Symposium Participants

SECURITIES CLASS ACTION LAWSUITS: A DESCRIPTIVE STUDY

Willard T. Carleton, Michael S. Weisbach
and Elliott J. Weiss*

1. INTRODUCTION

In the often contentious recent debate over the costs and benefits of securities class actions, anecdotal rather than systematic evidence typically has been employed. The reason for this reliance on anecdotal evidence is the lack of a systematic study of the characteristics of actual lawsuits. Our paper attempts to correct this deficiency in the literature by providing some basic facts about the nature of securities fraud lawsuits in recent years.

To do so, we consider a sample of 348 recently settled lawsuits.[1] We provide summary statistics on this sample. We also provide estimates of the damages in each case using a variety of techniques and analyze the sensitivity of damage estimates to the various techniques used. We consider the relation between settlements and damage estimates to answer a number of questions: Does the technique used to estimate damages affect qualitative conclusions regarding the magnitude of settlements as a fraction of damages? Do settlement/losses relations vary systematically for settlements above and below $2 million (the nuisance suit criterion suggested by Professor Grundfest)?[2] Are industry differences important (the high-tech factor)? What is the impact of class period, type of allegation, and precipitating events on settlement/loss relationships? We provide univariate statistics on these questions and interpret them in light of the existing literature.

The results suggest that damage estimates are, as one would expect, quite sensitive to their method of computation. The presence of outlying observations has a large impact on univariate statistics on settlements, damages and class period length. Nonetheless, we find differences in the pattern of settlements and

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* The authors' affiliations are, respectively, Department of Finance, University of Arizona; Department of Finance, University of Arizona; and College of Law, University of Arizona. They can be reached via the internet at "WCarleton@BPA.Arizona.Edu"; "Weisbach@U.Arizona.Edu"; and "Weiss@Law.Arizona.Edu." We would like to thank Douglas Allsworth, Peter Barron, Bill Reese, and George Schatz for excellent research assistance, Ed Dyl for useful discussions, and Ed Labaton and Roberta Romano for their extremely helpful discussants' comments.

1. The parties settle almost all class action lawsuits involving claims of open-market securities fraud that survive motions to dismiss under FED. R. CIV. P. 9(b) and 12(b)(6), and motions for summary judgment under FED. R. CIV. P. 56.

2. *See* Joseph A. Grundfest, *Why Disimply?*, 108 HARV. L. REV. 727, 727–47 (1995).

damages across industries, type of allegation, and precipitating event. Additionally, our results suggest that settlements under $2 million are different from other settlements, consistent with the argument that these are typically the resolution of "nuisance" suits.

The remainder of the paper is organized as follows: In Section 2, we present our hypotheses as to how the settlements/losses relation might vary. In Section 3, we describe our data sources and criteria for lawsuit inclusion and exclusion, as well as the statistical methods we employ. Section 4 presents the results and our interpretation of them. Section 5 summarizes the results and concludes.

2. HYPOTHESES

Our starting point for explaining the relation between class action settlements and damages to investors is to note that while settlements are directly measurable,[3] the true values of damages are not. In the first place, in the adversarial context in which class actions occur, one can reasonably expect that plaintiffs' claimed damages generally are upward-biased estimates of their alleged losses. Secondly, given that data on claimed damages either are unavailable or are extremely costly to obtain,[4] we rely on widely-used models employed by plaintiffs' and defendants' expert witnesses to estimate damages (the next section of this paper describes these models). One key parameter in both models, the proportion of investors in the company stock who are "traders" (as opposed to "holders"), and a second key parameter in the "two-trader" model used by defendants' experts, the proportion of trading volume for which traders are responsible, are not observable. For the sake of sensitivity analysis, as well as the possible interaction between settlements, damages estimates, and factors such as length of class period, we employ alternative versions of the "two-trader" model in our statistical estimates.[5]

With respect to specific hypotheses, we test whether the relationship between settlements and damages is different for settlements above, as opposed to below, $2 million. One of the major contentions in the debate over class action litigation is that many (most?) suits are nuisance suits, and/or that plaintiffs' lawyers' incentives differ from plaintiffs' incentives. The implication of this allegation is that unpromising (from the perspective of plaintiffs' attorneys) suits are frequently settled for amounts that approximate defendants' estimated litigation expenses.[6] We employ the settlement figure of $2 million

3. There are some exceptions, such as when warrants, whose values have to be estimated, are included in the settlement.

4. In the most recent empirical study of which we are aware, Dunbar, Foster, Juneja, and Martin examined 207 cases, of which they had only 30 observations on plaintiffs' claimed damages. *See* FREDERICK C. DUNBAR ET AL., NATIONAL ECONOMIC RESEARCH ASSOCIATES, RECENT TRENDS III: WHAT EXPLAINS SETTLEMENTS IN SHAREHOLDER CLASS ACTIONS? (1995).

5. For the two of us who are financial economists, it is hard to resist the observation that the heat of the academic, legal, and political debate over the costs and benefits of class action litigation derives significantly from the fact that unambiguous observation of investors' damages is impossible.

6. The arguments and recent writing on this subject are well summarized in DUNBAR ET AL., *supra* note 4. *See also* FREDERICK C. DUNBAR ET AL., NATIONAL ECONOMIC RESEARCH ASSOCIATES, SHAREHOLDER LITIGATION: DETERRENT VALUE, MERITS, AND LITIGANTS' OPTIONS (July 7, 1995).

suggested by Professor Grundfest[7] to divide our sample, for purposes of testing settlement/damages relations.

