Corporate Fraud and the Consequences of Securities Class Action Litigation

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We analyze class action litigation as a corporate governance device. Firms that have lower internal governance standards and those with fewer external monitors are more likely to be indicted. Lawsuits announcements are salient information to the market, as firms, on average, lose 12.3% without a reversal up to three years following the first court date, which points at a substantial reputation loss. Indicted firms readjust their operations, meanwhile sophisticated investors decrease their positions. Stock market activity surges for firms suspected of fraud, and a conservative trading strategy yields significant returns over the subsequent period. Lawsuits also affect competitors both through competitive and contagion channels.

Keywords: class action, fraud, governance, litigation, reputation, settlement, peer effects.

JEL classification: G30, G32, G39, K40, K41.

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1. Introduction

Large corporate scandals, such as those involving Enron, WorldCom, and Volkswagen were widely publicized in the media, but represent only the tip of the iceberg. The Association of Certified Fraud Examiners estimates that, over a 21-month period starting in January 2020, 5% of revenues of public and private firms, and of non-profit and governmental organizations from around world were lost due to fraud.[2] Dyck et al. (2023) predict that, in any given year, up to 10% of large US firms (> $750 million in assets) engage in fraud. Fraud not only causes directly measurable losses in corporate value, but has other, far-reaching effects on society such as welfare loss due to foregone taxes and loss of trust in (corporate) leadership.

In this paper, we examine class action lawsuits, the indictment of the firm and of its officers/directors by a large group (i.e., *class*) of shareholders, and whether the firm suffers from value declines in its assets and from (lasting) reputational damage. We also investigate whether litigation conveys valuable information to the market and how the competitive landscape changes both for indicted firms and their direct competitors. If a large shareholder or a group of investors becomes concerned with the firm's operations and management, and takes legal steps to assert their claims, it may affect a firm's outlook, competitive position, its risk premium, and hence discounted value. The extant literature on corporate fraud is predominantly concerned with the effects of prosecuted fraud, be it the stock market reaction, firm operating performance, or executive turnover. Our paper contributes to the discussion by examining fraud allegations, thus not restricting our investigation based on the eventual case outcome.

We evaluate the role of securities class action litigation as a corporate governance device and study the effect of class action litigation filings on the stock market performance of indicted firms and their peer companies. Our sample covers 2,910 firms in the period starting in 1996 and ending in 2019, which enables us to examine the long-term consequences after the litigation cases are closed.

[2] https://acfepublic.s3.us-west-2.amazonaws.com/2022+Report+to+the+Nations.pdf

This paper examines all indictments and not merely the settled fraud cases, enabling us to measure the direct effects of litigation, including the effects on firms which are subsequently acquitted. We use data on class action filings to identify firms indicted for fraud (following a lack of transparency with respect to price-sensitive information, lack of care in product development, accounting fraud, embezzlement, etc.)[3] 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 hence not corporate problems arising from bad luck or an honest mistake.

We focus on class actions for two reasons. First, relative to lawsuits where an individual shareholder claims to be harmed, there is broad consensus about managerial or corporate misconduct among shareholders in class action suits. Indicted firms in class action suits may erode trust and are potentially value destroying. Second, it is the enforcement channel with the lowest attrition rate in terms of data quality (Karpoff et al., 2017).[4]

Our results show that fraud is indeed widespread. We find that the median number of new filings each year amounts to 134, the propensity of fraud being the highest in the technology, services, financial, and healthcare industries. We also find a higher propensity of fraud around stock market bubbles and busts, for example, the number of filings was around 240 during the recent stock market surge (2016-2019), or about 80% higher than the median. The industry distribution of new filings also varies over time: the technology industry experienced its highest number of new filings after the dot-com bubble (2001); the financial industry experienced a high number of new filings during the financial crisis starting in 2008.

