



Stockholm School of Economics
Master's Thesis in Finance and Economics

Does Misconduct Matter?
**An Investigation into the Effect of Litigation Announcements on
America's Most Successful Companies.**

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ABSTRACT

This thesis analyses the effect of litigation by the US Security and Exchange Commission on the share price of large public US firms. Event study methodology and regression analysis have been used to examine the impact of SEC litigation announcements filed against Forbes 500 companies during the five year period from 2000 to 2005. Our results confirm our hypothesis, showing statistically significant negative abnormal returns on the day of the announcement as well as on the days immediately surrounding the announcement. Furthermore, as predicted, when isolating only those cases related to fraud, abnormal returns become more negative than both the sample as a whole as well as insider trading. This implies that the market considers misconduct involving fraud more severe. Insider trading exhibits consistently negative returns on the event day and surrounding days, however these returns lack significance. Contrary to earlier research, our findings exhibit no evidence of under-reaction surrounding the release of initial allegations of corporate misconduct, instead revealing an immediate and instantaneous reaction by the market in support of the efficient market theory. The results of the regression analysis confirm the significant negative impact of fraud for the days surrounding the announcement day, and also show that firms in the financial sector suffer less negative abnormal returns, while firms in the energy sector undergo greater abnormal returns.

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Table of Contents

1.	Introduction	2
1.1	Purpose and Contribution	3
1.2	Outline	4
2.	Past Research	4
3.	Theoretical Framework	7
3.1	The Efficient Market Hypothesis	7
3.2	Costly Information Theory	8
3.3	Behavioural Models	9
4.	Hypotheses	9
5	Data Characteristics	11
5.1	Data Sources and Selection Criteria	11
5.2	Data Characteristics	13
6.	Methodology	13
6.1	The Event Study Method	13
6.2	Models for Measuring Normal Performance	14
6.3	The Event and Estimation Windows	15
6.4	Single Index Market Model	16
6.5	Mean-Adjusted Method	18
6.6	Issues of Robustness	19
7.	Event Study Empirical Results	20
7.1	Shareholder wealth effects	20
7.2	Fraud versus Insider Trading	21
8.	Multivariate Regression analysis	25
8.1	Explanatory Variables and Hypotheses	25
9.	Regression Results	28
9.1	Results	28
9.2	Robustness Issues	30
10.	Discussion	31
11.	Conclusions and Recommendations	34
11.1	Conclusions	34
11.2	Recommendations for Future Research	34
12.	References	36
11.	Appendix	38

1. Introduction

In 2003 Worldcom, once hailed as one of the biggest success stories of the 90's, was ordered to pay a record-breaking \$750 million to its shareholders, to settle SEC charges related to extensive accounting fraud and misconduct. While this highly publicized case certainly served to heighten recent public awareness and sensitivity to news of corporate misconduct, such crimes have been an issue of concern for shareholders and government officials alike for many years. In 1995, congress introduced the Private Securities Litigation Reform Act¹ in an attempt to increase litigation transparency, whereby information regarding corporate lawsuits was made more accessible to the general public. However, this act did not provide specific measures aimed at strengthening financial reporting and accountability. The serious repercussions associated with the recent cases of Worldcom and Enron prompted further regulatory action and on July 30 2002, the US Congress passed the Sarbanes Oxley Act². This enactment not only enhanced the degree of accountability of firms but also facilitated the process of direct criminal litigation against company directors and officers. Effectively, the Sarbanes Oxley Act also seeks to increase the incentives of executives, auditors and accountants to detect any internal violations. Nevertheless, it seems that despite these efforts by the US Congress to enhance visibility and curb abusive practices in corporate behaviour, scandals and litigation in both the US and global business environment have only seemed to escalate (Clark & Gray, 2002). As a result, many people question whether actual or potential lawsuits affect shareholder wealth and corporate reputation *enough* to actually deter management from engaging in misconduct.

Research on the topic of corporate litigation has primarily focused on the direct costs associated with different types of class-action litigations such as fines and the repayment of damages to affected parties. Litigation filings made by specific plaintiff types, such as employees, partners, competitors, trade associations or regulatory authorities, against multiple firm types and sizes have also been investigated. Alternatively, the focus has been on the stock price effects of specific types of crime such as price fixing (Skantz et al., 1990) or the effects of violations within a particular industry such as the drug and automobile industries as examined by Jarell et al. (1985). Yet although there exist numerous studies surrounding the phenomenon of corporate crime, a direct link between official allegations of misconduct and the market's reaction, is still not clearly understood (Murphy et al., working paper). Furthermore, it seems that empirical results related to

¹ For more information on the Private Securities Litigation Reform Act, use the search engine at "The Library of Congress"
<http://thomas.loc.gov>

² For more information about the Sarbanes Oxley Act go to www.soxlaw.com

basic facts concerning corporate misconduct are rather scarce. For instance, a seemingly simple but potentially informative statistic such as the total number of lawsuits filed each year against the major exchange-listed firms is not known (Bhagat et al., 1998). Despite these shortcomings, prior research demonstrates that corporate defendants suffer economically and statistically significant wealth damages upon litigation filings, irrespective of the plaintiff. More specifically, announcements of securities law violations, such as those filed by the SEC, impose an additional penalty on the decline in stock price over violations filed by private parties or other firms.

1.1 Purpose and Contribution

This paper offers a more specific extension to previous studies by exclusively looking at litigation filings made by the Securities and Exchange Commission (SEC) against America's largest public firms. In addition, we are aware of only one other study (Griffin et al., 2004) that has examined the stock price effect of corporate litigation after the 1995 Private Securities Litigation Reform Act. Thus, this paper contributes to the current field of study by providing more applicable and relevant results, than those that were generated prior to the 1995 Reform Act³.

In order to ensure that our sample constitutes the largest and most well-known US firms, the data has been gathered from the "Forbes 500" list ranked according to market value over the period from 2000 to 2003. This four year rolling sample generated 579 firms in total, of which 96 (approx. 17%) were involved in at least one litigation action by the SEC. Moreover, of these 96 firms, 20 were involved in 2 or more SEC litigation cases. Considering the fact that these firms are, or were at one stage, considered the most successful firms in the US, we found this result to be surprisingly high. Moreover, the fact that these firms represent only those with the highest market value (mean approx. US\$44 Billion), implies that all of these firms have substantial business reputations on which their continued success depends. As a result, we find the investigation of the market's response to allegations that these large and reputable firms have committed corporate misconduct a particularly interesting topic to address. Consequently, the purpose of this thesis is:

To evaluate and analyse the stock price response of large public US firms to disclosures of SEC allegations of corporate misconduct.

³ Further reasoning for this assertion will be provided in section 2.

In carrying out this objective, we will not only look at the overall impact of such disclosures, but also investigate how the response varies for different types of allegations. An event study approach will be used to conduct the analysis, by determining if the return on the first announcement date can be considered significantly ‘abnormal’ when compared to the ‘normal’ or expected return. So as to ensure robustness, two methods will be used to generate the normal and abnormal returns. The first is known as the single index market model (SIMM) and relates the return of the security to the return of the market portfolio, where the broad based stock index of the S&P 500 has been used as a proxy for the market portfolio. The second method used is termed ‘mean-adjusted returns’ (Brown & Warner, 1984) and is based on the security’s raw returns, where normal returns are computed as the average daily returns across the designated estimation period. We will also employ a multivariate regression approach to determine whether the magnitude of the stock price response is influenced by crime-, industry- or firm-specific factors.

1.2 Outline

Section 2 describes past research on the stock price response to corporate litigation. Section 3 outlines the theoretical framework on which the explanation of the results is based. Section 4 specifies the two main hypotheses regarding the stock price response to SEC allegation disclosures. Section 5 describes the sources and characteristics of the data, and explains the event study methodology employed. Section 6 presents the empirical results of the event study analysis. Section 7 outlines the multivariate regression analysis and the hypotheses regarding the effects of the explanatory variables. The results of the regression are presented in section 8. Section 9 offers a discussion of the results and their implications. Section 10 provides some concluding comments and suggestions for further research.

2. Past Research

One relatively consistent result which has persisted in all of the prior studies is that firms suffer economically- and statistically-significant wealth losses upon the filing of a corporate lawsuit against them. Earlier studies include that conducted by Kellogg (1984) in which 56 class action suits against preparers and auditors of financial statements are analyzed. The entire class period beginning with the investigation announcement and ending with the settlement is the focus of the examination. This study reveals that the discovery of accounting misrepresentations are associated with significant negative risk-adjusted stock returns of 42.7% (average) over the entire class period. Feroz et al. (1991) conduct a related study by analyzing the abnormal returns of 58 observations from the period 1982 to 1989. Specifically, they examine three event days; the first

disclosure date, the SEC investigation date, and the settlement date for firms accused of accounting misstatements. Their results reveal abnormal returns of -13% for the first disclosure date, -7.5% for the SEC investigation date, and no abnormal returns around the settlement date. A study conducted by Francis et al. (1994), analyses 43 cases from 1988 to 1992, in which shareholders have filed litigation against the corporation for providing misleading information or omitting adverse earnings related information. Their results show that firms suffer a 17.2% average price decline on the day that shareholder lawsuits are announced.

A more extensive study is that by Bhagat et al. (1998) which looks at a large sample of lawsuits from 1981 to 1983 wherein either the plaintiff or defendant is a corporation. They examine the abnormal stock market returns related to litigation filings and settlement announcements and report an overall average of 0.97% wealth loss in the defendant's market value. Moreover, their study shows that corporate defendants involved in suits filed by the government suffer a 1.73% decline in shareholder wealth; a larger loss than that experienced when suits are filed by other firms or private parties. Within this group of suits filed by government agencies, violations of security laws result in significant wealth losses of -2.71%. The study also finds that the defendant wealth effect on a filing announcement is significantly positively related to firm size and in some cases, negatively related to the firm's likelihood of undergoing bankruptcy. In relation to firm-size, they ascertain that larger firms usually have more bargaining power or greater resources to assign to a legal dispute.

A study by Block (1991) utilizes a different approach whereby the stock price effects of corporate fraud are compared with those of other crimes termed as *malum prohibitum* crimes, i.e. crimes that have negligible effects on contractual parties to the firm. Examples of such crimes include money laundering, tax evasion and currency reporting violations. The study reports significant price declines for the fraud cases only.

A working paper by Murphy et al.⁴, comprises one of the most extensive empirical data sets to date, covering allegations of corporate crime from 1982 to 1995 (464 observations), and reveals average negative abnormal returns of -1.67%. In addition, the study investigates five subcategories of allegations and finds three (Fraud, Bribery and Patent Infringement) to exhibit statistical significant negative returns, with fraud showing the most substantial effect in concurrence with previous studies. The study also finds that larger firms suffer a smaller

⁴ The study by Murphy, Shrieves and Tibbs is a Working Paper from The University of Tennessee, Knoxville. No date is provided.

percentage of losses relative to the firm's market value, consistent with the more recent studies by Bhagat et al. (1998), Griffin et al. (2004). This supports the existence of scale economies based on size, diversification or reputation.

Griffin et al. (2004) however, criticize these earlier studies on the basis of several shortcomings. Firstly, they claim that the results do not represent the entire population of firms as a selection bias has occurred that over-represents larger firms. This is evidenced by the fact that most disclosures were taken from Wall Street Journal announcements. Secondly, they point out that the studies examine litigation cases that occurred during the 1980's and early 1990's prior to the introduction of the Private Securities Litigation Reform Act of 1995. This act imposed major changes in the associated legal doctrine and served to significantly decrease the market's cost of obtaining information regarding litigation events. Consequently, research conducted after the 1995 Reform Act as well as studies which focus specifically on one particular size group of firms (or obtain an unbiased sample of all firm sizes) constitute an improved study in terms of reliability and applicability.

The more recent study by Griffin et al. (2004) examines the period from 1990 to 2003 and focuses explicitly on class-action securities fraud. The authors make a clear distinction between the initial disclosure which precipitates the litigation and the announcement that a litigation suit has been filed. The results obtained confirm that the initial stock price response to a class action filing event is negative and that this initial negative response is greater for small firms and firms with low analyst coverage.