One of the most frequent allegations in the debate over class actions is that high technology industries, notably computer-related and biotechnology businesses, are "notoriously" subject to nuisance lawsuits. While we offer no direct evidence on the merits of this allegation,[8] it is of interest to see whether, for settlements above and below $2 million, the pattern of settlements to damages varies by industry.

Next, the length of the class period is hypothesized to have an impact on the relation between settlements and damages. The reason for this potential relation is straightforward: the measurement error in our damage estimates increases with the length of the class period for at least three reasons. First, the impact of arbitrary choice of parameters in the two-trader model increases with the length of the class period. Second, the longer the class period, the greater the likelihood that stock prices will be impacted by two kinds of information events: partial information arrival prior to the final arrival on the last day of the class period, and information not connected to plaintiffs' allegations, but which impacts the normal relationship between the stock's return and the benchmark stock index return.[9] Third, longer class periods are likely to be indicative of more complicated cases, suggesting the possibility of higher economic damages. We shall see further whether the impact of class period length varies systematically by industry.

Finally, we wish to determine whether the relation of settlements to damages varies with the type of allegation and precipitating news event. The categories are explained in greater detail in the next section, but we note here that they provide us with the opportunity (within the sample of settled lawsuits) to examine, for example, whether the relation of settlements to damages differs between "vaporware"[10] and other kinds of suits.

3. DATA

3.1. Sample Selection

Our sample is taken from the *Securities Class Action Alert* ("*SCAA*") between September 1989 and December 1994. *SCAA* contains information on new cases, pending cases, and settlements, so the datasets include cases with class periods covering portions of the period from 1970 to 1994. We wish to concentrate on settled open-market fraud cases, and therefore eliminate all other cases from our sample. The cases we eliminate include those that involve alleged breaches of fiduciary duty and those that involve alleged violations of

7. *See* Grundfest, *supra* note 2.

8. Indeed, our data are for cases in which settlements rather than dismissals occurred.

9. For example, in a case involving claims that a bank did not timely disclose the magnitude of its bad loan problems, information suggesting that some of the bank's borrowers are experiencing financial difficulties often will reach the market prior to the bank's announcement of a sharp increase in its reserve for bad debts.

10. The term "vaporware" is used in the computer industry to describe products that are announced long before they are ready to market. *See* Tom Shea, *Developers Unveil "Vaporware"*, INFOWORLD, May 7, 1984, at 48; *see generally* Robert A. Prentice & John H. Langmore, *Beware of Vaporware: Product Hype and the Securities Fraud Liability of High-Tech Companies*, 8 HARV. J. L. & TECH. 1 (1994).

other aspects of the securities laws, such as the provisions governing the conduct of tender offers.[11] A number of the listed cases actually are consolidations and/or updates of previous cases, so we combine these cases to avoid double-counting any observations. *SCAA* provides information on each suit's class period and settlement. It also provides information on a number of other characteristics of the suit, such as the person(s) named as defendant(s), the basis of the claim, the plaintiff's allegation, and the disposition of the suit. Where the plaintiffs make more than one allegation of fraud, we collect data on all entries but concentrate in our empirical work on the allegation emphasized as most important by *SCAA*.[12] In addition, we also gather from NEXIS/LEXIS information on the event that appears to precipitate the suit (usually the last major disclosure prior the end of the class period).

To calculate damages for the suits in our sample we combine this dataset on lawsuits with financial data provided by the Center for Research in Security Prices ("CRSP") at the University of Chicago. These data contain price, return, and volume observations (among others) for all stocks traded on the New York Stock Exchange, American Stock Exchange, and NASDAQ.[13] Using these data precludes our making damage calculations for a number of cases, including suits brought by holders of claims other than common stocks, or suits against firms that are either private or traded on a smaller regional exchange. After restricting our sample to cases where defendants have stock price data on CRSP, we end up with a sample of 348 firms.

We are also interested in characterizing the industries that are most prevalent in these cases. Spokespersons for high technology industries suggest that a disproportionately large number of nuisance lawsuits are directed at high technology firms, especially those in the computer and biotechnology industries.[14] In addition, a number of cases appear to involve the financial services industry. We categorize industries based on the SIC Classification Code contained on the CRSP tapes. We classify firms with three digit SIC codes of 283, 357, 367, and 737, as well as those with a two digit code of 38, as high technology. These codes correspond to the computer and biotechnology industries. We classify firms with a one digit SIC code of 6 as financial services. Firms in the remaining SIC codes are included in the group called "other" for purposes of comparison.

3.2. Calculation of Damages

There are several methods that have been used to estimate damages in these cases. Beaver, Malernee, and Keeley describe a number of these

11. Securities Exchange Act of 1934, as amended, § 14(d), 15 U.S.C. § 78n(d) (1994).
12. We treat the allegation listed first in *SCAA* as most important.
13. These data are by far the most commonly used in academic finance research involving stock prices and are described in detail in many studies.
14. That such firms are the targets of a disproportionate number of securities fraud claims is not surprising. These firms are engaged in highly competitive and dynamic industries in which products can lose their competitive advantage virtually overnight. Many such businesses are built around one or a few products. Consequently, the stock price of firms in these industries often is volatile and drops sharply because of announcements of unexpected bad news. We believe that plaintiffs' attorneys view such a stock price move as a necessary, but not a sufficient, condition for the initiation of a class action alleging securities fraud.

methods.[15] This section provides a generalization and a formalization of some of their ideas. We introduce three methods: a "naive" approach, a "one-trader" model, and a "two-trader" model.

