The Tangible and Intangible Consequences of Corporate Fraud

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Abstract

Using information on class action lawsuits in the period 1996-2016 covering 1,249 cases and 888 individual firms, I analyze the determinants of allegations and economic outcomes. Firms are more likely to be indicted if they are smaller, have a high level of investment, and have a bad stock market performance. Markets react negatively to lawsuits: firms may lose up to $1.3 billion or 23% of their market value around the start of the litigation procedure. This effect is more pronounced for firms that end up paying a settlement. I find no reversal in returns in the period after the filing, at significant court events or throughout the entire court procedure. Cross-sectional results indicate that firms with more resources to spend on litigation experience a smaller market reaction. Indicted firms significantly readjust their operations and their investor base changes as well. Finally, I find that a trading strategy based on fraud allegations yields a significant four-factor alpha of 3.7% per year.

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1. Introduction

The extant literature on corporate fraud is predominantly concerned with the effects of prosecuted fraud, be it stock market reaction, firm outcomes or executive turnover. However, conventional wisdom suggests that if a large group of investors becomes concerned with the firm's operations and management, and they take legal steps to assert their claims, it may have an effect on firm value and outlook. In this paper, I examine how the market reacts when a firm is indicted by a large group (i.e. class) of shareholders, and whether this market value reaction can be attributed to tangible changes in the firm's operations, or to a loss of reputation and hence a change in the value of intangible assets. I also investigate whether litigation conveys valuable information to the market.

Large corporate scandals, like Enron, WorldCom, and more recently Volkswagen are widely publicized in the media, but represent only the tip of the iceberg. The Association of Certified Fraud Examiners estimates that, in 2015 alone, 5% of revenues were lost due to fraud adding up to $6.3 billion. The report also states there is an irregularity at every fourth public firm. The findings of Dyck, Morse, and Zingales (2013) are equally alarming. They estimate that in any given year, up to 6% of S&P 1500 firms engage in fraud that is eventually prosecuted by the Department of Justice. Fraud not only causes directly measurable capital market losses, but has other, far-reaching effects on society.

In my paper, I study the effect of fraud revelation on stock market performance and analyze the cross-section of returns to identify company characteristics that act as a "red flag" and also the ones that mitigate market reaction. Additionally, I look at the factors that make a firm suspicious to investors. My sample covers over 1,200 firms in the period 1996-2016. To the best of my knowledge, this is the first paper that looks at all indictments and not only settled fraud cases allowing me to measure the direct effect of litigation. I use data on class action filings to identify fraudulent firms.[1] Class actions are civil lawsuits initiated by investors and thus represent cases where corporate actions and management decisions exceed the "tolerance" threshold of shareholders, and are not considered bad luck or an honest mistake.

I focus on class actions for two reasons. First, it is the enforcement channel with the lowest

[1]Throughout the paper, I use the term "fraudulent" for companies that end up in court. Within fraudulent companies, I distinguish firms that are acquitted and firms that eventually pay a settlement. Settlement is often reached without a court order, and the establishment of intent. I assume that the claim was meritorious if the company agrees to pay a settlement.

attrition rate (Karpoff et al., 2017a). Second, it provides a sample where indicted firms surpass shareholders' threshold of tolerance for errors and thus these firms are considered by their own shareholders to conduct business in an unruly way that erodes trust and is potentially value destroying. Analyzing the characteristics of firms whose shareholders file a lawsuit, I find that these firms tend to have relatively high market-to-book ratios and exceptionally high growth in terms of sales. When I look at the determinants of lawsuit filings, I document that large firms that have a bad year in terms of stock market performance are more likely to be indicted.

My results show that fraud is indeed widespread. In my sample, covering the S&P 1500, I find that about 60 cases are filed each year, the propensity of fraud being the highest in the financial, healtchare, services and tech industries. This is an overall 4% of the index constituents, but I also find a higher propensity of fraud around bubbles, for example, the number of filings was 95 in 2008, or almost 60% higher than the average.

My findings indicate that even the announcement that a company is taken to court has a non-trivial effect on the stock market. In the 1-day window around the day of filing a lawsuit, the average firm experiences an abnormal stock market drop of 2.7% and an abnormal market value dip of about $375 million. However, it appears that investors are –to some extent– able to assess if a lawsuit is meritorious, as firms that end up paying damages to their investors exhibit a 5% negative return at the initial announcement, while this figure is -1% for companies that are eventually cleared of all charges. While the difference between the returns of ex post settling and acquitted firms is large, even the latter group experiences a sizable value drop of $218 million. The fact that the value drop for prosecuted firms is significantly larger than the eventual penalty suggests that a lawsuit significantly reduces reputation. To asses whether the value drop of falsely accused firms is a selection issue, I construct a matching sample of similar, non-fraudulent firms. I determine the control sample within the same industry, and by size, market-to-book ratio and past returns. Estimating the abnormal returns for the control group reveals that there is indeed a litigation effect, as the abnormal return of the control sample is zero around the filing date at all reasonable critical levels. I also look at returns around the closure of court proceedings in order to identify if there is a reversal effect once a case nears its end. I find no significant price movements on the day the final order is issued by the court or in the overall period of the lawsuit. Strikingly, this is also true for acquitted firms. This result suggests that the drop in reputation is factored in into prices at the initiation of the lawsuit. Looking at tangible measures of firm performance, I find that litigation does not have an effect on sales or the return on equity, albeit sales growth and margins decrease. Overall, this suggests that

fraudulent firms experience a value loss in intangible assets. This loss can be quantified as the market value drop for firms that are acquitted, or about $900 million. For firms that end up paying a settlement, the loss is the difference between the settlement amount and the market value drop. In monetary terms, it is $2,010 million and $1,632 million for voluntary and ordered settlements, respectively.

I also analyze what drives the market value drop for indicted firms to assess whether the market sees fraud as need or greed (Wells, 2001). First, in cross-sectional regressions on observable risk characteristics, I find that fraudulent firms indeed experience significantly lower returns than their matched peers around lawsuit filings. On average, firms with high past volatility experience more negative returns. However, fraudulent firms that are large and that hold large amounts of cash are less affected. This could be due to investors' perception that these firms can weather the litigation process. Subsequent analyses support this argument, as indicted firms reduce their investments and hold more cash compared to the matched sample. Fraudulent firms that have large past volatility and that experienced a profitability shock experience a more measured price drop. Second, turning to governance characteristics, I find that firms with high institutional ownership also have lower returns, for which the potential channel is that some institutions might fire-sale fraudulent firms. Looking at the investor base of fraudulent firms, I confirm that institutions hold -2.6% less shares of these firms in the quarters following the filing of the lawsuit. Third, considering the investment activities of firms, I find no significant link between past acquisitions and the market reaction to fraud.

Finally, I test whether litigation conveys valuable information to the stock market. Constructing a long-short portfolio, I find that an investor can earn significant returns trading around litigation events. A portfolio that goes short in stocks of indicted firms and long in stocks of similar firms that do not face a court procedure earns a risk-adjusted alpha of 3.7% annually.

This paper contributes to several strands of the literature on corporate fraud. First, I advance the literature on the pervasiveness of corporate fraud. Corporate fraud is considerably more prevalent than the aforementioned mega cases. Naturally, managers try to conceal fraudulent behavior, to evade legal consequences that could harm their personal wealth and reputation (Karpoff, Lee, and Martin, 2008a). As a result, the literature only has estimates on the extent of corporate fraud. Karpoff, Lee, and Martin (2008b) look at accounting restatements and follow-up enforcements by the Securities Exchange Commission (SEC) and find that in the period 1978-2002 less than 1% of CRSP firms restated their earnings and the apprehension

rate of ill-intentioned restatements is about 80%. This suggests that fraud is relatively scarce, however, Dyck et al. (2013) arrive at a different conclusion. Using the demise of Arthur Andersen after the Enron scandal as a natural experiment, they estimate the pervasiveness of fraud by looking at irregularities uncovered by new auditors. Their results indicate that the likelihood that an S&P 500 company engages in fraud in any given year is as high as 15%. Additionally, in boom periods, such as the dot-com bubble, when investor scrutiny is more lax, as many as 6% or 30 of the largest US firms commit fraud. I add to this literature by showing in a large and comprehensive sample that if we consider a broad definition, the incidence of fraud is 4%, with considerable industry and time-series variation.

Second, my paper adds to the literature that looks at various types of fraud. Prior research typically focuses on a particular type of fraud. The fraud category receiving the highest attention in the literature is financial misrepresentation and earnings manipulation (for example, Dechow, Sloan, and Sweeney (1996), Desai, Hogan, and Wilkins (2006), Karpoff et al. (2008b), and Palmrose, Richardson, and Scholz (2004)). Other fraud types examined include product recalls and product market reputation (e.g., Johnson, Xie, and Yi (2014)), environmental violations (c.f. Karpoff, Lott Jr., and Wehrly (2005) and Konar and Cohen (2001)), and bribery (e.g., Hong and Liskovich (2015) and Karpoff, Lee, and Martin (2017b)). Studies on corporate fraud typically focus on one area due to data availability (Karpoff et al., 2017a), as there is no single database that includes all types of fraud. Academics use 4 datasets in most studies, the Stanford Class Action Clearinghouse (SCAC) for class actions, the Government Accountability Office (GAO) and Audit Analytics (AA) for restatements, and the Accounting and Auditing Enforcement Releases (AAER) for corporate wrongdoing prosecuted by the SEC. While these databases have considerable overlap, there are cases of fraud that are omitted in one or several of them. Looking at financial misrepresentation prosecuted by the Department of Justice due to the violation of Section 13(b) of the Securities Exchange Act of 1934, Karpoff et al. (2017a) find that the attrition rate can be as high as 61% (GAO) and it is the SCAC database that performs best, leaving out 13% of the cases. My contribution to this literature is to focus on class actions irrespective of the reason shareholders file them. This enables me to show the effects of litigation cases that arise when shareholders are displeased with the current operations of the firm.

Third, I contribute to the literature on the cost of fraud to shareholders. Regardless of the specific type of fraud, corporate misconduct is costly to society. The 2016 report of the Association of Certified Fraud Examiners (ACFE) claims that firms lose 5% of their revenues due to fraud. The report estimates that in 2015 alone $6.3 billion was lost because of corporate misconduct. As Zahra, Priem, and Rasheed (2005) put it, *"Where top management*

fraud exists, we all lose." Dechow et al. (1996) find that the initial announcement that a firm is under investigation results in a 9% drop in stock prices, aggravated by a widened bid-ask spread, suggesting that stocks of these firms become less liquid. Looking at SEC imposed penalties, Karpoff et al. (2008b) find that markets impose a penalty on firms that is 7.5 times larger than the actual fine they have to pay. Looking at the entire investigation period, they find that firms lose, on average, 38% of their market value, or $4.08 for every dollar of inflated value. This effect is even more pronounced for firms that remain listed during and after the SEC investigation process at $5.17 for each inflated dollar. Based on class actions in the SCAC database, Dyck et al. (2013) report a loss of 21.8% for fraudulent firms. Looking at firms investment opportunities, Yuan and Zhang (2014) find that fraudulent firms experience an increase in cost of capital and invest less in long term assets. My findings indicate that even the fact that a company is taken to court has a non-trivial effect on the stock market. I also find that indicted companies hold on to more cash and spend less on capital expenditures.

Shareholder losses, however, are not the only negative outcome attributable to fraud. The reputation of managers involved in fraud is ruined, and they may also face financial penalties and possible imprisonment (Karpoff et al., 2008a). Managers who are not directly involved or prosecuted could also suffer a reputation loss, as potential employers might see them as "passive bystanders". Additionally, if fraud puts a firm out of business then employees are also adversely affected as they lose their jobs and potentially their savings, if their retirement plan was strongly tied to the company' s stock. Related businesses also have to deal with a loss of revenues. These costs are hard to quantify, but the overall effect on society can be substantial (Zahra et al., 2005).

Finally, this study links up with the strand of literature that examines the motives to commit fraud. If the adverse effects of corporate fraud are so large, the question naturally arises: why would managers decide to engage in fraudulent behavior? Wells (2001) identifies two incentives to commit fraud: need or greed. The motives for "need" to commit fraud can be the need for external financing, to cover up financial distress or to acquire business. First, when a firm wants to expand rapidly, but its cost of capital is too high managers might try to make the numbers look better than they actually are. For example, Dechow et al. (1996), and Burns and Kedia (2006) both find that firms with large accounting restatements that were penalized by the SEC had ex ante considerably higher external capital needs than similar, non-fraudulent firms. Second, firms that are in distress might want to hide their fragile status. Looking at leverage as a proxy for distress, Burns and Kedia (2006) find that firms with high leverage that is costly are more likely to cook the books. However, in a related study, Bergstresser and Philippon (2006) do not find such an effect. Third, managers

might engage in fraudulent behavior if they see it as the only way to conduct business. Karpoff et al. (2017b) argue that in certain situations, e.g., dealing with officials in highly corrupt countries, fraud might be a necessity. They also show that in the majority of bribery cases, the present value of the business prospect outweighs penalties, and even if bribery is caught by authorities, the market reaction is non-negative, as long as no financial fraud is involved. However, if a firm engages in bribery and misrepresentation, the market reaction is even more severe than described above. I add to the extant literature by showing that firms having a bad performance streak are more likely to be indicted.

The "greed" motivation to commit fraud comes from how compensation schemes are set up. The exposure of CEO wealth to company stock has increased 6-fold in the 1980-2000 period (Bergstresser and Philippon, 2006) and base salary also tripled between 1993-2011 (Kaplan and Rauh, 2013). While Kaplan and Rauh (2013) and Gabaix, Landier, and Sauvagnat (2014) argue that CEO pay is determined by the market and thus wage is simply the price of talent, recent evidence by Antón et al. (2016) point out that managers' pay is strongly related to the performance of their rivals. In the latter setting, managers might be more incentivized to cook the books so that their performance and ultimately their pay is more in line with that of their rivals. The fraud literature shows that the amount of equity pay, specifically, stock option grants is positively related to the likelihood of committing fraud. For example, Bergstresser and Philippon (2006) and Jiang, Petroni, and I. Y. Wang (2010) find that larger option plans induce executives to manage accruals, and this effect is even more pronounced for CFOs than CEOs. This paper confirms that CEO compensation is only weakly related to fraud detection and the market reaction.

