focus on a direct empirical link between executives' incentive pay and shareholder litigation. Existing studies have focused on the impact of company characteristics such as company size,

curtailed the liability of "aiders and abettors", such as accountants who certify false financial statements and lawyers who advise on fraudulent schemes.

⁵ An early exception is Stein's (1989) paper focusing on managerial myopia. A recent contribution is Goldman and Slezak (2006).

⁶ From cross-country patterns, La Porta et al. (2006) argue that private enforcement through liability rules is more important for stock market development than public enforcement.

its stock market turnover, and the nature of its business. We include these variables as controls but add in the executive performance pay related variables. In addition, existing work has found evidence of accounting manipulation and insider selling in firms targeted by litigation, which suggest that litigation is merit based. We contribute by showing that the insider selling and options exercise during the litigation class periods is largely driven by executives *ex ante* option holdings.

The paper is organized as follows. Section 2 reviews the relevant empirical literature. Section 3 outlines the hypotheses tested in the paper. Section 4 describes the data. Section 5 presents the empirical analysis and results: Section 5.1 relates the *ex ante* executive compensation to lawsuit incidence, Section 5.2 examines earnings manipulation during the lawsuit class periods and Section 5.3 investigate option exercises and insider sales during the class periods and the ex post stock returns. Section 6 provides a concluding discussion.

2. Empirical Literature

Empirical research in law and economics has identified a number of predictors of shareholder litigation. Our paper focus on the underlying incentives for managerial behavior that triggers allegations of price manipulation and fraud in private securities litigation. In contrast, much of the existing litigation literature starts from measures of the manipulative behavior itself—and in particular, accounting manipulation—together with general characteristics of the firms involved, as determinants of the incidence of private securities class action litigation.

Studies that focus directly on the impact of aggressive accounting on the incidence of litigation include Johnson et al. (2002), who study a matched sample of sued and non-sued firms, 51 firms before PSLRA 1995 and 68 firms after, from the computer hardware and software industries. They find that variables capturing aggressive accounting choices (such as restatements, abnormal accruals, and sales growth) are related to the risk of a class action, but only since PSLRA 1995, suggesting that suits have become more merit based.⁷ Lu (2003) finds that over the period 1988–2000, her measure of earnings management is associated with allegations of manipulation over the same period in subsequent private securities litigation. DuCharme et al. (2004) limit their attention to 226 IPO and 88 SEO firms from 1988 to 1997; they also find that abnormal accounting accruals are significantly positively related to subsequent litigation to the SEO firms. And Heninger (2001) finds a positive

⁷ But Choi (2006) argues that PSLRA 1995 has also discouraged meritorious cases lacking obvious “hard” evidence.

relation between abnormal accruals and lawsuits against the auditors of 67 firms from 1969 to 1998.

In terms of the link between insider trading activity and litigation incidence, Jones and Weingram (1996) find that, prior to PSLRA 1995, insider trading does not increase firms' litigation risk. Niehaus and Roth (1999) find that, for the lawsuits filed between 1988 to 1994, insider managers are net sellers of their firm's stock during the class period, but the sales do not significantly differ from their prior selling practices. Johnson et al. (2002) find insider net sales are significant for post PSLRA 1995 litigation, but not for pre PSLRA litigation. We contribute to this literature by analyzing both insider trading and options exercise, and investigating the role of *ex ante* executive pay parameters as predictors of insider trading. Our insider trading measure also controls for industry and firm characteristics that were missing in these earlier studies.

We turn now to the empirical literature on the incentives for accounting manipulation. Early work dating from before the widespread use of option-based compensation focuses on the impact of bonus schemes. Healy (1985) and Guidry et al. (1999) find evidence that indeed managerial accounting decisions are related to the incentives provided by their bonus contracts; Holthausen et al. (1995) also find evidence consistent with the hypothesis that managers manipulate earnings downwards when their bonuses are at their maximum.

Contemporaneous papers include equity-based compensation among the determinants of accounting manipulation. Both Gao and Shrieves (2002) and Bergstresser and Philippon (2005) find that earnings manipulation, as measured by the absolute value of discretionary current accruals, is significantly related to the incentives provided by stock and option packages held by executives. Cheng and Warfield (2005) find a significant relationship between stock-based compensation and income increasing abnormal accruals as well as a tendency to meet or just beat analysts' forecasts.

Some papers focus on egregious earnings manipulation, as identified by SEC accounting enforcement actions or accounting restatements, rather than estimates of discretionary accruals. In terms of SEC actions, Johnson et al. (2003) find that equity-based executive compensation and the proportion of vested options exercised are significantly higher in 43 firms accused of fraud than in a matched control sample. Erickson et al. (2006) find similar results after considering the determinants of stock-based compensation. Beneish (1999) finds that SEC accounting enforcement actions concerning earnings overstatements are associated with insider sales at inflated prices. Burns and Kedia (2005) focus on accounting restatements and find that executive option holdings strongly predict announcements of such restatements in the

subsequent 2 to 5 years. Richardson et al. (2003) also document that executives at restating firms have more equity-based compensation.⁸

Regarding insider selling and earnings manipulation, Beneish and Vargus (2002) find that insider selling (buying) is associated with income-increasing accruals that are subsequently reversed (persistent), suggesting opportunistic earnings management. Bergstresser and Philippon (2005) find that insider selling and options exercise are significantly higher during years with extreme upward earnings manipulation. Cheng and Warfield (2005) show that their earnings manipulation indicators are correlated with insider stock sales in the next year.

Our paper contributes to this literature on the impact of executive compensation on manipulation by focusing on private securities litigation. All the existing studies focus on publicly announced accounting numbers such as those reported to the SEC. Private securities litigation captures a potentially broader set of manipulative activities: not just accounting fraud, but also misleading revenue projections, failure to disclose material information about the firm's business prospects, etc. Indeed, in many private class action filings the allegations concern public statements that are unrelated to accounting issues. On the downside, there is a concern that some determinants of lawsuit filings are unrelated to manipulative misbehavior. We address this issue by including a broad set of control variables that can be expected to affect lawsuit incidence.

3. Hypotheses

Recent theory work by Fisher and Verrecchia (2000) and Goldman and Sleazak (2005) argues that stock-based compensation gives managers incentives to manipulate short-term stock prices. This potential drawback to stock based compensation is the focus of our empirical analysis.

We consider three hypotheses. First, we predict that the sensitivity of pay to the short term stock price is a determinant of manipulative behavior, and hence of litigation:

⁸ There is also a growing body of evidence relating the timing of options grants and exercise decisions to patterns of abnormal stock returns. There are clear signs of self-dealing behavior in the timing of disclosures around option grants, (Yermack, 1997 and Aboody and Kasznik, 2000) and the back-dating of option grants (Heron and Lie, 2006). Similarly, Baker et al. (2003) document income-decreasing earnings management for firm with earnings announcements preceding option grant dates. Regarding the exercise of options, Huddart and Lang (2003) find that the level of employee option exercise activity is abnormally high in advance of low stock returns over the subsequent half year.

Hypothesis 1. *Litigation is positively associated with a higher sensitivity of the managers' wealth to the short term share price.*

Second, to investigate whether indeed litigation is associated with signs of stock price manipulation, we look at a proxy for a particular form that such manipulation can take. Our manipulation measure (discretionary current accruals) proxies for the degree to which earnings are overstated in accounting statements submitted to the SEC.

Hypothesis 2. *Litigation is positively associated with indicators of artificially inflated earnings.*

Ex post, the sensitivity of the manager's wealth to the short term stock price is measured by the options he exercises and/or the shares he sells. A principal determinant of option exercises and insider sales is the sensitivity of *ex ante* holdings to share prices.

Hypothesis 3. *During litigation class periods, managers exercise more options and sell more stocks relative to companies with similar characteristics; all or part of this difference may be explained by the higher ex ante sensitivity of their wealth to the short term share price.*

Our empirical work addresses these three hypotheses. Our discussion suggests that a root cause of stock price manipulation and resulting litigation is the *ex ante* short term incentives of the managers, and that subsequent price manipulation, executive option exercises and stock sales, and the eventual price drops are all to some extent endogenously driven by such incentives. Therefore, though we examine the association between these variables and litigation class periods, we do not include them in the regression that addresses the causal role of incentives in triggering litigation, even though variables such as price drops would be good predictors of the filing of class action litigation.⁹ From the viewpoint of companies and D&O insurers who seek to minimize their exposure to litigation risk, it is not very helpful to know that such risk depends on *a priori* unknown factors such as abnormal future price drops, earnings manipulation and insider option exercise and stock sales. We thus confine our regression to variables that are observable *ex ante*.

The timeline in Figure 1 illustrates that the incentives are measured prior to class periods (the period during which firms are alleged to have misled the market), while any price drops that trigger litigation filings would take place around or after the end of the class period in the runup to the litigation filing date.

⁹ As found by Alexander (1991), Jones and Weingram (1996) and others.

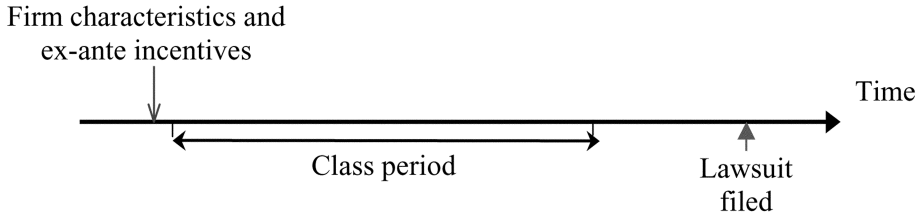


Figure 1. The lawsuit timeline.

Our discussion takes the manager's compensation contract as given, without taking a stand on the optimality of the compensation contract. Agency models argue that contracts are designed to align the interests of the manager and the shareholders by providing optimal incentives for managerial effort. However, there is an ongoing debate about whether the executive compensation contracts observed in practice are consistent with the interests of long term shareholders.¹⁰ While we do not explicitly model the determinants of the compensation contracts, we do include a large number of control variables (such as industry, firm size, leverage, book to market ratio, tangibility) that are expected to be correlated with the choice of contract. At the same time, such variables control for the cross-sectional variation in the cost of manipulation: for example, the detection probability may be industry related, or related to the complexity of the company's business as captured by the tangibility of assets. By including as wide as possible a range of controls, problems associated with unobserved cross-sectional heterogeneity are mitigated as best possible.

4. The Data

Our sample consists of all firms that have executive compensation data available in the Compustat Executive Compensation (ExecuComp) database. This database contains compensation information for the top five executives of 2,507 companies that are (or were) members of the S&P 1500 starting from fiscal year 1992.