To describe the methods, we use the following notation:

N = Number of Days in Class Period

S = Total Number of Shares Outstanding times P_i

P_i = Market Price on the Relevant Day

V_i = Dollar Volume on Day i, equal to the number of shares traded on Day i times P_i [16]

D_i = Return on Day i less the Return on the Value-Weighted CRSP Stock Index, the Estimate of Damages to Investors Entering the Class on Day i, per Dollar in the Class on Day i.

$D_{i,N}$ = Total Damages per Dollar in Class from Day i to the End of the Class Period

Note that our method of calculating daily damages assumes that all daily movements in stock returns over the class period, corrected for overall market movements, result from information arrival related to the allegation. We do not attempt to correct for company or industry specific factors unrelated to the allegation, nor do we attempt to classify specific news events as related to the allegation, which is common practice by expert witnesses. What our calculations provide, however, is a consistent approach across all cases. We do note, however, two implications: 1) our damages estimates under all the following models are likely to be biased upwards, because those companies sued are more likely to be experiencing periods of negative market-adjusted returns, whatever the cause; and 2) for some firms, model-generated damages over the class period will be negative.[17]

3.2.1. The "Naive" Approach

This approach assumes that all trading volume occurs from new traders purchasing shares from old traders. Total damages equal the sum of the returns for these traders from the time they purchase the shares until the end of the class period. Therefore, to calculate damages, we take the Day 1 dollar volume and multiply it by one plus the return for the remainder of the class period, add the Day 2 dollar volume multiplied by one plus the return for the remainder of the class period, and so forth for the entire class period. Algebraically, for

15. *See* WILLIAM H. BEAVER ET AL., CORNERSTONE RESEARCH, STOCK TRADING BEHAVIOR AND DAMAGE ESTIMATION IN SECURITIES CASES (1993).

16. Because of the dealer system in effect on the NASDAQ market, trades are essentially counted twice in the reported volume figures. Consistent with this argument, Allen Atkins and Edward Dyl find that when firms switch from NASDAQ to NYSE, reported volume drops by about a factor of two. ALLEN ATKINS & EDWARD DYL, MARKET STRUCTURE AND REPORTED TRADING VOLUME: NASDAQ VERSUS THE NYSE (University of Arizona Department of Finance Working Paper, 1994). Consequently, we divide all NASDAQ volume figures by two to control for this effect. *See also* John F. Gould & Allan W. Kleidon, *Market Maker Activity on Nasdaq: Implications for Trading Volume*, 1 STAN. J.L. BUS. & FIN. 11 (1994).

17. This will be true where a company fails to make timely or full disclosure of a positive business development.

those entering the class on Day i, damages equal $V_i D_{i,N}$. Total damages equal the sum of $V_i D_{i,N}$ over possible days of entering the class, or $\Sigma V_i D_{i,N}$.

This approach is "naive" because it is likely that much of the volume, especially later in the class period, is from new buyers purchasing shares from sellers who themselves bought during the class period. Thus it will provide an overestimate of the true damages. This overestimation is likely to be especially severe in cases with particularly long class periods; in fact, as Beaver, Malernee, and Keeley point out, damage estimates in these cases potentially exceed the total value of the firm.

3.2.2. The "One-Trader" Model

The natural approach to account for this "in and out trading" is to model it directly. The simplest assumption to make is that all traders are identical and that all are equally likely to trade a given security on a given day. From this assumption and the pattern of trading volume, we can calculate the expected fraction of total trading volume, that is from new traders relative to old traders, for each day in the class period.

Let α_i be the probability that a given seller of a security is not in the class on Day i. Therefore,

$$\alpha_i = 1$$

$$\alpha_i = \alpha_{i-1} (1 - V_i/S) \text{ for } i > 1.$$

$$\text{Damages} = \Sigma \alpha_i V_i D_{i,N}$$

This calculation implicitly assumes that all traders are the same, so they all are equally likely to sell a share of stock. The alphas generally will approach zero but stay positive over the class period.[18] This occurs because as the trading goes on, more of the holders of the stock will have bought during the class period, but there will always be some that bought prior to the beginning of the period and are thus unaffected by the precipitating event of the suit.

3.2.3. The "Two-Trader" Model

This model assumes that there are two types of investors, "traders" and "holders." This assumption is probably more realistic than the assumption that all traders are the same, since some investors hold shares of stock for years without adjusting their portfolios, while others regularly trade in and out of a single company's stock within a short period. The implication of this model for our purposes is to reduce the estimated damages, because it tends to increase the fraction of volume made up of in and out trading and to lower the fraction of shareholders who are hurt by the event described in the lawsuit.

In this model, "traders" at every point in time hold a fraction "y" of the shares and account for a fraction "x" of the stock's volume at any point in time, where x and y are arbitrary constants between zero and one. "Holders" hold the remaining $(1 - y)$ of the shares and account for $(1 - x)$ of the volume. Note that

18. This statement isn't exactly correct; if volume in one day exceeds the total shares outstanding then the alphas will turn negative. This is true because we don't allow for the possibility of in and out trading during the same day. In the empirical work discussed below, we set the alphas equal to zero rather than let them become negative (which is theoretically impossible).