We explore the factors that signal possible fraud. Smaller and risky companies are more often indicted as are firms with higher external financing needs. Firms with a less sophisticated ownership base (proxied by the lower-than-average institutional holdings) and lower transparency (lower analyst coverage) are also more often accused of fraud. The results of institutional

[3] Throughout the paper, we use the term "fraudulent" or "indicted" interchangeably for companies against which a complaint is made and litigation has been started. The fact that firms are considered by investors as "fraudulent" does not necessarily mean that they actually are fraudulent as the legal case against them may be dismissed ex post. When the case is closed and the firm pays a settlement fee, this does not mean that the firm admits guilt; a settlement is an agreement between parties to settle for damages without being found legally guilty (a court verdict of guilt virtually never occurs in class action suits). Still, a settlement may indicate that the defendant is morally guilty. We will distinguish among "fraudulent" firms that settle voluntarily (under supervision of the court), that are required to settle by court (settlement by court order), and against which the case is dismissed by the court. We assume that a claim was meritorious if the company agrees to pay a settlement (voluntary or after a court order).

[4] The SCAC database includes almost all securities class lawsuits (with hardly any omissions) that are filed under Rule 23 of the Federal Rules of Civil Procedure in US district Courts since 1996.

ownership and the degree of transparency indicate that litigation can act as a substitute governance mechanism.

We also analyze how the litigation process is eventually closed. We document that firms are more likely to settle the case quickly the less resilient the firm is to investor pressure and the worse its operational performance is. Our findings indicate that the announcement that a company is taken to court has a non-trivial effect on its stock price. In the 20-day window before and after the day of the filing of a lawsuit, the average firm experiences an abnormal return drop of 12.3%. It appears that the information released on the day of the indictment and during the previous month (when the class is built) is sufficient for investors to assess if a lawsuit is meritorious, as firms that will (ultimately) end up paying damages exhibit a 14.6-20.6% negative cumulative average abnormal return (CAAR), while this figure amounts to 7.2% for companies that are eventually cleared of all charges (when the case is dismissed). The difference between the returns of firms that ex post settle or are acquitted represent absolute losses of $516m to $932m for the former and $384m for the latter. The fact that the drop in value of a prosecuted firm is substantially larger than the eventual penalty (the settlement) suggests that a lawsuit significantly reduces a firm's reputation. To assess whether the value drop of firms against which the charges are dismissed depends on a selection issue, we construct a matching sample of similar firms that are not indicted. The litigation effect is confirmed by the control sample analysis: their abnormal returns are zero in the period around the filing date of the respective treated firm. We also study returns around the closure of court proceedings in order to identify a possible reversal effect once a case reaches the end phase in terms of dismissal or settlement. We find no significant upward price movements in the period surrounding the day that the final order is issued by the court or in the overall period of the lawsuit. Strikingly, this is also the case for acquitted firms. This result suggests that the drop in reputation is factored into prices at the initiation of the lawsuit and is not undone when the dismissal of the case is made public. Examining the long-term consequences on firm performance (up to three years after the case closure), we find that litigation significantly negatively affects profitability and operational expenses of the indicted firms. Overall, this suggests that indicted firms experience a value loss due to fraud. If a settlement is reached, the damage of past fraud can be partially recuperated by the shareholders. However, the reputational damage has lasting tangible effects captured by lower future cash flows (following losses in the product market, increased sourcing costs, etc.) and an increase in firm risk (reflected in a higher cost of capital). The share price drop

at the indictment is not undone over a period up to three years after the case closure. Remarkable is that the above dollar value losses of acquitted firms last for such a lengthy period. This loss can be quantified as the market value drop for firms that are ultimately acquitted and amounts to $384 million, on average. For firms that end up paying a settlement, the reputational loss is the difference between the settlement amount and the market value drop. In monetary terms, it is $872 million (=932.0-60.5) and $497 million (=516.1-19.2) for voluntary and ordered settlements, respectively.

We also analyze what type of factors relate to the share price response to an indictment. First, larger firms and less financially constrained firms are more resilient to share price declines around the indictment. The better market reaction may reflect investors' perception that these firms can weather the litigation process better. Second, turning to governance characteristics, we find little impact of the corporate governance mechanisms on the stock market responses except for the presence of investment companies. Their holdings mitigate the stock price decline, which suggests that some institutions are able to improve firms' resilience to adverse events, possibly through activism (see Brav et al., 2021 for a detailed overview of this mechanism). Third, considering the investment activities of firms, we find no significant link between past acquisitions and the market reaction to indictment.