¹⁰ Bebchuk et al. (2002), and Bebchuk and Fried (2004), argue that CEOs have been essentially able to set their own pay through captured boards and remuneration committees, and that option based executive compensation is merely a managerial "rent extraction" device that camouflages the excessiveness of the compensation package. Bolton et al. (2005, 2006) show that in a speculative market, it is in current shareholders' interest to adopt a compensation contract that induces managers to focus on "castle in the air"-type short term speculative projects at the expense of long term firm value.

4.1 CLASS ACTION LAWSUITS

We compile a database of all class action lawsuits filed between 1996 and 2002 using the Stanford Securities Class Action Clearinghouse.¹¹ This database enables us to investigate a much more comprehensive set of cases than the pre-existing litigation literature. For each case, we collect the lawsuit filing date, the class period (this term denotes the period during which the fraudulent activities are alleged to have taken place in the first complaint filed against the company), and the case summary. There are a total of 1,659 cases filed in this time period, of which 39 cases are filed against privately held companies and 147 cases are filed against OTC firms, leaving 1,473 cases involving listed firms.

Matching our lawsuit firms by ticker symbol and date with the Compustat ExecuComp database, only 488 of the 1,473 cases have executive compensation data available. This drop in numbers is mainly due to two factors. Firstly, only S&P 1500 companies are included in ExecuComp. Secondly, we require information on various firm characteristics and executive compensation variables for the year preceding alleged malfeasance, thus effectively excluding initial public offerings from our sample. These constitute a substantial fraction of shareholder class action filings, especially in 2001–2002. After deleting 9 cases where the start and end dates of the class period are missing, our final number of class action lawsuits is 479, of which 60 cases concern companies already targeted by other, distinct filings.

The securities law violations¹² cited in the case summaries are varied; but they all have in common (1) an allegation of some form of fraudulent behavior and (2) a reference to accounting or financial variables or to some form of public statement.¹³ Common classes of examples are omitting material information; artificially inflated earnings, revenue, sales and assets; premature revenue recognition; generally false and misleading information in conjunction with insider sales (49 case summaries use the word “insider”); overhyped technology, product or business success; and failure of accounts to conform to generally accepted accounting principles (GAAP). Some summaries give specific

¹¹ <http://securities.stanford.edu>.

¹² See Appendix 1 for a description of the legal framework for securities class action litigation.

¹³ A keyword search where there is at least one match from both of the following two categories: 1. (artificial, conceal, cook, deceive, deceptive, fail, false, fraud, illusive, improp, inappropriate, inflate, irregular, manage, manipulat, material, misle, misrepresent, misstate, omission, omit, overstat, restat, spurious, understat, violate); 2. (account, assets, book, disclos, earning, eps, financial result, financial statement, GAAP, generally accepted accounting principles, goodwill, income, press release, profit, projection, public statement, public filing, recognition, report, reserves, results, revenue, statement, write-off), yields over 99% of the cases for which summaries are available.

examples, such as announcing a credit line without mentioning that it is contingent (on goalposts that are unlikely to be satisfied), capitalizing expenditures that should have been expensed, or insiders' taking of merger-related stock awards in anticipation of a merger subsequently scuppered by antitrust considerations, etc. The case summaries can be quite brief, and do not always mention the particular aspect of securities law on which the plaintiffs base their case.¹⁴

The first column of Table I shows that the number of class action lawsuits filed against ExecuComp (S&P 1500) companies has quadrupled over the sample period 1996 to 2002. Our study focuses on activities prior to and during the class action period (a period about which allegations are filed). To match the class action periods with incentive and other accounting variables that are available by fiscal year, we convert the class action periods into fiscal years based on the "fiscal year end" information from Compustat. Multiple class actions against the same firm and for the same fiscal year are counted as one observation. The second column of Table I describes the number of firms in a class period for each fiscal year. We can see that the class periods start as early as fiscal year 1990, but this is unusual, as normally a 3-year limitation period applies (before the 2002 Sarbanes-Oxley Act) and cases filed any later are likely to be dismissed. Given that our sample consists of post-PSLRA 1995 filings, the proportion of firms in a class period has naturally increased dramatically from 1994–1995 to 1996. We therefore choose to focus our study on observations where the class periods are between fiscal years 1996 and 2001.¹⁵ For all firms in the ExecuComp database, and for each fiscal year between 1996 and 2001, if there are allegations about a firm's activities during that year identified in a post-PSLRA lawsuit, our *CLASSYEAR* dummy is set to a value of one (zero otherwise).¹⁶ The full sample average of *CLASSYEAR* is 5.4%.

It is worth noting that class periods can span multiple years, resulting in a string of consecutive 1's for the *CLASSYEAR* variable. Although we use robust standard errors with firm level clustering in all our analysis, it is possible that this may not completely account for this persistence. In addition, the *CLASSYEAR* variable is somewhat noisy in that it overstates the length of the actual class period to the extent that class periods often include only

¹⁴ For example, whether an implied 10b-5 action is involved, or whether some particular section of SA 1933 or SEA 1934 gives grounds for express private actions. Of the 479 cases in our sample, there are 262 that mention SEA 1934 and 32 that mention SA 1933, of which 12 mention both. Section 10(b) of SEA 1934 is explicitly cited in 206 case summaries. Section 18(a) is not mentioned at all; section 9(e) appears in 7 case summaries. Section 14(a), which concerns management abuses in the solicitation of proxies, appears 8 times.

¹⁵ Our results remain very similar if we include 1994 and 1995 as well.

¹⁶ In other words, the *CLASSYEAR* dummy takes the value one for any firm-year that includes all or part of a class period.

Table I. Number of class action lawsuits filed for 1996–2002

The first two columns of the table present the number of securities class action lawsuits filed against S&P 1500 firms present in Compustat's ExecuComp database between 1996 and 2002 (post PSLRA 1996). The lawsuit count is taken from the Stanford Securities Class Action Clearinghouse (<http://securities.stanford.edu>); the database consolidates multiple filings with similar allegations covering the same general period into a single record. The last two columns present, for each fiscal year, the number of firms in the Compustat Executive Compensation database that are in a lawsuit class period for all or part of the year, as well as such lawsuit firms as a percentage of the total.

Year	Number of Cases filed	Percent of total cases (%)	Number of firms in alleged period	lawsuit firms as % of all firms in ExecuComp
1994			11	0.44%
1995			36	1.44%
1996	23	4.80	67	2.67%
1997	53	11.06	102	4.07%
1998	59	12.32	115	4.59%
1999	74	15.45	160	6.38%
2000	67	13.99	168	6.70%
2001	94	19.62	136	5.42%
2002	109	22.76	84	3.35%

part of a year: our analysis is on an annual basis. Moreover, it is possible that the incentives to actively manipulate at the beginning of a class period are very different from those to continue the deception toward the end of a class period. To further make sure that the our results are robust to these issues, we repeated the analysis employing a more conservative definition of the *CLASSYEAR* dummy, setting it to one in a year containing the start of a class period (zero otherwise). The main results are very similar.

Figure 1 and Table II summarize the time line of lawsuits. The median lawsuit in our sample has a class period (a period about which allegations are filed) of 274 days, the median number of days from the start (end) of the class period to the filing date is 381 (31) days, respectively. The time line varies a lot across lawsuits: 25% of the lawsuits have a class period of less than 133 days and another 25% of the lawsuits have a class period of more than 499 days. Regarding the delay between the start of the class period and the filing date, 25% of lawsuits are filed in less than 190 days, while another 25% are not filed until more than 648 days after.

Table III summarizes the industry distribution of lawsuits filed in the period 1996–2002. Here we adopt French's 12 industry classification¹⁷ based on the

¹⁷ <http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/>

Table II. Timing of lawsuits

This table summarizes the timing of lawsuits filed against ExecuComp firms between 1996 and 2002.

	Mean	Std Dev	Q1	Median	Q3
Number of days in the class period	371	340	133	274	499
Number of days between the lawsuit filing date and the starting date of the class period	471	379	190	381	648
Number of days between the lawsuit filing date and the ending date of the class period	100	180	7	31	145

SIC codes of the firms. The industry with the greatest incidence of lawsuits filed is the “telecommunications” industry, closely followed by “business equipment” which includes computers, software and electronic equipment (this industry alone, with 152 lawsuits, accounts for 32% of all filings). Roughly a third of all firms in these two industries are sued during our sample period. The next most lawsuit-prone industry is “healthcare”, where the number of sample-period lawsuits is just over a quarter of the number of firms in the industry (11% of the lawsuits in our sample come from this industry). Securities class action lawsuits are least common in the “energy”, “chemicals”, “manufacturing” and “durables” industries over this period.

4.2 EXECUTIVE COMPENSATION VARIABLES AND FIRM CHARACTERISTICS

Our measures of incentives for company executives are constructed using the Compustat Executive Compensation (ExecuComp) database. We look at the aggregate compensation of the top five managers, not just the CEO.¹⁸ The compensation and incentive variables we use are the following: bonuses, incentive from equity ownership, and incentives from options, all measured in the year prior to the *CLASSYEAR* variable in order to capture the *ex-ante* incentives.

¹⁸ This seems appropriate because the cooperation of the executives as a team is generally required to implement any major decisions, whether in real operation of the firm or in “cooking the books”, that could be driven by compensation-related incentives. In addition, a practical reason to focus on all top five executives rather than the CEO alone is that the CEO identifier is only available for 78% of the companies in the ExecuComp data set. For robustness, we repeated our analysis using the incentive measures for company CEOs alone; the results are very similar.

Table III. Lawsuits filed by industry (French's 12 industry classification)

This table classifies the class-action lawsuits filed against ExecuComp firms between 1996–2002 into 12 industry categories as defined by Ken French (<http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/>). Column 1 gives the number of lawsuit firms in each industry. Column 2 shows the number of lawsuit firms in the industry as a percentage of all lawsuit firms. Column 3 presents the number of lawsuit firms as a percentage of all ExecuComp firms present in the industry at any time during 1996–2002.