Since there is a lot at stake if a firm commits fraud, legislative bodies have been trying to devise a regulatory environment that deters fraud, encourages the revelation of fraud, and generally increases the oversight and controlling power of shareholders. The Sarbanes-Oxley Act of 2002 was enacted as essentially a response to the Enron and WorldCom accounting scandals. The act calls for stricter reporting and auditing standards. Following the outbreak of the recent financial crisis, the Dodd-Frank Act of 2010 was drafted to increase prudency in financial markets, but it also had passages that increased incentives for whistleblowing. As shown by Dyck, Morse, and Zingales (2010), whistleblowing entails large costs. Employees may lose their jobs if they try to uncover fraud, while it can be very costly for external monitors to investigate a firm. To alleviate these problems, the Dodd-Frank Act protects whistleblowing employees, and also provides a bounty for whistleblowers who highlight fraud which violates federal rules. Dodd-Frank also introduced mandatory say-on-pay. Kronlund and Sandy (2015) show that firms do react to shareholder proposals, even though

these proposals are only advisory. Their results indicate that as a response to shareholder votes, firm decrease base salaries and increase equity grants, with a positive net effect on compensation. While further evidence is missing, this revised wage structure could increase incentives to commit fraud in the long run. I contribute to this discussion by showing that while institutional investors are not necessarily better at detecting fraudulent behavior, they do react significantly and rebalance their portfolios towards companies that do not engage in fraud.

2. Class action lawsuits

A class action lawsuit is a legal case where a group of plaintiffs, the *class*, claims the same damages from the defendant, typically from companies or organizations. Class actions belong to the jurisdiction of civil courts and are treated under civil law. Classes may be formed on any base that the plaintiffs have in common, such as consumer rights, minority issues, antitrust allegations, or securities fraud.

At the federal level, class actions are regulated under Rule 23 of the Civil Procedure, but states may have specific statutes. In order to harmonize court procedures and prevent frivolous cases, Congress passed the Private Securities Litigation Reform Act of 1995 (PSLRA) and subsequently the Class Action Fairness Act of 2005 (CAFA). Through the enactment of these two acts and the several amendments of Rule 23, class action lawsuits appear to be well codified, however, they are still subject to considerable debate (Coffee, 2015). The underlying concern is that litigation is not the optimal tool to address corporate wrongdoing. As Spamann (2016) argues, in a frictionless world, contracting should provide the right incentives and deterrents such that executives do not engage in fraudulent behavior. However, as perfect contracts are impossible to draw up, the need for legislation prevails. One possibility to monitor companies is to set up a supervisory agency, the other is to let individual stakeholders claim damages. Currently, the former role is filled by the SEC, while the latter by civil courts, and ultimately by class actions. In everyday practice, investigations by the SEC and class action filings are not coordinated. Prosecutions by the SEC can lead to class action filings and vice versa, but there is no automatic link.

Proponents of class actions argue that this procedure allows marginal stakeholders to have their voice heard, while opponents claim that it is only a tool for attorneys to "line their pockets" (Rakoff, 2015). Criticism stems from the fact the plaintiff law firms typically

charge a considerable fraction of the settlement amount in fees and expenses. In this setting, attorneys may be incentivized to seek out potential class actions and also go to courts that tend to lean towards plaintiffs. This often leads to frivolous cases, where the allegation is not even established and supported by firm evidence. For example, in the wake of the internet boom, the number of securities class actions skyrocketed (Perino, 2002). As a response, Congress passed PSLRA that aimed to reduce the number of non-meritorious filings. The Act was successful in the sense that pleading rates increased afterwards, suggesting that more substantiated cases reached courts. Another issue arising from misaligned incentives is forum shopping. Prior to the passing of the CAFA in 2005, there were class action hotspots across the US. As an example, Madison County (Illinois) had a class action filing rate of 20 times the national average (Brickman, 2002).[2] In a response, the CAFA states that class actions with diversity jurisdiction, where the number of plaintiffs is at least 100 and where the total amount in controversy is minimum $5 million should fall under federal jurisdiction. These conditions lead virtually all securities class actions to federal courts.

In addition to misaligned incentives, critics of class actions also argue that the settlement process is inefficient in that the settlement costs are borne by innocent parties, as compensatory damages are paid by corporations and not executives. This results in a wealth transfer between past and present shareholders that reduces social welfare. Ironically, long-term shareholders may suffer a loss twice, first when a fraud is revealed and stock prices drop (Dyck et al., 2013) and second when the company is prosecuted (although these shareholders could recover some of their losses from the settlement fund). Nevertheless, as Webber (2015) argues, a world without class actions further aggravates the wealth transfer between investors because, in such an environment, only large shareholders would recuperate their losses at the expense of their small counterparts who cannot afford legal representation.

It appears that class actions are necessary to safeguard all stakeholders' interests, although improvements to the current system are suggested by, for example, Spamann (2016) who theorizes that the limited liability of executives should be altered to the extent that the prospect of legal actions is a deterrent against fraudulent behavior. The approach of Coffee (2006) calls for better coordination between supervisory bodies and plaintiff firms. He argues that plaintiff firms should be employed by or work closely with the SEC. This setup would allow the SEC to have oversight of the quality of cases taken to court. Furthermore, collaboration would reduce or eliminate the duplication of efforts and enlarge the information

[2]Madison County was a hot spot mainly for consumer product-related complaints. Securities litigation class actions have a higher hurdle rate to enter court as the identification of economic wrongdoing is more complex than that of a poorly performing product.

pool.

2.1. Class action procedure

In the US, class actions are regulated under Rule 23 of the Federal Rules of Civil Procedure (Cooper Alexander, 2000). The rule ensures that class action procedures are standard across the United States. Figure 1 shows a schematic representation of the class action procedure.

The *class period* is the time period over which plaintiffs claim to be defrauded by the defendant. The class period is well defined with an exact *start* and *end* date, or potentially further defined e.g., in case of intraday price manipulation allegations. While the class period is the first element on the timeline, it is only defined once the class action is formally filed. The time between the class period end and the *first filing* (or first complaint) varies from case to case. Furthermore, it is possible that fraudulent behavior is revealed by a whistleblower other than the plaintiff (firm). The exact date of this *discovery* is hard to pinpoint (Dyck et al., 2010). In many cases, discovery can be associated with the case filing, especially in cases where law firms investigate potentially fraudulent companies. In general, the time gap between the class period end and the first filing date has been decreasing over time, suggesting that either information dissemination has become more efficient after fraud discovery, or law firms have become more proficient in uncovering fraudulent companies.

After the first complaint is filed, the court procedure begins, however, it is possible that several cases are filed at the same court, or there are filings in multiple districts, all claiming the same or similar damages. In this case, the filings are *consolidated* by the court, appointing a single judge to preside over the case and a lead plaintiff to head the process. It is possible that, through the consolidation process, the class period is revised to accommodate all claims. The consolidated case is referred to as the *reference filing*. Once a case is filed or consolidated, the court has to determine if the filing can be maintained as a class action and certify it. After the class is certified, the lead plaintiff is obliged to give notice to absent members of the class. This notice is typically disseminated through a website where class members can register to be able to track all court proceedings and file for claims from the settlement fund.[3] There are no restrictions in terms of holding amounts or legal status, the class can be joined by any investor who held any number of shares during the certified class period.

[3]Figure B.1 provides an illustration of such a website.

The court procedure has 3 potential outcomes. First, it is possible that the two sides engage in conversation and reach a *voluntary settlement* without any court order. In this case, the parties file a *stipulation of settlement* and all further court proceedings are canceled, conditional on the court finding the settlement fair to all class members.[4] Settlement typically entails that the defendant does not admit any degree of wrongdoing, but is willing to settle with the plaintiffs to maintain good faith. This outcome can be regarded essentially as an out-of-court resolution, where the parties come to an agreement themselves and the court only supervises the process. Second, the parties can decide to proceed with the trial, but then the court might find that the case is unsubstantiated and *dismiss* it. Third, if the case is meritorious, but the parties cannot reach an agreement, the court evaluates the assertions of both parties, orders the establishment of a settlement fund (*ordered settlement*) and closes the case (*final ruling*). If the parties disagree with the final ruling of the court or the dismissal of a case, they can take the case to the Court of Appeals or ultimately the Supreme Court. Once a case is closed, either through one form of settlement or dismissal, and all appeal procedures are exhausted, no investor can bring the same case to court again. It is important to note that civil courts never pronounce defendants guilty. A settlement order only states that plaintiffs' claim is meritorious and the defendant is obliged to compensate plaintiffs.

2.2. Case study: Investors versus General Motors

The Illinois-based law firm, Cafferty Clobes Meriwether & Sprengel LLP filed a complaint against General Motors (GM) at the Eastern District Court of Michigan on March 21, 2014. The complaint stated that GM engaged in a scheme to hide from consumers and investors that their cars, produced between late 2010 and March 2014, were plagued with a number dangerous defects, resulting in multiple adverse events, even fatal car crashes. In the period of February 7 to March 11, 2014 the company started a recall program for the affected vehicles, which resulted in a share price drop from \$36.11 to \$34.09, or a market value drop of about \$82.8 million dollars. On March 17, GM extended the recall program to include over 1.5 million additional vehicles, resulting in a total of 3.1 million recalled cars. In the month leading up to the filing of the lawsuit, GM's shares exhibited a cumulative abnormal return of -6.8%.

Independently from the original filing, but related to it, Bernstein Litowitz Berger &

[4]The judge or a settlement judge is most often actively involved in establishing the settlement fund, especially for large classes (Cooper Alexander, 2000).

Grossmann LLP of New York also filed a complaint against GM . The cases were consolidated under one docket and the New York Teachers' Retirement System was appointed lead plaintiff, represented by Bernstein Litowitz Berger & Grossmann LLP. Additionally, the class action period was revised to cover the period from November 17, 2010 up to and including July 24, 2014.

The parties filed a stipulation of settlement on November 13, 2015, which was preliminary approved by the court on November 20. On March 9 of the following year, the court approved the settlement fund as fair to all class members, and granted attorneys' fees and expenses.[5] Overall, GM's investors recovered $300 million in damages.[6]

3. Data

The data in this paper come from multiple sources. I obtain fraud data from the Stanford Securities Class Action Clearinghouse (SCAC) website. This website contains all securities class action filings since the enactment of the PSLRA. I collect all available information from this website using a webcrawler and then hand collect company identifiers to merge with other financial databases. Since that SCAC database does not contain settlement amounts for all cases, I conduct web searches for class action websites to gather this information. Accounting and stock market information is retrieved from the CRSP-Compustat merged database (CCM). Board characteristics and compensation data are downloaded from BoardEx and ExecuComp, respectively. I source data on analysts from I/B/E/S and data on accounting restatements from Audit Analytics. Information on mergers and acquisitions is from SDC Platinum.

3.1. Sample construction

The fraud database originally consists of 4,179 individual cases and covers the period 1996-2016. After dropping cases initiated against private companies (e.g. mutual fund management firms, brokerage firms or pension funds) there are 3,828 cases remaining in the sample. For inclusion in the final sample, I require that a firm has available information

[5] Closed cases, either dismissed or settled, cannot be taken back to court in the future, e.g., by shareholders who forgot to join the class. In legal terms, the case is *dismissed with prejudice*.

[6] See Figure B.1 for details on the settlement.

in CCM, as well as in ExecuComp and BoardEx, for executive compensation and board characteristics data, respectively. By construction of the latter two databases, this restricts my sample –to a large extent– to S&P 1500 firms. After merging the fraud data with the other databases, I obtain a sample of 1,249 fraud cases for 888 individual companies. Out of these cases, 117 are still ongoing at the time of my data acquisition.

3.2. Control sample and matching

In subsequent analyses, I contrast the fraud sample with similar, non-fraudulent companies. I define a company as non-fraudulent if it does not appear in the SCAC database. To arrive at the control sample, I apply a matching algorithm. My starting point is again the S&P 1500 universe over the sample period, or about 3,400 companies.[7] I match fraudulent firms to similar companies within the same Fama-French 49 industries based on market capitalization, market-to-book ratio and past stock return, and with replacement. For each potential fraudulent-control company pair, I calculate the Mahalanobis distance metric and keep the 3 closest matches.[8] If I cannot find a match within 49 industries (14 instances), I relax the classification to 17 industries. If a firm appears multiple times in the fraud sample, I determine the control group for the first appearance and keep it for subsequent cases. The Mahalanobis score is a convenient measure of similarity as it does not require any modeling assumptions, as for example with sorting or regression-based propensity score matching. Furthermore, the Mahalanobis metric takes into account the covariance between matching covariates, and if covariances are zero, the measure reduces to the Euclidean distance.

The topmost section of Table 3 contains the main matching variables. The test statistics show that the matching procedure worked well in case of the market-to-book ratio and past returns, as the test for the equality of means cannot be rejected. However, indicted firms appear to be, on average, significantly larger than their matched counterparts. This result is not unexpected as the matching universe is restricted to the S&P 1500, which means that the average Fama-French 49 industry is populated by about 30 firms. Therefore, the number of potential matches is relatively low, especially for an industry with multiple indicted firms, and hence even matched firms can be statistically different along the matching dimensions. The Fama-French industry classification can be somewhat restrictive. For example, my fraud sample contains Northrop Grumman which is classified as a "defense" company within the

[7] BoardEx and ExecuComp track companies after their exclusion from the S&P 1500, similarly they retroactively collect data prior to inclusion for new S&P 1500 constituents.

[8] My results are robust to keeping only the closest match for each indicted firm.

49 industries. In this classification, the only match in the S&P 1500 is Raytheon. However, relaxing the classification to 17 industries, Northrop Grumman falls into the "aviation" category and has more than 3 matches within the S&P 1500 universe.

3.3. Fraud characteristics

The final fraud sample consists of 1,249 cases for 888 individual companies, meaning that about every second company had, on average, 2 lawsuits during my sample period. Figure 2 shows the number of new class action filings per year, as well as the number of ongoing frauds in any given year that are brought to court at a later time. Ongoing fraud is defined as the class action period given in the case filing. The figure shows that there were two peak periods in which fraud was more prevalent: the dot-com bubble and the financial crisis. This observation is corroborated by Table 1 that shows that filings in the technology and financial sectors reached their all-time high in 2001 and 2008, respectively.

