Executive pay, earnings manipulation and shareholder litigation*

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Abstract

The paper examines the role of executive compensation in inducing management behavior that triggers private securities litigation. Incentive pay in the form of options is found to increase the probability of securities class action lawsuits, holding constant a wide range of other firm characteristics. In contrast, base pay levels and share ownership do not have a significant impact on lawsuit incidence. Our results suggest that option-based compensation may give executives too strong an incentive to target the short term share price, which may be harmful to long term shareholder value. We further identify earnings manipulation as an important channel linking compensation and litigation: incentive pay has a significant impact on earnings manipulation, which in turn significantly affects the probability of litigation. However, our accrual-based measure of manipulation does not capture the full impact of compensation on litigation, suggesting other channels are important.

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

Keywords: Executive compensation; executive stock options; shareholder lawsuits; earnings management; accounting accruals; securities law

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1. Introduction

Corporate governance has recently become an increasingly topical area of research in financial economics. The bursting of the stock market bubble of the late 90s has provided researchers with a unique opportunity to witness a series of severe consequences of corporate governance failures. Shareholder litigation in response to perceived mismanagement and fraud has increased concurrently. As reported by Cornerstone Research (2003a), federal securities class action filings have trended steadily upwards from a low of 108 in 1996 to 224 in 2002[1], and the total maximum dollar loss[2] involved has risen markedly over the same time period, increasing from $45 billion in 1996 to $1.9 trillion in 2002. The cases typically involve allegations of false and misleading disclosures or accounting practices.

Some recent observers have argued that many instances of stock price and earnings manipulation are attributable 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 onwards[3] 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.

Traditionally economists have argued that a strong linkage between compensation and performance is essential for resolving the agency problem created by the separation of ownership and control. However, until recently the theories have generally overlooked situations in which performance measures can be manipulated or falsified; it is becoming increasingly clear that this is a key issue in the design of managerial incentive contracts.

The main objective of this paper is to study the incentive effects of top managers' compensation contracts and to investigate whether they may have unintended consequences. More specifically, we look at whether the various components of executive compensation are related to

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[1] These numbers exclude filings relating to the allocation of shares in IPOs, as well as filings alleging that securities analysts or investment banks provided slanted research coverage (there was a huge burst of 312 IPO allocation filings in 2001, falling back to just one in 2002).

[2] The maximum dollar loss is defined as the dollar value decrease in the defendant firm's market capitalization, from the trading day on which it reached its maximum during the class period to the trading day immediately following the end of the class period. Naturally, this figure balloons in the wake of a substantial market correction such as that of 2000-2001.

[3] Hall and Murphy (2003) report that the value of stock option grants to CEOs of S&P 500 firms increased nine fold between 1992 and 2000, while other components of total compensation merely tripled.

allegations of executive misbehavior in shareholder class action lawsuit filings. We find that stock option related components of compensation are positively and significantly associated with the incidence of such lawsuits, controlling for other factors such as firm and industry characteristics. In contrast, salary and share ownership are insignificant, while bonuses are only marginally significant.

Given that "failure to disclose material information" and accounting violations are often cited in the lawsuits[4], we further investigate whether earnings manipulation, as measured by estimated discretionary accruals, is an important channel mediating this relationship. Our analysis shows that our earnings manipulation measure, and in particular that part of it that is induced by compensation, is highly significant in explaining fraud allegations.

Our results have important implications for the design of executive compensation contracts. The objective of such contracts is to maximize long-term shareholder value. Options (and to a lesser extent bonuses) in their current form seem to 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. Such self-dealing by executives may conflict with long-term shareholder value and can trigger shareholder class action lawsuits as well as SEC sanctions; and these outcomes are harmful in themselves in terms of legal fees, firm reputation and distracted management attention. At the very least, longer vesting periods and deferral of compensation may alleviate the problem: we find that vested options have the strongest association with class action lawsuits.

Our work also contributes to the evidence regarding the role of private securities litigation in identifying managerial fraud. Private class action litigation is an important disciplinary mechanism that distinguishes the U.S. capital markets from most others. While diffuse individual shareholders have no strong incentive to enforce good corporate governance, law firms have strong incentives to put together a class and sue on its behalf, since their fees can be a significant fraction of the damages recovered. However, it is widely felt that many such lawsuits are simply extortion devices triggered by any large share price drop, irrespective of its cause. We find that the incidence of private securities litigation is responsive to both managerial manipulation and the underlying incentives for it, a necessary condition for the effectiveness of class action litigation as a deterrent.

[4] "Stanford Security Clearinghouse found that 85 percent of the filings charge defendants with 10b-5 violations (i.e. affirmative fraud or failures to disclose material information) and more than 80 percent of the complaints cite misrepresentations in financial documents." Stanford Law School and Cornerstone Research (2003a)

What is new about our work is the focus on a direct empirical link between executives' incentive pay and shareholder litigation. The existing literature connects accounting manipulation to shareholder litigation; we investigate the fundamental compensation related incentives for such behavior and their impact on litigation risk. A series of recent papers separately examine the relationship between executive pay and earnings manipulation. Our paper bridges and contributes to these two lines of inquiry.

The paper is organized as follows. Section 2 reviews the legal background for shareholder class action lawsuits, and summarizes the relevant empirical literature. Section 3 describes the data. Section 4 presents the empirical analysis and results. Section 5 provides a concluding discussion.

2. Legal background and empirical literature

2.1 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[5]. 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 recent years. Since 1946 the federal

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

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"[6]: 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 written down in mandated SEC filings; it can include false press releases, silence in the face of a duty to update, and 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[7], 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. 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.

The remedies available to plaintiffs depend somewhat on the litigation strategy used.[8] In general, the formula used attempts to capture the damages sustained by the plaintiff; the goal of

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[6] 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).

[7] 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).

[8] 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 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 out-of-pocket damages calculated in a similar way.

liability is compensation, not punitive 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.

Since 1991 the federal limitations period for 10b-5 actions has been brought into line with that for other private actions explicitly authorized in SEA 1934 and SA 1933. The limitation period is one year: action must be brought within one year after discovery of the facts constituting the violation (or within one year after they could reasonably have been ascertained). The repose period is three years: the action must be commenced within three years of the violation.

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. Ways in which it has made such litigation more onerous are: a requirement that the lead plaintiff be the "most adequate plaintiff"[9], 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, since a landmark Supreme Court decision in 1994, the liability of "aiders and abettors", such as accountants who certify false financial statements and lawyers who advise on fraudulent schemes, has been severely curtailed.

Whilst discouraging baseless suits, these reforms also weaken the role of private securities class action as a complement to government actions in deterring securities fraud. But such deterrence is already compromised by the fact that generally the cases are settled out of court without admissions of guilt, because fraud charges are extremely difficult to prove; moreover, the settlements are largely paid out by the company itself and/or by D&O (directors and officers) insurers. Thus the executives involved generally escape jail time and even financial sanctions, though their reputation and career prospects do suffer.[10]

2.2 Empirical research

[9] Discouraging "professional plaintiffs" who hold tiny investments in many companies and lend their names to securities lawyers, in return for a fee, whenever there are stock price swings.

[10] Strahan (1998) finds that CEO turnover increases dramatically after class action filings.

Empirical research in law and economics has identified a number of predictors of shareholder litigation. The objective of our paper is to focus on the underlying incentives for the managerial actions that trigger allegations of manipulation and fraud in private securities litigation. The existing literature tends to start from measures of the manipulative behavior itself, as well as 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, Nelson and Pritchard (2002), who document that variables capturing aggressive accounting choices (such as *restatements*, *abnormal accruals*, and *sales growth*) are related to the risk of a class action. They find that the statistical relationship between such variables and the incidence of securities fraud litigation has become stronger since the Private Securities Litigation Reform Act of 1995, suggesting that suits have become more merit based. 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; it is also a significant predictor of the size of the settlement at the conclusion of such cases. DuCharme *et al.* (2003) limit their attention to firms issuing stock; they also find that abnormal accounting accruals are significantly positively related to subsequent litigation. Heninger (2001) finds a positive relation between income-increasing abnormal accruals and the incidence of lawsuits against firm auditors.

Insider trading provides a possible incentive to withhold or falsify information. Niehaus and Roth (1999) study insider selling in cases filed before PSLRA 1995 and find that during class periods top company insiders do not sell significantly more stock than they usually do. Johnson, Nelson and Pritchard (2002) confirm this finding for the pre-PSLRA 1995 period but find that post-PSLRA 1995 insider trading, as well as some governance variables such as *insider holdings*, have a significant impact on the likelihood of a class action suit (other governance variables - average tenure, outsider holdings, independence of outside directors - are not significant). Thus there are signs that PLSRA 1995 has had the intended effect of deterring frivolous litigation.

Clearly a precondition for launching a private lawsuit is that the amount of money at stake is large enough to support the costs of bringing a case. Not surprisingly, a substantial *decline in share price* is a significant trigger, as found by Alexander (1991), Jones and Weingram (1996a) and others. These papers also find that company size measures such as the value of *company assets*, the *size of a securities offering*, and/or share *turnover* are important determinants for similar reasons:

larger companies have more assets available for recovery of damages, and moreover shareholder damages are generally increasing in the number of shares traded at the allegedly misleading prices. Johnson, Nelson and Pritchard (2002) find that market capitalization and turnover continue to be significant lawsuit predictors in the period following PSLRA of 1995.