In summary, previous empirical investigations provide clear evidence of the existence of a statistically significant negative relationship between allegations of corporate misconduct and shareholder wealth effects. This assertion of negative abnormal returns for the defendant firm is also supported in a study by Bhagat and Romano (2001), which investigates the results of several studies conducted in the early 1990's. Moreover, it is also evident that there has been very little research conducted after the 1995 Reform Act⁵, further highlighting the relevance of our study and chosen sample. However, an overview of all the results obtained up until now reveals that research conducted prior to the 1995 Reform Act seems to report greater negative responses than the study by Griffin et al. (2004). As pointed out by the authors this may be attributed to the fact that information regarding litigation was harder and more costly to gain prior to 1995.

⁵ We are aware of only one study conducted after the 1995 Reform Act; that of Griffin et al., 2004.

Furthermore, in recent years the number of financial restatements, which trigger large securities claims and settlements, have reached record highs⁶. Thus, in the past, serious class-action suits were relatively rare in comparison, implying a greater degree of uncertainty surrounding the implications of such allegations. Finally, of all the categories of corporate misconduct in previous research, fraud is found to have the most substantial negative effect on shareholder wealth.

3. Theoretical Framework

It can be observed from past research that there are two main strands of thought used to explain stock market pricing formation: the efficient market hypothesis (EMH) and the behavioural model. A third explanation, namely the costly information theory, offers a more rational deviation from the purely efficient EMH while showing no consistency with the behavioural models. These theories and their implications for the current study will be outlined below.

3.1 The Efficient Market Hypothesis

Since its ‘revival’ in the 1950’s and 1960’s, the concept of market efficiency has become somewhat of a paradigm in finance and macroeconomics (where it is better known as ‘rational expectations theory’) (Jensen 1978). The Efficient Market Hypothesis (EMH) was officially formulated by Eugene Fama in 1970 and asserts that all relevant information related to a particular stock and/or market is incorporated in the price of the security. This implies that stock price movements represent a pure random walk process and are therefore completely unpredictable. In turn, this makes it impossible to effectively ‘beat the market’, as stocks are always traded at their fair value. Thus, according to the EMH, security prices should increase and decrease only in response to new information and that, per definition, such new information must be unpredictable and immediately available to all market participants.

There are three broad categories of the EMH that have been developed: the weak, the semi-strong and the strong form. The weak form states that stock prices reflect all information that can be derived from historical market data such as past prices and trading volume. This form of the EMH implies that technical trading strategies should not be profitable. The semi-strong form of the EMH asserts that all public information is reflected in the stock price, which, in addition to past trading data, includes data on the firm’s activities, management, financials, accounting practices, etc. The strong form version of the EMH implies that stock prices include all information,

⁶ See Huron Consulting Group at www.huronconsultinggroup.com

including insider information. This version is considered fairly extreme in academic circles and is often treated as simply a logical completion of a set of possible hypotheses (Jensen, 1978).

It is the semi-strong form which is most applicable to this study as it is expected that the initial announcement of the SEC's investigation, is considered new and unpredictable information which should be reflected by a subsequent drop in the stock price of the defendant firm. Furthermore, this information is expected to be almost immediately available to all relevant parties as the Reform Act of 1995 effectively introduced measures to improve the public's access to information related to corporate lawsuits. The fact that all firms in our sample are also considered the largest and most reputable in the US further supports this assumption that related information is readily available to the public. Interestingly, Griffin et al (2004) claim that litigation-prone firms are identifiable and thus that in an efficient market, investors should anticipate the cost and probability of a litigation event through earlier disclosures. In turn, they predict that this anticipation is incorporated into the stock price of the firm reflecting a negative price drift prior to the actual SEC litigation release date. However, Griffin et al. also point out that the market is unable to determine *inter alia* if a lawsuit will be filed for certain, when it will be filed, the magnitude of the alleged violation, and the nature and extent to which new information will be revealed at the time of the filing. In the present investigation, we have attempted to minimize the possibility that the market has already anticipated the event by examining the first public disclosure that an SEC investigation has been initiated. In those cases where earlier disclosures (media, company or other entity) did not exist however, the official SEC litigation release can be considered new and unpredictable information on which the market is expected to respond.

3.2 Costly Information Theory

One theory which provides a more rational deviation from the pure and somewhat unrealistic approach of the EMH is the costly information theory, which emphasizes the inherent costs in forming price expectations. This concept was first developed by Grossman (1976) and Grossman and Stiglitz (1980). The costly information theory asserts that market structure and information constraints as well as the organization of the security analysis industry are sufficient to explain the commonly observed post-announcement drift. That is, it predicts that higher information and trading costs lead to a slower diffusion of information. More specifically, if information is relatively expensive to process or seen as unprofitable in terms of the risk-adjusted trading opportunities, then the disclosure of negative news can result in an initial under-reaction. This

underreaction is then followed by a prolonged diffusion process, which can be reflected by a post-announcement drift.

In their study of class-action fraud, Griffin et al. (2004) report that evidence of the costly information theory is most observable in class-action filings against firms with lower information diffusion (lower analyst coverage) and/or small-sized firms. Large firms, with high analyst coverage were found to show more immediate and short-term effects in response to the negative news of lawsuit procedures. As a result, given that our sample consists solely of large firms, we do not expect to observe significant post-announcement drift in our results.

3.3 Behavioural Models

Behavioural models oppose both of the theories mentioned above, arguing that in reality people are not nearly as rational as the EMH and Costly Information Theory suggest. Behavioural models are based on the contention that post-announcement drift arises due to biases in the mechanisms by which investors interpret information. The models further ascertain the theory of bounded rationality on the part of investors whereby they are not able to rationally analyze and take into account all information that is presented to them. Therefore, changes in stock prices are influenced by specific beliefs or biases possessed by the investor. One such bias is ‘conservatism’ wherein investors fail to respond to new information until it has been confirmed by subsequent information.

Such behavioural theories are briefly presented here as an alternative explanation related to movements in security prices. However, as the main purpose of this paper is to investigate if there is an immediate impact on stock prices following litigation announcements, and in effect evaluate the ‘efficiency’ of the market, behavioural models will not be discussed any further.

4. Hypotheses

Based on the findings of past research, this section presents two main hypotheses to be tested regarding the market’s reaction to SEC litigation announcements against large public firms. They will be tested using event study methodology in which the measure of interest is daily abnormal stock returns in event time. This methodology is described in more detail in section 6.

Past empirical research shows clear evidence that SEC litigation against corporations will result in negative shareholder wealth effects. This evidence rests on the premise that firms facing litigation will suffer pecuniary as well as non-pecuniary costs which can only have a negative impact on the firm's market value. These costs include expected legal and administration fees, opportunity costs in terms of management resources and the potential loss of reputation and goodwill. Furthermore, due to the fact that only large public firms characterise our sample, we expect that the market will receive information simultaneously and react immediately to the disclosure of the SEC allegations, in accordance with the assumption of efficient markets. These predictions lead us to formulate the following hypothesis.

Hypothesis 1: The stock price of the defendant company will exhibit significant negative abnormal returns at the time of the first announcement of SEC allegations.

Our sample can be stratified into two groups (Fraud and Insider Trading) according to the type of alleged misconduct in order to examine whether possible differences exist using statistical analysis. Cases have been classified as 'Fraud' when they involve manipulation/misrepresentation of accounts, failure to produce reports (research, financial etc) according to SEC regulations and withholding SEC required information. Those cases that have been classified as 'Insider Trading', have involved the buying or selling of a security, while in possession of material, non-public information about the security and therefore breaching a fiduciary duty or other form of trust agreement. Insider trading violations may also include "tipping" such information, securities trading by the person "tipped" or securities trading by those who misappropriate such information (www.sec.gov).

Consistent with prior research (i.e. Murphy et al., and Block, 1991), different categories of misconduct are considered to affect the level of the market's response to litigation announcements. For example, litigation against individual employees for insider trading will not be expected to have as serious ramifications for the firm as compared to accounting fraud by an executive, which directly affects the firm's stakeholders. This can also be viewed from the aspect of perceived penalties by the market that a corporation will incur as a result of the violation. Again, a serious fraud case could lead to consumers boycotting the firm's goods or services, whereas individual actions by employees will likely lead to a much lesser penalty in relative terms. Based on this reasoning, we arrive at the second main hypothesis to be tested:

Hypothesis 2: The abnormal returns exhibited by stock prices as a result of SEC allegations will be more severe (more negative) for allegations of fraud as opposed to allegations of insider trading.

5. Data Characteristics

In this section, the sources for the data sample and criteria for selection will be outlined. The general characteristics of the data will also be described.

5.1 Data Sources and Selection Criteria

In order to investigate the extent to which large public US firms engage in corporate misconduct, and in turn to determine the implications of this misconduct on security returns, the data sample has been gathered from the 'Forbes 500' list ranked according to market value. We have taken a rolling sample from 2000 to 2003 so that our initial data set comprised 579 firms, all of which have appeared in the Forbes 500 list in at least one of the four years (2000, 2001, 2002, or 2003). The firms in the sample are all expected to exhibit a similar degree of public awareness and susceptibility to their business reputation. By limiting the sample to those on the Forbes list, we also ensure that we have accurately identified the largest corporations in the United States, as the minimum market value of our sample is \$1,074 million. Previous studies that examine the impact of different firm sizes on litigation effects employ a much lower cut-off level for their category of 'large firms', such as the median market value. For instance, in the study by Griffin et al. (2004), the cut off market value for the 'large firm' category is \$138 million, just over 1/10 the size of the smallest firm in our sample. Furthermore, the fact that all of the companies studied are listed on either the New York Stock Exchange (NYSE) or the NASDAQ means that analyst coverage is considered to be extensive and thus the public's cost of acquiring information is low. According to Griffin et al. (2004), these factors enable events such as litigation filings or press releases to be incorporated into prices more quickly and easily. Thus, by focusing on large companies alone, we hope to minimize the extent of post-announcement drift caused by information barriers.

The litigation releases which form the basis of this investigation, were those reported by the U.S Securities and Exchange Commission (SEC), the government organisation in charge of taking action against securities related fraud and misconduct. We examined all litigation releases from the period July 31 2000 through to September 31 2005 and gathered any filings that were related to one of the 579 firms in our data set. Only those litigations which were filed against an

employee(s) within the firm, or directly against the company itself, were included in the sample. For example, cases in which an employee of a Forbes 500 firm was involved in the insider trading of shares from another company or companies (not necessarily a Forbes 500 firm) were included in the sample. This is due to the fact that in most cases, these illegal trades were based on non-public information that the employee had gained in confidence while performing his/her work. Furthermore, employees act as representatives for the firm whereby misconduct on the part of an employee is expected to have a negative impact on the reputation of their employing company. On the other hand, cases involving illegal trading of a Forbes 500 company's shares by an independent individual not directly linked to the firm were not included in the sample. In such incidences, the individual alone is held responsible for their actions.

In those cases where one company had multiple litigation filings or complaints in connection with the same case and/or defendant, the earliest release was used as the date referenced in the analysis. However, for incidences in which one company had multiple litigation filings related to different types of violations, each litigation case was treated as an individual and independent case.

As highlighted in several prior studies (e.g. Feroz et al., 1991 and Bhagat et al., 2001), the market is often informed of the potential or upcoming litigation through disclosures made prior to the SEC litigation release date. Thus, in order to ensure that the true impact of the SEC allegation is measured, it is imperative that the first appearance of information related to the SEC litigation is used as the event date. As a result, each SEC litigation case was cross-referenced with press releases from the Wall Street Journal which may have been published prior to the SEC litigation release. The Wall Street Journal was used as the primary data source in the studies by Bhagat et al. (1998) Feroz et al. (1991), and Murphy et al. (Working Paper), among others, which supports the assumption that it can be viewed as a thorough and reliable source of information related to business events. This belief is further evidenced by the fact that, for every SEC litigation release investigated, at least one press release outlining the case was published on the same day or the subsequent day in the Wall Street Journal.

In those cases where a single firm had multiple disclosures pertaining to separate and independent litigation cases, only those in which the initial disclosures were at least 220 days apart were used.⁷

⁷ Only three firms have estimation windows less than 250 days and all are greater than 230 days, this is not expected to affect results.