$x > y$, because if $x = y$ this model becomes equivalent to the one-trader model, and if $x < y$ the names "traders" and "holders" make no sense. For notational purposes, let:

β_i = the fraction of selling "traders" not in the class at time i.

γ_i = the fraction of selling "holders" not in the class at time i.

As in the one-trader model, the fraction of volume in the class at any time (represented by the betas and gammas) declines over the class period.[19] The values of beta and gamma are given by:

$$\beta_i = 1$$

$$\gamma_i = 1$$

$$\beta_i = \beta_{i-1} (1 - (x\, V_i / y\, S)) \text{ for } i > 1$$

$$\gamma_i = \gamma_{i-1} (1 - ((1-x)\, V_i / (1-y)\, S)) \text{ for } i > 1$$

Damages are given by:

$$\text{Damages} = \sum [\beta_i x + \gamma_i (1-x)]\, V_i\, D_{i,N}$$

The two-trader model seems a reasonable way to estimate damages. Unfortunately, there is no way of knowing the most appropriate values for x and y, the key parameters of this model. Beaver, Malernee, and Keeley suggest $y = .20$ and $x = .95$ for illustrative purposes. Our approach is to present damage calculations using a variety of parameter values so that we can analyze the sensitivity of damage calculations to choice of parameters, but to focus on the damages calculated with the Beaver, Malernee, and Keeley parameters for the majority of the empirical work.

4. EMPIRICAL RESULTS

Table 1, *infra* page 498, presents some summary statistics for our sample. The mean length of class period was 358 trading days, with a median of 257 days. We note at the outset of our presentation of the results that the presence of large outliers (in terms of class period length, settlement, and estimated damages) generally results in the median values being smaller than the corresponding arithmetic means. For example, while the median observation on class period length is 257 days, the presence of some very long class periods resulted in a mean of 358 days. These long class periods make sense given the early beginning of some of the class periods in our sample; even though the sample includes *SCAA* settlement data from 1989 to 1994, fourteen percent of the observations have class periods that begin at least five years earlier. In terms of distribution by industry, our sample was made up of 30.5% in high technology, 22.4% in financial services, and 47.1% in all other industries.

19. These are also restricted to nonnegative values.

Table 1: Summary Statistics for 348 Open-Market Fraud Lawsuits

Mean (Median) Class Period Length [in trading days]	358 (257)
Mean (Median) Settlement	$7,700,000 ($3,800,000)
Number (Percentage) with Beginning of Class Period 1970-1979*	2 (.5%)
Number (Percentage) with Beginning of Class Period 1980-1984*	47 (13.5%)
Number (Percentage) with Beginning of Class Period 1985-1989*	189 (54.3%)
Number (Percentage) with Beginning of Class Period 1990-1994*	109 (31.3%)
Number (Percentage) in High Technology	106 (30.5%)
Number (Percentage) in Financial Services	78 (22.4%)
Number (Percentage) in Other	164 (47.1%)

** The number of observations grouped by year of beginning of class period does not add to the total number of observations because of one observation with a missing beginning of class period.*

The impact of model selection and parameter values on damage estimates is highlighted in Table 2, *infra* page 499. (Again because of the impact of outliers we describe and interpret our results primarily in terms of median values.)[20] The median value of damages using the naive model is $65,700,000. Moving to the single-trader model reduces the figure to $30,600,000. Of greater interest, perhaps, is the sensitivity of damages estimates to parameter variation in the two-trader model. Using a range of "traders" ownership fraction ("y") of .05 to .35 and trading volume fraction ("x") of .75 to .99 induces a range of mean estimated damages of $12 million to $106 million, and a range of median estimated damages between $2.8 million and $27.6 million.

20. From Table 2 onward we have eliminated from our sample statistics the eight cases for which the allegation was that the company had failed to disclose positive business developments. While in such cases market-adjusted returns with the sign reversed might possibly be the best estimate of daily damages per share in the class, without further study we concluded it would be inappropriate to consider such opportunity loss events to be symmetrical with negative loss events.

*Table 2: The Sensitivity of Damages Calculations to Alternative Techniques**

Sample: 340 Open-Market Fraud Cases Settled Between 1989 and 1994

Mean (Median) Value of Damages from "Naive" Model	$342,700,000 ($65,700,000)
Mean (Median) Value of Damages from "Single-Trader" Model	$126,800,000 ($30,600,000)

Mean (Median) Values of Damages from Two-Trader Models with Various Parameters

	$y^b = .05$	y = .20	y = .35
$x^{**} = .75$	$66,900,000 ($14,800,000)	$89,600,000 ($21,800,000)	$106,000,000 ($27,600,000)
x = .95	$24,400,000 ($5,700,000)	$48,300,000 ($11,100,000)	$73,300,000 ($16,700,000)
x = .99	$12,000,000 ($2,800,000)	$38,400,000 ($9,500,000)	$61,900,000 ($14,500,000)

* *See the text for discussion of the alternative techniques.*

** *The two parameters in the two-trader model are denoted "x" and "y." The parameter "x" refers to the fraction of trading volume accounted for by "traders," while "y" refers to the fraction of the population of investors who are "traders."*

It is useful to compare these estimates of damages with those of the Dunbar study of 266 settlements from 1991 to 1994. This study calculated daily damages per dollar in class in a fashion similar to ours, but utilized a version of the single-trader model for estimating the number of shares in the class. From the Dunbar study's Table 3b, which records a median settlement of $3.5 million and median settlement/damages ratio of .0576, one can infer median damages of $60.8 million—an amount almost equal to the median damages we calculated using a naive model and almost two times the median damages we calculated using a single-trader model. We are unable to account for this disparity.