Some further general characteristics of firms targeted by private securities class actions have been identified in empirical work. Strahan (1998) finds that *low market-to-book* firms, firms with more *intangible assets*, *high risk* firms, *young* and *non-dividend-paying* firms as of the end of 1990 tend to have a higher risk of facing a class action. Regarding industry membership, Jones and Weingram (1996b) find that after controlling for stock price declines, in 1989-1992 high technology companies were not significantly more likely to be the targets of securities class actions than issuers in other industries; however, financial services firms were very much so.

We turn now to the empirical literature on the incentives for accounting manipulation and securities fraud. 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, though Gaver *et al.* (1995) argue that income-smoothing, possibly motivated by a desire to make the company appear less risky, better describes the data.

More recent work includes equity-based compensation among the determinants of accounting manipulation. Both Bergstresser and Philippon (2002) and Gao and Shrieves (2002) 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 (2003) 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; moreover, these earnings manipulation indicators are correlated with insider stock sales in the next year. And Beneish and Vargus (2002) find that insider selling (buying) is associated with income-increasing accruals that are subsequently reversed (persistent), suggesting opportunistic earnings management.

Some papers focus on egregious earnings manipulation, as identified by SEC accounting enforcement actions or accounting restatements, rather than estimates of discretionary accruals.

Johnson, Ryan and Tian (2003) find that equity-based compensation and the proportion of vested options exercised are significantly higher in 43 firms committing fraud (as indicated by SEC actions) during 1992-2001 than in a matched control sample. Erickson, Hanlon and Maydew (2003) confirm that this link remains after controlling for the endogeneity 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 (2003) focus on accounting restatements and find that executive option holdings, but not equity holdings, strongly predict announcements of such restatements in the subsequent 2 to 5 years. Richardson, Tuna and Wu (2003) also document that executives at restating firms have more equity-based compensation, without distinguishing between options and straight equity.

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): favorable news seems to be delayed until after the strike prices have been determined, as evidenced by higher post-grant returns. Similarly, Baker *et al.* (2003) document income-decreasing earnings management for firm with earnings announcements preceding option grant dates. In term of insider selling, 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.

3. 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 2507 companies that are (or were) members of the S&P 1500 starting from fiscal year 1992.

3.1. Class action lawsuits

We use the Stanford Securities Class Action Clearinghouse[11] to identify class action lawsuits filed between 1996 and 2002. We extract the company name, exchange ticker symbol, lawsuit filing date, class period (this term denotes the period during which the fraudulent activities

[11] http://securities.stanford.edu.

are alleged to have taken place in the first complaint filed against the company), and the case summary. There are a total of 1659 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 1473 cases involving listed firms.

We do not consider the outturn of cases or the final settlement amounts in our study.[12] Because cases take years to resolve, if we focus on cases with known outcomes our post-PSLRA 1995 sample would be small, as well as biased towards the types of cases that are resolved quickly. Moreover, most cases are settled out of court, so that any subsample focusing on known court decisions would be very small and slanted towards a few extreme cases.

We next match our lawsuit firms by ticker symbol and date with the Compustat ExecuComp database. Of the 1473 cases remaining, only 488 have executive compensation data available through ExecuComp. This dramatic 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 violations 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

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[12] Regarding settlements, Cornerstone Research (2003b) gives descriptive statistics on the size of settlements for 400 cases filed after PSLRA 1995 and settled by December 2002. Median settlements are about 4.4% of estimated damages (the percentage declines as estimated damages increase, from 10.2% for cases under $50 million to 2.0% of cases with estimated damages above $1 billion). The median settlement is on average almost 50% higher in cases involving institutional investors as lead plaintiffs; it is also substantially higher in cases accompanied by derivative actions (on behalf of the issuer company, against officers and directors or outside third parties, with similar allegations to the class action), in cases accompanied by an SEC action (a litigation release or an administrative proceeding), and in cases involving accounting allegations (especially those with restatements or with accountants as named defendants) or insider trading allegations. Both settlement values and estimated damages have increased over the 1997-2002 period, but settlements as a proportion of estimated damages have declined from around 5% to 2-3%.

[13] A keyword search where there is at least one match from both of the following two categories: 1. (artificial, conceal, cook, deceiv, 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.

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 more specific 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; 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[14].

Table 1 shows that there has been a generally increasing trend in the number of class action lawsuits filed against ExecuComp (S&P 1500) companies each year, from 23 cases in 1996 to 109 cases in 2002. Table 2 summarizes the time line of lawsuits. The median lawsuit in our sample has a class period of 274 days, and the median number of days from the starting date of the class period to the date when the lawsuit is filed is 381 days. This 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 3 summarizes the industry distribution of lawsuits filed in the period 1996-2002. Here we adopt French's 12 industry classification[15] based on the 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

[14] 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] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

firms in the industry (11% of the lawsuits in our sample come from this industry). "Utilities", "shops" (including wholesale, retail and some services), "other: industry" ("everything else": mines, construction, building materials, transport, hotels, business services, entertainment) and "finance" are moderately lawsuit-prone (15-20% incidence within the industry); as these industries are fairly numerous, they each account for roughly 10% of the filings in our sample. Lawsuits are least common in the "energy", "chemicals", "manufacturing" and "durables" industries over this period.

To match the class action periods with incentive and earnings management 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. Table 4 describes the number of firms in a class period (a period about which allegations are filed) for each fiscal year[16]. From Table 4 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 and cases filed any later are likely to be dismissed. Given that the lawsuit filing data in our sample start in 1996 and the average number of days between the lawsuit filing date and the start date of the class period is 471, we choose to focus our study on observations where the class periods are between fiscal years 1994 and 2001. For all firms in the ExecuComp database, and for each fiscal year between 1994 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).[17] The full sample average of *CLASSYEAR* is 4.7%.

3.2 Executive compensation and incentive measures

Our measures of incentives for company executives are constructed using the Compustat Executive Compensation (ExecuComp) database. This database contains compensation information for the five most highly paid executives for 2507 companies that are (were) members of the S&P 1500 starting fiscal year 1992. To capture the incentives for the top executives, we look at the aggregate compensation of the top five managers, not just the CEO. 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

[16] Firms may not have the same fiscal year period. Among the 2507 companies in the Compustat ExecuComp database, around 70% have a December fiscal year end. The rest of companies have fiscal year end month scattered across January to November. We believe that the difference in the fiscal year end month do not affect our results materially.

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

compensation-related incentives. Another reason we choose 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.

The compensation and incentive variables we use are the following: salary, bonuses, share ownership, and incentives from options. *SALARY* and *BONUS* capture the cash component of executive pay. Larger bonus relative to salary indicates that executive pay is more sensitive to performance as measured by various accounting yardsticks. We focus on the dollar amount of *SALARY* and *BONUS* in the paper. We also considered two alternative measures of salary and bonus in our analysis, scaling them by total cash compensation and by the market value of the company. They all yield similar results.

The share ownership variable (*SHAREOWN*) is the percentage of total shares outstanding owned by the top five executives. On the one hand, higher share ownership alleviates agency problems by aligning the incentives of executives with shareholder value maximization. On the other hand higher share ownership, because it increases the sensitivity of executive wealth to the share price, may create incentives to manipulate short-term stock prices.[18]

Our proxies for option incentives are based on four ExecuComp variables, all measured at the end of the fiscal year: the number of vested options, the number of unvested options, the number of options exercised and the number of options granted. ExecuComp does not provide complete information about the exact features of executives' option portfolios; in order to capture as completely as possible the incentive effects of options, we include all the available relevant option-related variables separately in our analysis. The number of vested and unvested options captures the average effect of all previous option grants. The number of newly granted options and the number of options exercised capture any additional effects of recent grants or exercise behavior. Ideally, we would like to measure the option-related incentives as the sensitivity of executive option-related pay to changes in firm value[19]:

[18] Such behavior could be associated with insider stock sales around times when stock prices are ramped up, and possibly stock awards to management at times when stock is undervalued.

[19] We also checked the robustness of our results using alternative measures of option related incentives.

First, we attempted to proxy the elasticity of option related pay with respect to the share price:

$$\frac{\Delta \text{ option related pay}}{\Delta \text{ firm value}} \tag{1}$$

which can be expressed as:

$$\frac{\text{number of options}}{\text{total number of shares outstanding}} * \text{option delta} \tag{2}$$

ExecuComp does not provide the information needed to compute the executives' portfolio option delta; and we do not attempt to do so.[20] The sensitivity of executives' option-related pay to changes in firm value is proxied by the number of options (i.e. the number of shares involved) as a percentage of the total number of shares outstanding. This creates four variables denoted as *OPTVESTED* (exercisable or vested options), *OPTUNVESTED* (unexercisable or unvested options), *OPTEXERCISE* (options exercised) and *OPTGRANT* (options granted). Our ratio variables are only appropriate measures of the sensitivity of executive pay to firm value to the extent that the option delta within each of the four items does not vary too much, either cross-sectionally or over time. In this respect the new option grants (*OPTGRANT*) are likely to be a less noisy proxy than the other variables, because they are more likely to be close to at-the-money, and to have similar maturities, so that there is less cross-sectional variation in the option deltas.

Table 5 Panel A describes firm characteristics and incentive variables. The original distributions of these variables are highly positively skewed and have high kurtosis. We windsorize the variables so that the observations with values greater than the 99th percentile are set to the 99th percentile value. A median firm in our sample has a market capitalization of $806 million, a book to market ratio of 0.46, and a leverage ratio of 0.21. The median compensation variables for the top five executives added together are: salary, $1,309,000; bonus, $465,000; shareholding, 0.70% of the

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$\frac{\Delta \text{ option related pay} \,/\, \text{total compensation}}{\Delta \text{ firm value} \,/\, \text{firm value}}$, which can also be expressed as

$\frac{\text{number of options*stock price}}{\text{total compensation}} * \text{option delta}$

That is, we rescaled the number of vested, unvested, exercised and granted options by multiplying by the stock price and dividing by the total compensation. Again, this measure is only valid to the extent that the option delta does not vary drastically cross-sectionally. Since the value of executive option portfolios is impossible to measure using the available data, we use the total cash compensation to proxy for total compensation. We obtain similar results in our analysis with this alternative measure of option related incentives.