This allowed us to minimize confounding events and maintain a sufficient length in the estimation window.

5.2 Data Characteristics

From the initial data set of 579 Forbes 500 corporations, 96 (approx. 17%) firms were found to have been accused of violating SEC regulations. Subsequently, the DataStream financial database and Yahoo Finance were used to collect the 96 sample firm's daily return data. Of these 96 firms, 8 were omitted due to lack of sufficient information, 5 were omitted as a result of mergers and acquisitions, 2 were de-listed, and 7 were found to have Wall Street Journal disclosures prior to the cut-off year of 2000. Based on these omissions, 84 litigation releases in connection with 74 different Forbes 500 companies constitute the final data sample. The main characteristics are summarized in Table 1 (Appendix) and support several observations. Of the 84 events which complement the data criteria, 18% (15) of the cases are concerned with insider trading and 82% (69) with Fraud. In addition, apart from their large market values, ranging from \$1,074 million to \$406,525 million, the firms are reasonably random and unrelated in terms of operations and industry. Finally, the sample can be seen to be reasonably independent across events⁸.

6. Methodology

An event study will be used to analyse the two hypotheses specified in section 4. In this section, the application of event study methodology will be described and justified, and possible methods for computing normal performance measures will be discussed. In addition, an outline of the procedures used to estimate the primary parameters using the Single Index Market Model and Mean-Adjusted Model will be provided. The event study methodology described by MacKinlay (1997) and Brown and Warner (1984) will be used as the main reference source for this description.

6.1 The Event Study Method

As mentioned in the description of the efficient market hypothesis in section 3, given rationality in the market place, the effects of an event are expected to be immediately reflected in security prices. Determining the impact of this event through direct productivity measures may require an observation period of many months or even years. Therefore, the event study method provides a

⁸ Although some firms exhibit the same event date and may thus be correlated in some way, a small degree of dependence in the cross section of events would not present a problem to the tests conducted, as will be described in section 6.6..

simplified means to construct a measure of the event's economic impact using security prices observed over a relatively short time period.

Prior research has proven that corporate litigation proceedings can be considered as a specific and irregular event on which the market reacts. As a result, many prior studies related to the topic at hand have employed event study methodology in order to determine the precise stock price response to these events. Griffin et al. (2004), show that the event study methodology is especially suitable for this type of investigation for the following reasons: 1) litigation announcements are clearly identifiable and similar in format; 2) the information contained in a litigation release can be expected to affect stock returns; 3) separate events are largely cross-sectionally independent as the litigation releases are typically based on firm- and situation-specific charges such as insider trading or fraud.

The impact of an event is expressed as an abnormal change in the stock price of the firm and in order to measure this impact, a careful definition of the inputs is required.

6.2 Models for Measuring Normal Performance

There are different approaches that can be used to compute the normal return of a given security and these approaches can be broadly divided into the categories of statistical and economic models. The former follows from statistical assumptions concerning the joint distribution of security returns, and is not dependant on any economic arguments. Economic models on the other hand, such as the *Capital Asset Pricing Model* (CAPM) and the *Arbitrage Pricing Theory* (APT), do rely on economic restrictions concerning investors' behaviour. These assumptions facilitate the calculation of more precise returns than statistical models, however in recent years the use of statistical models has strongly dominated that of economic models (MacKinlay). This can be attributed to the fact that evidence inconsistent with the CAPM has been found and in turn the validity of the market restrictions imposed by the CAPM is being re-evaluated. Moreover, McKinlay reports that the driving factor of the APT model behaves like a market factor and that additional factors provide relatively little explanatory power. Thus, it has become widely accepted that the gains from using the APT over statistical models are quite small. As a result, we have chosen to employ statistical models for the calculation of normal returns.

There are several different types of statistical models that can be used to compute normal and abnormal returns. Two most commonly employed methods are the *Mean-Adjusted Model* (also

known as constant mean return model) and the *Single Index Market Model* (SIMM). The mean-adjusted method is based on the security's raw returns, whereby "normal" returns are simply computed as the actual return over the event period minus the mean return over a certain estimation period. The SIMM relates the return of a given security to the return of the market portfolio and uses an Ordinary Least Squares (OLS) regression to estimate the parameters of interest. The SIMM is actually a simplified version of a more general type of statistical model known as the *factor model*, in which the factors are typically represented by portfolios of traded securities. In a multifactor model for example, factors can be based on industry classification and are included in addition to the market index. Factor models are driven by the motivation to reduce the variance of abnormal returns by explaining more of the variance in normal return. MacKinlay however, points out that the gains from employing multifactor models are limited due to the fact that additional factors result in little reduction in the variance of abnormal returns. A third type of statistical model is the *market-adjusted model* which places restrictions on the SIMM by pre-specifying the model coefficients for alpha and beta. This model is only recommended when pre-event data is limited, and can introduce biases in the results. Consequently, this model is not appropriate for the study at hand. Based on the above discussion, we have chosen to employ and compare the SIMM and the mean-adjusted statistical methods to determine the normal and abnormal performance measures.

6.3 The Event and Estimation Windows

For a given allegation against a firm, the first related disclosure is used as the event/announcement date, denoted $\tau = 0$. However, in order to account for announcements that were made after the close of trading, it is necessary to also examine abnormal returns on the day following the announcement, denoted $\tau = +1$. Furthermore, MacKinlay asserts that when collecting event dates from financial publications such as the Wall Street Journal, as we intend to do, it is not clear whether the market was already informed prior to market close on the preceding day by, for example, the firm itself. Thus, we will also include day $\tau = -1$ in our evaluations.

Several prior studies (i.e. Griffin et al. 2004, Bhagat and Romano, 2001) have documented cases where the market has been able to anticipate the event due to information leakage, which can be observed as a downward trend in their results prior to the allegation announcement date. In addition, a post-announcement drift attributed to an initial under-reaction by investors, has been widely reported in past research (Bernard and Thomas, 1989, Bhushan, 1994 and Griffin et al., 2004). These studies imply that an extended period of observation is needed to gauge the full

effects of an announcement. As a result, we will consider event windows of various lengths in order to determine if there is any evidence of these effects or if instead our results concur with the more immediate reaction predicted by the efficient market hypothesis.

Accordingly, we report abnormal returns (AR_i) for each of the 20 days surrounding the event, as well as for the 2-day (days $\tau = -1$ to $\tau = 0$ relative to announcement date), 3-day (days $\tau = -1$ to $\tau = +1$ relative to announcement date), 7-day (days $\tau = -3$ to $\tau = +3$ relative to announcement date), and 21-day (days $\tau = -10$ to $\tau = +10$ relative to announcement date) event windows. An estimation window comprising the 250 days prior to the largest event window ($\tau = -11$ to $\tau = -260$) has been employed for the estimates of normal return.

6.4 Single Index Market Model

The single index market model (SIMM) calculation for normal returns is based on the given firm's alpha and beta with the market portfolio. As recommended in the study by MacKinlay, the broad based stock index S&P 500 has been used for the market portfolio. The return on any day t for any security i can be expressed through the linear specification:

$$R_{it} = \alpha_i + \beta_i \cdot R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0 \quad \text{var}(\varepsilon_{it}) = \sigma_{\varepsilon_i}^2$$

Where R_{it} and R_{mt} are the period- t returns on firm i 's common stock and the S&P 500 market portfolio respectively, and ε_{it} is the zero mean disturbance term. α_i , β_i and $\sigma_{\varepsilon_i}^2$ are the parameters to be estimated through an Ordinary Least Squares (OLS) regression of the 250-day estimation window (τ_{-11} , τ_{-260}). The normal return ($\bar{R}_{i\tau}$) for firm i on day τ in the event window can thus be simply defined as:

$$\bar{R}_{i\tau} = \hat{\alpha}_i + \hat{\beta}_i \cdot R_{m\tau}$$

The abnormal return ($AR_{i\tau}$) for firm i on each day τ in the event window is therefore the disturbance term of the SIMM and can be reformulated as:

$$AR_{i\tau} = R_{i\tau} - (\hat{\alpha}_i + \hat{\beta}_i \cdot R_{m\tau})$$

Under the null hypothesis, conditional on the event window market returns, the abnormal returns will be jointly normally distributed with a zero conditional mean and conditional variance of

$\sigma^2(AR_{i\tau})$. The variance of individual abnormal returns is made up of the variance of the disturbance term variance ($\sigma_{\varepsilon_i}^2$) and additional variance due to the sampling error in α_i and β_i . However, this sampling error approaches zero as the estimation window becomes large and thus the variance of the abnormal return, given our large 250-day estimation window, is simply the disturbance term variance ($\sigma_{\varepsilon_i}^2$). Moreover, this will allow the abnormal returns to become independent through time (MacKinlay).

In order to determine the significance of the individual abnormal returns for day $\tau = -10$ through to day $\tau = +10$ in the event window, we first need to find the average abnormal returns on each day τ , which can be computed as:

$$AR_{\tau} = \frac{1}{N_{\tau}} \left(\sum_{i=1}^{N_{\tau}} AR_{i\tau} \right)$$

Where N_{τ} is the number of events over which the abnormal returns are averaged on day τ . The Cumulative Abnormal Return (CAR) for day r through s of the given event window is:

$$CAR_{(r,s)} = \sum_{\tau=r}^s AR_{\tau}$$

For tests over multi-day event windows the cumulative *average* abnormal return (CAAR) is analyzed and this can be expressed as:

$$CAAR_{(r,s)} = \frac{1}{T} \left(\sum_{\tau=r}^s AR_{\tau} \right)$$

Where T is the length of the event window.

Finally, the test statistic (θ_1), employed in order to test the null hypothesis that the abnormal returns are zero, is the ratio of the day τ excess return to its standard deviation $\sqrt{\sigma_{\varepsilon_i}^2}$:

$$\theta_1 = \frac{AR_{\tau}}{\sqrt{\sigma_{\varepsilon_i}^2}} \sim N(0,1)$$

The resulting distribution is asymptotic with respect to the number of securities N and the length of the event window and thus, since the degrees of freedom in our sample exceeds 200, the test statistic is assumed unit normal (Brown & Warner).

6.5 Mean-Adjusted Method

The mean-adjusted method for calculating normal and abnormal returns is somewhat simpler than the SIMM as it uses only raw returns as the source of its computations. The normal return is the mean return R_i over the 250-day event window and can be expressed as:

$$R_i = \frac{1}{250} \left(\sum_{\tau=-260}^{-11} R_{i\tau} \right)$$

The abnormal return is therefore the difference between the actual return on day τ and the mean return:

$$AR_{i\tau} = R_{i\tau} - R_i$$

And the average abnormal return over N events for event day τ is simply:

$$AR_\tau = \frac{1}{N} \left(\sum_{i=1}^N AR_{i\tau} \right)$$

The standard deviation of the abnormal returns for day τ is estimated from the time series of average abnormal returns over the estimation window and is calculated as:

$$\sigma AR_\tau = \sqrt{\left(\sum_{\tau=-260}^{-11} (AR_\tau - \overline{AR})^2 \right) / 249}$$

Where:

$$\overline{AR} = \frac{1}{250} \left(\sum_{\tau=-260}^{-11} AR_\tau \right)$$

Therefore, the null hypothesis that the average abnormal return on day τ is equal to 0 can again be tested using the ratio of the mean excess return to its estimated standard deviation:

$$\theta_1 = \frac{AR_\tau}{\sigma AR_\tau}$$

The test statistic is Student-t distributed under the null hypothesis, given the average abnormal returns are independent, identically distributed, and normal, which is the case since the degrees of freedom is larger than 200. Moreover, by using the time-series average abnormal returns of the

estimation period to estimate the variance, the test statistic takes into account cross-section dependence in the security-specific abnormal returns.