Industry	Number of lawsuits	As % of all lawsuit firms	As % of firms in the industry	Industry description and SIC codes
1	19	4.0%	12.6%	Consumer NonDurables—Food, Tobacco, Textiles, Apparel, Leather, Toys (0100–0999, 2000–2399, 2700–2749, 2770–2799, 3100–3199, 3940–3989).
2	6	1.3%	8.6%	Consumer Durables—Cars, TV's, Furniture, Household Appliances (2500–2519, 2590–2599, 3630–3659, 3710–3711, 3714–3716, 3750–3751, 3792–3792, 3900–3939, 3990–3999).
3	27	5.6%	8.8%	Manufacturing—Machinery, Trucks, Planes, Off Furn. Paper, Com Printing (2520–2589, 2600–2699, 2750–2769, 3000–3099, 3200–3569, 3580–3629, 3700–3709, 3712–3713, 3715–3715, 3717–3749, 3752–3791, 3793–3799, 3830–3839, 3860–3899).
4	4	0.8%	4.2%	Oil, Gas, and Coal Extraction and Products (1200–1399, 2900–2999).
5	4	0.8%	5.6%	Chemicals and Allied Products (2800–2829, 2840–2899).
6	152	31.7%	33.5%	Business Equipment—Computers, Software, and Electronic Equipment (3570–3579, 3660–3692, 3694–3699, 3810–3829, 7370–7379).
7	28	5.8%	38.9%	Telephone and Television Transmission (4800–4899).
8	27	5.6%	19.4%	Utilities (4900–4949).
9	47	9.8%	16.4%	Wholesale, Retail, and Some Services (Laundries, Repair Shops) (5000–5999, 7200–7299, 7600–7699).
10	52	10.9%	27.4%	HealthCare, Medical Equipment, and Drugs (2830–2839, 3693–3693, 3840–3859, 8000–8099).
11	62	12.9%	17.0%	Finance (6000–6999)
12	51	10.6%	16.7%	Everything Else—Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment.

The pay for performance sensitivity of stock options (option sensitivity) is measured in two ways. Following Jensen and Murphy (1990), our first measure, $OPTDELTA^{JM}$, is the change in the value of options held by executives relative to change in firm value. This measure is obtained by multiplying the option delta by the ratio of number of options held to total shares outstanding. The second measure, $OPTDELTA^{CG}$, is the change in the dollar value of options per percentage change in stock price (Core and Guay, 1999). This measure is obtained by multiplying the option delta by the number of options held and (1% of) the stock price. ExecuComp does not provide all the information needed to compute the exact measure of the delta of executives' option portfolios. We compute an estimate of the option delta using the method developed by Core and Guay (2002).

Similarly, we measure the pay for performance sensitivity of top executives' equity holdings with $SHAREOWN^{JM}$ and $SHAREOWN^{CG}$. $SHAREOWN^{JM}$ captures the change in the value of stocks held by executives relative to change in firm value. This measure is equal to the number of stocks held as a fraction of total shares outstanding. $SHAREOWN^{CG}$ captures the change in the value of stocks held by executives for a percentage change in stock price. This measure is equal to the number of stocks held multiplied by (1% of) the stock price.

The variable *BONUS* is the value of bonus as a fraction of the total cash compensation (salary and bonus), measuring the sensitivity of pay to various accounting yardsticks of performance.

The original distributions of these compensation variables are highly positively skewed and have high kurtosis. We winsorize the variables so that the observations with values greater than the 99th percentile are set to the 99th percentile value.

To control for other economic factors that are not captured by compensation variables but that may influence the probability of litigation, we consider additional firm characteristics using data obtained from CRSP and Compustat. All the control variables are computed using the data from one year prior to the *CLASSYEAR* variable unless otherwise stated.

The first set of variables includes firm characteristics that are related to the probability of lawsuit filings. *SIZE* is the logarithm of the market capitalization of the firm at the end of the fiscal year, and *TURNOVER* is average daily trading volume as a percentage of the number of shares outstanding for the fiscal year.¹⁹ These two variables capture elements of the damage calculations for class action suits found by previous research to be positively associated

¹⁹ Due to the double counting of Nasdaq trades, *TURNOVER* is constructed as daily trading volume over the number of shares outstanding and divided by 2 for Nasdaq stocks.

with lawsuit incidence.²⁰ Given that lawsuits are typically filed after a major price decline, we also control for the *ex ante* probability of a large price drop using *VOLATILITY* and *SKEWNESS* measures computed based on the daily stock returns for the fiscal year.²¹ More specifically, *VOLATILITY* is the standard deviation of daily stock returns, annualized assuming 252 trading days per year.

The second set of variables is related to agency problems within the firm.

BM is the ratio of book value of equity to market capitalization. On the one hand, the *BM* may capture managerial success, so that low *BM* firms may be well managed and thus less likely to be sued (Strahan, 1998). On the other hand, a low *BM* may be a sign of overvaluation, as argued by Jensen (2005), and that may put pressure on management to manipulate share prices.

ROA is computed using earnings before interest divided by prior year total assets. It can also be interpreted as a sign of managerial success, thus high *ROA* should discourage litigation. Firms with more intangible assets are harder for outsiders to value and monitor, thus these firms are more likely to have greater agency problems. We measure the inverse of intangible assets with *TANGIBLE*, which is constructed as the ratio of property, plant and equipment to total assets.

Regarding the impact of leverage and dividends, Jensen (1986) argues that “free cash flow” available to the managers may give rise to agency problems that can be mitigated by high debt or dividend payments that force managers to pay out free cash flows. In contrast, previous studies have found that firms with high leverage are more likely to have accounting irregularities (Beneish, 1997). We include *LEVERAGE* as the ratio of total debt to total assets²² and *DIVIDEND* as a dummy variable equal to one if the firm paid dividends during the fiscal year and zero otherwise.²³

The third set of variables captures non-compensation related incentives for price manipulation. Previous studies suggest that firms with high sales growth (Beneish et al., 1997), and firms issuing equity (Teoh et al., 1998a, b and c) or

²⁰ See Johnson et al. (2002) for a review.

²¹ We also examined stock return *KURTOSIS*, but this variable was insignificant throughout the analysis, and we omit it from the results we report.

²² More specifically, *LEVERAGE* is calculated as [short-term debt (Compustat item 34) + long-term debt (Item 9)] / total assets.

²³ In the untabulated results, we also examine the effect of corporate governance variables. We use the corporate governance index measure of Gompers, Ishii and Metrick (2003). The index ranges from 2 to 17, with higher values correspond to weaker governance. The governance index itself, or dummies for extremely good or weak governance firms, are insignificant throughout our analysis, possibly because of the noisiness of the measure or its unavailability for a substantial fraction of our sample. For these reasons, we do not report results with this variable.

making stock based acquisitions (Erickson and Wang, 1999) are more likely to engage in aggressive accounting practices. We construct *SALESGROWTH* as the ratio of sales to its level in the previous year. *ACQUISITION* is a dummy variable that equals to 1 if the firm made business acquisitions (if Compustat data item 129 is greater than zero or shows a combined code) and zero otherwise. *EQUITYISSUE* is also a dummy variable that equals to 1 if the number of shares outstanding, adjusted for splits and dividends, increases by more than 10%, and zero otherwise. Since equity issuance and acquisitions are more likely to give incentives for self-dealing behavior during the same period, we examine the occurrence of acquisition and equity issuance for the same year as the *CLASSEAR*.

To control for industry specific lawsuit risk factors, we divide our firms into 12 industries based on Kenneth French's SIC-based classification scheme and assign industry dummies for each of them.²⁴ We also include year dummies to control for any time effects. To ensure that our results are not influenced by outliers, we winsorize *SALESGROWTH*, *ROA*, and *SKEWNESS* at the 1st and the 99th percentiles, and *TURNOVER* at the 99th percentile.

4.3 EARNINGS MANIPULATION, OPTIONS EXERCISE AND INSIDER SALES

To address the question of whether there is fraudulent and deceptive behavior during the class period as alleged in the lawsuits, we investigate a particular form of accounting manipulation, namely unusual accruals in reported earnings. We also analyze the proceeds to the top executives from options exercise and insider sales during the class periods, as these are activities that enable them to profit from share prices that are manipulated upward.

The earnings reported in financial statements comprise both cash flows from operations and accruals; and the latter are particularly vulnerable to manipulation. To identify abnormal accruals while adjusting for industry or firm specific business conditions, we follow the method of Teoh et al. (1998a) to decompose accruals into a nondiscretionary component that is necessary and expected by investors, and a discretionary component that is more likely to be a result of managerial manipulation.²⁵ The details of this procedure are described in Appendix 2. We consider both current accruals (*CA*), that is adjustments involving short-term assets and liabilities relating to day-to-day operations of the firm, and total accruals (*TAC*), which include both current and long-term

²⁴ Our results are not sensitive to the exclusion of the finance industry.

²⁵ This method is widely used in the accounting and finance literature. Recent examples are Teoh et al. (1998b), Ducharme et al. (2004), Bergstresser and Phillipone (2005), Burns and Kedia (2005).

accruals (involving long-term items such as depreciation, deferred taxes, etc.). Kreutzfeldt and Wallace (1986) and Guenther (1994) argue that managers have greater discretion over current accruals than over long-term accruals, so that current based measures should show more signs of manipulation.

We use discretionary current accruals (*DCA*) and discretionary total accruals (*DTAC*) as measures of earnings management. Depending on whether the current accruals are calculated based on balance sheet or cash flow statement items, the discretionary current accruals are labeled as DCA^{BS} or DCA^{CF} .

From the Thomson Financial Insider Filing database, we construct the *INSIDERSELL* variable by aggregating the net purchase and sale activity during the fiscal year for directors, CEOs, COOs, CFOs, presidents and chairmen of the board, and scaling the dollar value realized from net insider trading by the firm's market capitalization, winsorizing the variable at the 1% and the 99% percentiles to eliminate outliers. From Compustat ExecuComp, we construct *OPTEXERCISE*, which is the value realized from option exercises by the top five executives as a percentage of the market capitalization. The top executives in a median firm receive 0.01% of firm value from exercising options and 0.037% of firm value from selling stocks.

5. Analysis and Results

5.1 RELATIONSHIP OF INCENTIVE COMPENSATION AND LAWSUITS

Our first hypothesis is that the sensitivity of top executives' wealth to the short-term share price is a determinant of their propensity to manipulate the stock price. To see how the *ex-ante* incentive variables are related to lawsuit class periods, in Table IVA we compare the mean and median values for two groups: *CLASSYEAR* = 0 and *CLASSYEAR* = 1 and test whether the differences in means or medians are statistically significant using a *t*-test or Wilcoxon two-sided *t*-test. During the class period, the option portfolios of top executives in the lawsuit firms have significantly higher sensitivities to stock prices: the median of $OPTDELTA^{JM}$ is 1.72 when *CLASSYEAR* is one and 0.827 when *CLASSYEAR* is zero. The alternative incentive measure, $OPTDELTA^{JM}$, gives qualitatively similar results: the value is \$476,000 when *CLASSYEAR* is one and \$132,000 when *CLASSYEAR* is zero.