Second, Baker and Hall (1998) argue that in many situations the best measure of compensation-related incentives is not the $ for $ sensitivity of executive pay to firm value, but the $ change in executive pay per % change in firm value, which can be written as: number of options*stock price * option delta . Again, our results are insensitive to the use of this alternative measure (with, again, delta held constant).

[20] See Core and Guay (2002) for an approximation method.

total shares outstanding (the 75th percentile is 3.7%); vested options, 0.64% of the total (75th percentile: 1.6%); and unvested options, 0.59% (75th percentile: 1.5%). The median number of options exercised each year by the top five executives is a small 0.015% of shares outstanding (75th percentile: 0.19%), and the median number of options granted to them each year is 0.31% (75th percentile: 0.86%).

3.3 Aggressive accounting proxies

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, Welch and Wong (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. 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 accruals (involving long-term assets such as depreciation, deferred taxes, etc.).

Teoh *et al.*'s (1998a) method of measuring discretionary accruals essentially applies a modification of the Jones (1991) model in a cross-sectional context: for each industry and fiscal year, accrual measures are regressed on explanatory variables representing firm conditions, and in particular, on sales growth. The discretionary and non-discretionary components are then constructed using the coefficient estimates: the nondiscretionary accruals are the fitted accruals, after adjusting sales growth for accounts receivable; the remainder is the discretionary component. The details of this procedure are described in Appendix 1. We use discretionary current accruals (*DCA*), discretionary total accruals (*DTAC*) and their absolute values |*DCA*| and |*DTAC*| as measures of earnings management.

Table 5 Panel B summarizes the accrual measures. The original distributions of the accrual measures have large values of kurtosis because accruals are scaled by total firm assets at the beginning of the fiscal year: small values of total assets can lead to extreme values of accrual measures. To ensure that our results are not influenced by these outliers, we winsorize *CA, DCA, TAC* and *DTAC* at the 1st and the 99th percentiles. The median value of current accruals as a fraction of total firm assets is 0.01, and 0 for its discretionary component. For total accruals, the median

value is –0.05, and 0.02 for the discretionary component. There are large variations in the accrual measures, reflected in the large standard deviations[21]. The absolute values of the accrual variables have medians in the 0.04 to 0.08 range.

3.4 Controls

To control for other economic factors that are not captured by incentive or accrual variables but that may influence the probability of litigation, we use the following variables: firm size, book to market, leverage, volatility, industry, and year. *SIZE* is the logarithm of the market capitalization of the firm, *BM* is the ratio of book value of equity to market capitalization. *LEVERAGE* is the ratio of total debt to total assets.[22] *VOLATILITY* is the standard deviation of daily stock returns for the fiscal year, annualized assuming 252 trading days per year. We divide our firms into 12 industries based on Kenneth French's SIC-based classification scheme.[23]

4. Analysis and results

4.1 Relationship of incentive compensation and lawsuits

We are interested in whether the incentives provided in executive compensation contracts give rise to managerial self-dealing that ultimately triggers class action litigation. Our focus in this paper is the behavior of managers and their underlying incentives, not that of class action lawyers or plaintiffs. We do not attempt to predict the date when a class action lawsuit will be filed; instead, we focus on predicting whether any particular year includes (any part of) a class period for a subsequent lawsuit.[24] This approach precludes the use of post-class period variables, and in particular subsequent stock price drops, as explanatory variables: even though a substantial stock price drop is an excellent predictor of a class action filing, such is a drop is to some extent a consequence, not a cause, of securities laws violations.

For each firm and each fiscal year 1994-2001, 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 compensation and control variables. The relationship we estimate is the following:

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[21] For *DTAC* and *DCA*, part of the noise comes from estimation error in that these two variables are residuals from accrual regressions.
[22] Calculated as [short-term debt (Compustat item 34) + long-term debt (Item 9)] / total assets.
[23] Our results are not sensitive to the exclusion of the finance industry.
[24] As a practical matter, the period of delay between any fraudulent activity and the date of its discovery and the filing of a lawsuit is inherently variable.

$$\text{Prob}(CLASSYEAR_t) = F[SHAREOWN_{t-1}, SALARY_{t-1}, BONUS_{t-1}, OPTVESTED_{t-1}, OPTUNVESTED_{t-1}, OPTEXERCISE_t, OPTGRANT_{t-1}, SIZE_{t-1}, LEVERAGE_{t-1}, BM_{t-1}, VOLATILITY_{t-1}, \text{Industry dummies, Year dummies}] \quad (3)$$

Note that we use lagged executive compensation variables for the previous year to capture the *ex-ante* incentives for managerial activity that may result in litigation. In contrast, we use the options exercised for the same year, as it captures the potential payoff from contemporaneous deceptive activities.

We estimate a pooled Probit regression using maximum likelihood, with Huber/White/sandwich robust standard errors allowing for heteroskedasticity and firm level serial correlation. The resulting coefficient estimates and t-statistics are given in Table 6. Given that the simple coefficient estimates for Probit models do not directly 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.[25]

The regression analysis finds clear differences in the impact of the various components of executive pay. *SALARY* is insignificant, as expected: the amount is fixed (and, moreover, lagged one year), so that it should not provide an incentive for any activities that invite litigation. Managers' ownership of company stock *SHAREOWN* has no significant effect on lawsuit incidence. Long-term share ownership aligns managements' and shareholders' interests, discouraging manipulative behavior. But to the extent that shares can be sold in the short term, share ownership might provide incentives for stock price manipulation.

The impact of *BONUS* on the class-year probability is positive but insignificant. 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 accounting yardsticks of performance, and this sensitivity would be likely to persist into future years. Thus managers are given an incentive to boost firm performance, real or fictional, in the subsequent year. However, we do not find such an effect to be significant.

The number of vested options relative to total shares outstanding (*OPTVESTED*) is significant and quantitatively important. A change from minus to plus one standard deviation

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

around the mean of *OPTVESTED* (1.5% of total shares outstanding) induces a 0.9%-point increase in the class-year probability for the following year. This suggests that the more exercisable options managers have, the more incentive they have to manipulate the firm's stock price in the short run, thus triggering litigation.

The second significant option-related compensation variable in our regression is *OPTGRANT*, the number of options granted relative to total shares outstanding in year *t-1*. A change from minus one standard deviation to plus one standard deviation around the mean of *OPTGRANT* increases the class year probability by 0.7%-point. There are several reasons why *OPTGRANT* could increase the *CLASSYEAR* probability. First, even though most of these newly granted options do not vest immediately in the following year, some accounting tricks may be used to set the stage for an inflated stock price in later years, for example by the use of a "big bath" or "cookie jar reserves" to enhance earnings down the road and create the appearance of a high-growth business, as described in Section 4.2 below. Second, there is an incentive to manipulate share prices downward around the time when options are granted, as the exercise price is generally set at the current fair market value of the stock; such manipulation may either persist or rebound in the following year. Indeed self-dealing behavior in accounting and the timing of disclosures around option grants has been documented by Yermack (1997), Aboody and Kasznik (2000) and Baker *et al*. (2003). Third, even though *OPTGRANT* is just a subset of *OPTUNVESTED* (newly granted options typically have a vesting period of three years or longer), there is reason to expect it to have additional predictive power. As mentioned earlier in the data description, *OPTVESTED* and *OPTUNVESTED* are noisy measures of the performance sensitivity of executive pay coming from option portfolios. Newly granted options are more likely to be closer to the strike price than old options since executive options are usually granted at the money. The delta for an at-the-money option only depends on its return volatility, its time to maturity and the interest rate. As a result, there is less cross-sectional variation in delta for newly granted options after controlling for industry, size and book to market. Consequently, *OPTGRANT* is a less noisy measure of the sensitivity of executive option-related pay to underlying firm value compared to both *OPTVESTED* and *OPTUNVESTED.*

The number of unvested options relative to total shares outstanding (*OPTUNVESTED*) is positive but insignificant when industry and year controls are included. This could be because the impact of *OPTUNVESTED* is loaded onto the *OPTGRANT* variable, as we explain above.

Alternatively, the payoff from unvested options is often quite distant, though it should be noted that some of the options that have not yet vested at the close of the previous fiscal year may become vested in the course of the year of inquiry.

We also include the current-year exercise of options in our analysis. *OPTEXERCISE* is the number of options exercised relative to total shares outstanding in year *t*; this variable is insignificant, possibly because its impact is subsumed by that of *OPTVESTED*.

Of the control variables, *SIZE* (the log of market value), *LEVERAGE* and *VOLATILITY* are all significant. *BM* (the book to market ratio) is marginally significant. *SIZE* is highly significant and positive: 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 4.7%-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. This result is consistent with the literature: Alexander (1991), Jones and Weingram (1996a and b) and Strahan (1998) all find a strong positive relationship between firm size and litigation risk. The coefficient of *VOLATILITY* is also positive and very significant: the corresponding change in the class-year probability is 2.8%-points. More volatile firms are more likely to experience a large price drop, ensuring that potential damages are large enough to sustain the cost of bringing a suit. *LEVERAGE* is again significantly positive, agreeing with Strahan's (1998) findings. A minus one standard deviation to plus one standard deviation change increases the probability of litigation by 1.3%-point. There are at least two possible reasons why high leverage is associated with high litigation risk: it may be associated with higher future operating risk, and thus a higher probability of a large price drop; and it may simply indicate a recent history of poor performance, asset write-downs or forced heavy borrowing, fueling shareholder dissatisfaction. Lastly, *BM* is weakly negative: a change from minus one standard deviation to plus one standard deviation around the mean of *BM* results in a 0.8%-point decrease in the class year probability, possibly indicating that high growth firms, or firms with more intangible assets, are easier to manipulate and hence more likely to be sued. In contrast, the only paper in the literature that also examines *BM*, Strahan (1998), finds that firms with high book-to-market ratios in 1990 are more likely to be sued in 1991 to 1998; he views a low q as a sign of mismanagement, which can induce shareholder lawsuits.