6.6 Issues of Robustness

Statistical models, such as the SIMM and mean-adjusted method rest on the assumption that asset returns are jointly multivariate normal and independently and identically distributed through time. While this assumption may seem rather restrictive, it generally does not cause difficulties in the context of event studies as inferences using normal return models tend to be robust, even to large deviations from the assumption. For instance, Brown and Warner report that individual securities demonstrate substantial departures from normality, and that distributions of daily returns and abnormal daily returns are usually fat-tailed relative to normal distribution. However, as event studies examine the cross-sectional sample mean of abnormal returns, the Central Limit Theorem ensures that the distribution of the sample mean abnormal return tends toward normality as the number of securities increases. Furthermore, while the Central Limit Theorem relies on the assumption that excess returns in the cross-section of securities (i.e. across different events) are independent and identically distributed, this again does not present a problem. After several robustness tests, Brown and Warner show that even in event studies of sample sizes as small as 5, standard parametric tests for significance of the average abnormal return are still well specified. Furthermore, in cases where dependence does exist across several events, by estimating the variance from the time-series of estimation period mean abnormal returns, any cross-sectional dependence is accounted for. The only case where this procedure for obtaining the variance estimator can be questioned is in cases where there is a strong presence of serial autocorrelation⁹. However, many studies have proven that adjusting the estimated variance to reflect this autocorrelation does not result in large improvements (MacKinlay). Moreover, such adjustments are only beneficial if a high concentration of sample securities tend to trade with systematically lower frequency than the average (known as non-synchronous trading). As all of the securities in our sample trade on either the New York Stock exchange (NYSE) or NASDAQ, which represent the two largest US stock exchanges in terms of trading volume, serial autocorrelation is not considered an issue in our study¹⁰.

⁹ Serial autocorrelation in the context of the present topic refers to correlation in the mean daily excess returns over time and can be induced by, for example, non-synchronous trading (Brown and Warner).

¹⁰ Brown and Warner found that annual volume per security over a given sample period was several times greater for NYSE stocks than for AMEX stocks. Thus, an example in which serial autocorrelation should be considered is an event study concentrating only on AMEX firms.

7. Event Study Empirical Results

This section presents the results of the event study and discusses some general findings. First, the overall effect on stock prices of SEC litigation allegations will be analysed. Second, the degree to which this effect differs for allegations of fraud and insider trading will be examined.

7.1 Shareholder wealth effects

Table 2 and 3 present the single index market model (SIMM) and mean-adjusted model average daily abnormal returns (AR_t), associated t-statistic, percent negative AR_t s and associated non-parametric z-statistic for the 21-day event window surrounding the initial public disclosure of alleged violations. The sample consists of 84 events. Table 4 and 5 provide the SIMM and mean-adjusted CAAR results for the 2-day (-1,0), 3-day (-1,+1), 7-day (-3,+3), and 21-day (-10,+10) event windows for the total sample and by litigation category. Consistent with prior research, evidence of negative response of stock prices to allegations of corporate misconduct can be observed.

Looking at table 2, we see a negative response of -1.349% and -2.382% on days -1 and 0 respectively, both with 1% significance. A negative response of -0.784% at the 5% significant level can also be seen on day +1, supporting the assumption that in some cases the disclosure of the SEC's investigation was made after the market close on day 0. If we observe the percentage of negative returns exhibited by the sample, there is strong evidence (1% significance) that a majority (71.43%) of the firms exhibit negative returns on the same day the allegations are first announced. Surprisingly, we observe that on the day prior to the announcement (day -1), only 52.38% percent of the average abnormal returns are negative, and that this result is not significant, even though the average return (-1.349%) for this day is significant. When looking at the CAAR results in Table 4, a negative response of -1.865% occurs in the 2-day event window and of -1.505% in the 3-day event window, both of which are significant at the 1% level. CAARs for the 7-day and 21-day event windows, although negative, are insignificant, consistent with the assumption that there is no information leakage, and that the market reacts immediately to new disclosures.

The significant negative effects in our results on and directly surrounding the announcement day, concur with our first hypothesis (H1), that the stock price will exhibit negative abnormal returns in response to an announcement of SEC allegation. In addition, based on the cumulative abnormal returns (CAR) depicted in figure 1 below, it is observable that there is a clear decrease on the day

before the disclosure of SEC litigation/investigation. Arguably, information may have been provided to the market the day before the announcement, perhaps due to the fact that other information sources or the company in question made an announcement directly prior to either the Wall Street Journal or the SEC.

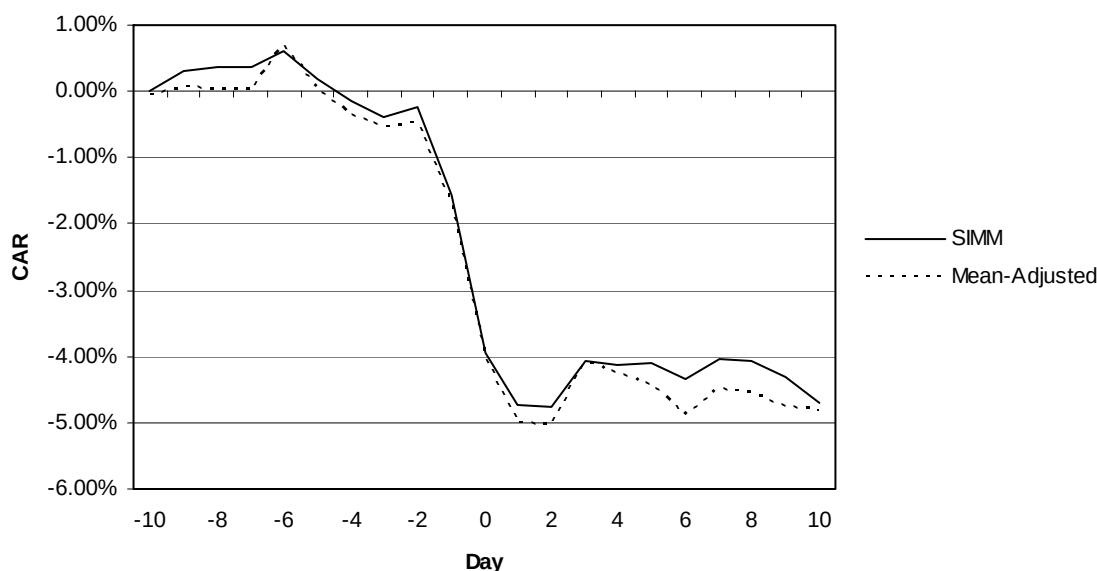


Figure 1. SIMM and Mean-adjusted Cumulative Abnormal Returns

In relation to the mean-adjusted average abnormal returns presented in table 3, similar results are observed as those obtained by the SIMM. Days -1 and 0 in the event day both exhibit significant negative returns (-1.234% and -2.317% respectively) at the 1% level, and day +1 (-0.964%) is significantly negative at the 5% level. The percentage of negative returns for the event day (0) is 72.62% and the percentage negative returns (66.67%) for day +1 are both significant at the 1% level. The CAAR (table 5) for both the 2-day (-1.776%) and 3-day event windows (-1.505%) are statistically significant at 1%, and are only slightly less than those for the SIMM 2-day window and identical (when rounded) to the SIMM's 3-day event window. The strong similarities between the results of the two models are illustrated in figure 1 above (note that the graph represents the cumulative sum across event days rather than the mean).

7.2 Fraud versus Insider Trading

Tables 2, 3, 4 and 5 further show the stock price responses according to the category of alleged violation. The total sample of 84 has been split into fraud and insider trading of size 69 and 15, respectively. As mentioned in section 6, Brown and Warner (1985) showed that small sample sizes in the context of event studies do not result in misspecification of the test statistic. However,

they do point out that the degree of skewness and kurtosis in the test statistics is slightly higher for samples of 5 and 20 than for samples of 50. As a result, significance levels for the insider trading sample should be interpreted with this in mind¹¹.

In the SIMM fraud category we can observe that day 0 and day -1 exhibit statistically significant negative returns at the 1 % level of -2.669% and -1.540% respectively (table 2). Moreover, the returns on day +1 of -0.829% are statistically significant at the 5% level. In line with the results from the total sample, the percentage of negative returns for fraud on the event day is 71.01%, significant at the 1% level. From the examination of the CAARs (table 4), we find statistically significant negative responses for fraud (at the 1% level) in both the 2-day and 3-day event window, with mean returns of -2.104% and -1.679% respectively. These results are slightly more severe than the overall sample and provide preliminary support for the increased effect of fraud allegations. In contrast, none of the SIMM abnormal results for insider trading exhibit any form of statistical significance. The same observation is true for the CAARs of insider trading, indicating that there is not enough evidence to reject the null hypothesis that abnormal returns for insider trading are equal to zero. Interestingly though, the percentage of negative AR_{it} s (73.33%) for the SIMM is in fact significant at the 10% level, suggesting that in a majority of cases, insider trading allegations are indeed associated with a negative effect. Overall however, the results clearly indicate that the market views allegations of fraud to have much higher associated costs than those of insider trading. This is further evidenced by figure 2, showing cumulative abnormal returns for the SIMM, where the large variation in shareholder wealth effects between allegations of fraud and insider trading is plainly visible. In addition, it would seem that insider trading cases actually have a mitigating effect on the total sample, as fraud cases alone exhibit higher negative CAAR's than the total sample. The results support our second hypothesis (H2), that allegations of fraud inflict greater negative effects on shareholder wealth than insider trading.

¹¹ That is, the power of the test is slightly lower for small samples.

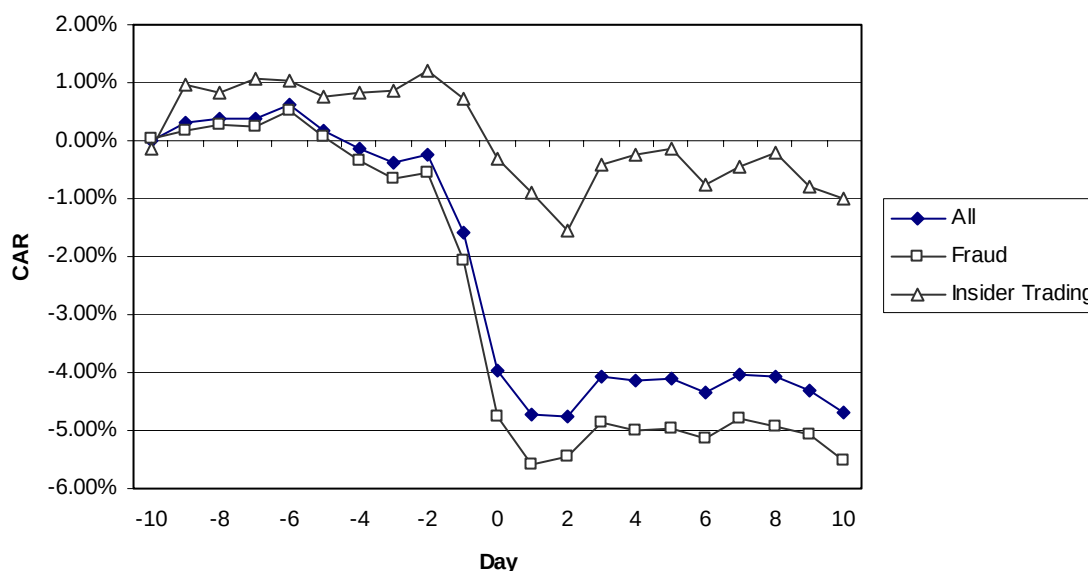


Figure 2. SIMM Cumulative Abnormal Returns

The mean-adjusted method for computing fraud and insider trading abnormal returns (Tables 3 and 5) again exhibits similar results to the SIMM. The stock price responses to fraud on day 0 of -2.697% and day -1 of -1.383% are both significant at the 1% level. Likewise, the percentage of negative returns of 73.91% is significant at the 1% level and slightly higher in relation to the SIMM. The CAARs of fraud for the mean-adjusted model (table 5) display similar significant results (at the 1% level) with returns of -2.040% and -1.710% for the 2-day and 3-day event windows respectively. As found in the SIMM, none of the abnormal returns or CAARs for the insider trading category are statistically significant. Comparing the graph of cumulative abnormal returns for the mean-adjusted model (figure 3) with that of the SIMM (figure 2), we can see that the SIMM exhibits slightly less severe cumulative abnormal returns. Although the CARs for insider trading are mainly positive for the mean-adjusted method, there is an apparent downward cumulative trend surrounding the event day (-2,+2) for both the SIMM and mean-adjusted method. Thus, combined with the rather high percentage of negative returns for insider trading on event day 0 as shown in table 2, this suggests that the reaction to SEC allegations of insider trading is indeed negative, albeit at an insignificant level.