Similarly, $SHAREOWN^{CG}$ is significantly higher (the median value is \$259,000 instead of \$100,000) when *CLASSYEAR* equals one, though $SHAREOWN^{JM}$ is not significantly different. This contrast between the two measures is likely be driven by the fact that lawsuit firms are generally larger, and that $SHAREOWN^{CG}$ is positively correlated with firm size while $SHAREOWN^{JM}$ is negatively correlated with firm size. Regarding bonus

Table IV. Summary statistics

Panel A and B compares incentive variables and firm characteristics during firm-years that do and do not overlap with litigation class periods. Panel C presents the correlations. *CLASSEYEAR* is a dummy variable set to one for any firm-year that includes all or part of a class period identified in a lawsuit, zero otherwise. *BONUS* is the bonus received by the top five executives of the firm, measured as a fraction of their total cash compensation. *SHAREOWNTM* is the change in the value of stocks owned by the top five executives as a fraction of the change in firm value. *SHAREOWN^{CG}* is the change in the value of stocks owned by the top five executives for a 1% change in stock price. *OPTDELTATM* is the change in the value of options owned by the top five executives as a fraction of the change in firm value. *OPTDELTA^{CG}* is the change in the value of options owned by the top five executives for a 1% change in stock price. *MKTVAL* is the market capitalization of the firm in millions of dollars. *TURNOVER* is average daily trading volume as a percentage of the number of shares outstanding for the fiscal year. For Nasdaq stocks, it's further adjusted by dividing by two. *BM* is the ratio of book equity to market capitalization of the firm. *LEVERAGE* is the ratio of total debt to total assets. *SALESGROWTH* is the ratio of sales to its previous year's level. *ROA* is earnings before interests divided by total assets. *TANGIBLE* is the ratio of property, plant and equipment to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for the fiscal year. *SKEWNESS* is the skewness of daily stock returns for the fiscal year. *DIVIDEND* is a dummy variable equal to one if the firm paid dividends during the fiscal year and zero otherwise. *ACQUISITION* is a dummy variable equal to one if the firm made business acquisitions, and zero otherwise. *EQUITYISSUE* is a dummy variable equal to one if the number of shares outstanding, adjusted for splits and dividends, increases by more than 10% from its level in the prior year, and zero otherwise. All the above variables are measured during fiscal years 1995 to 2000, except for *ACQUISITION* and *EQUITYISSUE*, which are measured during fiscal years 1996 to 2001. All the continuous variables are winsorized at the 99th percentile and *SALESGROWTH*, *ROA* and *SKEWNESS* are also winsorized at the 1st percentile. Significance levels are computed for the difference in mean (medians) using a *t*-test and Wilcoxon two-sided *t*-test. The 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

Variable	Panel A. Incentive variables											
	Mean		Median		Std		Q1		Q3		N	
	0	1	0	1	0	1	0	1	0	1	0	1
<i>CLASSEYEAR</i>												
<i>BONUS</i>	0.208	0.184***	0.188	0.145	0.157	0.158	0.083	0.060	0.300	0.279	11002	727
<i>SHAREOWNTM</i> (%)	4.377	4.341	0.708	0.669	8.545	8.351	0.128	0.131	3.572	4.171	12059	740
<i>SHAREOWN^{CG}</i> (millions\$)	0.676	1.839***	0.100	0.259***	2.117	3.883	0.017	0.066	0.375	1.260	11702	711
<i>OPTDELTATM</i> (%)	1.656	2.473***	0.827	1.716***	2.150	2.499	0.000	0.498	2.533	3.784	13912	697
<i>OPTDELTA^{CG}</i> (millions\$)	0.369	1.050***	0.132	0.476***	0.679	1.303	0.029	0.178	0.376	1.402	11270	665

Table IV. Summary statistics (continued)

Panel B. Firm characteristics												
Variable	Mean		Median		Std		Q1		Q3		N	
CLASSEYEAR	0	1	0	1	0	1	0	1	0	1	0	1
MKTVAL (million \$)	4293	14486***	837.3	2810.6***	16454	36134	325.29	840.6	2668.7	10707	12112	711
TURNOVER (%)	0.453	0.604***	0.270	0.406***	0.540	0.629	0.137	0.208	0.542	0.738	12182	690
VOLATILITY	0.468	0.558***	0.411	0.504***	0.244	0.266	0.292	0.365	0.585	0.692	12184	690
SKEWNESS	0.396	0.263***	0.335	0.274***	1.033	0.876	-0.010	-0.058	0.717	0.641	12179	689
LEVERAGE	0.240	0.244	0.222	0.224	0.200	0.221	0.062	0.024	0.363	0.377	11923	707
BM	0.566	0.376***	0.458	0.275***	0.446	0.357	0.265	0.143	0.733	0.469	10000	596
SALESGROWTH	1.224	1.566***	1.122	1.285***	0.432	0.758	1.027	1.099	1.288	1.704	12033	719
ROA	0.054	0.030***	0.071	0.059***	0.112	0.148	0.036	0.019	0.104	0.094	10920	624
TANGIBLE	0.302	0.210***	0.238	0.150***	0.242	0.193	0.108	0.061	0.457	0.289	12090	725
DIVIDEND	0.491	0.427***	0	0	0.5	0.495	0	0	1	1	13348	740
ACQUISITION	0.365	0.483***	0	0	0.481	0.5	0	0	1	1	12803	733
EQUITYISSUE	0.210	0.298***	0	0	0.407	0.458	0	0	0	1	12527	722

compensation, the arithmetic mean is significantly higher when *CLASSYEAR* equals to one, but the difference in medians is not statistically significant.

Table 4B shows that most firm characteristics differ significantly between class period firm years and control firm years. Therefore, a multivariate analysis is used to isolate the role of executive incentives in predicting lawsuits. For each firm and each fiscal year 1996–2001, we predict whether it is a *CLASSYEAR* (that is, a year during all or part of which executives are alleged to have committed securities fraud in a private lawsuit) using both compensation and control variables. We estimate a pooled Probit regression using maximum likelihood, with Huber/White/sandwich robust standard errors allowing for heteroskedasticity and firm level clustering:

$\text{Prob}(\text{CLASSYEAR}_t)$

$$= F[\text{BONUS}_{t-1}, \text{SHAREOWN}_{t-1}, \text{OPTDELTA}_{t-1}, \text{Control Variables}], \quad (1)$$

where the control variables are *SIZE*_{*t*−1}, *TURNOVER*_{*t*−1}, *VOLATILITY*_{*t*−1}, *SKEWNESS*_{*t*−1}, *LEVERAGE*_{*t*−1}, *BM*_{*t*−1}, *SALESGROWTH*_{*t*−1}, *ROA*_{*t*−1}, *TANGIBLE*_{*t*−1}, *DIVIDEND*_{*t*−1}, *ACQUISITION*_{*t*}, *EQUITYISSUE*_{*t*}, *Industry dummies* and *Year dummies*.

The resulting coefficient estimates and robust standard errors are given in Table V. To describe the economic effect of the independent variables, we also include (in the last column, labeled ΔProb) the change in the probability when the independent variable changes from minus one standard deviation to plus one standard deviation around its mean, holding other variables constant at their respective means.²⁶

Table V Panel A presents the results when pay for performance sensitivities are measured following Jensen and Murphy (1990), that is the dollar increase in executive wealth per dollar increase in firm value. Models 1 through 5 differ in the inclusion of control variables. Model 1 contains the compensation variables only and model 5 contains the full set of control variables described earlier. Model 2 excludes *VOLATILITY*, *SKEWNESS*, *LEVERAGE*, *BM* and *SALESGROWTH* from the full set of controls; model 3 excludes *VOLATILITY*, *SKEWNESS* and *LEVERAGE*; model 4 excludes *BM* and *SALESGROWTH*.

The regression analysis finds clear differences in the impact of the various components of executive pay. High levels of bonus relative to salary in year *t* − 1 could indicate that executive pay in the company in question is very sensitive to earnings or other performance yardsticks of performance, and

²⁶ For dummy variables, ΔProb is the difference in the c.d.f. when the dummy variable changes from 0 to 1.

Table V. Probit analysis of litigation class periods and manager incentives

This table summarizes the results of regression: $Prob(CLASSYEAR_t) = F[BONUS_{t-1}, SHAREOWN_{t-1}, OPTDELTA_{t-1}, SIZE_{t-1}, TURNOVER_{t-1}, VOLATILITY_{t-1}, SKEWNESS_{t-1}, LEVERAGE_{t-1}, BM_{t-1}, SALESGROWTH_{t-1}, ROA_{t-1}, TANGIBLE_{t-1}, DIVIDEND_{t-1}, ACQUISITION_t, EQUITYISSUE_t, Industry dummies]$ $t = 1996, \dots, 2001$. All variables are as defined in Appendix 3. SE stands for Huber/White/sandwich robust standard errors with firm level clustering. $\Delta Prob$ is the change in the c.d.f. when the independent variable changes from minus one standard deviation to plus one standard deviation around its mean, holding other variables constant at their respective means. For dummy variables, $\Delta Prob$ is the difference in the c.d.f. when the dummy variable changes from 0 to 1. The last two rows provide the number of observations, and the pseudo R^2 . Significance at the 10%, 5%, and 1% levels is indicated by *, **, and *** respectively. Panel A presents the regression result with Jensen and Murphy based equity and option incentive measures, and Panel B presents the results using Core and Guay incentive measures. The constant term is included in the regression but is omitted for space reasons.

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		$\Delta Prob$ (%-point)
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	
BONUS	-0.3140	0.1790*	-0.1267	0.2302	-0.1661	0.2427	-0.0941	0.2336	-0.1716	0.2488	-0.42
SHAREOWN ^{JM}	-0.0040	0.0032	0.0039	0.0040	0.0006	0.0044	0.0034	0.0040	0.0004	0.0044	0.06
OPTDELTA ^{JM}	0.0230	0.0114**	0.0581	0.0163***	0.0490	0.0172***	0.0559	0.0163***	0.0493	0.0173***	1.66
SIZE			0.2437	0.0232***	0.2205	0.0262***	0.2438	0.0238***	0.2125	0.0273***	5.78
TURNOVER			0.1816	0.0428***	0.1571	0.0482***	0.1532	0.0455***	0.1538	0.0500***	1.30
VOLATILITY							0.3917	0.1753**	0.0775	0.1919	0.29
SKEWNESS							-0.0413	0.0283	-0.0489	0.0317	-0.78
LEVERAGE							0.5807	0.1717***	0.5851	0.1901***	1.82
BM					-0.0614	0.1053			-0.1086	0.1099	-0.75
SALESGROWTH					0.3087	0.0523***			0.2883	0.0519***	2.06
ROA			-0.8648	0.2580***	-0.8131	0.2884***	-0.6543	0.2747**	-0.7331	0.3055***	1.31
TANGIBLE			-0.9283	0.2161***	-0.8319	0.2196***	-1.0613	0.2175***	-0.9877	0.2218***	3.69
DIVIDEND			-0.1596	0.0859*	-0.0594	0.0916	-0.1124	0.0902	-0.0498	0.0974	-0.39
ACQUISITION			0.1602	0.0586***	0.1374	0.0626**	0.1367	0.0601**	0.1011	0.0643	0.79
EQUITYISSUE			0.0302	0.0637	-0.0144	0.0703	0.0316	0.0652	-0.0133	0.0721	-0.10
Industry Dummies	No		Yes		Yes		Yes		Yes		
Year Dummies	No		Yes		Yes		Yes		Yes		
N	10849		8983		8085		8618		7754		
Pseudo R ²	0.004		0.126		0.143		0.131		0.147		