Industry and year dummies add additional explanatory power to the regression. All coefficients for industry dummies are relative to the industry 12 (everything else). Industries 3 (manufacturing), 4 (energy) and 5 (chemicals) have lower probability of litigation[26]. Surprisingly, the three industries that have the highest lawsuit incidence in Table 3 - industries 6 (computers, software, etc.), 7 (telecommunications) and 10 (healthcare) – do not have a significantly higher probability of litigation in our regression; inclusion of the *VOLATILITY* variable in our regression captures these industries' effects. Our result thus agrees with Jones and Weingram (1996b), who find that, controlling for price drops, Silicon Valley is not unusually litigation-prone. We also document a generally increasing trend of litigation probability since 1994, the base year. This period seems to coincide with the stock market bubble period: as the bubble gets bigger, there is more activity going on within firms that is the focus of subsequent litigation. These activities seem to fall off after fiscal year 2000, the year in which the bubble burst; though the decline for 2001 could simply be an indication that more lawsuits relating to that period have yet to be filed.

To summarize our analysis of the relationship between executive compensation and subsequent shareholder lawsuits, we find that firms whose executives hold more vested options and receive more new option grants are more likely to be the subject of a complaint alleging securities fraud in subsequent class action litigation.

4.2 Earnings manipulation and lawsuits

A natural next question to ask is through what channel incentive-based executive pay is related to securities lawsuits. When compensation is sensitive to the short-run stock price or to accounting performance, there is scope for managerial self-dealing via a wide range of deceptive disclosures. Managers can influence the stock price by manipulating or even falsifying accounting earnings, sales, or other yardsticks. There is also scope for non-accounting related misrepresentations, for example overoptimistic projections, product hype, failure to disclose problems in accessing debt capital, *etc*. We choose to focus on earnings manipulation for a number of reasons. First, there are established measures of earnings manipulation in the literature, while non-accounting violations are often hard to quantify. Second, violations of accounting principles are often cited in the plaintiffs' complaints in securities class action lawsuits. In addition, earnings

[26] Note that our sample only includes lawsuits filed during 1996 - 2002, with class periods in 1994 - 2001. The industry characteristics of lawsuits may be specific to this period.

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.

Table 7 provides a first look at the relationship between litigation and earnings manipulation, comparing abnormal or "discretionary" accrual activity in class and non-class firm-years. The median values of both the raw accruals (*TAC* and *CA*) and the discretionary accrual measures (*DTAC* and *DCA*) are quite similar in class and non-class firm-years. However, they are considerably more variable in class years, as reflected in the standard deviation and quartile analysis. Thus there is an unusual amount of accrual activity in class firm-years; but since it can be both negative and positive, the average level is not much affected. This is reflected in the averages of the absolute value of accruals in Table 7: for all four measures, and in particular for the discretionary components, the mean and median absolute value is higher in class-years.

The statistical model we use to investigate the relation between earnings manipulation and private litigation alleging that securities violations occurred in the same year is:

$$\text{Prob}(CLASSYEAR_t) = F[Earnings\ manipulation_t, SIZE_{t-1}, BM_{t-1}, LEVERAGE_{t-1}, VOLATILITY_{t-1}, Industry\ dummies, Year\ dummies] \quad (4)$$

where the measure of earnings manipulation is *DCA*, *DTAC*, |*DCA*| or |*DTAC*| respectively.

The results are given in Table 8. |*DCA*| is highly significant and positive, indicating that the absolute magnitude of discretionary current accruals is significantly higher in the alleged firm-years than the non-alleged firm-years. The economic impact computed in the last column of the table shows that a change from minus one standard deviation to one plus standard deviation around the mean of |*DCA*| is associated with a 0.9%-point increase in the class year probability in the same period, that is, a 20% increase in the 4.5% average probability over the whole sample.

That |*DCA*| is significantly associated with litigation class periods, but the other earnings manipulation measures are not, raises two important issues. One is the differential impact of current and long-run accruals. The other is the role of income-increasing and income-decreasing manipulation in inducing litigation. We discuss each issue in turn.

Regarding current versus total accruals, Kreutzfeldt and Wallace (1986) and Guenther (1994) have argued that managers have greater discretion over current accruals than over long-term

accruals. 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. In our empirical work *DTAC* and |*DTAC*|, which include both current and long-term discretionary accruals, are not significantly related to private securities litigation, as reported in Table 8. This suggests that although there is significant manipulation in current items during class periods, that is not so for long-term items. Indeed, most studies that investigate abnormal accruals and litigation risk, such as DuCharme *et al.* (2003), Lu (2003) and Johnson, Nelson and Pritchard (2002), focus on current accruals only, and find that discretionary current accruals are significantly associated with litigation risk. Accordingly, in the remainder of this paper we will focus on discretionary current accruals as our measure of earnings manipulation.

A striking feature of our results is that the signed measure of discretionary current accruals (*DCA*) is not significant whereas its absolute value |*DCA*| is. This suggests that although there is evidence of more active manipulation of current accruals during class period years, it can be both upward and downward, in accordance with the descriptive statistics in Table 7. Now upward manipulation is of particular benefit to company insiders in IPO situations; our study excludes IPOs while Lu (2003) and Johnson, Nelson and Pritchard (2002) do not, and DuCharme *et al.* (2003) actually restrict their attention to IPOs and seasoned offerings. It is known that IPOs induce upward earnings manipulation from the work of Teoh *et al.* (1998b). This may explain why studies find a significant impact of upward manipulation while we do not. Furthermore, in practice downward manipulation is not uncommon. A typical example is an excessively conservative "big bath" restructuring charge designed to create a cushion of undervalued resources for increasing future income and creating the appearance of high growth. Similarly, unrealistically pessimistic estimates of liabilities (loan losses, warranty costs, etc.) can be used to create "cookie jar reserves", reducing earnings during good years in return for future earnings enhancement. Mulford and Comiskey's (2002, p.144) survey of earnings management techniques observed by financial professionals cites these two techniques in 17% of reported cases. Other practices involve excessive one-time writeoffs in the context of acquisitions, and overly conservative forecasts (where companies set themselves very undemanding targets, in order to ensure that they meet them later on). Thus in the remainder of our analysis we will restrict our attention to the absolute value of discretionary current accruals.

4.3 Executive compensation and earnings manipulation

In this section, we investigate the empirical link between executive pay variables and $|DCA|$, addressing the hypothesis that executive pay gives incentives for earnings manipulation. This issue has been investigated by Bergstresser and Philippon (2002) and Gao and Shrieves (2002). Our work in this section is mainly directed towards decomposing our earnings manipulation variable into two parts, one that is and one that is not attributable to executive pay factors. These will be used as inputs into a further investigation of the determinants of private securities litigation.

As mentioned above, in our analysis we will focus on the absolute value of accruals as the measure of manipulation; Bergstresser and Philippon (2002) and Gao and Shrieves (2002) also focus on this measure. While at first sight one would expect options and bonuses to give incentives only for upward manipulation,[27] there are circumstances in which the opposite may be true. A case in point is the period preceding the granting of options, when downward manipulation of the stock price can secure a more favorable strike price. There is evidence of self-dealing behavior in earnings management and the timing of disclosures around option grants (Yermack, 1997, Aboody and Kasznik, 2000 and Baker *et al.*, 2003), with favorable news delayed until after the strike prices have been determined. Another example debated in empirical work is the shifting of earnings to future years whenever bonuses are at their maximum (Healy, 1985, Holthausen *et al.*, 1995, and Gaver *et al.*, 1995).

Our estimation equation for the impact of executive compensation on earnings manipulation is given by:

$$|DCA_t| = a + b_1 \cdot SHAREOWN_{t-1} + b_2 \cdot SALARY_{t-1} + b_3 \cdot BONUS_{t-1} + b_4 \cdot OPTVESTED_{t-1} + b_5 \cdot OPTUNVESTED_{t-1} + b_6 \cdot OPTEXERCISE_t + b_7 \cdot OPTGRANT_{t-1} + b_8 \cdot SIZE_{t-1} + b_9 \cdot BM_{t-1} + b_{10} \cdot LEVERAGE_{t-1} + VOLATILITY_{t-1} + \Sigma c_k \cdot Industry_k + \Sigma d_m \cdot Year_m \quad (5)$$

Table 9 reports the regression estimates. *SALARY* is significantly negative, as in Gao and Shrieves (2002); possibly because high base pay reduces the marginal utility relative to the cost of manipulation, or else because the salary level acts as an additional proxy for firm size beyond

[27] For example, stock option exercise decisions seem to anticipate subsequent returns (Huddart and Lang, 2003), suggesting that the disclosure of unfavorable information is delayed until after options are exercised (and the stock presumably sold).

market value.[28] The *BONUS* and *SHAREOWN* variables are positive but statistically insignificant even though they reflect pay-performance sensitivity and potential incentives for manipulation.