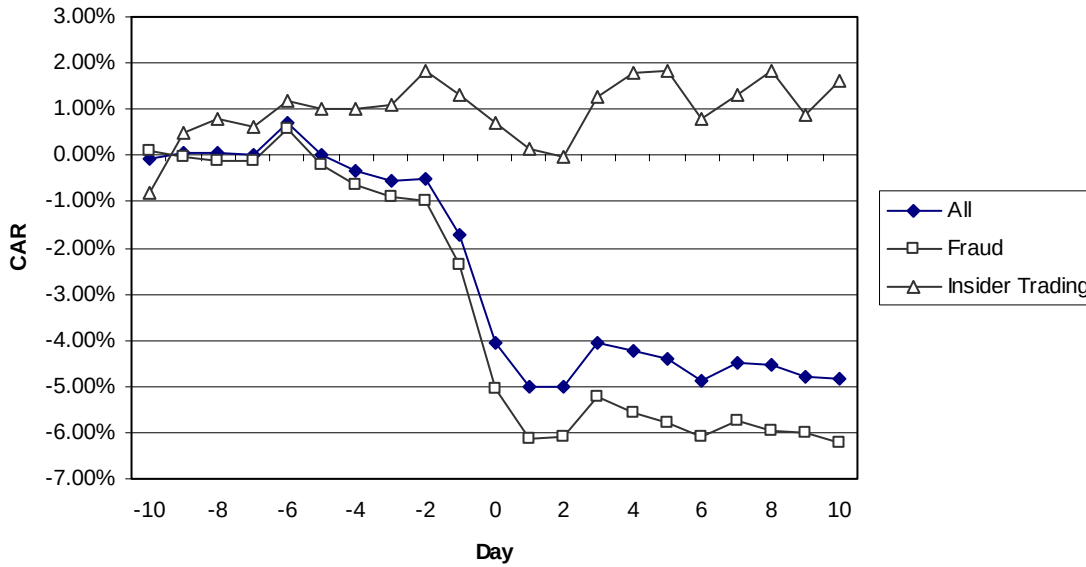


Figure 3. Mean-Adjusted Cumulative Abnormal Returns

In further reference to the CAARs from both the SIMM and mean-adjusted model, table 4 and 5 show that the magnitude of wealth losses tends to decrease for longer event windows. For the total sample, the negative returns “decrease” (in propensity) from -1.865% in the 2-day window to -0.224% for the 21-day window in the SIMM, and from -1.776% to -0.230% for the mean-adjusted model. Although information relating to alleged misconduct may not be limited to the 2-day event window, we interpret these results as more consistent with a market that reacts quickly and impartially to litigation announcements. Therefore, we find no evidence that reflects under-reaction or price momentum as advocated in previous studies.

In summary, both the SIMM and the mean-adjusted model indicate the existence of a statistically significant and more pronounced negative impact for cases of fraud as opposed to insider trading, in support of prior research and our second hypothesis.

8. Multivariate Regression analysis

The results of the event study analysis presented in the preceding section demonstrate significant negative abnormal returns associated with SEC allegations. However, it is possible that the differences found between different criminal categories were related to other factors such as industry or market value. As mentioned earlier, although the market value of all firms is considerably high, the range of market values between the largest and smallest firm in the sample is quite large (table 1). Thus, in order to test if these size differences as well as if industry factors effect the magnitude of abnormal returns obtained, we will conduct an ordinary least squares regression to estimate the incremental effect of one factor after controlling for the other factors.

Each of the five variables that will be included in the regression model, as well as their related hypotheses regarding their potential influence over the market's reaction to SEC allegations of misconduct will be described below.

8.1 Explanatory Variables and Hypotheses

SIZE: We employ the log of market capitalization as a proxy for firm-size. The log was taken so as to overcome skewness and ensure the reliability of the coefficients. Although all of the firms in our sample have been taken from 'Forbes 500' lists over a recent four year period, and thus comprise the largest firms in the US, the market values of these firms still exhibit significant differences. For instance, the largest firm in our sample has a market value of approx. \$406.5 Billion while the smallest firm has a market value of \$1 Billion. As a result, we would like to test if this difference affects the degree of abnormal returns. We define the market capitalisation as the equity value of the firm in the year prior to the alleged misconduct¹². Thus, firms with multiple events are reported with different market values pertaining to the year prior to each event.

Consistent with the findings of prior studies¹³, we expect firms with larger market values to suffer smaller shareholder wealth losses due to economies of scale. That is, the various costs imposed as a result of litigation, will be smaller relative to the firm's total market capitalization. Moreover, although firms with greater reputational capital may have more to lose if their reputation is marred, they nevertheless possess stronger financial backing when it comes to settling disputes or

¹² The listed market value was taken from the Forbes 500 website.

¹³ Bhagat et al., 1998, Rao et al., 1996, Griffin et al., 2004. Note that these studies all include a larger range of firm sizes in the data sample.

avoiding bankruptcy. Albeit, this second argument is perhaps not as relevant in the case of our sample, as we expect that all firms from the Forbes 500 list to possess a strong reputation which must be upheld, and as mentioned, even the smallest firm boasts quite a substantial market value. This leads us to formulate the following hypothesis:

Hypothesis 3: The magnitude of negative Cumulative Abnormal Returns is inversely proportional to firm size.

FRAUD: We include fraud as an explanatory variable in the regression in order to confirm the results found in the event study analysis and to gauge the specific incremental effect that fraud cases have on the magnitude of the response. Our prediction concerning fraud follows from the arguments put forward for hypothesis 2 outlined in section 4, wherein we anticipate fraud indictments to result in a more pronounced negative impact on abnormal returns. We therefore expect fraud to exhibit a negative coefficient when regressed against cumulative abnormal returns and formulate the following hypothesis.

Hypothesis 4: The negative stock price effect of an SEC litigation announcement will be amplified by allegations of fraud.

INDUSTRY: In order to test for any variation in abnormal returns based on industry characteristics, three industry categories which we believe could potentially influence the magnitude of the stock price response have been included in the regression model. In order to arrive at the industry categories, we have divided the sample according to official industry classifications provided on the Forbes website and then grouped similar classifications together. These categories are as follows: Energy, Finance (financial services, banking and insurance) and IT (computer services, software, telecommunications and internet). The remaining industries (consumer goods, health etc) have been grouped into an “other” category¹⁴, as we do not believe they would exhibit a dissimilar effect on the magnitude of abnormal stock returns.

ENERGY: Intuitively, we would expect companies which are related to the Enron indictment to exhibit higher abnormal negative returns than firms in other industries. Information at the time showed that the accounting practices pursued at Enron, where energy trades were executed

¹⁴ The *other* category is represented by the *intercept* in the regression to avoid the “dummy trap”.

purely in order to inflate operating results, were a widespread practice in the industry¹⁵. Therefore we would expect the market to react more severely to announcements of SEC indictments against energy firms, as previous cases in the industry resulted in significant financial repercussions. This leads to the following hypothesis:

Hypothesis 5: The market will react more severely (more negatively) to allegations of misconduct against firms in the energy industry.

FINANCE: In contrast to our predictions for the energy industry, we expect firms involved in the finance industry to exhibit a positive influence on the degree of abnormal returns. In our sample, almost all of the finance firms received two or more indictments against them in the data period, with some experiencing more than five. This high frequency of litigation would seem to suggest that legal proceedings are an inevitable part of the business for these firms. In addition, financial firms are often associated with third party operations (for example, mergers and acquisitions and preparation of accounting statements) and thereby become implicated in litigation when their clients are accused of misconduct¹⁶. For these reasons we expect the market to react more mildly to SEC indictments against financial firms as they are accustomed to such events. We thus form the following hypothesis:

Hypothesis 6: The market will react less severely (less negatively) to allegations of misconduct against firms in the finance industry.

IT: The IT & telecoms industry is predicted to have a negative influence on cumulative abnormal returns. The high frequency of bankruptcies and uncertain financial solvency associated with several internet and IT related firms is likely to have instilled considerable uncertainty on the part of investors. Moreover, the overall confidence in the IT industry continues to be weak, with very high operational volatility¹⁷. Based on these arguments, we put forward the following hypothesis:

Hypothesis 7: The market will react more severely (more negatively) to allegations of misconduct against firms in the IT industry.

¹⁵ See The Calgary Herald, "Enron scandal raises fundamental questions", 21 December 2001

¹⁶ See The Boston Herald, "Class-action lawsuits circle financial firms", 23 February, 2004

¹⁷ See The Economist, "Bubble 2.0", Sep 22, 2005, New York

The following regression equations are used to test the five explanatory variables discussed above:

$$AR_{it} = \alpha + \beta SIZE + \delta FRAUD + \eta ENERGY + \lambda FINANCE + \psi IT + \varepsilon_{it}$$

$$CAR_{i(r,s)} = \alpha + \beta SIZE + \delta FRAUD + \eta ENERGY + \lambda FINANCE + \psi IT + \varepsilon_{it}$$

We test whether the regression coefficients $\beta, \delta, \eta, \lambda$ and ψ are positive, zero, or negative, depending on the predicted sign. Table 6 presents descriptive statistics for the whole sample.

9. Regression Results

Table 7 presents the results of the regressions for the total sample (84 observations) of average abnormal returns (AR_t) on days -1, 0 and +1 as well as the cumulative abnormal returns for the 2-day, 3-day, 7-day and 21-day event windows. Abnormal returns are based on those generated from the Single Index Market Model¹⁸. For each regression, we report the coefficients, White's heteroscedasticity adjusted t-statistics¹⁹ and the significance levels. The adjusted R^2 and significance of the F-statistic for explanatory power and model reliability are also provided.

9.1 Results

From the table (7) we observe that the adjusted R^2 for the regression model is greatest when the dependent variable is day 0 and is almost twice as high as the adjusted R^2 for days -1 and +1 as the dependent variable. For the CAR regressions, the adjusted R^2 decreases as the length of the event window increases, which is in line with the greater statistical significance of the CAAR's over smaller windows found in the event study analysis. Therefore, the five variables exhibit higher explanatory power for variation in the dependent variable when measured over the period directly surrounding the announcement date. It is surprising to note that only one of the regression variables (*fraud*) prove to be statistically significant when regressed against $AR_{(-1)}$ and only at the 10% level. Similarly, only one variable is significant for the day following the announcement ($AR_{(+1)}$; *Energy*), at the 5% level.

¹⁸ As the results were very similar for the SIMM and mean-adjusted models, we did not feel it necessary to conduct an additional 2 regressions in which the AR 's and CAR 's from the mean-adjusted method are also used as dependent variables.

¹⁹ After conducting a White's general heteroskedasticity test we could reject the null hypothesis of homoskedastic error terms and thus report white's heteroscedasticity-consistent t-values and significance levels.

The *energy* industry dummy variable exhibits the expected sign for all of the AR_t and $CAR_{(r,s)}$ intervals, with $AR_{(+1)}$ and $CAR_{(-1,+1)}$ significant at the 5% level and $AR_{(0)}$, $CAR_{(-1,0)}$ and $CAR_{(-3,+3)}$ significant at the 10% level. This supports the hypothesis (H5) that firms in the energy industry, on average, exhibit greater losses in terms of negative abnormal returns. For example, on the day after the event day $AR_{(+1)}$, the stock price reaction to announcements that an energy firm is under SEC investigation, results in an additional -5.3% decrease in excess of the “*other*” industry category (the intercept). Even more severe is the effect of energy firms over the 3-day event window, where they exhibit a 13.6% additional drop in cumulative abnormal returns. The industry dummy for *finance* also shows the expected sign (positive) in all intervals except $AR_{(+1)}$, however, the slightly negative coefficient of -1.1% in this case is not statistically significant. The $AR_{(0)}$ and $CAR_{(-1,0)}$ coefficient of 3.2% and 4.6% respectively, for the *finance* dummy are statistically significant at the 5% level, while the positive coefficients for the $CAR_{(-1,+1)}$ and $CAR_{(-10,+10)}$ are significant at the 10%. This is consistent with the hypothesis (H6) that litigation among financial firms are viewed as part of the operational environment by the market and therefore result in a less severe negative response than firms in the *other* category. For the *IT* industry dummy variable, 5 of the 7 periods exhibit the expected sign; however none of the period returns are statistically significant. This suggests that IT firms in our sample do not exhibit significant influence over the magnitude of abnormal returns in response to litigation, in contrast to our hypothesis (H7).