Panel A. Jensen and Murphy incentive measures

Table V. Probit analysis of litigation class periods and manager incentives (continued)

Panel B. Core and Guay incentive measures											
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		$\Delta Prob$ (%/point)
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	
BONUS	-0.2502	0.1881	-0.1523	0.2283	-0.1863	0.2403	-0.1337	0.2317	-0.2032	0.2461	-0.51
SHAREOWN ^{CG}	0.0072	0.0269	0.0328	0.0330	0.0070	0.0353	0.0296	0.0331	0.0083	0.0356	0.13
OPTDELTA ^{CG}	0.8209	0.0613***	0.2990	0.1180**	0.2949	0.1260**	0.2640	0.1190**	0.2814	0.1280**	1.40
SIZE			0.1565	0.0320***	0.1347	0.0366***	0.1646	0.0329***	0.1289	0.0378***	3.59
TURNOVER			0.1866	0.0426***	0.1624	0.0481***	0.1611	0.0453***	0.1627	0.0499***	1.41
VOLATILITY							0.3624	0.1724**	0.0397	0.1892	0.15
SKEWNESS							-0.0357	0.0281	-0.0453	0.0317	-0.74
LEVERAGE							0.5822	0.1704***	0.5854	0.1886***	1.86
BM					-0.0841	0.1039			-0.1332	0.1081	-0.94
SALESGROWTH					0.3085	0.0518***			0.2905	0.0513***	2.12
ROA			-0.8598	0.2616 ***	-0.8077	0.2913 ***	-0.6611	0.2795**	-0.7385	0.3092***	-1.34
TANGIBLE			-0.9399	0.2158***	-0.8422	0.2203***	-1.0825	0.2176***	-1.0058	0.2229***	-3.84
DIVIDEND			-0.1844	0.0857**	-0.0756	0.0917	-0.1397	0.0897	-0.0689	0.0974	-0.55
ACQUISITION			0.1596	0.0588***	0.1398	0.0629**	0.1358	0.0602**	0.1027	0.0646	0.82
EQUITYISSUE			0.0394	0.0624	-0.0124	0.0694	0.0427	0.0638	-0.0103	0.0710	-0.08
Industry Dummies	No		Yes		Yes		Yes		Yes		
Year Dummies	No		Yes		Yes		Yes		Yes		
N	10722		8983		8085		8618		7754		
Pseudo R ²	0.069		0.123		0.142		0.127		0.145		

this sensitivity would be likely to persist into future years. Thus bonus may give managers an incentive to boost firm performance, real or fictional, in the subsequent year. However, we do not detect such an effect. A possible reason is that as firms shift away from bonus to option plans in the 1990s, the impact of bonuses becomes hard to discern because it is small relative to the impact of options. Another reason could be that our *BONUS* variable is a noisy indicator of the sensitivity of bonus pay to performance.

Managers' equity holding sensitivity, $SHAREOWN^{JM}$, has no significant effect on lawsuit incidence. This remains true even if we exclude restricted stock from the share ownership variable. On *a priori* grounds, one would expect the impact of share ownership to be ambiguous. On the one hand, higher equity sensitivity might provide incentives for stock price manipulation, to the extent that shares can be sold in the short term. On the other hand, if large share stakes are held for control purposes, or by founders with a strong personal loyalty to the company, selling shares for short term gain is precluded. Instead, more ownership helps to align managements' and shareholders' long term interests discouraging manipulative behavior.

The top executives' option portfolio sensitivity ($OPTDELTA^{JM}$) is highly significant at the 1% level. It is also significant economically. In the full model (model 5), a change from minus to plus one standard deviation around the mean of $OPTDELTA^{JM}$ induces a 1.66%-point increase (i.e., a 30% increase, from 5.6%-point to 7.26%-point) in the class-year probability for the following year. This suggests that, consistent with our hypothesis, the higher their option portfolio sensitivity, the more incentives the executives have to manipulate the firm's stock price in the short run, thus triggering litigation.

One concern is that the relationship between $OPTDELTA^{JM}$ and litigation incidence is driven by the possibility that the type of firms that use more options are high risk, more volatile, growth-oriented, innovative firms which attract more litigation. If this were the case, then we would expect the inclusion of variables that are correlated with risk and volatility (*VOLATILITY*, *SKEWNESS*, *LEVERAGE*) and growth (*BM* and *SALESGROWTH*) to significantly weaken the magnitude and significance of the option sensitivity variable. Model 2 excludes all of the five variables, model 3 excludes the risk and volatility proxies and model 4 excludes the growth proxies. Across these different specifications, the coefficient on $OPTDELTA^{JM}$ maintains a similar magnitude and significance. This comparison suggests that our results are not likely to be driven by the more volatile operating environments of firms that use a lot of option-based compensation, or by firms with greater growth opportunities using a higher pay-for-performance sensitivity.

Of the control variables in model 5, *SIZE* (the log of market value), *TURNOVER*, *LEVERAGE*, *SALESGROWTH*, *ROA*, and *TANGIBLE* are

all significant at least at the 5% level, while *VOLATILITY*, *SKEWNESS*, *BM*, *DIVIDEND*, *ACQUISITION* and *EQUITYISSUE* are insignificant once the full set of firm characteristic is included.

Consider first the control variables that are connected with litigation risk but not necessarily with managerial fraud. The two variables that directly capture the amount of the potential damages, *SIZE* and *TURNOVER*, are both significant at the 1% level. *SIZE* (the log of market value), is the most economically important variable: when *SIZE* changes from minus one standard deviation to plus one standard deviation around the mean, the class-year probability in the following fiscal year is 5.78%-points higher. Larger firms are more likely to be the target of litigation, not necessarily because they are more likely to engage in fraudulent behavior, but because they are more promising targets in terms of potential payoffs. Similarly, when *TURNOVER* changes from minus one standard deviation to plus one standard deviation around the mean, the class-year probability in the following fiscal year increases by 1.3%-points. This result is consistent with the previous literature on litigation risk: when a stock is heavily traded, there are more potential plaintiffs who transact at distorted prices.

The next economically important variables are *TANGIBLE*, *SALES-GROWTH*, *LEVERAGE* and *ROA*. The lawsuit probability decreases when a firm has more tangible assets relative to total assets ($\Delta\text{Prob} = 3.69\%$ -points), and increases when a firm had high sales growth rates ($\Delta\text{Prob} = 2.06\%$ -points). This result suggests that firms with more intangible assets may be harder for outsiders to value and monitor, thus are more likely to have agency problems, and that there may be higher pressure for high growth firms to maintain their growth record through aggressive accounting or share price manipulation. Firms with high *LEVERAGE* are more likely to be sued: high debt may indicate a recent history of poor performance, asset write-downs or forced heavy borrowing, fueling shareholder dissatisfaction. Similarly, firms with low *ROA* are also more likely to be sued, possibly because of poor management performance.

Table V Panel B presents the results with Core and Guay sensitivity measures, that is, the sensitivity of dollar wealth to a percentage change in firm value. We use the logarithm of stock and option sensitivity as in Core and Guay (1999).²⁷ Although the Core and Guay sensitivity measures are different from the Jensen and Murphy measures in principle (the former is the dollar change in the value of stocks/options held by executives for a 1% change in stock price and the latter is change in the dollar value of stocks/options held relative to a dollar change in firm value), the magnitude of their economic impact is

²⁷ We got very similar results without the log transformation as well.

very similar in regression (3). In the full model (model 5), $OPTDELTA^{CG}$ is significant at the 5% level, and a change from minus to plus one standard deviation around its mean induces a 1.4%-point increase (i.e., a 25% increase, from 5.6% to 7%) in the class-year probability for the following year. The bonus variable and the equity sensitivity variable are also insignificant as in Table VI Panel A. All the other control variables are very similar to those in Panel A as well.

The similarity of results using two different sensitivity measures suggest that the relationship between option sensitivity and a firm's probability of being the subject of a complaint alleging securities fraud in subsequent class action litigation is quite robust. This result is consistent with our hypothesis that options give executives an incentive to manipulate the short term share price, thus increasing the probability of subsequent securities class action litigation.

5.2 EARNINGS MANIPULATION DURING THE CLASS PERIODS

To address the question of whether there are signs of fraudulent or deceptive behavior during the class period as alleged by the lawsuits, or whether the lawsuits are entirely frivolous, we investigate a particular form of manipulation, namely that of reported earnings.

The securities laws proscribe a wide range of false and misleading disclosures, insofar as they have a material impact on the stock price. In addition to manipulating (or even falsifying) accounting earnings, sales, or other yardsticks, there is also scope for non-accounting related misrepresentation, for example, product hype, failure to disclose problems in securing strategic partnerships or accessing debt capital, etc. But here we limit our attention to the manipulation of reported earnings for a number of reasons. First, other types of violations are hard to identify and quantify while there are established measures of earnings manipulation in the literature. It should be pointed out that these measures identify statistical deviations from normal levels of earnings accruals, and such deviations are neither necessary nor sufficient signs of fraudulent accounting. However, they are—albeit imperfectly correlated—flags for such illegal reporting as well as for aggressive accounting that, even if it is not illegal, misleads by exploiting the scope for maneuver in established accounting conventions.²⁸ Second, violations of accounting principles are often cited in the plaintiffs' complaints in securities class action lawsuits, and earnings

²⁸ Richardson et al. (2003) document that information in accruals is a key indicator of the earnings manipulation that leads to earnings restatement. But Burns and Kedia (2005) find no difference in the discretionary accruals of restating firm-years and those of nonrestating firm-years.