OPTEXERCISE is significantly positive, reflecting a strong positive relationship of earnings manipulation and the executives' payoff from exercising options in the same period. Huddart and Lang (2003) find that employees tend to exercise options in advance of low short-term stock returns; our results suggest that deliberate manipulation may be a contributing factor. *OPTGRANT* is also significantly positive, consistent with the work of Yermack (1997), Aboody and Kasznick (2000) and Baker *et al*. (2003) suggesting manipulation around the time of option grants. The variables that proxy for the average sensitivity of executives' option portfolios, *OPTVESTED* and *OPTUNVESTED,* are not statistically significant. The discussion of the relative impacts of *OPTGRANT*, *OPTVESTED* and *OPTUNVESTED* in Section 4.1 is again applicable here. Our results are broadly consistent with the findings of Gao and Shrieves (2001) and Burns and Kedia (2003), who find an impact from option awards but not from stock holdings. Bergstresser and Phillippon (2002) and Johnson Ryan and Tian (2003) also find that the equity-based incentives, without distinguishing between stocks and options, are related to earnings manipulation. In addition, those papers that examine concurrent option exercise behavior all find, as we do, that earnings manipulation is associated with unusually high levels of options exercise; see Bergstresser and Philippon (2002) and Johnson, Ryan and Tian (2003).

The results in Table 9 show that incentive variables, together with other control variables, explain 15% of the variation in the magnitude of discretionary current accruals. This explanatory power is quite large, especially given that the dependant variable |*DCA*| is estimated from regressions (see appendix for details) and thus is measured with error, imparting a downward bias to the R squared and the t statistics.

Tables 7 and 8 showed that earnings manipulation (as measured by the absolute value of discretionary current accruals) is associated with the incidence of securities class action; and Table 9 finds a link between executive compensation and earnings manipulation. A natural question for further investigation is: does all earnings manipulation trigger litigation, or is it in particular manipulation driven by executive pay incentives that triggers litigation? To do this, we first

[28] *SIZE* and *BM* are significantly negative, capturing the well-established fact that there is less earnings manipulation in large firms and in value firms.

decompose earnings manipulation into a component that is wholly attributable to previous-year executive compensation, and a remaining component:

$$|DCA_t| = |DCA_t|^p + |DCA_t|^e \quad (6)$$

where

$$|DCA_t|^p = b_1 \cdot SHAREOWN_{t-1} + b_2 \cdot SALARY_{t-1} + b_3 \cdot BONUS_{t-1} + b_4 \cdot OPTVESTED_{t-1} + b_5 \cdot OPTUNVESTED_{t-1} + b_6 \cdot OPTEXERCISE_t + b_7 \cdot OPTGRANT_{t-1};$$

$$|DCA_t|^e = |DCA_t| - |DCA_t|^p;$$

and b_4 through b_9 are estimated from equation (5), and reported in the last column of Table 9. The mean values for $|DCA_t|^p$ and $|DCA_t|^e$ are 0.0007 and 0.0777, the standard deviations are 0.0139 and 0.099, respectively.

Then we run the following Probit analysis:

$$\text{Prob}(CLASSYEAR_t) = F[|DCA_t|^p, |DCA_t|^e, SIZE_{t-1}, BM_{t-1}, LEVERAGE_{t-1}, VOLATILITY_{t-1}, \textit{Industry dummies, Year dummies}] \quad (7)$$

Table 10 summarizes the results. Model 3 corresponds to equation (7). Model 1 and 2 are restricted versions of (7) where the coefficient of either $|DCA|^e$ or $|DCA|^p$ is set to zero. Comparing the general fit of models 1 and 2, the executive compensation related $|DCA|^p$ explains more about the incidence of a class period than $|DCA|^e$, since model 1 has a slightly higher pseudo R-squared, and a higher log likelihood. In model 3, both $|DCA|^p$ and $|DCA|^e$ are both significantly positive at the 1% level. However, $|DCA|^p$ is both economically more important and statistically more significant than $|DCA|^e$: the coefficient estimate for $|DCA|^p$ is more than ten times that of the $|DCA|^e$, and the t-statistic for $|DCA|^p$ is 3.61, compared to 3.42 for $|DCA|^e$. We can also compute the marginal effects and analyze the economic significance of the two components. For a change from minus one standard deviation to plus one standard deviation around the mean of the earnings manipulation measure attributable to compensation, the probability of litigation increases by 1.0%-point, while if the earnings manipulation is not compensation related, the probability only increases by 0.8%-point. Note that the standard deviation for $|DCA|^p$ is only about 1/8 of that of $|DCA|^e$.

Interpreting our results, we find, first of all, that accounting manipulation that is linked to executive compensation, and therefore to incentives for self-dealing by executives, is a considerably better predictor of lawsuit incidence than manipulation for which we cannot find such a link. A

possible explanation is that cases of manipulation where there is a clear personal gain for the top executives are easier to prosecute successfully and therefore more attractive targets for potential plaintiffs. But secondly, manipulation that we could not link to compensation incentives is also significant. In principle, there are two possible reasons for this. Either, due to data imperfections, we did not perfectly capture the compensation-related incentives for manipulation. Or else, executives really do manipulate earnings for reasons other than compensation-related personal gain. For example, earnings management may be used to give a more realistic picture of long-term prospects, to secure credit on better terms, to discourage market entry by competitors, *etc*.

4.4 Incentives, earnings manipulation and litigation

The next issue to be addressed is whether earnings manipulation is the only channel through which executive compensation impacts subsequent litigation. The securities laws apply to false and misleading statements in general, not just to accounting violations. There are many forms of misinformation (overoptimistic projections, product hype, failure to disclose problems securing new debt capital, misleading remarks to analysts or investors, *etc*.) that are not directly accounting-related. Thus many securities lawsuits could well be unrelated to accounting violations. In addition, the estimated variable we used to capture aggressive accounting is quite noisy and imperfect. Therefore a direct statistical relationship between compensation and litigation, over and above that mediated by observable aggressive accounting variables, is not excluded.

The model we estimate is:

$$\text{Prob}(CLASSYEAR_t) = F[SHAREOWN_{t-1}, SALARY_{t-1}, BONUS_{t-1}, OPTVESTED_{t-1}, OPTUNVESTED_{t-1}, OPTEXERCISE_t, OPTGRANT_{t-1}, |DCA_t|, SIZE_{t-1}, BM_{t-1}, LEVERAGE_{t-1}, , VOLATILITY_{t-1}, \textit{Industry dummies, Year dummies}] \quad (8)$$

Table 11 summarizes the results. Model 3 corresponds to equation (8). Model 1 and 2 are restricted versions of (8) where the coefficient of either the compensation variables or of $|DCA|$ are set to zero. In order to compare results consistently across these three models, we only include the 10947 observations where all variables in equation (8) are not missing.

Comparing the general fit of models 1 and model 2, we see that the executive compensation variables are better predictors of *CLASSYEAR* than earnings manipulation measures. This is not surprising, given that our earnings manipulation measures are noisy and moreover, as we saw from

Table 10, compensation-driven manipulation is a dominant force in explaining securities class action litigation. However, likelihood ratio tests reject both restricted models in favor of the full regression, model 3. In that model, the compensation variables $OPTVESTED_{t-1}$ and $OPTUNVESTED_{t-1}$ and the earnings manipulation measure $|DCA_t|$ are significant and positive. That model 1 is rejected suggests that either (1) the incentives from executive compensation contracts may prompt non-accounting related deception or securities fraud that is also important in predicting lawsuits, or (2) our earnings manipulation measure $|DCA_t|$ is very noisy and does not adequately capture all accounting manipulations, or both. That model 2 is rejected suggests that there are motives for accounting manipulation that triggers lawsuits that we do not capture with our compensation variables.

5. Conclusion

Our paper finds that there is a significant relationship between executive compensation and shareholder class action litigation, and that this relationship is to some extent mediated by manipulative accounting practices. We find that incentive pay in the form of options significantly increases the probability of a shareholder class action lawsuit making allegations about the firm's activities in the subsequent year, controlling for a wide range of other firm characteristics. In contrast, base pay levels and executive share ownership do not have a significant impact on lawsuit incidence.

We further examine whether earnings manipulation, as measured by estimated discretionary current accruals, is an important channel for this phenomenon. Incentive pay does have a significant impact on our measure of earnings manipulation, which in turn significantly affects the probability of litigation. However, this mechanism does not account for the full impact of compensation on litigation, suggesting that other channels may also be important. Conversely, we also document that some litigation is associated with earnings manipulation activity that does not seem to be directly related to managers' compensation contracts.

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 by, for example, manipulating earnings, and that such misbehavior ultimately triggers shareholder class action lawsuits. A natural conclusion is that incentive compensation contracts should focus more on long-

term incentives. The optimal design of such contracts is an important direction for economic research.

In addition, our results are relevant to the current policy debate on how to make private securities litigation a more effective deterrence mechanism. We find that such litigation is triggered by both managerial self-dealing and the underlying incentives for it, a necessary condition for an effective disciplinary role. But there is widespread 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 investors and D&O insurers.

In terms of avenues for further research, constructing and incorporating alternative measures of the sensitivity of executive pay to performance would be potentially rewarding. Similarly, a broad array of alternative indicators of securities violations and their relation to executive compensation are worth investigating.

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Appendix 1: Construction of earnings manipulation measures

The method used to estimate discretionary accruals follows Teoh *et al.* (1998a), a cross-sectional adaptation of a modified Jones model. All numbering of items refers to the Compustat data item numbers).