Turning to the spatial distribution of class action filings, I find that cases are far from evenly distributed across the United States, and there is also variation within states.[9] As Figure 4 illustrates, there are 4 states in my sample where cases are concentrated, New York, California, Texas and Illinois, in descending order of frequencies. Among these states, the number of cases per industries also shows considerable variation. The financial sector takes first place in New York (90 out of 242), technology in California (111 out of 238), and services in Texas and Illinois, respectively, with about 20 out of 70 cases each.

While New York and California appear to top other states in terms of class action filings, the question arises whether class actions are in fact overrepresented in these two states in my sample. In order to answer this question, I contrast the overall litigation intensity in each state with the number of listed firms headquartered in the area.[10] Figure 4 shows that my sample is in line with the overall intensity of class actions for New York and California, however, Texas and Illinois have lower intensities, behind Arizona, Florida and New Hampshire. A possible explanation for this is that there might be large, specialized law firms filing cases at courts in their vicinity. For example, Milberg LLP, a New York-based law firm that focuses on counseling plaintiffs, was involved in about a quarter of all class

[9] There are 89 districts across the 50 states, and a total of 94 districts including territories.

[10] I look at headquarter locations as an overwhelming majority of firms is incorporated in Delaware, for example, 69% of Fortune 500 companies, but most of them are headquartered elsewhere. As an example, Facebook was incorporated in Delaware, but has its headquarters and largest employee base in Menlo Park, California.

actions in the SCAC database.[11]

Investors' ultimate goal when filing class actions is the recovery of their losses through damages. Table 2 gives a breakdown of mean settlement amounts by industries and years. The overall mean of settlement is about $78 million, with the largest amounts awarded in utilities, financials, and conglomerates, respectively. This ordering is driven by the inclusion of the largest ever settlements like Enron and Tyco International, with $7.2 and $3.2 billion, respectively. However, my sample mean is still lower than the $198 million reported by Dyck et al. (2010), but their sample is more restrictive, heavily tilted towards mega cases. When I restrict settlement amounts in the range between $3 million and $1 billion to represent typical class actions, in unreported results, I find that the mean settlement is about $67 million. In this latter setting, largest settlements are paid by financials, conglomerates and consumer cyclical product manufacturers, respectively. It is important to note that most cases in my sample where the parties reach a settlement are in fact out-of-court settlements and guilt is not established by the court nor pleaded by the defendants. However, for the purpose of my study, I do differentiate cases that are settled voluntarily and ones that are settled through a court order.

Considering the operational aspects of class actions, Table 3 indicates that, on average, the length of the class action period is 466 days or about 5 quarters. The time to filing, or the gap between the end of the class action period and the first case filing date is, on average, 107 days. However, in more than 50% of cases the lag is less than a month. The filing speed has been improving lately, with the median case being filed no later than 21 days after the class period in the years 2011-2015. Recent cases are filed considerably faster than cases in the earlier part of the sample. As an example, Volkswagen' s diesel fraud was uncovered by the California office of the Environmental Protection Agency on September 18, 2015 (Friday) and a lawsuit followed within one week, on September 25.[12] On the other hand, in periods of financial distress (e.g., the dot-com bubble and the financial crisis), when companies are expected to be under more serious scrutiny, I observe that some cases are brought to court where the filing date and the class period end can be up to 6 months apart. There are typically 4 law firms involved in prosecuting a case, but with mega cases I find this number multiple times higher, for example, there were a total of 33 law firms representing plaintiffs against Enron. Finally, I note that there are 41 cases filed in a given industry (as defined by

[11]In unreported results, I find that the top law firms in my sample are the same as in the full SCAC database, albeit in a slightly different order.

[12]This lawsuit concerns securities class action litigation and should not be confused with the consumer class action that settled the "dieselgate" scandal, even though the underlying reason is the same.

SCAC) in any given year.

4. Engaging in fraud

4.1. Univariate results

Table 3 provides descriptive statistics for the fraud and the control sample. Each fraudulent firm is matched with 3 similar companies in the same industry using the Mahalanobis distance metric calculated from size and market-to-book. For each fraudulent firm, I create a pseudo-firm based on the average characteristics of the 3 matched companies.[13]

Compensation. It is a well established fact in the literature that a higher level of executive compensation, especially variable and equity based compensation induces managers to manipulate earnings or provide misleading information to investors (e.g., Bergstresser and Philippon (2006) or Burns and Kedia (2006)). Table 3 reveals that executives of indicted firms are paid more both in terms of base salary and equity based compensation (options and stocks combined). While the difference in means is statistically significant in for salary, in economic terms, the difference of $50,000 is probably not enough to outweigh the potential loss of reputation and hampered career outlooks that could result from the discovery of fraud (Aharony, Liu, and Yawson, 2015). However, the $800,000 difference in the value of equity based compensation is significant both statistically and economically.

Board structure. Table 3 shows that there are no significant differences between fraudulent and control firms with respect to having an independent chairman or CEO duality. Overall, the statistics suggest in 60% of the cases the CEO is the chairman of the board, in 10% of the sample the board is chaired by an executive other than the CEO, and in 30% of the sample there is an independent chairman. Fraudulent firms have more directors, of whom more are independent (i.e. non-executive), who held more positions in the past and who typically sit on more different boards at the same time. It appears that fraudulent firms work with directors who are better connected and have a considerably larger professional network size, compared to their counterparts in matched firms. Fraudulent firms appear to have a more diverse board structure, with more women and foreign nationals involved. Finally, fraudulent firms have somewhat younger CEOs, proxied by the time to retirement, who also have a shorter tenure in the position.

[13]Table A.1 provides a description for all variables, as well as their respective sources.

It is ex ante unclear what to expect with respect to the relationship of board characteristics and the likelihood to engage in fraudulent behavior. Ferris, Jagannathan, and Pritchard (2003) argue busier directors perform just as well as directors that sit on a single board. However, Falato, Kadyrzhanova, and Lel (2014) find that an attention shock at one firm can have an adverse effect on director-interlocked firms, suggesting that the effort a director can devote to monitoring is limited.

Outside monitors. External monitors can be important in uncovering corporate misconduct (Dyck et al., 2010). I find that indicted companies are followed by more equity analysts and have a larger institutional shareholder base. Breaking down institutional ownership even further, the holdings of advisory firms, banks, insurance companies and investment managers do not differ significantly, but there is substantial variation in the holdings of institutions that do not fit any of the previous four categories.

Risk and profitability. In the context of securities class action litigation, one can expect that firms are indicted either because they go through a period of turmoil, their performance is overinflated, or they deceive shareholders with false claims about the future prospects of their business. I address the first two possibilities by looking at measures of past performance, and the third one by inspecting what outlook the market has on the firm. Fraudulent companies exhibit a somewhat lower, though statistically insignificant, buy-and-hold return in the year preceding the filing of a lawsuit, but with large volatility. Both fraudulent and control stocks appear to be highly liquid, captured by Amihud's illiquidity measure (Amihud, 2002), although it is not a surprise as the sample contains large firms where price impact is expected to be relatively small. Fraudulent companies operate less efficiently as their profitability measures are lower than those of non-fraudulent firms. However, their market share and annual sales growth is considerably larger, both statistically and economically. Finally, fraudulent firms have appreciably higher market-to-book and Tobin's Q ratios.

Taken together, measures of risk and profitability indicate that fraudulent firms are riskier and managed less efficiently than their matched peers. Furthermore, it appears that indicted firms can somehow deceive the market, because despite their lower level of efficiency they have markedly higher market-to-book ratios.

Size and capital structure. Fraudulent firms are larger in terms of size, including total assets, sales and the market value of equity. They also have higher leverage, indicating that in addition to external monitors associated with equity, they are also possibly screened by debtholders to a larger extent. Indicted firms have a lower level of tangibility which ties in

with the observed high replacement ratios.

Cash, investments and payout. Firms that are taken to court hold slightly more cash, yet, their external financing need is considerably higher as estimated by the SA-index of external financing need Hadlock and Pierce (2010). The dividend policies of fraudulent and control firms are not markedly different. Turning to expenses, I find that operating expenses are not distinguishable between the two groups, however, fraudulent firms invest considerably more in long term assets. This expense and investment pattern can explain why fraudulent firms have a weaker bottom line.

Acquisitions. T. Y. Wang (2013) shows that fraudulent firms have a higher level of M&A activity. My sample shows the same pattern across fraudulent and control firms. While the majority of firms do not conduct deals during their respective class action period, 25% of my sample firms complete 1 or more deals. These deals are significantly larger for fraudulent acquirers, almost double over their non-fraudulent counterparts. I proceed to break down acquisitions into 2 categories: diversifying and expansion. I label an acquisition as diversifying if the acquirer and the target are in different 2-digit SIC industries. An acquisition is labeled as expansion if the deal takes place within a particular 2-digit SIC industry. I find that both fraudulent and control firms perform more expansion acquisitions than diversifying deals, although for indicted firms the figures are much closer in relative terms. Furthermore, irrespective of the acquisition type I find that fraudulent companies close bigger deals. This suggests that these acquisitions are value destroying acts of empire building.

Restatements. Since class action litigations might be only one of several channels through which corporate wrongdoing is revealed, I examine accounting restatements in the sample. The results show that almost 18% of fraudulent companies issued restatements compared to 5% in the control group. Restatements in the fraud sample are not only more numerous, but also have larger effects on the value of equity. Furthermore, in 70% of the cases the board was involved in forging the numbers at fraudulent firms, while this metric is 55% for the control group. The SEC followed up on these restatements with an investigation in 31% and 13% of the time for fraudulent and control firms, respectively. Restatements were labeled as financial fraud in 3 times as many cases when issued by a fraudulent firm compared to the control group.

4.2. Multivariate results

I estimate the probability of fraud detection and court outcomes using observable firm characteristics in the S&P 1500. I estimate a probit model for the probability of fraud detection, where the dependent variable is 1 if a firm is indicted and 0 otherwise. I also estimate the determinants of court outcomes using probit and ordered probit models. I run a probit model where the dependent variable is 1 if a firm pays a settlement and 0 otherwise. In order to distinguish between voluntary and ordered settlements, I also estimate an ordered probit model where the dependent variable is 1 for voluntary settlements, 2 for ordered settlements and 0 for dismissed cases. In order to account for selection bias in modeling the court outcome, I also estimate the probit and ordered probit models of the court outcome using Heckman's 2-stage method.

I follow T. Y. Wang (2013) and Dyck et al. (2013) in the specification of the selection equation. They argue that there are ex ante and ex post detection factors, as well as fraud commission factors that come into play at different stages around the engagement in fraud and its subsequent detection.

Ex ante detection factors. Ex ante detection factors can be interpreted as "red flags" that draw heightened attention to the firm. A high level of real investments (CapEx) might induce managers to commit fraud through manipulating cash flow figures to reduce the cost of capital T. Y. Wang (2005). Similarly, higher M&A activity can lead to the need to doctor the numbers (e.g., Erickson and S.-W. Wang (1999) or Louis (2004)). Sophisticated players, such as institutional investors and equity analysts can be more effective at uncovering fraud. Additionally, larger firms might be under stricter monitoring, but at the same time, managers of such corporations might feel that they can hide fraud easier.

Ex post detection factors. Ex post detection factors are the ones that potentially increase the probability of detection, but their influence can be hard to assess before or at the time of the commission of fraud. These factors serve as the basis of my identification. I use industry litigation intensity to proxy for increased scrutiny from investors. Additionally, I include measures of performance shocks to control for unexpected changes in profitability and stock returns. I take the residual from an AR(1) regression of ROA, where a positive residual translates into a positive shock. To account for return shocks, I create an indicator variable that is 1 if the firm had a stock return in the lowest quartile of its industry in the year preceding the court filing. I also control for the 1-year buy-and-hold return of firms, and their stock return volatility in the same period. Finally, I control for the 4 industries

that experience the most litigations: financials, healtcare, services and technology.

Fraud commission factors. I also include variables beyond the ex ante detection factors that might have an influence on the propensity to commit fraud. In order to deal with "need or greed" I include leverage, external financing need and profitability. I calculate external financing need using the SA-index of Hadlock and Pierce (2010). If managers engage in fraud out of need, I can expect that leverage and external financing need will have a positive effect on the propensity of fraud commission. However, if fraud is induced by greed, it is profitability that should have a more pronounced effect.

Table 4 shows the results of the probit estimations. In the first column of the table, I include the univariate probit estimation of fraud detection with all controls, except for variables describing the court process. Companies that invest large amounts in long-term assets, firms with external financing need are indicted more. Additionally, the performance metrics indicate that a stock return shock and high volatility increase the likelihood of being cited to court. Surprisingly, companies that are more profitable, are also more likely to face a lawsuit, and abnormal litigation intensity in a certain industry also reduces the likelihood that the marginal firm is indicted.

Turning to the univariate probit model on the propensity of paying a settlement, I observe that smaller firms, firms dependent on external financing, as well as firms closing a larger number of acquisition deals are more likely to settle. Additionally, firms that experience a return shock and those with high volatility are prone to paying a settlement. To disentangle the differences between the two settlement types, I estimate an ordered probit model. Overall, the estimates for the various outcomes show a similar pattern as those of the probit. There is no difference between the outcomes in terms of size and external financing need. However, return shocks, volatility, litigation intensity and acquisition activity all drive firms to settle voluntarily relative to settling through a court order. This suggests that firms are more likely to reach an agreement with plaintiffs when there is high pressure from investors in the industry, and when they want to end a bad performance streak.

In Section 3 of Table 4, I estimate probit models that account for the fact that case outcomes are a result of a first stage selection, i.e. the indictment. The 2-stage estimation also allows me to introduce lawsuit-specific variables. The results indicate that firms are more likely to settle voluntarily when industry litigation is high, and the number of plaintiff law firms is large. However, firms that are taken to court repeatedly are less likely to settle either voluntarily or through a court order.

5. The effects of fraud revelation

Reading the news on class action lawsuits, it is apparent that the stock market always reacts if a firm is indicted. For example, when news broke about the "defeat device" in Volkswagen cars, the stock of VW fell by a total of 35% over 1 week, until the first lawsuit was filed. Therefore, I estimate the market reaction to lawsuit filings in my sample.

5.1. Short-term returns

In order to gauge the market reaction to the revelation of fraud, I estimate abnormal returns around the filing of securities litigation class actions. I estimate the Fama-French-Carhart 4-factor model (Carhart, 1997; Fama and French, 1993), and use factor return data from the website of Kenneth French.[14] I estimate betas in the [-250,-31] window. For IPO fraud allegations, I require at least 3 months' worth of data for estimation (no less than 60 trading days). I define the event window up to 1 month before and after the court filing as [-20,20]. The motivation for such a long event window around the filing is twofold. First, as discussed before, it is hard to pinpoint the exact date of discovery in many cases, but it is reasonable to assume that discovery happens in the interval between the end of the class action period and the filing date. On the other end, I allow a long window post-filing to be able to observe any reversal pattern following the filing.