Examining the effects of the *fraud* variable, we find that all the intervals show the expected negative sign. Specifically, the coefficients for the $CAR_{(-1,0)}$ of -3.7% and $CAR_{(-1,+1)}$ of -4.0% are both statistically significant at the 5%. Furthermore, the $AR_{(-1)}$ and $CAR_{(-3,+3)}$ are negative and significant at the 10% level. Indeed, in support of our fourth hypothesis (H4) and prior results from the event study analysis, firms accused of fraud do exhibit more pronounced negative effects than insider trading.

The indication for the effect of firm size in relation to shareholder wealth effects is clearly non-existent as the coefficient is consistently close to zero, (with the exception of $CAR_{(-10,+10)}$). The signs for the *log of market cap* variable are primarily negative across the intervals and none of the coefficients are statistically significant, contrary to our hypothesis (H3). However this outcome is not very surprising, given that our sample is characterized by high market value firms.

The F-values for the overall regressions show the models for $AR_{(0)}$, $CAR_{(-1,0)}$, $CAR_{(-1,+1)}$ and $CAR_{(-3,+3)}$ to be significant at the 1% level, while the model for $CAR_{(-10,+10)}$ is statistically significant at the 5% level. Moreover, the models for $AR_{(-1)}$ and $AR_{(+1)}$ are significant at the 10% level. The strong significance levels of the F-values support the presumption that the five independent variables can be used to reliably predict the dependant variables employed.

Overall, the results in table 7 suggest that the category of alleged misconduct is an important determinant for shareholder wealth effects upon the announcement of an SEC allegation. Furthermore, firms belonging to the financial industry are affected relatively mildly by SEC litigation. In contrast, firms in the energy industry exhibit increased negative sensitivity to alleged litigation whereas IT related firms do not have a significant impact on the magnitude of shareholder wealth effects. Size showed now impact on the degree of abnormal returns in our sample.

9.2 Robustness Issues

As highlighted by Prabhala (1997), firm characteristics in traditional cross-sectional models are often proportional to the true cross-sectional parameters. As a result, Prabhala claims that the reported t-statistics should be interpreted as conservative lower bound estimates of the parameters' true statistical significance. Accordingly, rather than relying on the accuracy of the associated t-statistics and significance levels, the primary purpose of the regression analysis in our paper is to relate the size and sign of the abnormal and cumulative abnormal returns to the explanatory variables.

Therefore, in order to ensure that the signs of the respective independent variables give a reliable indication of the relationships that are present, the coefficients were estimated under different specifications of the regression model. For instance, additional explanatory variables were included in the regression and this resulted in no qualitative change in the results. More specifically, we added a dummy variable to separate the sample into litigation announcements made before and after the Sarbanes Oxley Act; however, this did not lead to any additional improvement in the initial model's explanatory power. We also re-ran the regressions after removing the three largest observations (Enron, Dynegy and Computer Associates). In all cases, the *fraud* and *finance* dummy variables remained significant over the same intervals and the signs of all coefficients in the model remained. However, the removal of the three events did result in a decrease in the negative magnitude of the *energy* dummy variable as well as the significance of

the coefficient, (p-value for $CAR_{(-1,+1)} = 0.12$). This can be attributed to the fact that two of the three removed observations were in the energy industry (Enron and Dynegy) and represented some of the largest corporate legal proceedings ever documented²⁰. However, even after their removal, all energy coefficients remained negative and therefore, the overall impact associated with firms in the energy industry can still be considered negative as predicted.

10. Discussion

As outlined in the previous section, conclusive evidence was found to support the hypothesis (H1) that firms, on average, experience negative abnormal returns at the time of litigation announcement. Our event study results show an average wealth loss for defendant firms of 1.865% over the 2-day window. In economic terms, this translates to a market value decrease of US\$824 Million in response to SEC litigation announcements (based on mean market capitalization). Clearly, the market expects allegations of misconduct to have serious repercussions for future cash-flows of the firm in question.

This statement can be regarded in accordance with the efficient markets hypothesis in that the litigation disclosure represents an unanticipated event and that prices react to the information immediately as it becomes available. The efficient market theory is questioned by Griffin et al. (2000) as well as Feroz et al. (1991) who find statistically significant evidence of post-announcement drifts and momentum. However, our examination over several event window lengths leads us to believe that the negative shareholder wealth effect is only significant in the days immediately surrounding the announcements date, lending further support to the efficient market hypothesis (this is true for all crime categories, table 4). Murphy et al (working paper), document a different trend based on data from 1982 to 1996 (464 observations), noting that an increase in the event window leads to a similar increase in the magnitude of shareholder wealth effects. The reason for this discrepancy could be that information relating to litigation matters was not only costly to obtain but also disclosed to different parties at different periods prior to passage of the reform act in 1995. In addition, the data used in the studies above included smaller firms, which would impact the amount of information readily available to all parties. Thus, the availability of adequate information concerning allegations of misconduct has a significant effect on the magnitude and scope of shareholder wealth effects. This is supported by Reichert, Lockett

²⁰ See "The Corporate Scandal Sheet", www.forbes.com

and Rao (1996), who attribute increased public awareness to a statistically significant increase in the market response to corporate indictments after 1987.

Possible differences in the effects of fraud vs. insider trading cases were also looked at in the event study analysis. As explained in prior sections, fraud cases would be expected to have more severe consequences for the firm compared to the sample as a whole, directly implying that companies facing fraud indictments should be subjected to larger negative returns. Our results concur with this notion (2-day SIMM abnormal return of -2.104%), which is also consistent with other studies that categorize litigation cases. Murphy et al. (Working Paper) and Karpoff and Lott (1993) find fraud indictments exhibit the most severe reactions with a statistically significant 2-day abnormal return of -3.81% and -1.58% respectively. Given that we have used a different sample period, but a similar methodology, a possible explanation for the variation in level of reaction may be the composition of the fraud sample and/or a difference in investor response. In addition, the studies above include indictments for antitrust and copyright/patent infringements, whereas our data only concerns those indictments brought by the SEC.

In relation to the findings for insider trading indictments, the results are inconclusive. Both the SIMM and mean-adjusted model show insider trading to exhibit negative abnormal returns; however they are not statistically significant. Nevertheless, the percentage of negative responses in the SIMM was found to be significant at the 10% level and the figure of CAR's for both statistical models indicate a negative trend in responses around the insider trading announcement day. Overall, the results can be indicative of a higher shareholder wealth effect for fraud cases coherent with hypothesis H2 and consistent with Bhagat and Romano (2001) and Murphy et al. (Working Paper). Furthermore, Block (1991) concludes fraud indictments to be the only significant category of litigation when analyzing shareholder wealth effects. These findings are in line with the efficient markets hypothesis since fraud indictments arguably will result in a significant decrease in future cash-flows due to the larger associated costs. The results of the multivariate regression lend further support to our hypotheses (H2 and H4) that shareholder wealth effects will vary according to the alleged misconduct. The significance of the fraud dummy variable shows that the market does expect the associated costs of such litigation to be higher than for other types and reacts accordingly (more severely).

Our hypothesis relating the magnitude of shareholder wealth effect to firm size (H3), based on the notion of reputation as well as economies of scale, proves to be rejected. Contrary to Murphy et al

(working paper) and Griffin (2004), an alleged criminal act does not impose fixed costs (in terms of legal expenses, fines, and loss of goodwill) that are proportionally smaller relative to the firm's market capitalization. This result however, must be analyzed in the context of firm size as all of the firms in the sample are the largest and most well-known in the US economy, while previous studies include a much broader range of firms.

The regression results also support our hypothesis related to the effects of industry characteristics on the magnitude of the market's reaction to SEC litigation indictments. As predicted (H5), firms in the energy industry suffer a more pronounced negative stock price response to SEC litigation announcements. Several of the cases in our sample relate to the well-known scandals concerning trading strategies and show substantial abnormal returns in the raw data. Moreover, the severe financial repercussions of Enron would support the notion that the market would react in the same manner for similar cases.

Further support for variation in shareholder wealth effects are derived from firms in the financial industry. As hypothesised (H6), the market generally does not view potential litigation against these firms as having as serious financial or reputational damages as those associated with firms in other industries. One possible explanation for this observation could be that financial firms often syndicate their operations or act as third parties to other organizations and thus corporate misconduct affects several different firms simultaneously. Therefore, the market arguably assigns litigation as part of the risk characteristics that are associated with the financial industry.

Finally, it is important to remember the potential effects of survivorship bias. During our sample construction, 22 firms were omitted due to lack of data, acquisition, de-listing or because they were related to a disclosure prior to the period of investigation. As a result, an unavoidable survivorship bias is present within our data. In order to more accurately predict the effect that this survivorship bias has on our results, we examined the 22 companies that were omitted from the initial sample. Specifically, we found that WorldCom and Lucent Technologies were among those omitted. Thus, due to the fact that these companies represent some of the largest litigation cases²¹, they would be expected to have a notable negative impact on abnormal returns, suggesting that our results could be underestimated.

²¹ See "The Corporate Scandal Sheet" www.forbes.com

11. Conclusions and Recommendations

11.1 Conclusions

This study investigates the shareholder wealth effects of SEC litigation on the largest public US companies. Based on event study methodology and using two different models for generating abnormal returns, we test the hypothesis that SEC allegations lead to significant negative abnormal returns on the day of the announcement. In addition, we hypothesize that allegations of fraud result in more severe wealth losses (a more negative response) than allegations of insider trading.

Our results from both the Single Index Market Model (SIMM) and Mean-Adjusted Model clearly show negative abnormal returns on the day of the announcement with a 2-day announcement period price decline of -1.865% (SIMM), significant at the 1% level. This result is consistent with previous findings of statistically significant shareholder wealth losses related to disclosures of firm misconduct. Furthermore, as predicted, when isolating only those cases related to fraud, abnormal returns become more negative than both the sample as a whole as well as insider trading. Contrary to earlier research, we find no evidence of price momentum surrounding the release of initial allegations of criminal activity, suggesting an immediate and instantaneous reaction by the market in support of the efficient market theory.

The results of the regression analysis confirm the significant negative impact of fraud for the days surrounding the announcement day, and also show that firms in the financial sector suffer less negative abnormal returns, while firms in the energy sector undergo greater abnormal returns.

11.2 Recommendations for Future Research

A possible suggestion for future research would be to expand the sample by scanning litigation releases for a broader range of companies as well as extending the period under study. A larger sample would allow for further stratification, so as to examine the distinctions between companies based on characteristics besides that of the litigation type. In addition, an investigation of shareholder wealth effects for the largest global corporations (the Forbes global 500, for example) would, albeit a rather extensive task in terms of judicial disclosure, allow for country by country or regional comparisons. Another interesting topic could be a more in depth analysis into the specific consequences of insider trading on shareholder wealth effects, given their statistical insignificance in this study.

Finally, the introduction of the Sarbanes Oxley Act in 2002 provides ample opportunities for empirical investigations such as the frequency and severity of SEC allegations before and after the enactment. Such research could focus on Forbes 500 companies as well as smaller firms to evaluate the degree to which they experience similar share price developments. In addition, it would be interesting to examine whether the Act has had the desired effect in terms of increased internal controls and assignment of responsibility.