Current accrual (or working capital accruals):

$$CA = \Delta[\text{current assets (data item 4)} - \text{cash (data item 1)}]$$
$$- \Delta[\text{current liabilities (data item 5)} - \text{current maturity of long term debt (data item 44)}]$$

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

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

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

$$DCA_{i,t} = \frac{CA_{it}}{TA_{i,t-1}} - NDCA_{i,t}$$

where *TA* is total assets (data item 6), Δ*SALES* is the change in sales (data item 12), and Δ*TR* is the change in trade receivables (data item 151).

Total accruals:

TAC = *CA*+*LA* (long term accruals) = Net Income (172)- Cash Flow from Operations (308)

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

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

$$NDTAC_{i,t} = \hat{b}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{b}_1\left(\frac{\Delta SALES_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}}\right) + \hat{b}_2\left(\frac{PPE_{i,t}}{TA_{i,t-1}}\right)$$

$$DTAC_{i,t} = \frac{TAC_{it}}{TA_{i,t-1}} - NDTAC_{i,t}$$

where *PPE* is gross property, plant and equipment (data item 7).

Appendix 2. Definition of variables

Variable	Description
BM	book to market ratio
SIZE	logarithm of market cap (in Millions)
LEVERAGE	ratio of total debt to total assets
VOLATILITY	daily stock return volatility (annualized)
SALARY	salary (millions $)
BONUS	bonus (millions $)
SHAREOWN	shares owned as a percentage of total shares outstanding
OPTVESTED	number of shares of vested options as a percentage of total shares outstanding
OPTUNVESTED	number of shares of unvested options as a percentage of total shares outstanding
OPTEXERCISE	number of options exercised as percentage of total shares outstanding
OPTGRANT	number of new option grants as percentage of total shares outstanding
TAC	total accrual
CA	current accrual
DTAC	discretionary total accrual
DCA	discretionary current accrual
$\|TAC\|$	absolute value of total accrual
$\|CA\|$	absolute value of current accrual
$\|DTAC\|$	absolute value of discretionary total accrual
$\|DCA\|$	absolute value of discretionary current accrual
CLASSYEAR	dummy variable, takes the value one for any firm-year that includes all or part of a class period identified in a lawsuit, zero otherwise.

Table 1. Number of class action lawsuits filed for 1996-2002

This table presents the number of securities class action lawsuits filed against S&P 1500 firms present in Compustat's ExecuComp database between 1996 and 2002. 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.

year	number of cases	Percent of total cases(%)
1996	23	4.80
1997	53	11.06
1998	59	12.32
1999	74	15.45
2000	67	13.99
2001	94	19.62
2002	109	22.76
total	479	100

Table 2. Timeline of lawsuits

This table summarizes the timeline 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

Table 3. 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 NonDur	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 Durbl	6	1.3%	8.6%	Consumer Durables -- Cars, TV's, Furniture, Household Appliances (2500-2519,2590-2599,3630-3659,3710-3711,3714-3714,3716-3716,3750-3751,3792-3792,3900-3939,3990-3999)
3 Manuf	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 Energy	4	0.8%	4.2%	Oil, Gas, and Coal Extraction and Products (1200-1399,2900-2999)
5 Chems	4	0.8%	5.6%	Chemicals and Allied Products (2800-2829,2840-2899)
6 BusEq	152	31.7%	33.5%	Business Equipment -- Computers, Software, and Electronic Equipment (3570-3579,3660-3692,3694-3699,3810-3829,7370-7379)
7 Telcm	28	5.8%	38.9%	Telephone and Television Transmission (4800-4899)
8 Utils	27	5.6%	19.4%	Utilities (4900-4949)
9 Shops	47	9.8%	16.4%	Wholesale, Retail, and Some Services (Laundries, Repair Shops) (5000-5999,7200-7299,7600-7699)
10 Health	52	10.9%	27.4%	HealthCare, Medical Equipment, and Drugs (2830-2839,3693-3693,3840-3859,8000-8099)
11 Money	62	12.9%	17.0%	Finance (6000-6999)
12 Other	51	10.6%	16.7%	Everything Else -- Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment

Table 4. Number of firms in class period per fiscal year

For each fiscal year, this table presents 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.

fiscal year	lawsuit firms	lawsuit firms as % of all firms in ExecuComp
1990	1	0.04%
1991	1	0.04%
1992	1	0.04%
1993	4	0.16%
1994	11	0.44%
1995	36	1.44%
1996	67	2.67%
1997	102	4.07%
1998	115	4.59%
1999	160	6.38%
2000	168	6.70%
2001	136	5.42%
2002	84	3.35%

Table 5. Summary statistics

Panel A. Firm characteristics and incentive variables

MKTVAL is the market capitalization of the firm in millions of dollars. *BM* is the ratio of book equity to market capitalization of the firm. *LEVERAGE* is the ratio of total debt to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for the fiscal year. *Compensation* variables are based on aggregates for the highest-paid five company executives taken from the Compustat Executive Compensation database. *SALARY* and *BONUS*, the salary and bonus received by the top five executives of the firm, are measured in millions of dollars. *SHAREOWN* is the number of shares owned by the top five executives as a percentage of total shares outstanding. *OPTVESTED*, *OPTUNVESTED*, *OPTGRANT* and *OPTEXERCISE* are the numbers of exercisable options, unexercisable options, new options granted, and options exercised respectively, as percentages of total shares outstanding. All variables in the panel are windsorized at the 99th percentile and are measured during fiscal years 1993 to 2000, except for *OPTEXERCISE*, which is measured between 1994-2001.

Name	mean	std	skew	kurt	q1	med	q3	N
MKTVAL (millions)	4284	16372	13.32	269.70	305	806	2630	16499
BM	0.550	0.410	1.770	4.340	0.270	0.460	0.730	13766
LEVERAGE	0.230	0.190	0.840	0.540	0.060	0.210	0.350	16488
VOLATILITY	0.450	0.230	1.330	1.990	0.280	0.390	0.560	16923
SHAREOWN (%)	4.380	8.507	0.275	0.738	0.120	0.698	3.713	16750
SALARY (10^{+6})	1.396	1.194	0.001	0.005	0.258	1.309	2.061	20056
BONUS (10^{+6})	1.189	2.900	0.012	0.246	0.000	0.465	1.345	20056
OPTVESTED (%)	1.176	1.536	0.218	0.520	0.105	0.641	1.598	16750
OPTUNVESTED (%)	1.060	1.303	0.178	0.309	0.087	0.587	1.540	16750
OPTEXERCISE (%)	0.239	0.545	0.346	1.266	0.000	0.015	0.186	16750
OPTGRANT (%)	0.700	1.070	2.620	7.510	0.040	0.310	0.860	16750

Panel B. Accruals

Accrual measures are constructed following Teoh, Welch and Wong (1998a); see Appendix 1 for details. *DCA* is discretionary current accruals, *DA* is discretionary total accruals, *TAC* is total accruals and *CA* is current accruals; all four variables are windsorized at the 1st and the 99th percentiles. |*DCA*|, |*DA*|, |*TAC*| and |*CA*| are the respective absolute values of accruals. All variables are constructed from Compustat for the period 1994-2001.

Name	mean	std	skew	kurt	q1	med	q3	N
DCA	0.02	0.13	1.13	5.59	-0.03	0	0.05	12790
DA	0.24	2.01	5.04	35.69	-0.05	0.02	0.12	13887
TAC	-0.06	0.11	-0.82	4.14	-0.10	-0.05	-0.01	15152
CA	0.01	0.10	0.67	3.53	-0.03	0.01	0.05	13483
| *DCA* |	0.08	0.10	2.62	7.80	0.02	0.04	0.10	12790
| *DA* |	0.54	1.95	5.80	36.56	0.03	0.08	0.20	13887
| *TAC* |	0.09	0.09	2.31	6.72	0.03	0.06	0.11	15152
| *CA* |	0.06	0.07	2.16	4.93	0.02	0.04	0.08	13483

Table 6. Probit analysis of litigation class periods and manager incentives

This table summarizes the results of regression: $Prob(CLASSYEAR_t) = F[SHAREOWN_{t-1}, SALARY_{t-1}, BONUS_{t-1}, OPTVESTED_{t-1}, OPTUNVESTED_{t-1}, OPTEXERCISE_t, OPTGRANT_{t-1}, SIZE_{t-1}, LEVERAGE_{t-1}, BM_{t-1}, Industry\ dummies, Year\ dummies]$ $t = 1994, \ldots, 2001$. *SALARY* and *BONUS* are the salary and bonus received by top five executives of the firm in millions of dollars. *SHAREOWN* is the percentage of shares owned by the top five executives relative to the total shares outstanding. *OPTVESTED*, *OPTUNVESTED*, *OPTGRANT* and *OPTEXERCISE* are the number of exercisable options, unexercisable options, new options granted, and options exercised, all as percentages of total shares outstanding. *SIZE* is the logarithm of the market capitalization of the firm. *BM* is the ratio of book equity to market capitalization of the firm. *LEVERAGE* is the ratio of total debt to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for a fiscal year. *i1* - *i11* are the 11 industry dummies; the default is industry 12. *yr1995* - *yr2001* are the year dummies; 1994 is the default year. The t-statistics are computed using Huber/White/sandwich robust standard errors allowing for firm level serial correlation. ΔProb 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, ΔProb is the difference in the c.d.f. when the dummy variable changes from 0 to 1. The last three rows provide the number of observations, the observed probability of *CLASSYEAR*=1, and various test statistics. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