My results show that being indicted is bad news. The upper section of Figure 5 shows that abnormal returns are particularly low in the [-5,0] window around filing and the effect is more pronounced for fraudulent companies. The week prior to the filing day has the overall lowest returns. This suggests that it is not necessarily the news about discovery, but the news about litigation that has the larger effect. Returning to the Volkswagen example, the stock fell by the largest amount on the day the company was indicted, not on the day the report was published by Environmental Protection Agency. Turning to the lower section of the figure, I note that cumulative abnormal returns (CAR) decline in the period leading up to the filing, even more so the week before the filing and then level off in the subsequent month. While (cumulative) abnormal returns are about 6% higher for eventually dismissed cases, there is still no reversal. The figure also shows that the control sample does not experience any unusual price movements.

[14] My results are robust to using alternative models, such as the Fama-French 5-factor model (Fama and French, 2015).

Table 5 shows summary statistics for CARs. Panel A reports the results for CARs around case filings. The numbers in Panel A fully support the results from Figure 5. CARs are significantly negative across all event windows. Furthermore, the difference between settled and dismissed cases is also markedly different, but there is no difference between CARs of voluntary and ordered settlements.

In order to assess whether the market reacts to a significant event in the court process or to the final court order, I also calculate CARs around the approval of the settlement fund and the final court order. Panel B of Table 5 displays CARs around settlement events, while Panel C reports CARs around the final court order. I find no reversal either at intermediate or final dates, but there is a small but statistically significant drop when a voluntary settlement is filed.

To assess the economic magnitudes of abnormal returns around lawsuit filings, I calculate value losses and contrast them with the eventual penalty amount. Table 6 displays my findings. I calculate value losses on a rolling basis. Specifically, I have $\Delta MV_t = MV_{t-1} \cdot AR_t$. I find that indicted firms lose about \$1.3 billion or about 23% of their market value. Firms that end up paying a settlement lose significantly more. Voluntary settlements can be attributed with a loss of \$2.1 billion, while ordered settlements with \$1.7 billion, though the difference is not significant. This loss can be attributed more to a loss of reputation than the forecast of the eventual settlement amount, as the latter is about 20 times lower. Losses are non-trivial for dismissed cases either, as over the [-20,20] window these firms also lose almost \$900 million of their market value. The differences in market value losses between settled and dismissed cases are significant across all windows.

5.2. Long-term returns

The question naturally arises given these large losses, whether indicted firms experience a reversal. To investigate this, I estimate a long-run event study around the lawsuit filing and throughout the court process. I estimate a 4-factor model based on monthly data in the [-48,-2] window relative to the lawsuit filing. I require at least 24 months of data for IPO fraud allegations. I define the event window over the [-1,36] months around the lawsuit filing, as the average length of the court procedure is about 3 years.

Figure 6 graphically shows the return pattern over the [-1,36] horizon. Following an initial dip in the filing month, CARs stay negative. The return pattern of ordered settlements shows

a reversal, however, initial losses are not recovered. Table 7 corroborates the figure. The returns of indicted firms are significantly lower than those of control firms. Additionally, irrespective of the case outcome, cumulative abnormal returns never revert back to zero. Cases that are settled through a court order show a slight reversal, but the 36-month CAR is still about -11%.

5.3. The cross-section of returns

Next, I turn to the cross-sectional analysis of abnormal returns. In what follows, I regress CARs on observable firm characteristics, governance measures and metrics of M&A activity. In all specifications, I compute heteroskedasticity robust standard errors that are clustered at the firm level. I run regressions of the form

$$CAR[-20, 20] = \alpha + \beta controls + \epsilon. \tag{1}$$

Table 8 shows the results of regressing CARs on observable stock market and accounting characteristics. On the one hand, I find that larger firms that hold more cash and had a better-than-expected year in terms of profitability have significantly higher abnormal returns, keeping other things constant. On the other hand, indicted firms that are more dependent of external financing earn a significantly lower return. This result indicates that the market considers these firms to be able to weather the litigation process. The stocks of firms in the healthcare industry are also hit harder. Furthermore, I observe a weakly significant negative effect in terms of litigation intensity. Surprisingly, if an indicted company experienced a profitability shock or high volatility in the year prior to the filing date, its CAR is less negative than that of a firm with relatively stable performance and stock return. I interpret this as a liberation effect, in that the market considers the lawsuit as a tool that puts and end to a bad streak. Columns 6-7 indicate that the market is able –to some extent– to forecast the eventual court outcome. Firms that end up settling the case earn a significantly lower CAR around the start of the litigation process. Firms that pay a larger settlement also have a more negative CAR.

In Table 9, I extend Equation 1 with measures of governance and monitoring. My results in the table are largely in line with previous studies on corporate fraud. I find that base salary is

positively, while equity incentives are negatively related to CARs, however only base salary is statistically significant. Reporting quality, measured by the number of restatements and their effect on equity does not have an effect on CARs around court filings. The majority of board characteristics do not affect CARs. However, gender ratio and nationality mix are significant determinants of CARs. Finally, turning to outside monitors, I find that the number of equity analysts following a firm does not have an effect on CARs. It is unsurprising, as analysts themselves cannot put a price pressure on firms. Institutional investors can, and I indeed find the a larger institutional shareholder base is associated with significantly lower abnormal returns, especially for investment companies and other institutions, like pension funds. This can potentially indicate that some institutions start offloading fraudulent companies from their portfolios, either due to regulation or pressure from their clientele.

In Table 10, I focus my attention on the M&A activity of indicted firms. Again, I enrich specification 1 from Table 8 with additional controls on acquisitions. Looking at the number and value of completed deals in the class action period, I do not find that M&A has a significant effect on stock returns around class action filings. Partitioning acquisitions into expansion and diversification acquisitions does not change the conclusion.

5.4. Long-term effects

Next, I turn to the analysis of long-term firm performance and changes in the investor base. I estimate differences-in-differences (DD) models around the filing of the lawsuit. In the DD, the treatment effect is 1 for fraudulent firms and 0 for the control group. For operational measures, I look at the [-3,3] years around the lawsuit. The time indicator variable is 1 starting in the year of the lawsuit and for the 3 subsequent years, and 0 prior to the lawsuit. For holding information, I examine the [-12,12] quarter around the filing. The time indicator variable is 1 in the quarter of the lawsuit filing and in the 12 subsequent quarters and 0 otherwise. The DD specification is of the following form (with ROA as an example):

$$ROA_{i,t} = \alpha + \beta Post_t \gamma + Treated_i + \delta Post_t \times Treated_i + Controls_{i,t} + \epsilon_{i,t}. \quad (2)$$

Table 11 shows the results of the DD estimation. To conserve space, the table only reports the differencing term (δ) for the full sample and various case outcome breakdowns. Therefore, each cell in the table refers to a different specification. Panel A shows the results for operational measures. In each regression, I control for market-to-book and size, as well

as year and industry fixed effects, and cluster standard errors at the firm level. The results indicate that sales and the return on equity do not change. However, overall profitability and sales growth are negatively affected by the lawsuit. Indicted firms reduce long-term investments and hold more cash. Their dependence on external financing also increases around the lawsuit filing.

Panel B reports changes in institutional holdings around lawsuit filings. I control for log market capitalization and market-to-book, and quarter and industry fixed effects in each specification. The results indicate that institutions lower their holding in indicted firms by 2.6% in total. Furthermore, all types of institutions offload a significant amount of shares from their portfolio.

5.5. Trading around fraud

Litigation has a significant effect on the returns of indicted firms. The question then naturally arises, whether an investor can profit from trading on the information that a lawsuit brings to the market. To asses this question, I devise a simple trading strategy. I construct a long-short portfolio of indicted and control firms. The trading strategy is the following. In the month following the lawsuit filing I create an equally weighted portfolio that is long in the control firms and short in the indicted companies. I hold each position until the court process is finished.

Table 12 shows the characteristics of this trading strategy. In Panel A, the table reports the portfolio's mean return and average size. In a typical month, there is about 591 stocks in the portfolio. The portfolio has positive returns through the entire sample period, even in the dotcom bubble and the housing crisis. The mean return is 14% over the entire period.

Panel B of the table shows the risk-adjusted returns of the trading strategy. I estimate the CAPM, the Fama-French 3-factor, the Fama-French-Carhart and the Fama-French 5-factor alphas. The alphas are significant and positive irrespective of the risk adjustment. The annualized alpha is 2.6%-4.2% depending on the model applied.

6. Conclusion

Using a detailed dataset on class action lawsuits, I analyze what drives the market reaction to lawsuit filings and what makes a company suspicious to investors. To mitigate selection issues, I match indicted firms to firms that do not experience any lawsuits.

Firms that are taken to court are typically large with large market share, are followed by more analysts, and have a large institutional shareholder base. This indicates that visible firms with more outside monitors are suspected more often. My multivariate results indicate that a disastrous stock market performance in the year preceding the lawsuit filing is also associated with an increased probability of being sued.

Firms that are taken to court experience a significant negative return in the period leading up to the lawsuit filing, and there is no reversal effect in the month after the filing date or throughout the court process. Negative returns are more pronounced for firms that end up settling the lawsuit, suggesting that markets can forecast the outcome of lawsuits to some degree. Looking at dollar values, I observe that the value losses are sizable, up to $2 billion for settling and about $900 million for acquitted firms. The settlement amount is about 1 twentieth of the value drop for fraudulent firms meaning that $1.8 billion is loss in reputation. Furthermore, there are no abnormal stock price movements around the final order of the court, nor at the approval of the settlement amount or at any point during the course procedure. This suggests that it is the filing of the lawsuit that conveys more information to the market. Taken together, these indicate that litigation imposes a great penalty on firm reputation, especially since the long-term value drop for eventually acquitted firms is as high as 50% of the value drop of firms that end up paying a settlement.

Examining the cross section of announcement returns, I find that firms with large cash holdings and firms that are bigger experience a more modest market reaction. This suggests that the market considers these firms to be able to weather the litigation process. This is confirmed by operational changes, as indicted firms tend to increase their cash holdings and reduce investments. Among governance measures, I find that the presence of large institutional investors leads to a considerable value drop. Institutions also reduce their holdings in fraudulent firms considerably compared to similar firms not facing a court procedure.

I find that indicted firms change their operations, by holding more cash and investing less in long-term assets. They do not experience a sales drop, but their profitability and sales

growth decreases. This indicates that their customer relations also suffer from the lawsuit.

Finally, I show that a trading strategy based on available information on class action filings yields positive returns. A long-short portfolio of non-fraudulent and fraudulent firms earns a four-factor alpha of 3.7% annually.

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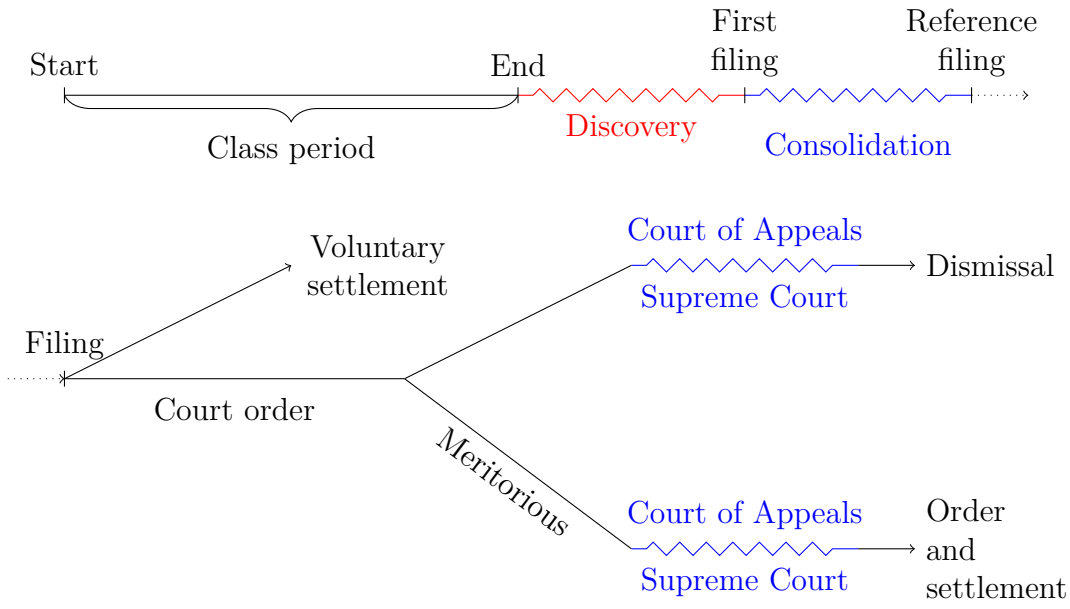


Figure 1 Class action timeline

This figure provides a schematic overview of the timeline of class actions and the following court process.