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11. Appendix

Table 1: Complete Data Sample

Company	Market Cap (\$ Mil)	Litigation Release Number and Date	Wall Street Journal Release Date	Litigation Type
General Electric (1)	406,525	Litigation Release No. 50426 / 23-Sep-04	17-Sep-02	Fraud
General Electric (2)	242,835	Litigation Release No. 19078 / 14-Feb-05	2-Aug-04	Fraud
Citigroup (1)	225,498	Litigation Release No. 48230 / 28-Jul-03	31-May-01	Fraud
American Intl Group (1)	193,333	Litigation Release No. 18340 / 11-Sep-03	-	Fraud
AOL	173,053	Litigation Release No. 19147 / 21-Mar-05	25-Jul-02	Fraud
Citigroup (2)	170,465	Litigation Release No. 51761 / 31-May-05	21-Jul-04	Fraud
Cisco	166,090	Litigation Release No. 19162 / 30-Mar-05	-	Insider Trading
American Intl Group (2)	124,914	Litigation Release No. 18985 / 30-Nov-04	22-Sep-04	Fraud
Motorola	123,331	Litigation Release No. 46898 / 25-Nov-02	30-Mar-01	Fraud
Coca Cola Company	119,142	Litigation Release No. 51565 / 18-Apr-05	15-Jul-03	Fraud
Bristol Myers	115,044	Litigation Release No. 18820 / 4-Aug-04	11-Jul-02	Fraud
Bank of America	103,533	Litigation Release No. 48493 / 16-Sep-03	13-Sep-03	Fraud
JP Morgan Chase	84,371	Litigation Release No. 18252 / 28-Jul-03	15-Jan-02	Fraud
Wyeth	83,592	Litigation Release No. 18264 / 30-Jul-03	-	Insider Trading
EMC	77,819	Litigation Release No. 17699 / 26-Aug-02	-	Insider Trading
PepsiCo	66,297	Litigation Release No. 18989 / 2-Dec-04	30-Apr-04	Fraud
Morgan Stanley (2)	63,663	Litigation Release No. 18117 / 28-Apr-03	01-May-02	Fraud
Morgan Stanley (3)	60,942	Litigation Release No. 48789 / 17-Nov-03	16-Jul-03	Fraud
Morgan Stanley (1)	57,754	Litigation Release No. 19050 / 25-Jan-05	13-Dec-00	Fraud
American Express	53,866	Litigation Release No. 8365 / 21-Feb-04	17-Nov-03	Fraud
Goldman Sachs(1)	50,386	Litigation Release No. 19051 / 25-Jan-05	13-Dec-00	Fraud
Enron	49,131	Litigation Release No. 17692 / 21-Aug-02	22-Oct-01	Fraud
Wachovia	48,896	Litigation Release No. 18958 / 4-Nov-04	31-Mar-03	Fraud
Bank one	47,204	Litigation Release No. 26490 / 29-Jun-04	3-Sep-03	Fraud
Merrill Lynch(2)	42,579	Litigation Release No. 18038 / 17-Mar-03	12-Aug-02	Fraud
Goldman Sachs (2)	40,409	Litigation Release No. 48436 / 4-Sep-03	29-Mar-02	Insider Trading
Merrill Lynch(1)	40,197	Litigation Release No. 18115 / 28-Apr-03	11-Jul-01	Fraud
Morgan Stanley (4)	39,980	Litigation Release No. 50632 / 4-Nov-04	-	Fraud
Goldman Sachs(3)	31,469	Litigation Release No. 8434 / 1-Jul-04	-	Fraud
Marsh & McLennan Cos	29,727	Litigation Release No. 26255 / 28-Oct-03	22-Oct-03	Insider Trading
Washington Mutual	29,510	Litigation Release No. 18333 / 9-Sep-03	-	Insider Trading
Duke Energy	28,030	Litigation Release No. 34-51995 / 8-Jul-05	15-Jul-02	Fraud
Household International	26,662	Litigation Release No. 47528 / 18-Mar-03	-	Fraud
Fifth Third Bancorp	24,138	Litigation Release No. 46087 / 18-Jun-02	-	Fraud
Genentech	23,973	Litigation Release No. 17684 / 15-Aug-02	-	Insider Trading
MetLife	21,870	Litigation Release No. 25787 / 25-Oct-02	-	Fraud
SunTrust Banks	20,800	Litigation Release No. 34-51700 / 17-may-05	13-Jan-05	Fraud
PNC Financial Services Group	18,358	Litigation Release No. 33-8112 / 18-Jul-02	30-Jan-02	Fraud
Halliburton	18,077	Litigation Release No. 18817 / 3- Aug-04	29-May-02	Fraud
Prudential Financial	17,875	Litigation Release No. 18444 / 4-Nov-03	19-Sep-03	Fraud
Gemstar-TV Guide International	17,427	Litigation Release No. 18760 / 23-Jun-04	22-Oct-02	Fraud
Waste Management Holdings	17,239	Litigation Release No. 17435 / 26-Mar-02	-	Fraud
Lehman Brothers Holdings	15,398	Litigation Release No. 48336 / 14-Aug-03	23-Jan-02	Fraud
Dynegy	14,824	Litigation Release No. 46537 / 24-Sep-02	25-Apr-02	Fraud
Qwest	14,468	Litigation Release No.17996 / 25-Feb-03	-	Fraud
Computer Associates Intl	14,361	Litigation Release No. 18891 / 21-Sep-04	21-Feb-02	Fraud
Anadarko Petroleum	14,059	Litigation Release No. 18158 / 28-May-03	-	Insider Trading
Capital One Financial	12,862	Litigation Release No. 18794 / 26-Jul-04	4-Mar-03	Insider Trading
Siebel Systems (1)	12,719	Litigation Release No. 46896 / 25-Nov-02	-	Fraud
Reliant Energy	11,906	Litigation Release No. 47828 / 12-May-03	21-Jun-02	Fraud
PeopleSoft	11,094	Litigation Release No. 17983 / 13-Feb-03	-	Insider Trading
Franklin Resources	11,049	Litigation Release No. 2271 / 2-Aug-04	16-Oct-03	Fraud
MedImmune	10,553	Litigation Release No. 18164 / 2-Jun-03	-	Insider Trading
Raytheon	9,756	Litigation Release No. 46897 / 25-Nov-02	15-Mar-01	Fraud

Table 1 Continued

Kroger	9,719	Litigation Release No. 49309 / 24-Feb-04	5-Jun-03	Fraud
Charles Schwab	9,602	Litigation Release No. 50360 / 14-Sep-04	-	Fraud
Univision Communications	9,108	Litigation Release No. 18407 / 9-Oct-03	-	Insider Trading
Eastman Kodak	8,438	Litigation Release No. 18989 / 2-Dec-04	-	Fraud
Coca-Cola Enterprises	8,264	Litigation Release No. 18989 / 2-Dec-04	-	Fraud
Corning	7,559	Litigation Release No. 18383 / 1-Oct-03	-	Insider Trading
Fiserv	7,540	Litigation Release No. 19197 / 21-Apr-05	-	Fraud
Bear Stearns Cos	7,380	Litigation Release No. 18116 / 28-Apr-03	22-Nov-02	Fraud
Newell Rubbermaid	6,940	Litigation Release No. 19353 / 29-Aug-05	-	Fraud
Symbol Technologies	6,632	Litigation Release No. 18050 / 15-Mar-03	14-Aug-02	Fraud
Dollar General	5,868	Litigation Release No. 19174 / 7-Apr-05	15-Jan-02	Fraud
Adelphia Communications	5,802	Litigation Release No. 17627 / 24-Jul-02	3-april-02	Fraud
BJ Services	5,288	Litigation Release No. 1972 / 10-Mar-04	-	Fraud
Huntington Bancshares	5,260	Litigation Release No. 19243 / 31-May-05	26-Apr-05	Fraud
Biogen	5,135	Litigation Release No. 19194 / 20-Apr-05	14-May-04	Insider Trading
HealthSouth	5,130	Litigation Release No. 18044 / 19-Mar-03	19-Sep-02	Fraud
Monsanto	4,151	Litigation Release No. 50978 / 6-Jan-05	23-Mar-04	Fraud
Siebel Systems (2)	4,018	Litigation Release No. 18766 / 29-Jun-04	14-Nov-04	Fraud
Nvidia	3,886	Litigation Release No. 48480 / 11-Sep-03	20-Nov-01	Fraud
CMS Energy	3,864	Litigation Release No. 8403 / 17-Mar-04	16-May-02	Fraud
Dean Foods	3,801	Litigation Release No. 18884 / 14-Sep-04	6-Nov-03	Fraud
Amazon	3,795	Litigation Release No. 46052 / 10-Jun-02	-	Fraud
Checkfree	3,768	Litigation Release No. 17370 / 21-Feb-02	-	Insider Trading
Centex	3,128	Litigation Release No. 50459 / 28-Sep-04	-	Fraud
Legg Mason	3,106	Litigation Release No. 8368 / 12-Feb-04	-	Fraud
Andrx Group	2,947	Litigation Release No. 47803 / 6-May-03	-	Fraud
Tyson Foods	2,923	Litigation Release No. 19208 / 28-Apr-05	30-Mar-04	Fraud
SEI Investments	2,669	Litigation Release No. 50017 / 14-Jul-04	-	Fraud
i2 technologies	2,521	Litigation Release No. 18741 / 9-Jun-04	28-Jan-03	Fraud
Network Associates	1,074	Litigation Release No. 18189 / 9-Jun-03	26-Mar-02	Fraud

Table 2:
Singel Index Market Model Average Daily Abnormal Returns During 21-Day Event Period Across Securities

Average daily abnormal returns AR_t are based on market model parameters calculated over the period -260 days to -11 days relative to the announcement date. T-statistics are calculated according to the methodology in MacKinley (1997). % negative is the fraction of abnormal returns (AR) that are negative and the z-statistics pertain to a binomial sign test. Fraud and Insider trading represent categories of alleged violations.

	Total Sample No. Obs = 84				Fraud No. Obs = 69				Insider Trading No. Obs = 15			
Day	Avg. Excess Returns	t-statistic	% negative	z-statistic	Avg. Excess Returns	t-statistic	% negative	z-statistic	Avg. Excess Returns	t-statistic	% negative	z-statistic
-10	-0.011%	-0.035	48.81%	-0.218	0.021%	0.063	47.83%	-0.361	-0.155%	-0.198	53.33%	0.258
-9	0.317%	1.030	46.43%	-0.655	0.142%	0.430	47.83%	-0.361	1.123%	1.437	40.00%	-0.775
-8	0.067%	0.218	57.14%	1.309	0.114%	0.345	56.52%	1.083	-0.148%	-0.189	60.00%	0.775
-7	0.003%	0.010	47.62%	-0.436	-0.051%	-0.155	49.28%	-0.120	0.252%	0.323	40.00%	-0.775
-6	0.236%	0.767	47.62%	-0.436	0.295%	0.895	47.83%	-0.361	-0.037%	-0.047	46.67%	-0.258
-5	-0.430%	-1.397	57.14%	1.309	-0.467%	-1.414	55.07%	0.843	-0.261%	-0.335	66.67%	1.291
-4	-0.324%	-1.051	60.71%	1.964 **	-0.405%	-1.225	62.32%	2.047 **	0.049%	0.063	53.33%	0.258
-3	-0.243%	-0.790	58.33%	1.528	-0.303%	-0.917	62.32%	2.047 **	0.031%	0.039	40.00%	-0.775
-2	0.159%	0.518	51.19%	0.218	0.117%	0.355	49.28%	-0.120	0.353%	0.452	60.00%	0.775
-1	-1.349%	-4.383 ***	52.38%	0.436	-1.540%	-4.665 ***	55.07%	0.843	-0.472%	-0.604	40.00%	-0.775
0	-2.382%	-7.737 ***	71.43%	3.928 ***	-2.669%	-8.084 ***	71.01%	3.491 ***	-1.061%	-1.358	73.33%	1.807 *
1	-0.784%	-2.546 **	63.10%	2.400 **	-0.829%	-2.510 **	62.32%	2.047 **	-0.577%	-0.738	66.67%	1.291
2	-0.028%	-0.090	48.81%	-0.218	0.110%	0.334	47.83%	-0.361	-0.663%	-0.849	53.33%	0.258
3	0.708%	2.300 **	46.43%	-0.655	0.613%	1.857 *	49.28%	-0.120	1.144%	1.464	33.33%	-1.291
4	-0.080%	-0.260	48.81%	-0.218	-0.136%	-0.411	49.28%	-0.120	0.175%	0.224	46.67%	-0.258
5	0.032%	0.103	40.48%	-1.746 *	0.017%	0.050	40.58%	-1.565	0.102%	0.130	40.00%	-0.775
6	-0.237%	-0.769	51.19%	0.218	-0.156%	-0.473	49.28%	-0.120	-0.607%	-0.777	60.00%	0.775
7	0.314%	1.021	48.81%	-0.218	0.317%	0.960	49.28%	-0.120	0.303%	0.388	46.67%	-0.258
8	-0.051%	-0.166	52.38%	0.436	-0.117%	-0.353	53.62%	0.602	0.251%	0.321	46.67%	-0.258
9	-0.219%	-0.710	51.19%	0.218	-0.134%	-0.406	47.83%	-0.361	-0.609%	-0.779	66.67%	1.291
10	-0.407%	-1.321	47.62%	-0.436	-0.452%	-1.370	46.38%	-0.602	-0.197%	-0.253	53.33%	0.258

***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Table 3:
Mean-Adjusted Average Abnormal Excess Returns During 21-Day Event Period Across Securities

Average daily abnormal returns AR_t are based on mean-adjusted returns calculated over the period -260 days to -11 days relative to the announcement date. T-statistics are calculated according to the methodology in Brown and Warner (1984). % negative is the fraction of abnormal returns (AR) that are negative and the z-statistics pertain to a binomial sign test with. Fraud and Insider trading represent categories of alleged violations.