It also is notable that our calculation of median damages using a single-trader model was approximately 2.8 times as large as our calculation of median damages using a two-trader model and Beaver, Malernee, and Keeley's parameters. The sharp differences between our calculations and those of the Dunbar study, as well as between our calculations using a single-trader model and a two-trader model, color significantly the conclusions that one might reach

about many aspects of the controversy surrounding securities class action litigation.

Table 3 displays the frequency distribution of computed settlements/damages ratios for the 327 cases for which damages could be calculated. The calculations are based on the two-trader model and Beaver, Malernee, and Keeley's parameters of y = .20 and x = .95. Employing a single model for consistency across cases, with no adjustment for case-specific information effects, produces noisy damages estimates: 7.6% of settlements/damages ratios are less than zero, and 12.2% are greater than one. Clearly the choice of model and model parameters is as important in damage estimates as the more micro assessment of industry, company, and allegation-specific factors impacting market-adjusted returns.

Table 3: The Distribution of Settlement/Damages Ratios

Sample: 327 Settled Open-Market Fraud Cases for Which Damages Could Be Calculated

Settlement/Damages Ratio	Number of Cases	Percentage of Total
Settlement/Damages < 0	25	7.6
0 Settlement/Damages < .1	79	24.2
.1 Settlement/Damages < .25	81	24.8
.25 Settlement/Damages < .5	63	19.3
.5 Settlement/Damages < 1.0	39	11.9
1.0 Settlement/Damages	40	12.2

* *Damage calculations here are done using the two-trader model with twenty percent of the population made up of traders, who account for ninety-five percent of the volume (x = .20, y = .95 in the two-trader model). Class period length is in trading days.*

Table 4, *infra* page 501, sheds some light on the inter-industry differences in these cases. The median settlement value in high technology cases, at $4.2 million, was about $1 million higher than in financial services and other categories, although this difference is not significantly different from zero at conventional levels. The median damages estimates in high technology cases were also higher, at $14.8 million versus $8.4 million for financial services, and $10.4 million for other industries, although, again, these differences are not significantly different from zero. The median class period was also substantially shorter, at 204 trading days, for high technology cases than for financial services (409 days) or other (240 days). Both a test of means and a Wilcoxon nonparametric test (based on the medians) reject the hypothesis that high technology cases are the same length as other cases at conventional

levels, implying that we can reliably tell that these cases are shorter than other cases. In addition, both of these statistical tests reject the hypothesis that financial services cases are the same length as other cases, suggesting that the observed longer length of the cases in this sample is too systematic to be due to chance.

Table 4: Industry Differences in Settlements, Damages, and Class Period Length*

Sample: 340 Open-Market Fraud Cases Settled Between 1989 and 1994

	High Technology	Financial Services	Other	Overall
Mean (Median) Settlement	$6,600,000 ($4,200,000)	$8,900,000 ($3,200,000)	$8,000,000 ($3,300,000)	$7,700,000 ($3,800,000)
Mean (Median) Damages	$50,400,000 ($14,800,000)	$45,100,000 ($8,400,000)	$48,500,000 ($10,400,000)	$48,300,000 ($11,100,000)
Mean (Median) Length of Class Period	259 (204)	493 (409)	370 (240)	364 (268)

* *Damage calculation here and onward are done using the two-trader model with twenty percent of the population made up of traders, who account for ninety-five percent of the volume. Class period length is in trading days.*

In Table 5, *infra* page 503, we present the pattern of settlements, damages, and class period lengths by categories of plaintiffs' allegations. The first thing to notice is that the preponderance of settled cases fell into two categories: 85 (25%) involved dissemination of misleading projections; and 100 (29%) involved failure to disclose adverse business developments. Only 21 (6%) of the cases resulted from allegations that the defendant company disseminated misleading information on products under development. At a first cut, it would thus appear that the incidence of "vaporware" cases, at least among those which were settled, was relatively small. At the same time, however, the median damages estimate in these cases ($26.8 million) was higher than in all other plaintiffs' allegation categories. And the median class period (209 days) was also shorter than in all other categories. The pattern of settlements also varied by type of allegation. The highest median settlement values were for cases involving fraud or falsification of records ($7.4 million) and accounting fraud ($7.9 million). In cases of disseminating misleading information on products under development, the median settlement was $6.1 million, compared with $3.2 million when the allegation involved dissemination of misleading projections. One can conjecture as to the impact of "safe harbor" rules in the recently enacted legislation on such statistics.[21]

21. Joel Seligman, *The Private Securities Reform Act of 1995*, 38 ARIZ. L. REV. 717, 731–34 (1996) (discussing new safe harbor rule).