We also investigate whether the share price declines are due to altered cash flows valuations by examining the operations and financial policies over the three years after the indictment. We find that a class action suit reduces profitability and increases operational expenses. The cost of capital increases and sophisticated investors decrease their positions. We conclude that the lasting stock price fall indeed reflects a less prosperous outlook for the indicted firm.

Trading in the stock of indicted firms is abnormally high around the litigation date: we find that more sophisticated investors (financial institutions) decrease their positions in indicted firms by 2%. Given that institutions do not usually adjust their portfolio positions (Gabaix and Koijen (2021) demonstrate a high inelasticity in financial markets), a reduction of 2% is economically significant. We also test whether investors can take advantage of the litigation information when it reaches the stock market. Constructing long-short portfolios with stocks of indicted firms (short) and peer firms without litigation (long), we find that an investor can earn significant returns trading around litigation events. The risk-adjusted alpha amounts to an annual 6.39%.

Finally, we investigate the peer effects of litigation. Indictment may be good or bad news for competitors: investors may be distrustful of peer companies when they expect them to suffer from

similar problems as indicted firms (a contagion effect); but competitors' businesses may benefit if distrusting customers switch to their products and services (a competitive effect). We find evidence of both contagion and competitive effects, with the former effect dominating.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 introduces the sample and data, and gives an overview of institutional detail of the class action procedures. Section 4 defines the methodology and Section 5 discusses determinants of fraud detection. Section 6 presents short- and long-term market reactions to the indictments, and the cross-sectional differences of market reactions. Section 7 shows the operational and governance consequences of the indictments, including changes in institutional holdings, operations, financial policies. Section 8 provides the impact of indictment on peer firms. Section 9 concludes.

2. Related Literature

Our paper relates to several strands of the literature on corporate fraud. First, we advance the literature on corporate fraud by highlighting that corporate fraud is prevalent and has an impact beyond the fraudulent firms. Naturally, managers try to conceal fraudulent behavior to evade legal consequences that could harm their personal wealth and reputation, which entails that research is limited to public cases of fraud (Helland, 2006; Karpoff et al., 2008). Karpoff et al. (2008) examines accounting restatements and the subsequent enforcements by the Securities Exchange Commission (SEC). They find that, over the period 1978-2002, about 1% of listed firms restated their earnings and that the apprehension rate of ill-intentioned restatements is about 80%. While this suggests that fraud is relatively scarce, Dyck et al. (2023) arrive at a different conclusion based on an analysis of large firms. Using the demise of Arthur Andersen after the Enron scandal as a quasi-natural experiment, they estimate the pervasiveness of fraud by investigating irregularities uncovered by newly appointed auditors. Their results indicate that the likelihood that a company with more than $750 million in assets engages in fraud in any given year is as high as 10%. In addition, in boom periods, such as the dot-com bubble, when investor scrutiny is laxer, as many as 6% or 30 of the largest US firms are caught committing fraud. Considering the outlook of fraudulent behavior, Karpoff (2021) predicts that given the recent advances in technology, such as the advent of blockchain, corporate fraud will decrease in the future. We show – for a comprehensive sample of all listed firms – that 2910 firms are engaged in securities class action lawsuits at least once.

Second, our paper adds to the literature that studies various types of fraud. Prior research typically focused on a particular type of fraud with the category of financial misrepresentation and earnings manipulation attracting most academic attention (Dechow et al., 1996; Palmrose et al., 2004; Desai et al., 2006; Karpoff et al., 2008). Other examined fraud types include product recalls and product market reputation, environmental violations (Konar and Cohen, 2001; Karpoff et al., 2005), and bribery (Karpoff et al., 2017; Hong et al., 2019). Studies on corporate fraud typically focus on only one area due to data availability (Karpoff et al., 2017).[5] In this paper, we select all class actions included in the SCAC database, irrespective of the reason of filing.