Table VI. Accrual activity and litigation class periods

This table compares accrual activity during firm-years that do and do not overlap with litigation class periods. *CLASSYEAR* is a dummy variable set to one for any firm-year that includes all or part of a class period identified in a lawsuit, zero otherwise. All variables are constructed from Compustat for the period 1996–2001 and are winsorized at the 1st and the 99th percentiles. Significance levels are computed for the difference in mean (medians) using a *t*-test and Wilcoxon two-sided *t*-test. The 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

Panel A. Accrual activity using TWW (1998) method													
Accrual measures are constructed following Teoh et al. (1998a); see Appendix 2 for details. <i>TAC</i> is total accruals and <i>DTAC</i> is discretionary total accruals. <i>CA^{CF}</i> and <i>CA^{BS}</i> are current accruals constructed from cash flow statement items or balance sheet items, respectively. <i>DCAC^{CF}</i> and <i>DCAC^{BS}</i> are the corresponding discretionary current accruals.													
Variable	Mean		Median		Std. dev.		<i>q</i> 1		<i>q</i> 3		Nobs		
<i>CLASSYEAR</i>	0	1	0	1	0	1	0	1	0	1	0	1	
<i>TAC</i>	-0.062	-0.099***	-0.052	-0.056	0.111	0.170	-0.101	-0.142	-0.013	-0.006	10907	694	
<i>CA^{CF}</i>	0.016	0.026***	0.008	0.014***	0.073	0.099	-0.016	-0.014	0.041	0.063	10899	694	
<i>CA^{BS}</i>	0.014	0.011	0.005	0.006	0.094	0.122	-0.024	-0.037	0.043	0.060	10927	694	
<i>DTAC</i>	0.335	0.303	0.019	0.033*	1.540	1.540	-0.060	-0.093	0.148	0.198	9929	631	
<i>DCAC^{CF}</i>	0.009	0.040***	0.006	0.016***	0.138	0.172	-0.025	-0.021	0.043	0.083	10885	693	
<i>DCAC^{BS}</i>	0.010	0.032***	0.001	0.007**	0.127	0.172	-0.035	-0.039	0.042	0.077	10903	693	

Table VI. Accrual activity and litigation class periods (continued)

Panel B. Accrual activity, after controls												
This panel presents discretionary current accrual measures after various controls. The discretionary current accrual variables in the first row are constructed following the methodology similar to that of TWW, with an exception that we included cash flows from operations as an additional control variable in the accrual estimation equation. Row 2 summarizes the DCA^{CF} and DCA^{BS} measures constructed following TWW with the exclusion of firms in the top and bottom deciles ranked by return on assets. Row 3 analyzes the residual DCA measures where the residual is extracted from a regression of DCA on $SIZE$, $LEVERAGE$, $VOLATILITY$, ROA , as well as year and industry dummies.												
Variable	Mean		Median		Std. dev.		$q1$		$q3$		Nobs	
$CLASSYEAR$	0	1	0	1	0	1	0	1	0	1	0	1
1 DCA^{CF}	0.011	0.038***	0.007	0.016***	0.158	0.186	-0.025	-0.023	0.047	0.087	11035	688
DCA^{BS}	0.008	0.034***	0.003	0.008	0.170	0.204	-0.038	-0.040	0.047	0.081	11040	688
2 DCA^{CF}	0.009	0.030***	0.005	0.014***	0.127	0.145	-0.021	-0.015	0.037	0.076	8303	455
DCA^{BS}	0.010	0.026***	0.001	0.008***	0.113	0.141	-0.031	-0.027	0.037	0.067	8317	455
3 DCA^{CF}	-0.001	0.019***	-0.003	0.014***	0.128	0.150	-0.040	-0.038	0.038	0.067	9380	556
DCA^{BS}	0.000	0.006	-0.006	-0.004	0.116	0.147	-0.046	-0.050	0.034	0.053	8769	510

manipulation has become an increasingly visible concern for the investing public. Levitt (2002, p. 117) points out that in the four years between 1997 and 2000, 700 companies admitted mistakes in their past financial statements and restated their earnings, compared with only three cases in 1981; and earnings manipulation is a frequent target of SEC investigations.

In Table IVA, we investigate whether earnings manipulation is positively related to lawsuit incidence by comparing accrual activity in class and non-class firm-years. Among the accrual variables reported, the discretionary current accruals are generally considered to be the best proxy for earnings manipulation. “Discretionary” accruals are the abnormal part of accruals that cannot be explained by industry or firm specific business conditions. And current discretionary accruals are preferred to total discretionary accruals because managers have greater discretion over the current accruals than over long term accruals (Kreutzfeldt and Wallace, 1986 and Guenther, 1994).²⁹

We find that current discretionary accruals are significantly higher in class periods, using both DCA^{BS} and DCA^{CF} measures. The median of DCA^{CF} , scaled by total assets, is 0.016, which is 2.76 times higher in the class periods compared to control firm-years, and the median of DCA^{BS} is 0.007, 7 times higher in class periods than its value in control firm-years. This finding suggests that the reported earnings for the lawsuit firms are manipulated upwards significantly during the class period, consistent with lawsuit allegations.

Dechow et al. (1995) show that the modified Jones models such as the discretionary accrual measures we used above provide the most powerful tests of earnings management amongst the models they considered. But Dechow et al. (1995) do find that all the models they consider lead to misspecified tests when applied to samples of firms with extreme performance and suggest the inclusion of firm performance (e.g., cash flow from operations) in the earnings management regression. We analyze the potential misspecification issue in Table VIB with two approaches. The first approach adds cash flow from operations as an additional control variable in the accruals equation. The second approach examines the discretionary accrual measures excluding the extreme-performing firms classified as the top and bottom performance deciles by *ROA*. Both of these two approaches yield results similar to those in Panel A, which suggests that our results are robust with respect to the potential measurement errors in discretionary accruals.

²⁹ Teoh et al. (1998a) also find that seasoned equity issuers raise reported earnings through discretionary current accruals, while there is no significant activity in the long-term discretionary accruals.

The last column of Table VIB further analyzes discretionary current accrual measures after controlling for firm characteristics that potentially affect earnings manipulation measures, namely *SIZE*, *LEVERAGE*, *VOLATILITY*, *ROA*, as well as year and industry dummies. After these controls, the residual *DCA* measures are higher during the class periods for both the cash flow based as well as the balance sheet based measures. The median (mean) of DCA^{CF} , is 0.014 (0.019) in the class periods, significantly higher than the level of -0.003 (-0.001) for control firm-years, and this difference is significant at less than 1% level. The DCA^{BS} measure shares similar pattern, although the difference is not significant. Hribar and Collins (2002) argue that the cash flow based measure is superior because the former is free of the “nonarticulation” problems³⁰ that existed for the balance sheet based discretionary accruals measure.

Thus our results agree with the findings in the literature that discretionary currently accruals are higher for the lawsuit companies. Our contribution is twofold. Not only do we incorporate a broader sample of firms,³¹ but we also find the result to be robust for the cash flow based *DCA* measure.

We also examine broader accrual variables, which do not distinguish between current and long term accruals, or estimated discretionary and non-discretionary components. The total accruals, *TAC*, have a lower mean for the class periods when compared to the control firm-years, but the differences in median values are insignificant. The current accruals are higher in class periods using cash flow statement items, CA^{CF} , but the balance sheet items based measure CA^{BS} , does not have the same pattern. The discretionary total accruals, *DTAC*, are not significantly different across class periods and control firm-years.

Thus we find evidence in favor of Hypothesis 2: litigation is associated with upward manipulation of earnings. The question arises whether such manipulation is directly linked to stock price based compensation. As reviewed in Section 2, there is considerable evidence suggesting that this is the case (Beneish, 1999; Johnson et al., 2003; Richardson et al., 2003; Erickson et al., 2006; Burns and Kedia, 2005 and Cheng and Warfield, 2005).

³⁰ Mismeasurement arising from nonoperating events such as reclassifications, acquisitions, discontinued operations, divestitures, accounting changes and foreign currency translations.

³¹ While our sample consists of all the SP 1500 firms during the period of 1995 to 2002, Johnson et al. (2002) finds the relationship between *DCA* and lawsuits to be significant for the 68 firms in the computer industry after 1995. The litigation sample in DuCharme et al. (2004) consists of 150 IPO firms and 72 SEO firms from 1988 to 1997, and the relationship between *DCA* and lawsuits is found to be significant only for the 72 SEO firms.

5.3 OPTIONS EXERCISE AND INSIDER SALES DURING CLASS PERIODS AND THE AFTERMATH OF LITIGATION

We now directly compare the payoff to the top executives through options exercise and stock sales during class periods and control firm-years. Such transactions are the means by which executives are able to benefit from any share price manipulation.

The first column of Table VIII shows the differences in the value realized from options exercise, *OPTEXERCISE*, and insider sales, *INSIDERSALES*, as percentages of firm value. This column shows that the top executives in the lawsuit firms received 0.26% of firm value through options exercise and 2.85% of firm value through selling shares during the class period (note that a portion of the shares sold by insiders could come from the options that the executives exercised). In contrast, the managers in the control firm-years received 0.18% through options exercise and 1.066% through selling shares; for both variables, the differences are statistically significant.³²

Next, we investigate whether the differences in value realized from options exercise and insider sales can be explained by factors such as industry, firm size, and growth prospects of firms. We construct abnormal levels of *OPTEXERCISE* and *INSIDERSALES* by regressing the raw levels on industry and year dummies, as well as *SIZE*, *BM*, *Ret*(−1) and *LEVERAGE*. The residuals from these regressions are the abnormal levels after controlling for industry and firm characteristics. Column 2 of Table VII presents the comparison of the abnormal *OPTEXERCISE* and *INSIDERSALES* for class periods and control firm-years. The results show that, even after controlling for the industry and firm characteristics, managers in the lawsuit firms still benefit significantly more than the control firms from options exercise and selling of shares.

We next analyze whether the abnormally high levels of *OPTEXERCISE* and *INSIDERSALES* during the class periods are driven by the *ex-ante* option-based incentives of managers in the lawsuit companies. We extract the abnormal level of these two variables by adding the managers' preexisting option sensitivity to the regressors. Column 3 (4) shows the results using Jensen and Murphy (Core and Guay) option sensitivity, respectively. Both columns demonstrate that, once we control for the *ex-ante* option-based incentives, the differences between value realized from options exercise and selling of stocks for class years and control firm-years become largely insignificant. The one exception is that insider sales are still higher if the Core-Guay measure of option sensitivity is used, but only at the 10% significance level.

³² Johnson et al. (2002) also find that raw insider sales have a significant impact on lawsuit incidence.

Combined with the results of Table IVA, which shows that executives of class year firms have higher option sensitivity, Table VII shows that management's higher proceeds from options exercise and insider selling during class periods is largely explained by the high option sensitivity of their compensation packages, consistent with hypothesis 3.

In contrast to the relatively high cashouts by managers during the class period, the long-term shareholders in these companies suffer large losses. This is not surprising given that these are the firms that are subject to class action lawsuits afterwards. In Table VIII, we look at returns in the aftermath of the class period. Such returns should be interpreted with caution because a substantial share price drop is needed to establish sufficient shareholder damages to attract litigation.³³ Large share price drops for reasons unrelated to price manipulation can trigger frivolous litigation, and conversely, potentially meritorious cases may not be filed if the price correction that should follow manipulation is offset by unrelated offsetting news. For both reasons, a price drop around the end of a class period is to be expected, and cannot be interpreted as firm evidence of upward manipulation during the class period.

We measure average monthly returns in excess of the industry median for our sample firms. Table 8 presents clear differences in the post-class period returns for the lawsuit and non-lawsuit firms. After a class year, firms had lower returns, concentrated in the first two subsequent years, with an average monthly difference of 185 basis points in the first year and 88 basis points in the second year.