	model 1		model 2		
variable	Coef.	t-stats	Coef.	t-stats	ΔProb
constant	-4.404	-18.81***	-4.781	-16.80***	
SALARY	-0.021	-0.58	0.006	0.15	0.001
BONUS	0.018	1.85*	0.015	1.54	0.005
SHAREOWN	0.001	0.44	0.001	0.39	0.001
OPTVESTED	0.053	2.73***	0.052	2.51**	0.009
OPTUNVESTED	0.053	2.09**	0.038	1.47	0.006
OPTEXERCISE	0.051	1.27	0.024	0.57	0.002
OPTGRANT	0.058	2.30**	0.053	2.07**	0.007
BM	-0.152	-1.62	-0.177	-1.72*	-0.008
SIZE	0.266	9.65***	0.238	8.21***	0.047
LEVERAGE	0.513	3.30***	0.567	3.44***	0.013
VOLATILITY	1.151	10.64***	1.054	7.54***	0.028
i1			-0.256	-1.52	-0.012
i2			-0.209	-0.93	-0.010
i3			-0.275	-1.94*	-0.013
i4			-0.604	-2.61***	-0.021
i5			-0.527	-2.31**	-0.019
i6			0.106	0.87	0.007
i7			-0.017	-0.09	-0.001
i8			0.243	1.54	0.017
i9			-0.055	-0.42	-0.003
i10			0.223	1.55	0.016
i11			0.166	1.19	0.011
yr1995			0.495	4.67***	0.041
yr1996			0.661	5.78***	0.062
yr1997			0.738	5.95***	0.073
yr1998			0.646	4.88***	0.060
yr1999			0.730	5.40***	0.073
yr2000			0.737	5.34***	0.075
yr2001			0.466	3.19***	0.039
n obs (Prob of 1s)	12971	(0.047)	12971	(0.047)	
Wald chi^2	368.12		400.5		
Pseudo R^2	0.14		0.17		
Log likelihood	-2123.22		-2049.51		

Table 7. 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. Accrual measures are constructed following Teoh, Welch and Wong (1998a); see Appendix 1 for details. *DCA* is discretionary current accruals, *DTAC* discretionary total accruals, *TAC* total accruals and *CA* current accruals; all four are windsorized at the 1st and 99th percentiles. |*DCA*|, |*DTAC*|, |*TAC*| and |*CA*| are the respective absolute values. All variables are constructed from Compustat for the period 1994-2001.

Variable	Mean		Std Dev		Q1		median		Q3		nobs	
CLASSYEAR	0	1	0	1	0	1	0	1	0	1	0	1
DCA	0.01	0.04	0.13	0.18	-0.03	-0.04	0.00	0.01	0.05	0.11	12195	595
DTAC	0.25	0.11	1.98	2.44	-0.05	-0.12	0.02	0.01	0.12	0.15	13215	672
TAC	-0.06	-0.09	0.11	0.16	-0.10	-0.14	-0.05	-0.05	-0.01	0.00	14414	738
CA	0.02	0.01	0.09	0.12	-0.02	-0.05	0.01	0.01	0.05	0.06	12843	640
|*DCA*|	0.08	0.12	0.10	0.14	0.02	0.03	0.04	0.07	0.09	0.15	12195	595
|*DTAC*|	0.53	0.87	1.92	2.28	0.03	0.05	0.08	0.13	0.19	0.35	13215	672
|*TAC*|	0.09	0.12	0.08	0.14	0.03	0.03	0.06	0.07	0.11	0.15	14414	738
|*CA*|	0.06	0.09	0.07	0.09	0.02	0.02	0.04	0.05	0.08	0.12	12843	640

Table 8. Probit analysis of litigation class periods and discretionary accruals

This table presents results for the regression: Prob(*CLASSYEAR*$_t$) = F[*Earnings manipulation*,*BM*$_{t-1}$,*SIZE*$_{t-1}$, *LEVERAGE*$_{t-1}$, *Industry dummies, Year dummies*], where the earnings manipulation measure is *DCA, DTAC*, |*DCA*| or |*DTAC*| respectively, and *t*=1994, ..., 2001. The earnings manipulation measures are constructed following Teoh, Welch and Wong (1998a); see Appendix 1 for details. *DCA* is discretionary current accruals, and *DTAC* is discretionary total accruals. |*DCA*| and |*DTAC*| are the respective absolute values. *SIZE* is the logarithm of the firm's market capitalization. *BM* is the ratio of book equity to market capitalization. *LEVERAGE* is the ratio of total debt to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for a fiscal year. *i1 - i11* are the 11 industry dummies, the default is industry 12. *yr1995 - yr2001* are the year dummies, the default year is 1994. The t-statistics are computed with Huber/White/sandwich robust standard errors allowing for firm level serial correlation. ΔProb 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, ΔProb is the difference in the c.d.f. when the dummy variable changes from 0 to 1. The last four rows provides the number of observations, the observed probability of *CLASSYEAR*=1, and various test statistics. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

earnings manipulation measure	*DTAC*		*DCA*		|*DTAC*|		|*DCA*|	
variable	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats	ΔProb
constant	-4.480	-16.08***	-4.605	-15.05***	-4.461	-16.29***	-4.698	-15.38***	
Earnings Manipulation	-0.003	-0.26	0.110	0.62	-0.012	-0.99	0.836	4.00***	0.009
BM	-0.197	-2.01**	-0.217	-2.06**	-0.198	-2.02**	-0.178	-1.71*	-0.008
SIZE	0.214	9.73***	0.222	9.50***	0.214	9.73***	0.230	9.92***	0.044
LEVERAGE	0.566	3.27***	0.614	3.32***	0.571	3.30***	0.612	3.34***	0.013
VOLATILITY	1.147	8.17***	1.190	8.01***	1.147	8.15***	1.145	7.67***	0.030
i1	-0.274	-1.51	-0.218	-1.26	-0.302	-1.68*	-0.219	-1.27	-0.010
i2	-0.197	-0.86	-0.199	-0.79	-0.225	-0.99	-0.207	-0.82	-0.010
i3	-0.338	-2.20**	-0.307	-2.12**	-0.366	-2.42**	-0.305	-2.11**	-0.014
i4	-0.628	-2.59***	-0.747	-2.87***	-0.655	-2.72***	-0.784	-3.01***	-0.023
i5	-0.600	-2.59***	-0.588	-2.60***	-0.629	-2.74***	-0.592	-2.60***	-0.020
i6	0.074	0.52	0.076	0.59	0.059	0.46	0.043	0.34	0.002
i7	0.063	0.31	-0.020	-0.09	0.036	0.17	-0.039	-0.18	-0.002
i8	0.013	0.07	0.048	0.25	-0.015	-0.07	0.034	0.18	0.002
i9	-0.104	-0.71	-0.081	-0.59	-0.131	-0.91	-0.096	-0.70	-0.005
i10	0.205	1.34	0.204	1.38	0.179	1.19	0.206	1.39	0.014
i11	0.274	1.65*	0.427	2.21**	0.247	1.52	0.371	1.92*	0.030
yr1995	0.547	4.60***	0.614	4.63***	0.547	4.60***	0.608	4.59***	0.053
yr1996	0.737	5.76***	0.816	5.67***	0.737	5.76***	0.809	5.60***	0.082
yr1997	0.832	6.13***	0.857	5.58***	0.831	6.12***	0.848	5.52***	0.088
yr1998	0.750	5.26***	0.775	4.81***	0.750	5.26***	0.759	4.68***	0.075
yr1999	0.846	5.91***	0.880	5.44***	0.856	5.90***	0.832	5.09***	0.087
yr2000	0.851	5.82***	0.873	5.39***	0.872	5.94***	0.848	5.21***	0.090
yr2001	0.566	3.77***	0.566	3.40***	0.574	3.79***	0.569	3.41***	0.050
n obs (Prob of 1s)	11868	(0.047)	10948	(0.045)	11868	(0.047)	10948	(0.045)	
Pseudo R^2	0.1588		0.1598		0.1590		0.1632		
Log likelihood	-1900.8		-1683.8		1900.3		-1677.0		

Table 9. Executive compensation and earnings manipulation

This table presents the results of a linear regression of earnings manipulation, as measured by the absolute value of s with executive compensation variables in the preceding year. The dependent variable is the absolute value of discretionary current accruals |*DCA*|, computed from regressions (described in Appendix). The independent variables are measured in the preceding fiscal year. *SALARY* and *BONUS* are the salary and bonus received by top five executives of the firm, in millions of dollars. *SHAREOWN* is the percentage of shares owned by the top five executives relative to the total shares outstanding. *OPTVESTED*, *OPTUNVESTED*, *OPTGRANT* and *OPTEXERCISE* are the numbers of exercisable options, unexercisable options, new options granted and options exercised respectively, all as percentages of total shares outstanding. *SIZE* is the logarithm of the market capitalization of the firm. *BM* is the ratio of book equity to market capitalization. *LEVERAGE* is the ratio of total debt to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for a fiscal year. *i1* - *i11* are 11 industry dummies; the default is industry 12. *yr1995*-*yr2001* are the year dummies, the default year is 1994. The t-statistics are computed using Huber/White/sandwich robust standard errors allowing for firm level serial correlation. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats
constant	0.0741	30.15***	0.0718	8.81***	0.0763	8.05***
SALARY	-0.0123	-9.97***	-0.0034	-2.36**	-0.0040	-2.68***
BONUS	0.0020	2.71***	0.0011	1.51	0.0007	0.92
SHAREOWN	0.0003	2.27**	0.0001	1.12	0.0001	0.86
OPTVESTED	-0.0008	-0.85	-0.0009	-0.93	-0.0009	-0.96
OPTUNVESTED	0.0026	2.02**	-0.0003	-0.23	-0.0019	-1.49
OPTEXERCISE	0.0220	8.55***	0.0173	6.82***	0.0148	5.97***
OPTGRANT	0.0107	6.48***	0.0079	4.90***	0.0077	4.84***
BM			-0.0303	-10.7***	-0.0299	-9.56***
SIZE			-0.0034	-3.05***	-0.0050	-4.25***
LEVERAGE			-0.0038	-0.60	0.0043	0.65
VOLATILITY			0.0777	15.00***	0.0504	7.79***
i1					0.0005	0.12
i2					0.0001	0.01
i3					-0.0025	-0.71
i4					0.0089	1.54
i5					-0.0045	-0.97
i6					0.0273	6.07***
i7					0.0111	1.58
i8					0.0018	0.46
i9					0.0135	3.15***
i10					-0.0037	-0.87
i11					0.0532	3.81***
yr1995					0.0068	2.76***
yr1996					0.0045	1.84*
yr1997					0.0057	2.18**
yr1998					0.0096	3.27***
yr1999					0.0500	12.43***
yr2000					0.0258	7.15***
yr2001					0.0042	1.17
Number of obs	11005		10947		10947	
R-squared	0.07		0.11		0.15	
Root MSE	0.09		0.09		0.09	