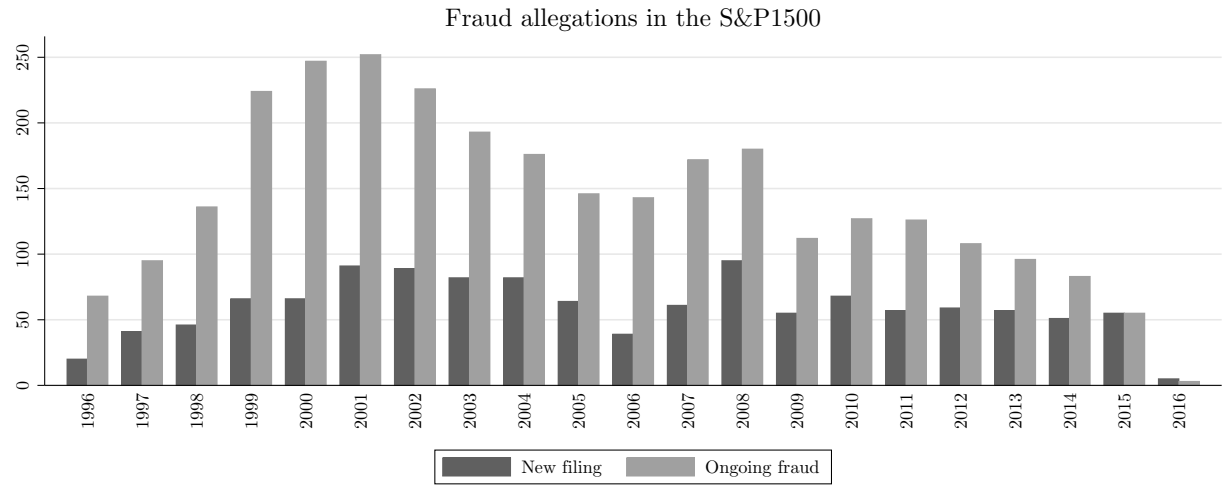
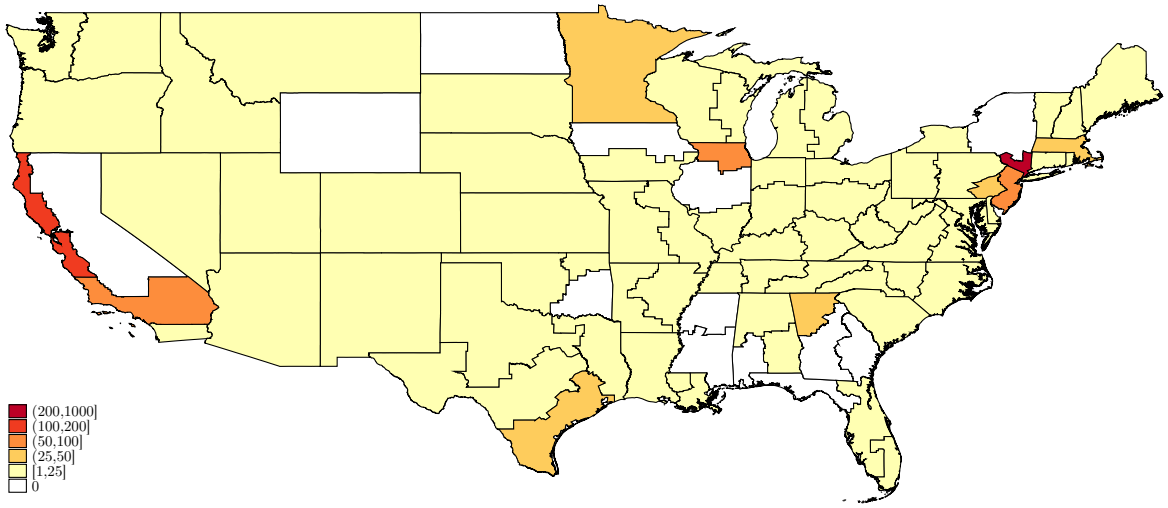


Figure 2 Fraud occurrence and class action filing intensity

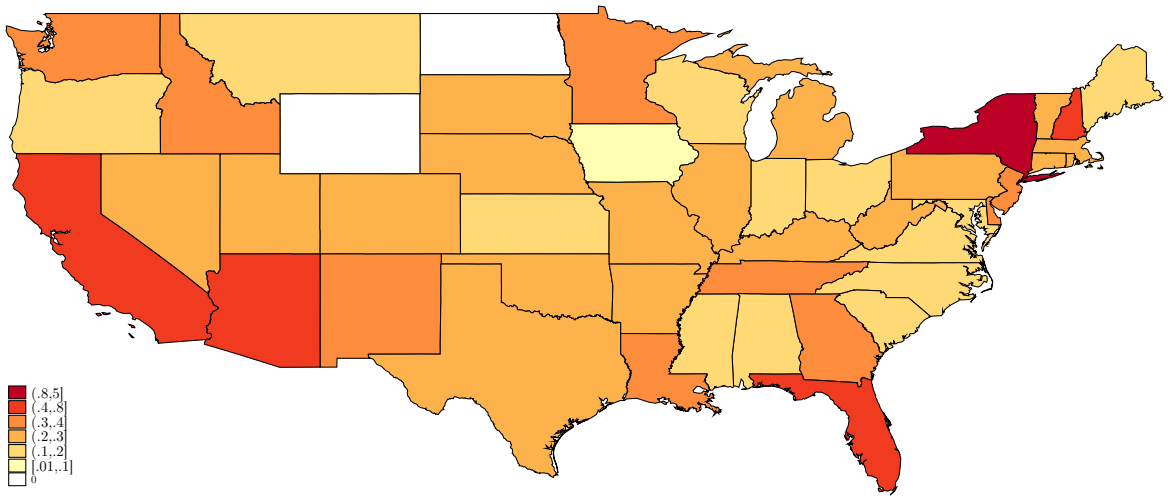
The figure shows the number of fraudulent and indicted firms in the S&P 1500 universe over time. Frequencies are calculated based on first identified complaint filings. Ongoing fraud is defined by the span of the class action period once a case is brought to court.



Other territories: AK: 0; HI: 0; PR: 3; VI: 0.

Figure 3 Spatial distribution of securities litigation class action filings

The figure shows the geographical dispersion of securities class action filings across the contiguous US area and federal court districts. Frequencies are calculated based on first identified complaint filings. The sample period is 1996-2016.



Other territories: AK: 0; HI: 0; PR: 0.34; VI: 0.75.

Figure 4 Spatial distribution of securities litigation class action filing intensity

The figure shows the geographical dispersion of securities class action filing intensity across the contiguous US area and states. Filing intensity is the ratio of class action filings and the number of firms headquartered in a given state. Class action filing frequencies are calculated based on first identified complaint filings in the entire SCAC universe. The sample period is 1996-2016.

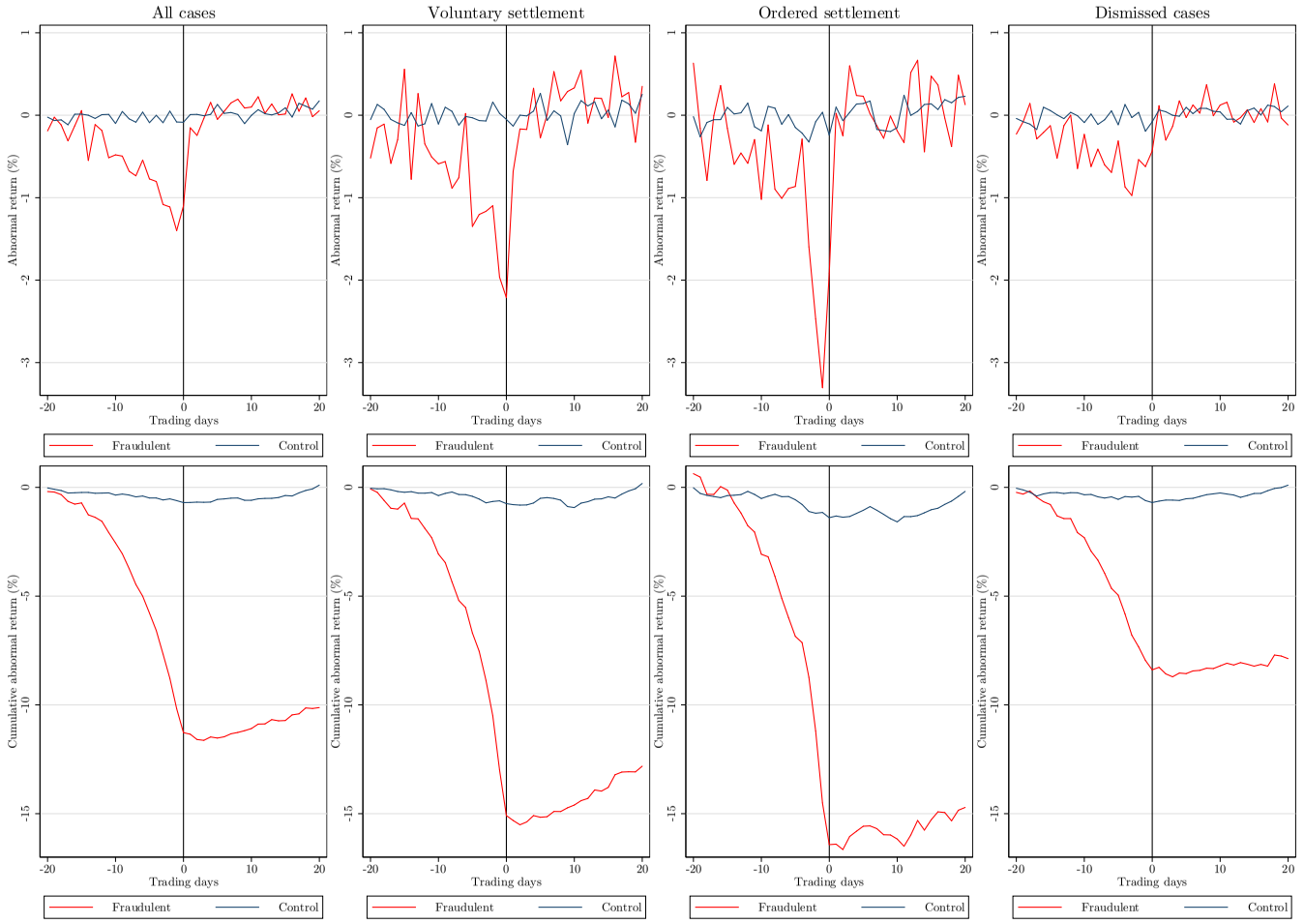


Figure 5 Abnormal and cumulative abnormal returns around securities litigation class action filings

The figure shows abnormal returns and cumulative abnormal returns in the [-20,20] day window around securities class action filings for all cases, voluntarily settled cases, cases settled by order and dismissed cases, respectively. Settled cases are either settled through an agreement between the parties or through a final judgment and order by the court. Dismissed cases are dismissed by the court as non-meritorious. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-250,-31] trading days relative to the filing date.

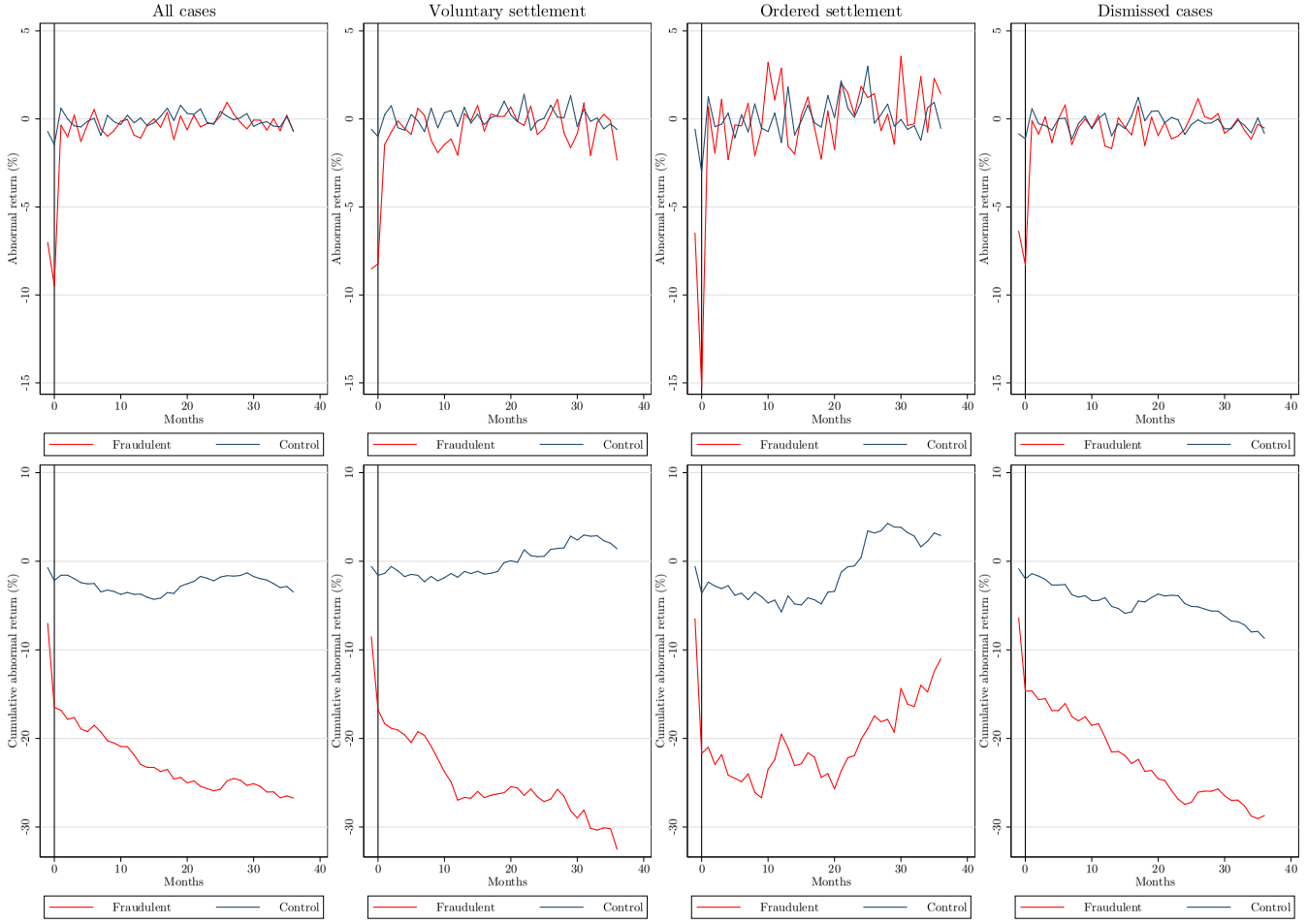


Figure 6 Long-term abnormal and cumulative abnormal returns around securities litigation class action filings

The figure shows abnormal returns and cumulative abnormal returns in the [-1,36] month window around securities class action filings for all cases, voluntarily settled cases, cases settled by order and dismissed cases, respectively. Settled cases are either settled through an agreement between the parties or through a final judgment and order by the court. Dismissed cases are dismissed by the court as non-meritorious. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-48,-2] months relative to the filing date.

Table 1 Filings by industries and years

This table shows the yearly distribution of new securities litigation class action filings by industries. Industry definitions are provided by SCAC.