Further insights into the relation between plaintiffs' allegations and industry can be gleaned from Table 6, *infra* page 504. In the cases involving allegations of accounting fraud, dissemination of misleading projections, and dissemination of misleading information on products under development, the median values of settlement in high technology firms exceeded those of the other industry groups. Under failures to disclose adverse business developments, these industry differences in median settlement values are relatively small.

The major categories of precipitating events are shown in Table 7, *infra* page 505. Not surprisingly, half of the cases (170) involved the defendant's financial statement disclosure, and another twenty-four percent were precipitated by the defendant's disclosure related to other business developments. Another twelve percent (forty-two cases) were precipitated by press stories (not initiated by the defendant). It is interesting to observe, again not surprisingly, that the median class periods were shorter in the first two categories (242 days and 268 days respectively) than in the third (352 days). The median values of settlements and damages were also similar across the first two categories. In the cases involving press stories, both settlements (median of $5,000,000) and damages (median of $20,900,000) were higher than in the cases instigated by the defendant's own disclosure. One possible explanation: press stories are likely to signal more serious charges against the defendant; defendants will tend to control the damage by releasing the information themselves for a relatively minor allegation, but it takes a press story to break a major one. Finally, the incidence of cases precipitated by the news of government investigation or litigation, or of bankruptcy is quite small, totaling fifteen cases. The median values for settlement and damages were also correspondingly small, but class periods were lengthy (close to 600 days).

In Table 8, *infra* page 506, we have cross-tabulated the joint impacts of precipitating event and plaintiffs' allegations on settlement values. For the principal categories of event and allegation with more than a few observations, we can record the following summary observations: First, in the category of defendant's disclosure about financial statement, the median settlement value was highest ($8 million) when plaintiff's allegation was of accounting fraud, followed by fraud or falsification of records ($7.4 million) and dissemination of misleading information about products under development ($6.5 million). The preponderance (ninety-three) of the cases involving the remaining allegations are associated with defendant's disclosure about financial statement, dissemination of misleading projections, or failure to disclose adverse business developments. These cases had lower median settlement values, around $3.2 million.

Table 5: Differences in Settlements, Damages and Class Period Length by Plaintiff's Allegation

Sample: 340 Open-Market Fraud Cases Settled Between 1989 and 1994

Plaintiff's Allegation	Fraud or Falsification of Records	Accounting Fraud	Dissemination of Misleading Projections	Dissemination of Misleading Information on Products Under Development	Failure to Disclose Adverse Business Developments	Other
Mean (Median) Settlement	$24,100,000 ($7,400,000)	$11,600,000 ($7,900,000)	$6,900,000 ($3,200,000)	$7,200,000 ($6,100,000)	$7,700,000 ($4,000,000)	$6,600,000 ($3,000,000)
Mean (Median) Damages	$9,500,000 ($3,100,000)	$30,100,000 ($16,300,000)	$56,100,000 ($10,300,000)	$47,100,000 ($26,800,000)	$40,900,000 ($12,100,000)	$55,900,000 ($10,300,000)
Mean (Median) Class Period Length	406 (245)	504 (322)	330 (239)	290 (209)	365 (259)	378 (301)
Number of Cases	9	17	85	20	98	102

Table 6: Mean Differences in Settlements by Industry and Plaintiff's Allegation

(Median Settlements are in Parentheses.)
[Number of Cases is in Brackets.]
Sample: 340 Open-Market Fraud Cases Settled Between 1989 and 1994

Plaintiff's Allegation	Fraud or Falsification of Records	Accounting Fraud	Dissemination of Misleading Projections	Dissemination of Misleading Information on Products Under Development	Failure to Disclose Adverse Business Developments	Other
High Technology	$12,000,000 ($12,000,000) [1]	$15,700,000 ($10,800,000) [5]	$5,300,000 ($4,200,000) [22]	$8,000,000 ($6,300,000) [15]	$5,500,000 ($3,800,000) [32]	$ 6,300,000 ($3,600,000) [28]
Financial Services	$15,500,000 ($15,500,000) [1]	$12,000,000 ($7,900,000) [7]	$8,600,000 ($3,200,000) [17]	 [0]	$13,900,000 ($3,200,000) [22]	$ 4,100,000 ($2,600,000) [28]
Other Industries	$27,000,000 ($3,300,000) [7]	$7,200,000 ($5,500,000) [5]	$7,000,000 ($2,700,000) [46]	$4,900,000 ($4,000,000) [5]	$6,100,000 ($4,000,000) [44]	$8,200,000 ($2,400,000) [46]

Table 7: Differences in Settlements, Damage Estimates, and Class Period Length by Precipitating Events

Sample: 340 Open-Market Fraud Cases Settled Between 1989 and 1994

Precipitating Event	Defendant's Disclosure About Financial Statement	Defendant's Disclosure About Other Business Development	Story in Press (Not a Press Release)	Government Investigation or Litigation	Bankruptcy	Other
Mean (Median) Settlement	$6,200,000 ($3,400,000)	$7,200,000 ($4,000,000)	$14,600,000 ($5,000,000)	$4,100,000 ($2,100,000)	$36,400,000 ($1,500,000)	$4,700,000 ($3,300,000)
Mean (Median) Damages	$35,000,000 ($11,600,000)	$50,100,000 ($12,000,000)	$139,600,000 ($20,900,000)	$15,700,000 ($5,600,000)	$27,100,000 ($5,600,000)	$17,600,000 ($3,000,000)
Mean (Median) Class Period Length	323 (242)	372 (268)	409 (352)	570 (582)	505 (598)	417 (234)
Number of Cases	170	81	42	10	5	32