Table 10. Explaining litigation class periods: incentive-related and residual |DCA|

This table summarizes the results for regression: Prob(*CLASSYEAR*) = F[$|DCA_t|^p$, $|DCA_t|^e$, BM_{t-1},$SIZE_{t-1}$, $LEVERAGE_{t-1}$, *Industry dummies, Year dummies*], t=1994, ..., 2001. |DCAt|^p is predicted |DCA| using executive compensation variables in the preceding year from equation (5), and |DCA|^e is the remaining |DCA|. *SIZE* is the logarithm of the market capitalization of the firm. *BM* is the ratio of book equity to market capitalization. *LEVERAGE* is the ratio of total debt to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for a fiscal year. *i1* - *i11* are the 11 industry dummies, with industry 12 the default. *yr1995* - *yr2001* are the year dummies, the default year is 1994. The t-statistics are computed using Huber/White/sandwich robust standard errors allowing for firm level serial correlation. ΔProb 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, ΔProb is the difference in the c.d.f. when the dummy variable changes from 0 to 1. The last four rows provide the number of observations, the observed probability of *CLASSYEAR*=1, and various test statistics. The LR tests are the likelihood ratio tests against model 3. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

	model 1		model 2		model 3		
variables	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats	ΔProb
constant	-4.756	-15.10***	-4.672	-15.33***	-4.823	-15.35***	
$\|DCA\|^p$	7.556	3.68***			7.380	3.61***	0.010
$\|DCA\|^e$			0.750	3.55***	0.716	3.42***	0.008
BM	-0.160	-1.51	-0.189	-1.82*	-0.129	-1.23	-0.006
SIZE	0.243	9.96***	0.227	9.80***	0.248	10.22***	0.047
LEVERAGE	0.656	3.51***	0.608	3.32***	0.652	3.51***	0.014
VOLATILITY	1.105	7.43***	1.158	7.76***	1.078	7.21***	0.028
i1	-0.209	-1.21	-0.220	-1.28	-0.212	-1.23	-0.010
i2	-0.173	-0.68	-0.209	-0.83	-0.184	-0.72	-0.009
i3	-0.290	-1.98**	-0.307	-2.12**	-0.291	-1.99**	-0.013
i4	-0.735	-2.78***	-0.781	-3.01***	-0.766	-2.92***	-0.022
i5	-0.559	-2.46**	-0.594	-2.61***	-0.565	-2.48**	-0.019
i6	0.067	0.52	0.049	0.38	0.036	0.28	0.002
i7	-0.030	-0.13	-0.036	-0.16	-0.048	-0.22	-0.003
i8	0.035	0.18	0.037	0.19	0.024	0.13	0.001
i9	-0.072	-0.52	-0.094	-0.69	-0.089	-0.64	-0.005
i10	0.221	1.48	0.206	1.39	0.219	1.47	0.015
i11	0.405	2.05**	0.379	1.97**	0.359	1.83*	0.028
yr1995	0.614	4.65***	0.610	4.60***	0.606	4.59***	0.053
yr1996	0.811	5.63***	0.810	5.61***	0.804	5.57***	0.081
yr1997	0.844	5.51***	0.851	5.54***	0.838	5.46***	0.086
yr1998	0.751	4.66***	0.763	4.71***	0.740	4.57***	0.072
yr1999	0.874	5.40***	0.839	5.14***	0.829	5.06***	0.086
yr2000	0.849	5.22***	0.855	5.26***	0.827	5.06***	0.086
yr2001	0.578	3.47***	0.568	3.40***	0.577	3.45***	0.051
n obs (Prob of 1s)	10947	(4.5%)	10947	(4.5%)	10947	(4.5%)	
Pseudo R^2	0.164		0.162		0.17		
Log likelihood	-1675.62		-1678.34		-1670.54		
LR test (P value)	10.16	(0.001)	15.60	(0.000)			

Table 11. Executive compensation, earnings manipulation and litigation

This table summarizes the results of regression: Prob(*CLASSYEAR*) = F[$SHAREOWN_{t-1}$, $SALARY_{t-1}$, $BONUS_{t-1}$, $OPTVESTED_{t-1}$, $OPTUNVESTED_{t-1}$, $OPTEXERCIS_t$, $OPTGRANT_{t-1}$, $|DCA|_t$, $SIZE_{t-1}$, $LEVERAGE_{t-1}$, BM_{t-1}, *Industry dummies*, *Year dummies*] . *t*=1994, 1995, ..., 2001. *SALARY* and *BONUS* are the salary and bonus received by top five executives of the firm in millions of dollars. *SHAREOWN* is the percentage of shares owned by the top five executives relative to the total shares outstanding. *OPTVESTED*, *OPTUNVESTED*, *OPTGRANT* and *OPTEXERCISE* are the number of exercisable options, unexercisable options, new options granted, and options exercised, all as percentages of total shares outstanding. |*DCA*| is the absolute value of discretionary current accruals. *SIZE* is the logarithm of the market capitalization of the firm. bm is the ratio of book equity to market capitalization of the firm. *LEVERAGE* is the ratio of total debt to total assets. *VOLATILITY* is the annualized standard deviation of daily stock returns for a fiscal year. *i1~i11* are the 11 industry dummies, industry 12 is the default. *yr1995~yr2001* are the year dummies, the default year is 1994. The t-statistics are computed using Huber/White/sandwich robust standard errors allowing for firm level serial correlation. The last five rows provide the number of observations, the observed probability of *CLASSYEAR*=1, and various test statistics. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and *** respectively.

	model 1		model 2		model 3		
variable	Coef.	t-stats	Coef.	t-stats	Coef.	t-stats	ΔProb
constant	-5.117	-15.17***	-4.698	-15.38***	-5.181	-15.43***	
SALARY	-0.030	-0.67			-0.026	-0.59	0.000
BONUS	0.010	0.66			0.010	0.66	0.003
SHAREOWN	0.001	0.29			0.001	0.22	0.001
OPTVESTED	0.062	2.79***			0.062	2.80***	0.010
OPTUNVESTED	0.055	1.96**			0.057	2.06**	0.008
OPTEXERCISE	0.020	0.44			0.007	0.15	0.000
OPTGRANT	0.045	1.59			0.038	1.35	0.004
|DCA|			0.835	4.00***	0.722	3.42***	0.008
BM	-0.155	-1.33	-0.178	-1.72*	-0.124	-1.08	-0.005
SIZE	0.276	8.41***	0.230	9.92***	0.280	8.60***	0.051
LEVERAGE	0.644	3.42***	0.612	3.34***	0.640	3.43***	0.013
VOLATILITY	1.104	7.31***	1.146	7.67***	1.079	7.11***	0.026
i1	-0.200	-1.16	-0.219	-1.27	-0.203	-1.18	-0.009
i2	-0.150	-0.59	-0.207	-0.82	-0.161	-0.63	-0.007
i3	-0.255	-1.72*	-0.305	-2.11**	-0.257	-1.73*	-0.011
i4	-0.702	-2.61***	-0.784	-3.01***	-0.735	-2.74***	-0.021
i5	-0.525	-2.26**	-0.592	-2.60***	-0.531	-2.28**	-0.017
i6	0.075	0.56	0.043	0.34	0.043	0.32	0.002
i7	-0.072	-0.35	-0.039	-0.18	-0.091	-0.45	-0.004
i8	0.140	0.71	0.034	0.18	0.129	0.66	0.008
i9	-0.065	-0.46	-0.096	-0.70	-0.082	-0.58	-0.004
i10	0.190	1.22	0.207	1.40	0.189	1.22	0.012
i11	0.324	1.60	0.371	1.92*	0.276	1.37	0.019
yr1995	0.617	4.58***	0.608	4.59***	0.610	4.52***	0.051
yr1996	0.810	5.55***	0.809	5.59***	0.804	5.48***	0.078
yr1997	0.830	5.32***	0.849	5.52***	0.824	5.28***	0.081
yr1998	0.703	4.29***	0.759	4.68***	0.692	4.20***	0.062
yr1999	0.808	4.87***	0.832	5.09***	0.761	4.54***	0.072
yr2000	0.775	4.63***	0.849	5.21***	0.753	4.47***	0.072
yr2001	0.484	2.80***	0.569	3.41***	0.482	2.79***	0.038
n obs (Prob of 1s)	10947	(4.5%)	10947	(4.5%)	10947	(4.5%)	
Pseudo R^2	0.17		0.16		0.18		
Log likelihood	-1656.51		-1676.78		-1651.43		
LR test (P value)	10.15	(0.001)	50.70	(0.000)			