	Basic Materials	Capital Goods	Conglomerates	Consumer Cyclical	Consumer Non-Cyclical	Energy	Financial	Healthcare	Other	Services	Technology	Transportation	Utilities	Total
1996	0	1	0	0	1	0	4	3	0	7	3	1	0	20
1997	3	3	0	0	0	0	4	4	0	10	14	2	1	41
1998	0	2	0	4	1	0	4	13	0	4	17	1	0	46
1999	0	4	3	5	4	2	7	10	1	12	18	0	0	66
2000	2	0	2	5	6	0	7	6	0	12	22	0	4	66
2001	0	1	0	4	6	0	9	8	0	19	42	0	2	91
2002	2	0	2	2	0	3	19	13	0	15	16	1	16	89
2003	4	2	1	1	2	0	24	16	0	12	15	0	5	82
2004	2	5	1	3	0	1	20	9	0	21	17	0	3	82
2005	3	0	1	6	6	1	9	13	0	7	17	1	0	64
2006	0	0	0	2	3	0	5	5	0	10	14	0	0	39
2007	0	4	0	2	2	0	15	9	0	16	12	1	0	61
2008	0	0	2	2	3	2	50	10	0	12	12	0	2	95
2009	4	2	2	3	0	1	21	5	0	12	5	0	0	55
2010	2	2	0	1	2	6	14	16	0	14	10	0	1	68
2011	2	1	0	2	3	3	7	5	0	11	18	2	3	57
2012	2	1	0	5	3	5	4	13	0	10	11	1	4	59
2013	0	0	0	5	1	1	5	5	15	12	13	0	0	57
2014	2	1	0	3	2	1	8	11	0	13	7	2	1	51
2015	3	1	0	3	3	2	8	6	0	7	17	2	3	55
2016	0	0	0	0	1	0	0	1	0	2	1	0	0	5
Total	31	30	14	58	49	28	244	181	16	238	301	14	45	1,249

Table 2 Settlements by industries and years

This table shows the yearly distribution of mean settlement amounts of securities litigation class action cases by industries. The year of settlement is the year when a settlement gets final approval from the court. Industry definitions are provided by SCAC. Settlement figures are in nominal $ million.

	Basic Materials	Capital Goods	Conglomerates	Consumer Cyclical	Consumer Non-Cyclical	Energy	Financial	Healthcare	Other	Services	Technology	Transportation	Utilities	Overall
1996														
1997					2.5									2.5
1998	10						30			140	4.8			46.2
1999		14.8						4.3		176.6	7	5		58.2
2000	2.9	22.5		3.7			20.2	13	0.8	3.3	56	34		23
2001				0.5	38.5		64	3.8		37.6	60.7			45.2
2002		92.5			2.5		116.9	17.3		44.4	25.4			50.5
2003				8.9	35		203.8	55		79	75.9	15	145.5	92.4
2004	4		255	7.9	6.1		26.2	82.3		29.7	50.6		38.5	49.9
2005	92.4	18		4.8	21.5		30.3	16.8		33.1	45.7		32.8	31.6
2006		10	7	11.7		9	82.3	103.6		53.5	37.6		8	51.9
2007		14.6			6.6		36.3	90		39.5	332.8		164.6	142.5
2008		1.2		42	57.3		11.5	6.5		14.9	20.6		7,227.4	261.8
2009	10.6	17.3	6.5	750			116.9	50.2		37.6	12.9	1.5		52.3
2010	15	55		3.9		10.5	96.3	84.6		19.6	82			67.6
2011	20	25				5	72.1	81.2		10.8	30.2			45.1
2012				186.2	13	238.1	206.1			45.4	40.7			112.3
2013			70.5	104.3	241.4		140.8	48.8		10.1	35		4	84.9
2014		19.5	40		5	82.5	366	82.9		74.8	10.5			110.8
2015	9.5				8.1	27.6	164.7	59.7	5	19.6	14		73.1	44.4
2016	42			77.3	31		171.7	68.7	37.7	18.9	5.3			75.5
Overall	22.5	21.5	105.7	58.2	53.7	68.2	133.7	61.3	16.7	37.7	52.6	6.9	393.8	77.8

Table 3 Summary statistics

This table reports summary statistics for all variables. For each case, I keep the first firm-year observation and use a lag of one year. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. The t-statics stand for the difference in means between the fraud and the control group. The Z-score is calculated for the Wilcoxon signed rank test, for which I use the median difference between the fraudulent firm and the control group. For the t-statistics and rank tests I report p-values in brackets. Dollar amounts are in millions. All variable definitions are in the Appendix.

	Indicted						Control		Difference	
Variable	Obs.	Mean	Sdev.	25%	Median	75%	Obs.	Mean	t-test	Rank
Matching variables										
Size	1,248	8.275	2.268	6.614	7.931	9.751	3,505	7.815	[0.000]	[0.000]
Buy-and-hold return,	1,143	0.142	0.960	-0.300	0.005	0.340	3,456	0.118	[0.339]	[0.000]
Market-to-book	1,248	3.572	20.607	1.357	2.357	4.141	3,503	3.107	[0.198]	[0.109]
Fraud characteristics										
Class period length	1,246	466	509	146	286	610				
Time to filing	1,246	107	157	6	27	113				
Law firms	1,249	4	4	2	3	5				
Voluntary settlement	1,249	0.265	0.442	0.000	0.000	1.000				
Settlement amount $	664	77.751	351.845	2.325	10.000	40.150				
Industry litigation	1,249	41.399	49.845	18.000	31.000	46.000	3,747	41.399	[1.000]	[1.000]
Compensation										
Salary ($)	1,248	0.780	0.481	0.458	0.742	1.000	3,505	0.715	[0.000]	[0.081]
Equity incentives	1,249	2.087	4.927	0.000	0.000	2.111	3,747	1.210	[0.000]	[0.001]
Board structure										
Indep. chairman	839	0.328	0.470	0.000	0.000	1.000	2,489	0.347	[0.317]	[0.000]
CEO duality	839	0.597	0.491	0.000	1.000	1.000	2,489	0.575	[0.268]	[0.007]
Number of directors	839	10.081	3.139	8.000	10.000	12.000	2,489	9.765	[0.007]	[0.033]
Independent director	839	8.460	2.945	6.000	8.000	10.000	2,489	8.189	[0.018]	[0.662]
Previous board seats	839	1.502	1.651	0.000	1.143	2.250	2,489	1.211	[0.000]	[0.153]
Other board seats	839	0.261	0.525	0.000	0.000	0.375	2,489	0.186	[0.000]	[0.008]
Time on board	839	7.435	3.589	4.829	7.125	9.422	2,489	8.805	[0.000]	[0.000]
CEO tenure	831	4.236	4.321	1.300	2.900	5.500	2,463	5.142	[0.000]	[0.000]
CEO retirement	839	9.963	4.123	7.400	9.680	12.000	2,489	9.021	[0.000]	[0.000]
Network size	839	1390.	878	820	1172	1705	2,489	1070	[0.000]	[0.000]
Gender ratio	839	0.879	0.102	0.818	0.889	1.000	2,489	0.886	[0.055]	[0.234]
Nationality mix	832	0.092	0.155	0	0	0.200	2,470	0.063	[0.000]	[0.086]
Outside monitors										
Analyst	937	13.401	8.343	6.917	11.833	18.167	2,887	11.310	[0.000]	[0.000]
Institutional holding	942	0.735	0.241	0.591	0.746	0.879	2,924	0.717	[0.021]	[0.016]
Mutual fund holding	943	0.287	0.120	0.205	0.283	0.368	2,928	0.290	[0.598]	[0.791]
Advisory firm holding	942	0.145	0.101	0.060	0.125	0.211	2,922	0.143	[0.531]	[0.447]
Bank holding	942	0.083	0.047	0.053	0.081	0.106	2,922	0.083	[0.908]	[0.574]
Insurance holding	932	0.021	0.027	0.005	0.010	0.027	2,903	0.021	[0.630]	[0.000]
Investment holding	897	0.024	0.049	0.007	0.010	0.017	2,793	0.024	[0.697]	[0.000]
Other holding	942	0.464	0.222	0.332	0.462	0.609	2,923	0.447	[0.027]	[0.155]

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	Indicted						Control		Difference	
Variable	Obs.	Mean	Sdev.	25%	Median	75%	Obs.	Mean	t-test	Rank
Risk and profitability										
Volatility	1,143	0.486	0.324	0.283	0.396	0.592	3,456	0.403	[0.000]	[0.000]
Buy-and-hold return	1,143	0.142	0.960	-0.300	0.005	0.340	3,456	0.118	[0.339]	[0.000]
Amihud ILLIQ	1,143	0.008	0.066	0.000	0.001	0.003	3,456	0.009	[0.886]	[0.000]
ROA	1,028	0.013	0.422	-0.008	0.038	0.087	2,858	0.040	[0.002]	[0.000]
ROE	1,028	0.101	2.765	0.005	0.101	0.187	2,858	0.072	[0.585]	[0.824]
Asset turnover	1,248	0.899	0.886	0.341	0.717	1.201	3,504	0.905	[0.784]	[0.000]
Sales growth	1,185	0.184	0.854	0.000	0.003	0.181	3,423	0.027	[0.000]	[0.000]
Market share	1,245	0.009	0.020	0.001	0.003	0.011	3,504	0.006	[0.000]	[0.003]
Profit margin	1,028	0.013	0.422	-0.008	0.038	0.087	2,858	0.040	[0.002]	[0.000]
Market-to-book	1,248	3.572	20.607	1.357	2.357	4.141	3,503	3.107	[0.198]	[0.109]
Tobin's Q	1,237	3.205	4.574	1.236	1.895	3.420	3,500	2.589	[0.000]	[0.343]
Size and capital structure										
Size	1,248	8.275	2.268	6.614	7.931	9.751	3,505	7.815	[0.000]	[0.000]
Log of sales	1,244	7.718	1.956	6.370	7.657	9.174	3,504	7.324	[0.000]	[0.000]
Log of market equity	1,248	8.069	1.894	6.731	7.944	9.358	3,502	7.690	[0.000]	[0.000]
Book leverage	1,249	0.354	0.592	0.046	0.289	0.527	3,747	0.257	[0.000]	[0.001]
Tangibility	1,223	0.197	0.198	0.049	0.130	0.281	3,419	0.219	[0.002]	[0.000]
Cash, investments and payout										
Cash holdings	1,237	0.110	0.126	0.021	0.063	0.158	3,469	0.100	[0.013]	[0.004]
CapEx	1,023	0.057	0.060	0.022	0.041	0.072	2,840	0.054	[0.035]	[0.036]
Operating expenditures	1,028	0.906	0.752	0.417	0.700	1.136	2,858	0.918	[0.647]	[0.000]
Dividend yield	1,241	0.016	0.049	0.000	0.000	0.019	3,495	0.016	[0.701]	[0.000]
Dividend payout	1,026	0.726	15.691	0.000	0.000	0.153	2,851	0.309	[0.229]	[0.000]
SA-index	1,248	14.269	14.099	5.135	11.513	19.917	3,505	9.837	[0.000]	[0.000]
Acquisitions										
Acquisitions	1,249	0.717	1.642	0.000	0.000	1.000	3,747	0.608	[0.051]	[0.004]
Acquisitions/assets	1,249	0.075	0.369	0.000	0.000	0.014	3,747	0.044	[0.000]	[0.000]
Diversifying acq.	1,249	0.320	1.113	0.000	0.000	0.000	3,747	0.233	[0.005]	[0.012]
Div. acq./assets	1,249	0.032	0.308	0.000	0.000	0.000	3,747	0.013	[0.001]	[0.000]
Expansion acq	1,249	0.396	0.950	0.000	0.000	0.000	3,747	0.375	[0.587]	[0.000]
Exp. acq./assets	1,249	0.043	0.205	0.000	0.000	0.000	3,747	0.031	[0.014]	[0.000]
Restatements										
Restatement	1,249	0.177	0.382	0.000	0.000	0.000	3,747	0.054	[0.000]	[0.000]
Effect on income	1,249	-19.824	191.193	0.000	0.000	0.000	3,747	-21.002	[0.972]	[0.001]
Effect of equity	1,249	-7.809	86.831	0.000	0.000	0.000	3,747	-0.123	[0.000]	[0.001]
Board involvment	1,249	0.123	0.329	0.000	0.000	0.000	3,747	0.029	[0.000]	[0.000]
SEC investigation	1,249	0.054	0.227	0.000	0.000	0.000	3,747	0.006	[0.000]	[0.000]
Financial fraud	1,249	0.021	0.143	0.000	0.000	0.000	3,747	0.003	[0.000]	[0.020]
Auditor same	1,249	0.732	0.443	0.000	1.000	1.000	3,747	0.753	[0.128]	[0.000]

Table 4 Fraud detection and case outcome

This table shows the results of probit regressions on fraud detection (indictment) and court case outcome (settlement). For ordered probit models, the baseline is case dismissal. The table reports regression coefficients and their corresponding average marginal effects in brackets. Fraudulent firms are compared with the universe of S&P 1500 companies. Standard errors are robust to heteroskedasticity and clustered at the firm level. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)			(3)		
	Probit	Probit	Ordered probit probit		Heckman probit	Heckman ordered probit	
Dependent var. (D)	Indicted (D=1)	Settled (D=1)	Voluntary settlement (D=1)	Ordered settlement (D=2)	Settled (D=1)	Voluntary settlement (D=1)	Ordered settlement (D=2)
Size	-0.044***	-0.027*	-0.028*	-0.028*	-0.009	-0.043	-0.043
	[-0.006]	[-0.002]	[-0.001]	[-0.001]	[-0.003]	[-0.005]	[-0.002]
CapEx	0.892***	0.809*	0.710	0.710	0.033	0.951	0.951
	[0.117]	[0.053]	[0.026]	[0.021]	[0.011]	[0.105]	[0.054]
Acquisition value	0.034	0.086**	0.083**	0.083**	0.087	0.099	0.099
	[0.004]	[0.006]	[0.003]	[0.002]	[0.030]	[0.011]	[0.006]
SA-index	0.008***	0.007***	0.007**	0.007**	0.004	0.007	0.007
	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]
Book leverage	0.011	0.019	0.021	0.021	0.061	0.089	0.089
	[0.001]	[0.001]	[0.001]	[0.001]	[0.021]	[0.010]	[0.005]
ROA	0.209**	0.120	0.109	0.109	0.010	-0.192**	-0.192**
	[0.027]	[0.008]	[0.004]	[0.003]	[0.004]	[-0.021]	[-0.011]
Profitability shock	-0.001	-0.037	-0.041	-0.041			
	[-0.000]	[-0.002]	[-0.002]	[-0.001]			
Return shock	0.268***	0.229***	0.228***	0.228***			
	[0.035]	[0.015]	[0.008]	[0.007]			
Buy-and-hold ret.	-0.001	-0.018	-0.023	-0.023			
	[-0.000]	[-0.001]	[-0.001]	[-0.001]			
Volatility	0.250***	0.178**	0.195***	0.195***			
	[0.033]	[0.012]	[0.007]	[0.006]			
Institutional hold.	-0.051	-0.095	-0.121	-0.121	0.056	-0.286	-0.286
	[-0.007]	[-0.006]	[-0.004]	[-0.004]	[0.019]	[-0.032]	[-0.016]
Analyst coverage	-0.001	-0.004	-0.004	-0.004	-0.007	-0.003	-0.003
	[-0.000]	[-0.000]	[-0.000]	[-0.000]	[-0.003]	[-0.000]	[-0.000]
Litigation intensity	-0.043**	0.056	0.072*	0.072*	-0.046	0.327***	0.327***
	[-0.006]	[0.004]	[0.003]	[0.002]	[-0.016]	[0.036]	[0.019]
SEC investigation					0.232	0.141	0.141
					[0.080]	[0.016]	[0.008]
Serial offender					-0.109	-0.208*	-0.208*
					[-0.037]	[-0.023]	[-0.012]
Number of law firms					0.010	0.041***	0.041***
					[0.003]	[0.005]	[0.002]
N	16,300	16,226	16,300	16,300	16,300	16,300	16,300
N-Uncensored					1,144	1,144	1,144
Year FE	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y
rho					0.015	0.615	0.615
p-value					0.967	0.335	0.335