Table 8: Mean Settlement by Precipitating Events and Allegation

(Median Settlements are in Parentheses.)
[Number of Cases is in Brackets.]
Sample: 340 Open-Market Fraud Cases Settled Between 1989 and 1994

Plaintiff's Allegation	Defendant's Disclosure About Financial Statement	Defendant's Disclosure About Other Business Development	Story in Press (Not a Press Release)	Government Investigation or Litigation	Bankruptcy	Other Precipitating Event
Fraud or Falsification of Records	$7,800,000 ($7,400,000) [7]	[0]	$80,800,000 ($80,800,000) [2]	[0]	[0]	[0]
Accounting Fraud	$11,800,000 ($8,000,000) [9]	$10,800,000 ($10,800,000) [2]	$51,800,000 ($51,800,000) [1]	$1,700,000 ($1,700,000) [1]	[0]	$9,100,000 ($7,200,000) [4]
Dissemination of Misleading Projections	$5,300,000 ($3,200,000) [47]	$8,400,000 ($2,900,000) [18]	$14,300,000 ($4,200,000) [10]	$1,500,000 ($1,500,000) [1]	[0]	$4,500,000 ($4,200,000) [9]
Misleading Information About Products Under Development	$10,100,000 ($6,500,000) [11]	$4,500,000 ($5,200,000) [5]	$1,800,000 ($1,800,000) [2]	[0]	[0]	$3,500,000 ($3,500,000) [2]
Failure to Disclose Adverse Business Developments	$5,800,000 ($3,300,000) [46]	$6,800,000 ($4,200,000) [25]	$5,900,000 ($4,500,000) [15]	$6,800,000 ($6,800,000) [2]	$89,100,000 ($89,100,000) [2]	$4,600,000 ($3,200,000) [8]
Other Allegation	$5,500,000 ($2,300,000) [47]	$7,600,000 ($4,200,000) [28]	$13,700,000 ($6,500,000) [11]	$4,000,000 ($2,000,000) [6]	$1,200,000 ($1,400,000) [3]	$3,000,000 ($3,000,000) [7]

Table 9 documents the impact of including defendants' accountants, lawyers, or underwriters in the class action. Not surprisingly, of the sixty-two cases in which underwriters were included as defendants, fifty-five were in cases involving public securities issues. The median settlement/damages ratio for the ninety-two cases where at least one of the groups was sued (a number of cases involved more than one category) is .255, which is significantly higher than the median ratio of .168 for the other 245 cases in the sample. This difference is significantly different at the one percent level using both a test of means and a Wilcoxon nonparametric test. The mean and median settlement amount and class period length are also higher for these cases, although the difference is not significantly different from zero at conventional levels.

Table 9: Cases Where the Defendants Included Accountants, Lawyers, or Underwriters

	Number (Percent) of Cases	Number that Involved Public Offerings	Mean (Median) Settlement	Mean (Median) Settlement/ Damages Ratio	Mean (Median) Class Period Length
Accountants	44 (13.1)	16	$11,000,000 ($5,000,000)	.323 (.273)	485 (388)
Lawyers	11 (3.3)	7	$24,400,000 (7,800,000)	.462 (.222)	519 (518)
Underwriters	62 (18.4)	55	10,200,000 ($3,400,000)	.256 (.233)	314 (228)
Defendants Do not Include Accountants, Lawyers, or Underwriters	245 (72.7)	60	$6,800,000 ($3,200,000)	.237 (.168)	335 (253)
Total	327		$7,500,000 ($3,400,000)	.259 (.193)	344 (255)

Moving on to the first question posed at the outset of this paper, Table 10 displays the pattern of settlements to damages ratios[22] by industry, broken into settlement size segments, above and below $2 million. In high technology cases,

22. Given that we have relatively noisy estimates of damages, some of them turn out, because of measurement error, to be negative, and some of the positive ones are less than actual settlements. Since our damages estimates are likely to be particularly bad in these cases, we eliminate them from the sample when we compute settlement/damages ratios. The net effect of eliminating these observations from these calculations on the interpretation of our numbers is not clear.

the median settlement/damages ratio for small settlements was, at twelve percent, only about half of that for large settlements. While we do not (and cannot) explore the merits of individual cases, there is at least a conjecture that many of the small settlements are nuisance suits. Such a conjecture is reinforced by the fact that the median settlements/damages ratio is quite similar for small and large settlements in the other two industry categories.

Once again, our settlements/damages computations contrast strongly with NERA's. Because of our more conservative damages estimates employing the two-trader model, median values of the settlements/damages ratio vary from .167 to .221 (depending on industry) compared to NERA's overall figure of .0576.[23]

Table 10: Mean Settlement/Damages Ratios* by Industry for Large and Small Settlements

(Median Values are in Parentheses.)
[Number of Observations is in Brackets.]