In addition to the returns after the class period, it is also interesting to look at the other important consequence of class action filings, namely the settlements. We have limited information on the lawsuit settlements, restricted to 159 of the cases in our sample. The mean settlement is 175 million dollars and the median is 16.5 million dollars; relative to firm value at the time of the filing, the corresponding numbers are 1.6% and 0.8%. The maximum settlement is 6.6 billion; the 25 (75) percentile values are 7 (55.9) million. For 61 cases, we have information on the proportion paid by the insurers. The mean insurance payout is 76% and the median is 90%, with the remainder generally paid out by the company itself. We do not have information on money paid by individual executives, but we expect such payments, if any, to be negligible as director and officer liability is almost always covered by D&O insurance taken out by the company.³⁴

³³ Cases that allege upward manipulation of the share price are very rare. An example is a suit by the ex-shareholders of a firm taken over in a friendly deal at an unfairly low price.

³⁴ Note that the lawsuits that target executives personally are generally filed by the company itself, or derivative lawsuits filed on behalf of the company; they are not the shareholder class-action lawsuits of our data set.

Table VII. Top executives' option exercise and stock sales during the class periods

This table compares the top five executives' net insider sales and options exercise during firm-years that do and do not overlap with litigation class periods. Class period is equal to one for any firm-year that includes all or part of a class period identified in a lawsuit, and zero otherwise. *OPTEXERCISE* and *INSIDERSELL* are the value realized from options exercise and insider sales, respectively, as a percentage of firm value for the top five executives. Significance levels are computed for the difference ("1-0") in mean using a *t*-test. The 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

Variables'	Class period	Level		Abnormal level controlling for Size BM, Leverage, Ret(-1), industry and year		Abnormal level controlling for Option sensitivity (JM) Size BM, Leverage, Ret(-1), industry and year		Abnormal level, controlling for Option sensitivity (CG), Size BM, Leverage, Ret(-1), industry and year	
		Option exercise	Net insider sell	Option exercise	Net insider sell	Option exercise	Net insider sell	Option exercise	Net insider sell
Mean	0	0.180	1.066	-0.003	-0.073	0.000	-0.062	-0.002	-0.070
	1	0.261	2.854	0.054	1.261	0.007	1.064	0.026	1.206
Difference		<i>0.081</i>	<i>1.788</i>	<i>0.057</i>	<i>1.334</i>	<i>0.007</i>	<i>1.126</i>	<i>0.028</i>	<i>1.276</i>
P value		<i>0.000***</i>	<i>0.030**</i>	<i>0.009***</i>	<i>0.056*</i>	<i>0.743</i>	<i>0.120</i>	<i>0.213</i>	<i>0.078*</i>

Table VIII. Average monthly excess returns after the class year

This table presents the average monthly returns in excess of industry median for lawsuit and non-lawsuit firms in the Compustat ExecuComp database. The industry median returns are the median returns for the Compustat ExecuComp firms in the same French 12 industry. The lawsuit indicator equals to 0 for firms that are not subject to class action lawsuits during the period of 1996–2002. The lawsuit indicator equals to 1 for firms that are subject to lawsuits and with a class period identified in a lawsuit that includes all or part of the fiscal year t . The $xret$ variables describe the average monthly excess returns: $xret(t + 1)$, $xret(t + 2)$ and $xret(t + 3)$ are the average monthly excess return for the year $t + 1$, $t + 2$ and $t + 3$, respectively; $xret(t + 1 : t + 2)$ is the average monthly excess return for the 24 months from year $t + 1$ to $t + 2$; $xret(t + 1 : t + 3)$ is the average monthly excess return for the 36 months from year $t + 1$ to $t + 3$. Significance levels are computed for the difference (“0 – 1”) in mean (medians) using a t -test and Wilcoxon two-sided t -test. The 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

Fiscal year t	Lawsuit indicator	$xret$ (%) ($t + 1$)	$xret$ (%) ($t + 2$)	$xret$ (%) ($t + 3$)	$xret$ (%) ($t + 1 : t + 2$)	$xret$ (%) ($t + 1 : t + 3$)
1996	0	0.77	0.54	1.44	0.57	0.83
	1	-1.68	-0.68	2.34	-1.20	-0.05
	(0 – 1)	2.45***	1.22	-0.91	1.77***	0.88**
1997	0	0.54	1.44	1.47	0.93	1.05
	1	-0.09	0.88	-0.08	0.02	-0.06
	(0 – 1)	0.63	0.56	1.55**	0.92*	1.12***
1998	0	1.44	1.47	0.87	1.35	1.19
	1	-0.17	-1.44	1.11	-0.83	0.21
	(0 – 1)	1.61**	2.91***	-0.24	2.18***	0.98**
1999	0	1.47	0.87	0.03	1.12	0.76
	1	-1.81	0.90	-1.24	-0.25	-0.61
	(0 – 1)	3.29***	-0.03	1.27*	1.38***	1.38***
2000	0	0.87	0.03	0.66	0.41	0.57
	1	0.37	-1.71	2.51	-0.87	0.69
	(0 – 1)	0.50	1.74***	-1.84***	1.28***	-0.12
2001	0	0.03	0.66	0.18	0.44	0.37
	1	-2.58	1.77	0.42	-0.12	0.30
	(0 – 1)	2.61***	-1.11	-0.24	0.56	0.07
Average difference		1.85	0.88	-0.07	1.35	0.72

Finally, it may also be interesting for future work to investigate whether the firms engaged in abnormal real activities during the alleged fraud periods. Kedia and Philippon (2005) find that, while there is no difference in terms of real productivity, firms that subsequently restate their earnings hire and invest significantly more than other comparable firms. Preliminary analysis of our sample shows that hiring and real investment are significantly higher during class periods, but our productivity measure (growth rate of sales per employee) is also significantly higher during class periods. Thus the evidence of “real”

manipulation during class periods is inconclusive for our sample based on these measures, and merits further analysis.

6. Conclusion and Further Discussion

Our paper finds that there is a significant relationship between option-based executive compensation and shareholder class action litigation: *ex ante* incentive pay in the form of options significantly increases the probability of a shareholder class action lawsuit, controlling for a wide range of other firm characteristics. The relationship is robust to the choice of option sensitivity measures and the inclusion of variables capturing firms' fundamental uncertainty and growth profile. In contrast, other compensation variables such as the salary-bonus mix and executive share ownership do not have a significant impact on lawsuit incidence.

We further document that there is abnormal upward earnings manipulation during litigation class periods and that insiders exercise more options and sell more shares during class periods. We find that such exercise and sales activity is largely driven by the *ex ante* option holdings of the managers, as controlling for such holdings, the abnormal patterns during class periods are largely eliminated. Lastly, we show that stock returns are abnormally low in the wake of class periods. Thus managers who hold options are able to exit in advance of price drops in a way that shareholders are not.

Our results suggest that the fast-vesting options that represent a substantial component of current executive pay may give managers perverse incentives to self-deal, ultimately triggering shareholder class action lawsuits. A natural remedy, as suggested by Bolton et al. (2006), is that incentive compensation contracts should focus more on long-term incentives, for example, by the use of restricted stock or options with a very long vesting period, a conclusion mirroring recent work on firm performance by Habib and Ljungqvist (2005).³⁵ However, it should be noted that in a speculative market, share price manipulation may reflect the wishes of short-term shareholders, so that optimal contracting between current shareholders and management might be consonant with such a short-term incentive contract (Bolton et al., 2006).

In addition, our results are relevant to the current policy debate on how to make private securities litigation a more effective deterrence mechanism. Our evidence suggests that private securities litigation is triggered by both managerial self-dealing and the underlying incentives for it. This is a necessary precondition for the effectiveness of private litigation as a disciplinary device.

³⁵ They empirically relate shortfalls in firm value, as measured by Q , to the incentives provided to CEOs and find that boards appear to grant CEOs too few shares and too many options.

But our paper does not address the concern that most class action lawsuits are settled on terms that provide insufficient sanctions for executive malfeasance, as the costs are largely borne by the company, its long-run investors and D&O insurers.³⁶ The cases are generally settled out of court without admission of guilt because fraud charges are difficult to prove, and the executives involved normally escape jail time and even financial sanctions. And the evidence on whether their reputation and career prospects suffer is mixed.³⁷ Further work on the aftermath of lawsuits: gainers and losers in the settlements, and the impact on the turnover of executives and board members, can tell us more about the disciplinary role of securities class action litigation.

Appendix 1. Legal background

Under the securities laws it is illegal to make materially false and misleading statements, or to trade stock as an insider when in possession of undisclosed material information. We will be using the incidence of shareholder class action lawsuits as an indicator of such abuses.

The two central pieces of legislation that are relevant to our study are the Securities Act of 1933 (SA 1933), which regulates the process whereby companies make offerings of securities, and the Securities Exchange Act of 1934 (SEA 1934), which is much broader in scope, covering all aspects of securities trading. The SEA 1934 imposes registration and reporting requirements on firms whose securities are traded on secondary markets and regulates all parties involved in trading. Most of the securities laws' provisions for civil liability concern disclosure and registration requirements, together with a set specifically directed at manipulative practices.

The SEA 1934 outlaws deceptive and manipulative behavior and provides a private remedy for injured investors.³⁸ Its Section 10(b) empowers the SEC to put forth rules barring such manipulative and deceptive conduct. Rule 10b-5, the blanket antifraud rule promulgated in 1942 by the SEC, is the cornerstone of US securities regulation. It has been used aggressively by the federal courts to regulate not just fraud but also negligent securities practices and corporate mismanagement, though its reach has been pruned back in

³⁶ Typically insurance picks up part but not all of the settlement amount. For example, in the case of Emulex Corporation, the company's D&O insurance paid about 32% of the settlement. But the premia for D&O insurance are a business cost borne by shareholders in all companies.

³⁷ Though Strahan (1998) found that CEO turnover increases dramatically after class action filings, Agrawal et al. (1999) find no significant management turnover once firm characteristics have been controlled for.