Table 5 Cumulative abnormal returns around court filings

This table shows cumulative abnormal returns for various event windows around securities litigation class action filings. The table also provides a breakdown for settled and dismissed cases. Settled cases are either settled voluntarily through an agreement between the parties or through a final judgment and order by the court. Dismissed cases are dismissed by the court as non-meritorious. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-250,-31] trading days relative to the filing date. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: CARs around court filing

	Full sample		Control group		Voluntary settlement		Ordered settlement		Dismissed		Differences			
	Mean	S. dev.	Mean	S. dev.	Mean	S. dev.	Mean	S. dev.	Mean	S. dev.	t-stat			
	(1)		(2)		(3)		(4)		(5)		1 vs. 2	3 vs. 5	4 vs. 5	3 vs. 4
CAR[-1,1]	-0.027***	(0.139)	-0.002**	(0.047)	-0.049***	(0.168)	-0.052***	(0.159)	-0.009*	(0.119)	9.112***	3.937***	3.884***	-0.223
CAR[-1,3]	-0.029***	(0.150)	-0.002	0.062	-0.052***	(0.176)	-0.048***	(0.175)	-0.014**	(0.133)	8.877***	3.554***	2.857***	0.214
CAR[-5,5]	-0.066***	(0.214)	-0.001	(0.090)	-0.100***	(0.255)	-0.096***	(0.240)	-0.039***	(0.183)	14.303***	3.968***	3.391***	0.156
CAR[-10,10]	-0.090***	(0.259)	-0.003	(0.126)	-0.114***	(0.297)	-0.141***	(0.307)	-0.058***	(0.225)	14.938***	3.061***	3.956***	-0.972
CAR[-20,20]	-0.101***	(0.308)	0.001	(0.176)	-0.118***	(0.333)	-0.147***	(0.359)	-0.077***	(0.287)	13.786***	1.904*	2.736***	-0.911
Obs	1,149		3,451		300		192		548					

Panel B: CARs around settlement filing

	(1)		(2)		(3)		(4)		(5)		1 vs. 2	3 vs. 5	4 vs. 5	3 vs. 4
CAR[-1,1]	0.001	-0.048	0.000	-0.044	-0.006*	-0.050	0.002	-0.047	0.004	-0.048	-0.285	2.411**	0.438	1.432
CAR[-1,3]	-0.003	-0.065	0.002	0.053	-0.010**	-0.063	0.002	-0.064	0.000	-0.065	1.943*	1.931*	-0.384	1.835*
CAR[-5,5]	-0.001	-0.094	0.004***	-0.077	-0.004	-0.081	0.002	-0.094	0.000	-0.099	1.484	0.569	-0.172	0.638
CAR[-10,10]	-0.001	-0.145	0.004*	-0.110	0.006	-0.127	-0.012	-0.155	-0.002	-0.149	1.110	-0.736	0.682	-1.236
CAR[-20,20]	-0.002	-0.220	0.005	-0.164	0.007	-0.195	0.003	-0.245	-0.007	-0.223	0.889	-0.838	-0.497	-0.159
Obs	851		2,695		229		144		478					

Panel C: CARs around final order

	(1)		(2)		(3)		(4)		(5)		1 vs. 2	3 vs. 5	4 vs. 5	3 vs. 4
CAR[-1,1]	0.003*	-0.050	0.000	-0.042	0.004	-0.052	0.000	-0.056	0.003	-0.047	-1.905*	-0.222	0.662	-0.698
CAR[-1,3]	0.002	-0.068	0.001	0.053	0.004	-0.069	0.008	-0.074	-0.001	-0.066	-0.156	-0.804	-1.291	0.531
CAR[-5,5]	0.001	-0.103	0.004**	-0.081	0.002	-0.118	0.005	-0.090	0.000	-0.099	0.731	-0.243	-0.490	0.215
CAR[-10,10]	0.000	-0.148	0.003	-0.111	0.005	-0.144	-0.003	-0.149	-0.002	-0.150	0.685	-0.595	0.034	-0.487
CAR[-20,20]	-0.006	-0.206	0.003	-0.164	-0.009	-0.181	0.008	-0.186	-0.008	-0.224	1.297	0.013	-0.791	0.847
Obs	850		2,689		230		143		477					

Table 6 Market value change around lawsuit filings

This table the shows the market value change of indicted firms around the filings of securities litigation class actions. The table also provides a breakdown for settled and dismissed cases. Settled cases are either settled voluntarily through an agreement between the parties or through a final judgment and order by the court. Dismissed cases are dismissed by the court as non-meritorious. The table shows the change in market value over the event window relative to the market value of the firm 2 months prior to the filing datet. Market value change is calculated using abnormal returns. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-250,-31] trading days relative to the filing date. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Full sample		Voluntary settlement		Ordered settlement		Dismissed		Differences		
	Mean	Sd. dev.	Mean	Sd. dev.	Mean	Sd. dev.	Mean	Sd. dev.	t-stat.		
	(1)		(2)		(3)		(4)		2 vs. 4	3 vs. 4	2 vs. 3
Loss[-1,1]	-375.2***	(3035.5)	-695.2***	(3132.7)	-625.0*	(5067.5)	-218.1**	(2103.4)	2.362**	1.081	0.172
Loss[-1,3]	-373.1***	(2940.7)	-694.5***	(3143.5)	-603.1*	(4924.0)	-186.4**	(1827.4)	2.572**	1.145	0.229
Loss[-5,5]	-755.2***	(4087.2)	-1433.1***	(4809.8)	-920.8**	(5680.6)	-462.7***	(3142.1)	3.146***	1.062	1.035
Loss[-10,10]	-992.6***	(4952.9)	-1638.9***	(5410.8)	-1422.2**	(7593.9)	-602.4***	(3701.2)	2.960***	1.437	0.344
Loss[-20,20]	-1319.5***	(6476.0)	-2149.3***	(6753.9)	-1686.8**	(10000.6)	-894.9***	(5037.5)	2.817***	1.051	0.564
Settlement			139.1	(535.1)	54.8	(109.3)					-2.645***
Loss proportion	-0.232	(0.702)	-0.324	(1.077)	-0.337	(0.732)	-0.154	(0.398)	2.637***	3.291***	-0.155
Obs.	1,149		300		192		548				

Table 7 Long-term cumulative abnormal returns around lawsuit filings

This table shows cumulative abnormal returns for various event windows around securities litigation class action filings. The table also provides a breakdown for settled and dismissed cases. Settled cases are either settled voluntarily through an agreement between the parties or through a final judgment and order by the court. Dismissed cases are dismissed by the court as non-meritorious. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-48,-2] trading days relative to the filing date. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: CARs around court filing

	Full sample		Control group		Voluntary settlement		Ordered settlement		Dismissed		Differences			
	Mean	S. dev.	Mean	S. dev.	Mean	S. dev.	Mean	S. dev.	Mean	S. dev.	t-stat			
	(1)		(2)		(3)		(4)		(5)		1 vs. 2	3 vs. 5	4 vs. 5	3 vs. 4
CAR[-1,1]	-0.170***	-0.309	-0.016***	-0.223	-0.182***	-0.321	-0.210***	-0.339	-0.148***	-0.296	15.618***	1.343	2.026**	-0.776
CAR[-1,6]	-0.186***	-0.495	-0.025***	-0.370	-0.199***	-0.469	-0.249***	-0.615	-0.161***	-0.476	9.953***	0.963	1.717*	-0.863
CAR[-1,12]	-0.224***	-0.688	-0.036***	-0.542	-0.274***	-0.662	-0.195***	-0.804	-0.199***	-0.671	8.070***	1.354	-0.048	0.999
CAR[-1,18]	-0.253***	-0.854	-0.035***	-0.700	-0.267***	-0.804	-0.244***	-0.996	-0.236***	-0.844	7.334***	0.446	0.089	0.239
CAR[-1,36]	-0.269***	-1.258	-0.035*	-1.021	-0.325***	-1.234	-0.110	-1.463	-0.295***	-1.222	5.386***	0.298	-1.433	1.475
Obs	800		2,701		220		132		406					

Table 8 Determinants of market reaction: Risk characteristics

The table shows cross-sectional differences of securities class action filings' abnormal returns with respect to observable firm risk characteristics. The dependent variable is CAR[-20,20] in all specifications. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-250,-31] trading days relative to the filing date. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Standard errors are robust to heteroskedasticity, and clustered at the firm and the year-month level. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

CAR[-20,20]	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fraud	-0.566***	-0.558***	-0.574***				
Size	-0.010	-0.010	-0.010	0.030***	0.030***	0.029***	0.031**
Market-to-book	-0.003	-0.002	-0.003	-0.001**	-0.001**	-0.001**	-0.003**
Book leverage	0.001	0.001	0.001	0.021*	0.020*	0.023*	0.029**
CapEx	-0.083	-0.054	-0.083	0.110	0.123	0.101	0.134
Cash holding	-0.084	-0.085	-0.084	0.313***	0.307***	0.295***	0.465***
Dividend payout	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.004
Sales growth	0.033	0.033	0.032	-0.010	-0.011	-0.009	-0.015
Volatility	-0.048**	-0.049**	-0.049**	0.056	0.056	0.053	0.014
Return shock	0.043**	0.043**	0.043**	0.064***	0.064***	0.065***	0.104***
Profitability shock	-0.008	-0.007	-0.008	0.028	0.028	0.029	0.035
SA-index	0.001	0.001	0.001	-0.000	-0.000	-0.000	0.001
Amihud ILLIQ	-0.001	-0.001	-0.001	-0.141**	-0.133*	-0.142**	-0.168
Industry litigation			0.000	-0.001	-0.001	-0.001	-0.001
Serial offender				-0.002	-0.002	-0.003	0.001
Voluntary settlement					-0.023		
Settled						-0.040*	
Settlement							-0.044***
Fraud×							
Size	0.042***	0.042***	0.043***				
Market-to-book	0.002	0.001	0.002				
Leverage	0.025*	0.023*	0.024*				
CapEx	0.294	0.293	0.301				
Cash	0.457***	0.457***	0.457***				
Dividend payout	-0.001	-0.000	-0.001				
Sales growth	-0.041	-0.041	-0.038				
Volatility	0.111***	0.110**	0.121**				
Return shock	0.020	0.019	0.021				
Profitability shock	0.047**	0.048**	0.047**				
SA-index	-0.003***	-0.003**	-0.003**				
Amihud ILLIQ	-0.103	-0.104	-0.108				
Industry litigation			-0.000				
Financial		-0.039					
Healthcare		-0.056**					
Services		-0.029					
Technology		-0.025					
Constant	0.142	0.180**	0.142	-0.510***	-0.509***	-0.478***	-0.524***
Observations	4,153	4,153	4,153	1,022	1,022	1,022	483
Adjusted R-squared	0.04	0.04	0.04	0.08	0.08	0.08	0.13
Year FE	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	N	Y	Y	Y	Y	Y

Table 9 Determinants of market reaction: Governance characteristics

The table shows cross-sectional differences of securities class action filings' abnormal returns with respect to observable governance characteristics. The dependent variable is CAR[-20,20] in all specifications. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-250,-31] trading days relative to the filing date. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Standard errors are robust to heteroskedasticity, and clustered at the firm and the year-month level. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

CAR[-20,20]	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fraud	-0.201***	-0.205***	-0.261***	-0.087	0.120	-0.186**	-0.157*
Salary	-0.041**						
Equity incentives	0.002						
Restatements		-0.037					
Market val. change		-0.048					
SEC investigation		0.017					
Auditor same			0.001				
Directors				0.002	0.002		
Independent chair				0.027**			
CEO duality				0.032**			
Gender ratio					-0.023		
Nationality mix					-0.006		
Analyst coverage						-0.000	-0.000
Institutional hdg.						-0.111***	
Advisory firm hdg.							-0.185
Bank hdg.							-0.693***
Insurance hdg.							0.112
Investment hdg.							0.108
Other hdg.							-0.051
Fraud×							
Salary	0.047*						
Equity incentives	-0.000						
Restatements		-0.010					
Market val. change		-0.138					
SEC investigation		0.006					
Auditor same			0.007				
Directors				-0.003	-0.004		
Independent chair				-0.006			
CEO duality				-0.006			
Gender ratio					-0.213*		
Nationality mix					0.159*		
Analyst coverage						0.002	0.002
Institutional hdg.						-0.036	
Advisory hdg.							0.194
Bank hdg.							0.402
Insurance hdg.							-0.487
Investment hdg.							-0.792**
Other hdg.							-0.104*
Constant	0.057	0.064	0.066	0.018	0.072	0.130	0.123
Observations	4,185	4,185	3,751	2,865	2,846	4,185	3,293
Adjusted R-squared	0.04	0.03	0.04	0.03	0.03	0.04	0.04
Controls	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y