Third, this study relates to the literature that examines the motives to commit fraud (Dechow et al., 1996; McTier and Wald, 2011; Wells, 2001) and the flags to detect fraud (Louis, 2004; Wang, 2013). As the adverse effects of corporate fraud are so large when caught, the question arises why managers decide to engage in fraudulent behavior? Wells (2001) distinguishes between two incentives: need or and greed. Motives for the "need" to commit fraud can be financial constraints, covering up financial distress, or problems following acquisitions. When a firm wants to expand rapidly, but its cost of capital is high, managers may try to embellish the accounts. 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. Moreover, distressed firms may want to hide their fragile status. Using leverage as a proxy for distress, Burns and Kedia (2006) report that highly levered firms are more prone to "cook the books." Another reason why managers may justify fraud and consider it as a need is that they may see it as the only way to conduct business. For instance, Karpoff et al., (2017) argue that in certain situations, e.g., when dealing with officials in corrupt countries, fraud may be an unavoidable necessity. They also show that in most bribery cases, the present value of the business prospect outweighs potential penalties. Even if this type of bribery ("required" by the host country) is detected by the authorities in the firm's home country, the market reaction is non-negative.

[5] Most academic studies use one of more of these four datasets: 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 somewhat overlap, some cases of fraud are only present in one database. For instance, when studying financial misrepresentation prosecuted by the Department of Justice following a violation of Section 13(b) of the Securities Exchange Act of 1934, Karpoff et al., (2017) observe that the attrition rates amount to 61% in the GAO data and merely 13% in the SCAC database.

In contrast, the "greed" motivation to commit fraud may be induced by executive compensation contracting. The exposure of CEO wealth to corporate stock movements has increased many-fold since the 1980s (Bergstresser and Philippon, 2006; Kaplan and Rauh, 2013). While Kaplan and Rauh (2013) and Gabaix et al. (2014) argue that CEO pay is determined by the market and that wage is thus simply the price for talent, Antón et al. (2023) point out that managerial pay is strongly related to the performance of their rivals and spirals up to their pay levels. Consequently, some managers may be incentivized to cook the books so that corporate performance – and ultimately their own pay – does not lag that of their peer firms. The fraud literature shows that the amount of equity-based pay offered (especially in terms of the stock option grants) is positively correlated to the likelihood of committing fraud. For example, Bergstresser and Philippon (2006) and Jiang et al. (2010) demonstrate that larger stock option plans induce executives to manipulate accruals. Later in this paper, we will show that, in the context of securities' class action litigation, firms commit fraud mainly for reasons of "need", rather than "greed".

Part of the extant literature has tried to identify "red flags" that signal fraud. Wang (2005) states that abnormally high capital expenditures signal cash flow manipulation. Louis (2004) documents that acquiring firms overstate their earnings in the quarter preceding a stock swap announcement. Kempf and Spalt (2023) find that successfully innovative firms attract more class action litigations. Our paper documents that the factors that precede the detection of fraud include negative abnormal performance in terms of operations and stock prices. We also find evidence that securities class action litigation can act as a substitute governance device (such as the presence of institutional investors, or a higher degree of transparency), which echoes Appel (2019).

Fourth, we contribute to the literature on the cost of fraud to shareholders. Irrespective of the type of fraud, corporate misconduct is costly to society (Gande and Lewis, 2009). The 2022 reports of the Association of Certified Fraud Examiners (ACFE) claim that firms lose on average 5% of their revenues due to fraud. As Zahra et al. (2005) put it: "Where top management fraud exists, we all lose." Dechow et al. (1996) show that the initial announcement that a firm is under investigation results in a 9% drop in its stock price, which is aggravated by a widened bid-ask spread, suggesting that these stocks become less liquid. Examining SEC imposed penalties, Karpoff et al. (2008) report that markets impose a penalty on firms that is 7.5 times larger than the actual fine they have to pay. These firms lose on average 38% of their market value. Based on class actions in the SCAC database, Dyck et al. (2023) report an average of 21.8% of value loss. Indicted firms experience

an increase in cost of capital and reduce their investments in long-term assets (Arena and Julio, 2015; Yuan and Zhang, 2016). Our findings indicate that the mere fact that a company is taken to court – even if the case proves to be without merit - has a non-trivial effect on its stock price. We also document that indicted companies hoard cash and reduce capital expenditures.