	Total Sample No. Obs = 84				Fraud No. Obs = 69				Insider Trading No. Obs = 15			
Day	Avg. Excess Returns	t-statistic	% negative	z-statistic	Avg. Excess Returns	t-statistic	% negative	z-statistic	Avg. Excess Returns	t-statistic	% negative	z-statistic
-10	-0.071%	-0.183	50.00%	0.000	0.085%	0.212	47.83%	-0.356	-0.788%	-0.842	60.00%	0.775
-9	0.134%	0.348	51.19%	0.218	-0.114%	-0.283	53.62%	0.593	1.275%	1.363	40.00%	-0.775
-8	-0.022%	-0.058	57.14%	1.309	-0.096%	-0.237	59.42%	1.542	0.314%	0.336	46.67%	-0.258
-7	-0.011%	-0.027	47.62%	-0.436	0.022%	0.056	46.38%	-0.593	-0.162%	-0.173	53.33%	0.258
-6	0.671%	1.742 *	44.05%	-1.091	0.697%	1.730 *	43.48%	-1.068	0.554%	0.592	46.67%	-0.258
-5	-0.679%	-1.762	59.52%	1.746 *	-0.785%	-1.949 *	57.97%	1.305	-0.189%	-0.202	66.67%	1.291
-4	-0.371%	-0.962	58.33%	1.528	-0.452%	-1.122	59.42%	1.542	0.002%	0.003	53.33%	0.258
-3	-0.187%	-0.484	55.95%	1.091	-0.249%	-0.618	56.52%	1.068	0.100%	0.107	53.33%	0.258
-2	0.048%	0.125	51.19%	0.218	-0.101%	-0.251	55.07%	0.830	0.734%	0.785	33.33%	-1.291
-1	-1.234%	-3.203 ***	50.00%	0.000	-1.383%	-3.434 ***	50.72%	0.119	-0.548%	-0.586	46.67%	-0.258
0	-2.317%	-6.013 ***	72.62%	4.146 ***	-2.697%	-6.693 ***	73.91%	3.915 ***	-0.570%	-0.609	66.67%	1.291
1	-0.964%	-2.503 **	66.67%	3.055 ***	-1.051%	-2.609 **	68.12%	2.966 ***	-0.565%	-0.604	60.00%	0.775
2	-0.023%	-0.060	54.76%	0.873	0.014%	0.036	56.52%	1.068	-0.197%	-0.210	46.67%	-0.258
3	0.952%	2.470 **	40.48%	-1.746 *	0.876%	2.174 **	44.93%	-0.830	1.301%	1.391	20.00%	-2.324 **
4	-0.174%	-0.451	51.19%	0.218	-0.326%	-0.810	53.62%	0.593	0.526%	0.563	40.00%	-0.775
5	-0.175%	-0.455	46.43%	-0.655	-0.220%	-0.547	44.93%	-0.830	0.032%	0.034	53.33%	0.258
6	-0.450%	-1.167	50.00%	0.000	-0.324%	-0.804	46.38%	-0.593	-1.029%	-1.100	66.67%	1.291
7	0.376%	0.977	50.00%	0.000	0.341%	0.846	52.17%	0.356	0.540%	0.577	40.00%	-0.775
8	-0.055%	-0.143	50.00%	0.000	-0.178%	-0.442	52.17%	0.356	0.510%	0.545	40.00%	-0.775
9	-0.224%	-0.581	53.57%	0.655	-0.063%	-0.156	52.17%	0.356	-0.963%	-1.030	60.00%	0.775
10	-0.056%	-0.146	48.81%	-0.218	-0.229%	-0.569	46.38%	-0.593	0.740%	0.791	60.00%	0.775

***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Table 4:
Single Index Market Model Cumulative Average Abnormal Returns and Percentage Negative Returns over Selected Intervals

The single index market model cumulative average abnormal returns (CAAR(r,s)), in percent, for day r through s relative to the announcement date. T-statistics are calculated according to the methodology in MacKinley (1997). % negative is the fraction of CAAR(r,s) that are negative and the z-statistics pertain to a sign test with $\sim N(0,1)$. Fraud and Insider trading represent categories of alleged violations.

	Mean	t-statistic	% Negative	z-statistic
Category: Total Sample	no. obs. = 84			
CAAR(-1,0)	-1.865%	-6.060 ***	61.90%	2.182 **
CAAR(-1,+1)	-1.505%	-4.888 ***	62.30%	2.255 **
CAAR(-3,+3)	-0.560%	-1.818 *	55.95%	1.091
CAAR(-10,+10)	-0.224%	-0.728	52.27%	0.416
Category: Fraud	no. obs. = 69			
CAAR(-1,0)	-2.104%	-6.374 ***	63.04%	2.167 **
CAAR(-1,+1)	-1.679%	-5.086 ***	62.80%	2.127 *
CAAR(-3,+3)	-0.643%	-1.947 *	56.73%	1.118
CAAR(-10,+10)	-0.262%	-0.795	52.38%	0.396
Category: Insider Trading	no. obs. = 15			
CAAR(-1,0)	-0.766%	-0.981	56.67%	0.516
CAAR(-1,+1)	-0.703%	-0.900	60.00%	0.775
CAAR(-3,+3)	-0.178%	-0.228	52.38%	0.184
CAAR(-10,+10)	-0.048%	-0.061	51.75%	0.135

***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Table 5:
Mean-Adjusted Cumulative Average Abnormal Returns and Percentage Negative Returns over Selected Intervals

The mean adjusted cumulative average abnormal returns (CAAR(r,s)), in percent, for day r through s relative to the announcement date. T-statistics are calculated according to the methodology in Brown and Warner (1984). % negative is the fraction of CAAR(r,s) that are negative and the z-statistics pertain to a binomial sign test. Fraud and Insider trading represent categories of alleged violations.

	Mean	t-statistic	% Negative	z-statistic
Category:	Total Sample	no. obs. = 84		
CAAR(-1,0)	-1.776%	-4.608 ***	61.31%	2.073 **
CAAR(-1,+1)	-1.505%	-3.906 ***	63.10%	2.400 **
CAAR(-3,+3)	-0.532%	-1.381	55.95%	1.091
CAAR(-10,+10)	-0.230%	-0.597	52.83%	0.520
Category:	Fraud	no. obs. = 69		
CAAR(-1,0)	-2.040%	-5.064 ***	62.32%	2.047 **
CAAR(-1,+1)	-1.710%	-4.246 ***	64.25%	2.368 **
CAAR(-3,+3)	-0.656%	-1.628	57.97%	1.324
CAAR(-10,+10)	-0.297%	-0.737	53.42%	0.568
Category:	Insider Trading	no. obs. = 15		
CAAR(-1,0)	-0.559%	-0.598	56.67%	0.516
CAAR(-1,+1)	-0.561%	-0.600	57.78%	0.602
CAAR(-3,+3)	0.036%	0.039	46.67%	-0.258
CAAR(-10,+10)	0.077%	0.082	50.16%	0.012

***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Table 6:
Total Sample Descriptive Statistics

Means, standard deviations, minimum and maximum for the following variables: $AR(\tau)$ are the single index market model (SIMM) abnormal returns for day τ , $CAR(r,s)$ are the SIMM cumulative abnormal returns for the period (r,s) ; Market Capitalization is the equity value at the fiscal year-end prior to the announcement (\$ million); IT, Finance and Energy are all dummy variables representing firm industry and Fraud is the dummy variable for litigation cases categorized as fraud. Statistics are reported for the maximum number of observations for each variable.

Variable	Mean	Max	Min	Std. Dev.	Obs
AR (-1)	-0.0135	0.0356	-0.2305	0.0431	84
AR (0)	-0.0238	0.1230	-0.2933	0.0581	84
AR (+1)	-0.0078	0.1041	-0.2080	0.0404	84
CAR(-1,0)	-0.0373	0.0495	-0.3444	0.0748	84
CAR(-1,+1)	-0.0451	0.0726	-0.5525	0.0958	84
CAR(-3,+3)	-0.0392	0.0931	-0.6566	0.1029	84
CAR(-10,+10)	-0.0471	0.2401	-0.9748	0.1917	84
Market Cap. (Millions)	44147	406525	1074	66765	84
IT	-	-	-	-	17
Financial Services	-	-	-	-	36
Energy	-	-	-	-	8
Fraud	-	-	-	-	69

Table 7

Multivariate Regression Tests of the Relation Between Abnormal Returns, Energy Industry, Financial Industry, IT industry, Fraud, and Market Cap.

This table reports seven regression analyses between the stock market reaction (SIMM) to SEC litigation and the variables that would explain that reaction. The dependent variable is the daily average abnormal returns $AR(\tau)$ for event day τ or cumulative abnormal returns $CAR(r,s)$ for period r to s . The explanatory variables are: three dummy variables for firm industry; Energy, Finance and IT (where a value of 1 is assigned if the firm is part of that industry, 0 otherwise), a dummy variable for cases of Fraud (fraud = 1, otherwise 0), and Log of Market Capitalization. The columns show the coefficient value, t-value (White's heteroscedasticity corrected), and a two-tailed test of significance for the intercept and explanatory variable.

Abnormal Return Variable	Intercept	t-value	Signif.	Energy	t-value	Signif.	Finance	t-value	Signif.	IT	t-value	Signif.	Fraud	t-value	Signif.	Log Market Cap	t-value	Signif.	Adj. R ²	F-test Signif.	Obs.
Predicted Sign of																					
Coefficient	$\hat{G}$			-			+			-			-			+					
AR (-1)	0.027	0.743		-0.018	-0.984		0.014	1.403		-0.023	-1.297		-0.019	-1.927 *		-0.002	-0.627		0.065 *		84
AR (0)	-0.012	-0.252		-0.066	-1.771 *		0.032	2.071 **		0.010	0.570		-0.018	-1.373		-0.001	-0.139		0.189 ***		84
AR (+1)	0.004	0.121		-0.053	-2.123 **		-0.011	-0.991		-0.017	-1.169		-0.003	-0.371		0.000	0.099		0.069 *		84
CAR (-1,0)	0.015	0.229		-0.083	-1.795 *		0.046	2.179 **		-0.013	-0.577		-0.037	-2.215 **		-0.003	-0.478		0.232 ***		84
CAR (-1,+1)	0.019	0.307		-0.136	-2.119 **		0.035	1.938 *		-0.030	-1.032		-0.040	-1.987 **		-0.003	-0.495		0.232 ***		84
CAR (-3,+3)	0.060	0.742		-0.147	-1.980 *		0.023	1.168		-0.035	-1.229		-0.039	-1.695 *		-0.006	-0.754		0.188 ***		84
CAR (-10,+10)	0.081	0.552		-0.162	-1.210		0.090	1.844 *		0.009	0.153		-0.062	-1.589		-0.010	-0.825		0.091 **		84

***, ** and * denote significance at the 1%, 5% and 10% levels respectively.