Table 10 Determinants of market reaction: Investment characteristics

The table shows cross-sectional differences of securities class action filings' abnormal returns with respect to observable investment characteristics. The dependent variable is CAR[-20,20] in all specifications. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model. The estimation window is [-250,-31] trading days relative to the filing date. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Standard errors are robust and clustered at the firm level. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

CAR[-20,20]	(1)	(2)	(3)	(4)	(5)	(6)
Fraud	-0.566***	-0.564***	-0.567***	-0.572***	-0.564***	-0.565***
Acquisitions	0.001					
Acquisition value		-0.052				
Expansion acq.			0.006			
Exp. acq. value				-0.039		
Diversifying acq.					-0.008	
Div. acq. value						-0.116
Fraud×						
Acquisitions	0.006					
Acquisition value		0.019				
Expansion acq.			0.014			
Exp. acq. value				0.082		
Diversifying acq.					0.010	
Div. acq. value						0.057
Constant	0.143	0.144	0.146	0.143	0.140	0.144
Observations	4,153	4,153	4,153	4,153	4,153	4,153
Adjusted R-squared	0.04	0.04	0.04	0.04	0.04	0.04
Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y

Table 11 Differences-in-differences analysis around court filings

The table shows the results of differences-in-differences estimations for various samples. Each line represents a different independent variable. The table reports the difference (interaction term) for each specification (δ). Panel A displays results for operational performance measures, while Panel B reports those for holdings. The post variable is determined around the first court filing date. In Panel A, post is 1 in the year of the filing and afterwards, and 0 otherwise. In Panel B, the post variable is 1 in the quarter of the filing and afterwards, and 0 otherwise. The estimation period is [-3,3] years in Panel A. In Panel B, the estimation period is [-12,12] quarters. The treatment variable is 1 for the fraudulent sample and 0 for the control sample. In Panel A, I control for year and industry fixed effects, as well as size and market-to-book in all specifications. In Panel B, I control for quarter and industry fixed effect, as well as log market capitalization and market-to-book in each specification. The control sample is determined by Mahalonobis distance metric matching. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Standard errors are robust to heteroskedasticity, and clustered at the firm level. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Operational measures

δ	Full sample	Voluntary	Ordered	Dismissed
Log of sales	0.012	0.040	0.124**	-0.020
ROA	-0.031***	-0.059***	-0.028	-0.013
ROE	0.206	-0.192*	-0.718	0.902
Tobin's Q	-1.182***	-1.503	-1.826***	-0.816***
Volatility 1 year	0.060***	0.073***	0.072***	0.048***
Profit margin	-0.031***	-0.059***	-0.028	-0.013
Sales growth	-0.129***	-0.104***	-0.305***	-0.071***
Cash holdings	0.008**	0.011**	0.005	0.012***
CapEx	-0.004**	-0.002	-0.006	-0.004*
OpEx	0.015	0.054*	0.047	-0.018
SA-Index	0.322**	0.423*	0.055	0.267
Book leverage	0.021	0.035	0.101*	-0.008

Panel B: Holdings

δ	Full sample	Voluntary	Ordered	Dismissed
Institutional holding	-0.026***	-0.038***	-0.023	-0.021**
Advisory firm holding	-0.006***	-0.009**	-0.005	-0.004
Bank holding	-0.003***	-0.002	-0.004	-0.004**
Insurance holding	-0.003***	-0.004**	-0.001	-0.003**
Investment holding	-0.003***	0.002	-0.008*	-0.004**
Other holding	-0.011**	-0.024***	-0.003	-0.007

Table 12 Portfolio analysis

The table shows portfolio characteristics for an investment in fraudulent and non-fraudulent firms. The portfolio is an equal weighted investment of short positions in fraudulent companies and long positions in control firms. Stocks enter the portfolio 1 month after a firm is indicted and are held until the closure of the court procedure. Panel A reports descriptive portfolio characteristics. Panel B shows risk adjusted returns. For all engaged companies, I draw 3 matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. Standard errors are heteroskedasticity robust. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Portfolio statistics

	Full sample	1996-2005	2006-2016	Dotcom bubble	Housing crisis
Annualized return	0.140	0.172	0.110	0.128	0.165
	(0.389)	(0.410)	(0.368)	(0.457)	(0.619)
Portfolio size	590.711	567.193	612.748	616.972	782.417
	(270.170)	(336.225)	(187.208)	(103.295)	(35.698)
Obs.	246	119	127	36	24

Panel B: Risk-adjusted returns

	(1)	(2)	(3)	(4)
Market$-r_f$	0.518***	0.514***	0.492***	0.539***
	(0.028)	(0.021)	(0.022)	(0.027)
SMB		0.188***	0.195***	0.197***
		(0.037)	(0.036)	(0.040)
HML		0.206***	0.184***	0.144***
		(0.032)	(0.031)	(0.051)
RMW				0.047
				(0.051)
CMA				0.107
				(0.072)
Momentum			-0.001***	
			(0.000)	
Constant	0.003***	0.003***	0.003***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Observations	246	246	246	246
Adjusted R-squared	0.63	0.71	0.72	0.71
Annualized alpha	0.042	0.033	0.037	0.026

Appendix A Variable definitions

Table A.1 Variable definitions

This table reports variable descriptions and their respective sources.

Variable	Description	Source
Fraud characteristics		
Class period length	Span of time period (days) over which plaintiffs claim to be defrauded as defined in the case filing.	Stanford Securities Class Action Clearinghouse (SCAC)
Time to filing	Time between class period end and first case filing date (days).	
Law firms	Number of law firms involved as plaintiffs.	
Voluntary settlement	The defendant and plaintiffs enter a stipulation of agreement. Indicator variable (1 if voluntary)	
Settlement amount	Settlement amount ($ million).	
Industry litigation	Number of litigations in industry per year, based on entire SCAC universe.	
Compensation		
Salary	Base salary ($ million).	ExecuComp
Total equity incentives	Equity and option compensation ($ million).	
Board structure		
Independent Chairman	Chairman has no executive status, indicator variable (1 if independent)	BoardEx
CEO/Chair	CEO duality: the CEO is the chairman of the board, indicator variable (1 if duality)	
Directors	Number of directors on board	
Independent director	Non-executive directors on the board	
Previous board seats	Number of previous board positions held	
Other board seats	Number of currently held other board positions	
Time on board	Tenure in current board position	
CEO tenure	CEO tenure as CEO (years).	
CEO retirement	CEO time to retirement (years).	
Network size	Network size of a director defined as known connections to other directors.	
Gender ratio	Ratio of female and male directors, 1 all male.	
Nationality mix	Ratio of US nationals to internationals on the board, 0 all US national.	
Outside monitors		
Analysts	Number of analysts issuing EPS estimates	I/B/E/S
Institutional holding	Percentage of market value held by institutions	Thomson Reuters (s12 and 13f)
Mutual fund holding	Percentage of market value held by mutual funds	
Advisory firm holding	Percentage of market value held by independent investment advisory firms	
Bank holding	Percentage of market value held by banks	
Insurance holding	Percentage of market value held by insurance companies	
Investment holding	Percentage of market value held by investment companies	
Other holding	Percentage of market value held other, miscellaneous institutions	

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Variable	Description	Source
Risk and profitability		
Volatility	Average daily stock return volatility over the year, annualized.	CRSP
Buy-and-hold return	1-year buy-and-hold return	
Amihud ILLIQ	1-year mean Amihud illiquidity measure	
ROA	$\frac{\text{Net income}}{\text{Total assets}}$	Compustat
ROE	$\frac{\text{Net income}}{\text{Book equity}}$	
Asset turnover	$\frac{\text{Revenues}}{\text{Total assets}}$	
Sales growth (annual)	$\frac{\text{Revenues}_t}{\text{Revenues}_{t-1}} - 1$	
Market share	$\frac{\text{Revenues}}{\text{Total industry revenues}}$	
Profit margin	$\frac{\text{Net income}}{\text{Total assets}}$	Compustat
Market-to-book	$\frac{\text{Market equity}}{\text{Book equity}}$	
Tobin's Q	$\frac{\text{Market equity+Long term book debt}}{\text{Book equity+Long term book debt}}$	
Size and capital structure		
Size	natural log of Total assets	Compustat
Log of sales	natural log of revenues	
Log of market equity	natural log of market equity	
Book leverage	$\frac{\text{Long term book debt}}{\text{Long term book debt+Book equity}}$	
Tangibility	$\frac{\text{Plant, property and equipment}}{\text{Total assets}}$	
Cash, investments and payout		
Cash	$\frac{\text{Cash}}{\text{Total assets}}$	Compustat
CapEx	$\frac{\text{Capital expenditures}}{\text{Total assets}}$	
OpEx	$\frac{\text{Operating expenses}}{\text{Total assets}}$	
Dividend yield	$\frac{\text{Total dividends}}{\text{Market equity+Preferred equity}}$	
Dividend payout	$\frac{\text{Total dividends}}{\text{Net income}}$	
External financing	SA-index; Hadlock-Pierce measure of external financing need $-.737\ln(\text{assets}_t) + .043\ln(\text{assets}_t)^2 - .04\text{age}_t$	
Acquisitions		
Acquisitions	Number of acquisitions in class action period, globally, worth at least $50 million	SDC Platinum
Acquisition/assets	Value of all acquisitions over total assets	
Div. acquisitions	Number of acquisitions in other 2-digit SIC industries; diversifying.	
Div. acq./assets	Value of diversifying acquisitions over total assets	
Exp. acquisitions	Number of acquisitions in same 2-digit SIC industries; expansion	
Exp. acq./assets	Value of expansion acquisitions over total assets	
Restatements		
Restatements	Number of accounting restatements in class period	Audit Analytics
Effect on income	Cumulative effect of restatements on net income ($ million).	
Effect on equity	Cumulative effect of restatements on market equity ($ million).	
Board involvment	Board was involved in restatement, indicator variable (1 if yes).	
SEC investigation	SEC investigated restatement, indicator variable (1 if yes).	

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Variable	Description	Source
Financial fraud	Restatement is prosecuted as financial fraud, indicator variable (1 if yes).	
Auditor same	Auditor was the same (incumbent auditor) over class action period, indicator variable (1 if yes).	
Miscellaneous		
Profitability shock	The residual from an AR(1) regression of ROA. A positive residual means a positive shock.	
Return shock	The 1-year buy-and-hold return is in the lowest quartile in the industry. Indicator variable, 1 if there is a shock.	
Age	Company age measured as the years since IPO or since the first appearance in Compustat	

Appendix B Class action example

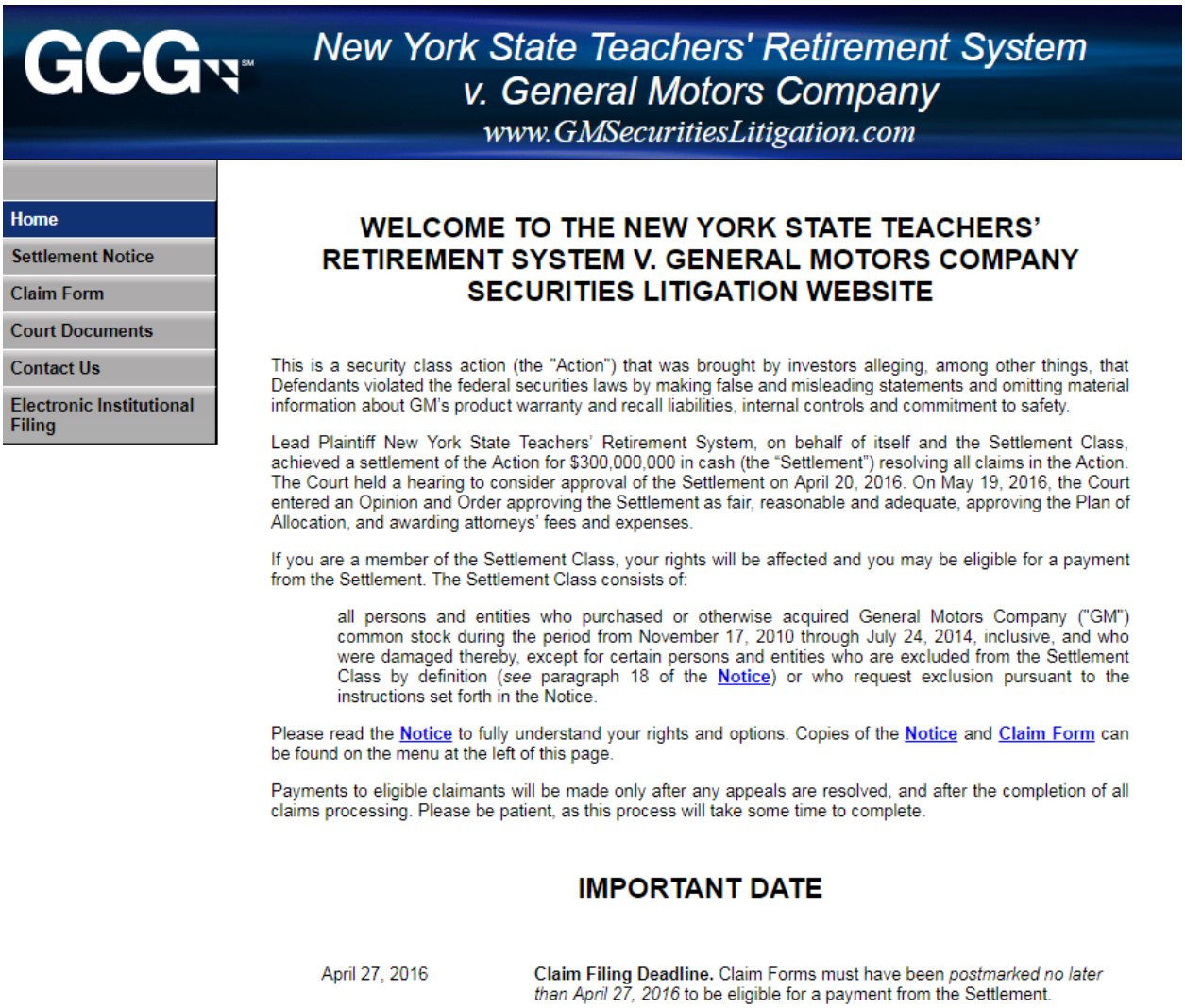

Figure B.1 Class action website example

The figure shows the home page of a typical class action case. Retrieved on August 7, 2017 from http://www.gmsecuritieslitigation.com/.