	High Technology	Financial Services	Other
Settlement/Damages [Settlements > $2,000,000]	.282 (.234) [60]	.238 (.206) [33]	.239 (.165) [63]
Settlement/Damages [Settlements < $2,000,000]	.206 (.122) [19]	.335 (.241) [24]	.250 (.195) [38]
Settlement/Damages [Entire Sample]	.264 (.195) [79]	.279 (.221) [57]	.243 (.167) [101]

* *Settlement/Damages ratios are computed only for those observations where settlements are less than estimated damages.*

Similarly, our conjectures as to the impact of class period length appear to be borne out in Table 11. Estimated damages for cases over 600 trading days are significantly higher than other cases, while estimated damages for cases under 100 trading days are significantly lower than other cases. (Both differences are significant at the one percent level using both a test of means and a Wilcoxon test.) Quite clearly, the median damages estimate is an increasing function of class period length. This result could be an artifact of our damages model's construction and the circumstances of firms likely to have been sued. On the other hand, it is also true that the settlements appear to

23. Recall, too, that neither set of estimates adjusts for company-specific or industry-specific disclosures that, in many cases, will have the effect of further reducing losses attributable to defendants' alleged fraud. *See supra* text accompanying note 9.

increase with class period length. Settlements over 600 days are significantly larger than shorter class period cases using both a test of means and a Wilcoxon nonparametric test (p-values .007 and .02). While longer class periods potentially are associated with more complicated cases and larger economic losses, the noise component of damages estimates also probably increases with period length. This may explain why the settlement/damages ratio is noticeably lower for the over 600 day periods than for the shorter ones. Again, this difference is statistically significant using both a test of means and a Wilcoxon nonparametric test (p-values under .01).

Table 11: Mean Settlement and Damages Estimates by Class Period Lengths*

(Median Values are in Parentheses.)
[Number of Observations is in Brackets.]

	Class Period < 100	100 < Class Period < 300	300 < Class Period < 600	Class Period > 600	Overall
Settlement	$8,700,000 ($2,400,000) [47]	$5,900,000 ($4,000,000) [135]	$6,800,000 ($3,500,000) [91]	$12,700,000 ($5,200,000) [58]	$7,700,000 ($3,800,000) [331]
Damages	$17,000,000 ($1,900,000) [45]	$30,500,000 ($11,500,000) [128]	$64,300,000 ($12,700,000) [90]	$91,500,000 ($19,200,000) [52]	$48,300,000 ($11,100,000) [315]
Settlement/ Damages**	.321 (.220) [24]	.278 (.221) [99]	.258 (.191) [72]	.179 (.126) [42]	.259 (.192) [237]

* *Class period lengths are presented in terms of the number of trading days in the class period.*

** *Settlement/Damages ratios are computed only for those observations where settlements are less than estimated damages.*

Finally, on the small settlement/large settlement question, we examine the role of type of allegation. In Table 12 there are only two types of allegations with enough computable settlement/damages ratios to permit any inferences. In the category of dissemination of misleading projections, the median settlement/damages ratio was fifteen percent for small settlements, compared to twenty-five percent for large ones. Under failure to disclose adverse business developments, the ratios were closer but still small (twelve percent versus seventeen percent). Again, these differences at least permit a conjecture that for these two types of allegations, the small settlements results included some nuisance suits in which the outcome reflected defendants' anticipated litigation expenses rather than legitimate damages.

Table 12: Settlement/Damages Ratios by Allegation for Large and Small Settlements*

(Median Values are in Parentheses.)
[Number of Observations is in Brackets.]

Plaintiff's Allegation	Fraud or Falsification of Records	Accounting Fraud	Dissemination of Misleading Projections	Dissemination of Misleading Information on Products Under Development	Failure to Disclose Adverse Business Develop-ments	Other
Settlement/ Damages [Settlements > $2,000,000]	.362 (.362) [3]	.300 (.259) [7]	.289 (.249) [41]	.130 (.110) [11]	.267 (.171) [52]	.225 (.192) [42]
Settlement/ Damages [Settlements < $2,000,000]	.643 (.643) [2]	.208 (.213) [5]	.254 (.151) [21]	.189 (.198) [3]	.196 (.121) [18]	.303 (.208) [32]

* *Settlement/Damages ratios are computed only for those observations where settlements are less than estimated damages.*

5. CONCLUSIONS

In this paper, we consider a sample of 348 open-market fraud cases which were settled between 1989 to 1994. We categorize settlements and damages, and their relation to allegations, precipitating events, and class period length. Because of the impact of outlying observations, mean values of settlements, damages, and class period length generally exceed medians. While both are calculated throughout the paper, we view the medians as more meaningful for purposes of drawing inferences about settlements and damages in securities fraud lawsuits because they are not sensitive to outlying observations. It is also clear from the algebra of damage estimation models (and is borne out by our empirical estimates) that the results are quite sensitive to model and parameter choice, especially when employing a single model for all settlements, without making any case-specific adjustments of the sort employed by expert witnesses.

Despite these caveats, some conclusions can be drawn from our study. First, the median value of settlements is higher, and class periods shorter, for high technology industry cases. Second, only six percent of the settlements were for cases in which plaintiff's allegation was that the defendant disseminated misleading information about products under development. The fact that such

cases have the largest median damages and shortest class periods may explain the high visibility, both financially and politically, of such "vaporware" cases. Finally, we find evidence of smaller settlements/damages ratios for cases in which settlements were less than $2 million, which is consistent with the presence of nuisance suits settled on the basis of plaintiffs' attorney's expenses rather than on the economic damages suffered by plaintiffs.