³⁸ See Palmiter (2002) for an exposition of the full range of federal securities fraud remedies available.

recent years. Since 1946 the federal courts have recognized a private cause of action under Rule 10b-5, and it is widely used as a basis for class action lawsuits because it is in some important ways less demanding than other remedies for securities fraud victims. In particular, if misinformation is disseminated in the securities markets there is a presumption of “reliance”:³⁹ the plaintiffs are not required to prove that they relied on the misinformation. In addition, actionable misinformation is not just restricted to what has been submitted in mandated SEC filings; it can include false press releases, silence in the face of a duty to update, and public statements by company officials. But shareholder class action lawsuits are not limited to Rule 10b-5. Many actions are brought under sections 11 and 12 of the Securities Act of 1933, which cover fraudulent registration statements and, more broadly, noncompliance with registration rules and misrepresentation. Because they relax the burden of proof for the plaintiff,⁴⁰ these are considered relatively more advantageous than 10b-5 litigation in those cases covered by SA 1933, namely situations in which a company makes a primary issue of securities (either an IPO or a seasoned offering) or when inside shareholders sell securities in conjunction with a primary offering.⁴¹

The remedies available to plaintiffs depend somewhat on the litigation strategy used.⁴² In general, the formula used attempts to capture the damages sustained by the plaintiff; the goal of liability is compensation, not punitive

³⁹ The civil liability schemes of the federal securities laws draw on and sometimes modify principles of the common law of misrepresentation. The tort of *deceit* has five elements, all of which must be proved by the party who seeks to recover: (i) misrepresentation of material fact (it must be important in deciding whether to enter into the transaction; opinions are not actionable; and silence is not actionable unless there is a duty to disclose); (ii) scienter (the maker of the misrepresentation must know or believe the facts are otherwise); (iii) reliance (the person seeking to recover must have actually and justifiably relied on the misrepresentation); (iv) causation (his pecuniary loss can reasonably be expected to result from the reliance); and (v) damages (“out-of-pocket” damages plus any consequential damages, and punitive damages in flagrant cases). See Palmiter (2002, §6.1.1). See also Palmiter (2002, §6.1.2) for a description of the common law basis for *rescission* (a contracting party may seek to rescind a deal if there is material misrepresentation of fact, even if it is not fraudulent; reliance must be proved, but scienter and loss causation need not be proved).

⁴⁰ There is no need to prove scienter (deliberate fraud or reckless disregard by defendant), reliance (plaintiff relied on the misinformation in his decision to buy the securities) and causation (the plaintiff’s loss was caused by the fraud).

⁴¹ Express private causes of action are also available under Sections 18(a) and 9(e) of SEA 1934, against persons making false statements in filings and against willful participants in manipulative conduct respectively; however, they are generally considered less advantageous than Rule 10b-5 and therefore especially Section 18(a) is rarely used.

⁴² For example, under Section 12(a) of SA 1933, the remedy is rescission of the securities purchase or broadly equivalent compensation. Under Section 11 of SA 1933, damages for direct purchasers in an offering are based on the difference between the offer price and either the sale

damages. Clearly, a necessary condition for a nonnegligible remedy is a substantial stock price movement between the times when the initial transaction takes place and when corrective disclosures are made.

As mentioned in the introduction, the Private Securities Litigation Reform Act of 1995 (PSLRA 1995), enacted over President Clinton's veto, was expressly designed to discourage frivolous securities litigation, and in particular Rule 10b-5 class actions. Meanwhile, the statute of limitations for 10b-5 actions was tightened in 1991 to bring it into line with that of other private actions explicitly authorized in SEA 1934 and SA 1933, and then again lengthened somewhat in the Sarbanes-Oxley Act of 2002.⁴³ While PSLRA 1995 discourages baseless suits, such pro-defendant reforms generally make it harder for plaintiffs to sue successfully, thus weakening the role of private securities class action as a complement to government action in deterring securities fraud.

Appendix 2. Construction of Earnings Manipulation Measures

The method used to estimate discretionary accruals follows Teoh et al. (1998a,b), who use a cross-sectional adaptation of a modified Jones (1991) model and distinguish current from total accruals. All variables are taken from Compustat, with corresponding data item numbers in parentheses.

To construct discretionary total accruals (*DTAC*), we estimate the following regression for each of the 12 industries each year:

$$\frac{TAC_{it}}{TA_{i,t-1}} = b_0 \left(\frac{1}{TA_{i,t-1}} \right) + b_1 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + b_2 \left(\frac{PPE_{i,t}}{TA_{i,t-1}} \right) + \varepsilon_{i,t} \quad (A1)$$

$$NDTAC_{i,t} = \hat{b}_0 \left(\frac{1}{TA_{i,t-1}} \right) + \hat{b}_1 \left(\frac{\Delta SALES_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} \right)$$

price or the security's price at the time of the lawsuit, depending on whether or not the claimant's shares were subsequently sold (for aftermarket purchasers, damages are based on the lower of the offer price and the price at which the security was bought). Under Rule 10b-5, the remedy is somewhat malleable, but most commonly it involves out-of-pocket damages calculated in a similar way.

⁴³ The limitation period is now two years (up from one year in 1991), that is, action must be brought within two years after discovery of the facts constituting the violation (or within two years after they could reasonably have been ascertained). The repose period is five years (up from three years): the action must be commenced within five years of the violation.

$$+ \hat{b}_2 \left(\frac{PPE_{i,t}}{TA_{i,t-1}} \right) \quad (A2)$$

$$DTAC_{i,t} = \frac{TAC_{i,t}}{TA_{i,t-1}} - NDTAC_{i,t} \quad (A3)$$

where TAC denotes total accruals:

$$TAC = \text{Net Income (\# 172)} - \text{Cash Flow from Operations (\# 308)}$$

and TA is total assets (# 6), $\Delta SALES$ is the change in sales (# 12), PPE is gross property, plant and equipment (# 7), and ΔTR is the change in trade receivables (# 151).

To construct discretionary current accruals, we estimate the following regression for each of the 12 industries each year:⁴⁴

$$\frac{CA_{i,t}}{TA_{i,t-1}} = \alpha_0 \left(\frac{1}{TA_{i,t-1}} \right) + \alpha_1 \left(\frac{\Delta SALES_{i,t}}{TA_{i,t-1}} \right) + \alpha_2 \quad (A4)$$

$$NDTAC_{i,t} = \hat{\alpha}_0 \left(\frac{1}{TA_{i,t-1}} \right) + \hat{\alpha}_1 \left(\frac{\Delta SALES_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} \right) \quad (A5)$$

$$DCA_{i,t} = \frac{CA_{i,t}}{TA_{i,t-1}} - NDTAC_{i,t} \quad (A6)$$

CA is current accruals (or working capital accruals). We adopt two measures of CA : CA^{CF} and CA^{BS} , constructed from the cash flow statement items or the balance sheet items respectively.⁴⁵ The corresponding discretionary current accruals are labeled as DCA^{CF} and DCA^{BS} .

$$\begin{aligned} CA^{CF} = & -[\text{decrease in accounts receivable (\# 302)} \\ & + \text{decrease in inventory (\# 303)} \\ & + \text{increase in accounts payable and accrued liabilities (\# 304)}] \end{aligned}$$

⁴⁴ This approach is also identical to Ducharme et. al (2004). The ΔTR term in equation (A2) and (A5) allows for the possibility of credit sales manipulation by the firm. The main results of our paper remain robust if this adjustment is omitted.

⁴⁵ Hribar and Collins (2002) point out that using successive year balance sheet variables to measure earnings management creates potential problems around ‘nonarticulation’ dates, such as mergers and acquisitions, and they suggest that cash flow statement items can be used to solve this problem.

$$\begin{aligned}
& + \text{increase in accrued income taxes (\# 305)} \\
& + \text{changes in other assets and liabilities (\# 307)]} \\
CA^{BS} = & \Delta[\text{current assets (\# 4) - cash (\# 1)}] - [\text{current liabilities (\# 5)} \\
& - \text{current maturity of long term debt (\# 44)}]
\end{aligned}
\tag{A7}$$

To reduce the influence of nonstandard classifications of certain items on CA^{BS} , we follow the accounting literature as:

$$\begin{aligned}
CA^{BS} = & \Delta[\text{accounts receivable (\# 2) + inventory (\# 3)} \\
& + \text{other current assets (\# 68)}] - \Delta[\text{accounts payable (\# 70)} \\
& + \text{tax payable (\# 71) + other current liabilities (\# 72)}]
\end{aligned}
\tag{A8}$$

$|TAC|$, $|DTAC|$, $|CA^{CF}|$, $|CA^{BS}|$, $|DCA^{CF}|$ and $|DCA^{BS}|$ are the respective absolute values of accruals.

Appendix 3. Definition of Variables

Variable	Description
<i>CLASSEYEAR</i>	Dummy variable, one for any firm-year that includes all or part of a class period identified in a lawsuit, zero otherwise.
<i>BONUS</i>	Bonus as a fraction of total cash pay.
<i>SHAREOWN^{N/M}</i>	Jensen and Murphy's equity sensitivity measure: The change in the value of stocks held by executives relative to change in firm value.
<i>SHAREOWN^{CG}</i>	Core and Guay's equity sensitivity measure: The dollar change in the value of stocks held by executives for a 1% change in stock price.
<i>OPTDELTA^M</i>	Jensen and Murphy's option sensitivity measure: The dollar change in the value of stock options held by executives relative to change in firm value.
<i>OPTDELTA^{CG}</i>	Core and Guay's option sensitivity measure: The dollar change in the value of stock options held by executives for a 1% change in stock price.
<i>OPTEXERCISE</i>	Value realized from executives options exercise as a percentage of market cap.
<i>INSIDERSELL</i>	Value realized from insider net sell as a percentage of market cap.
<i>TAC</i>	Total accrual.
<i>CA^{BS}</i>	Current accrual constructed from Balance Sheet items.
<i>CA^{CF}</i>	Current accrual constructed from Cash Flow Statement items.
<i>DTAC</i>	Discretionary total accrual.
<i>DCA^{BS}</i>	Discretionary current accrual, constructed from balance sheet variables.
<i>DCA^{CF}</i>	Discretionary current accrual, constructed from cash flow statement variables.
<i>BM</i>	Book to market ratio.
<i>SIZE</i>	Logarithm of market cap (in Millions).
<i>LEVERAGE</i>	Ratio of total debt to total assets.
<i>VOLATILITY</i>	Daily stock return volatility (annualized).
<i>SALESGROWTH</i>	Sales growth, ratio of sales to its previous year's level.
<i>TURNOVER</i>	Average daily trading volume as a percentage of the number of shares outstanding.
<i>SKEWNESS</i>	Daily return skewness.
<i>ROA</i>	Return on assets.
<i>ACQUISITION</i>	Dummy variable, one if the firm made business acquisition, zero otherwise.
<i>EQUITYISSUE</i>	Dummy variable, one if the number of shares outstanding, adjusted for splits and dividends, increases by more than 10%, zero otherwise.
<i>DIVIDEND</i>	Dummy variable, one if the firm paid a cash dividend during the year, zero otherwise.
<i>TANGIBLES</i>	Tangibility of assets, constructed as the ratio of PP&E to total assets.
<i>Ret(-1)</i>	Previous year stock returns.
<i>il-111</i>	The eleven industry dummies as defined by French's 12 industry classification, the default is industry 12.
<i>yr1997-yr2001</i>	The five year dummies, the default year is 1996.

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