Shareholder losses are not the only negative outcome attributable to fraud. The reputation of managers and directors involved in fraud is tarnished, and they may face financial penalties and imprisonment (Karpoff et al., 2008). Even managers not directly involved or prosecuted may suffer a reputational loss, as potential employers may see them as "passive bystanders." In addition, if fraud puts a firm out of business, employees may also be adversely affected by job losses and a reduction in savings in case their retirement plan was tied to the company's stock. When fraud causes financial distress, the problem may extend to related parties such as suppliers or customers. These indirect costs are hard to quantify, but the overall effect on society is undoubtedly substantial (Zahra et al., 2005). Our paper demonstrates that firms do experience substantial and lasting reputation losses after the indictment.

Fifth, this paper relates to the growing literature investigating peer effects. Foroughi et al. (2009) show that corporate governance practices can propagate from one firm to another belonging to the same network. Also, companies adopt corporate social responsibility practices of peer firms (Cao et al., 2019). Choi et al. (2023) document that regulatory enforcement actions for financial misrepresentation invoke information spillovers to industry peers. An early paper on peer effects is by Lang and Stulz (1992) who study the change in the stock price of competitor firms to a firm sliding towards bankruptcy. Naumovska and Lavie (2021) pursue this line and study contagion and competitive effects after a firm was accused of misconduct. Our paper investigates the peer effects of the securities class action litigation and presents evidence that both contagion and competitive effects emerge at class action litigation but that contagion effects dominate.

Legislative bodies have tried to devise a regulatory environment that deters fraud, encourages the revelation of fraud (by protecting whistleblowers), and generally increases the oversight and controlling power of shareholders. The Sarbanes-Oxley Act of 2002 was enacted as a response to the Enron and WorldCom major accounting scandals. The Act called for stricter reporting and auditing standards. Following the outbreak of the financial crisis in 2008, the Dodd-Frank Act of 2010 was drafted to increase prudence in financial markets. As shown by Dyck et al. (2010), whistleblowing entails large costs; not only for whistleblowing employees who put their

employment at stake, but also for external monitors investigating suspect firms. To alleviate these problems, the Dodd-Frank Act protects whistleblowing employees and provides a bounty for whistleblowers who bring fraud to light. The Dodd-Frank Act also introduced mandatory say-on-pay, although the shareholder vote on say-on-pay proposals is non-binding. Kronlund and Sandy (2018) show that firms respond to shareholder votes by decreasing base salaries and increasing equity-based compensation. Revised compensation contracting towards equity-based pay could induce incentives to commit fraud. We contribute to this discussion by showing that, while institutional investors are not necessarily better at detecting fraudulent behavior, they rebalance their portfolios towards companies that do not engage in fraud.

3. Data and Judicial Institutional Detail

3.1. The Class Action

3.1.1. Class Action Lawsuits

A class action lawsuit is a legal case where a group of plaintiffs, the *class*, claims damages from a defendant, typically a company or organization and its management. Class actions belong to the jurisdiction of civil courts and are treated under civil law. Classes may be formed on any basis common to plaintiffs, such as consumer rights, expropriation of minority shareholders' rights, 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 laws and the amendments to Rule 23, class action lawsuits appear to be well codified, although they are still subject to debate. 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 all-encompassing contracts are impossible to draw up, the need for legislation and monitoring prevails. Hence, either a supervisory agency is needed, or individual stakeholders should be able to claim damages. Currently, the former role is filled by the SEC,

while the latter by (class) actions in civil courts. In everyday practice, investigations by the SEC and class action filings are not coordinated, although inquiries by the SEC can lead to class action filings and vice versa.

Proponents of class actions argue that this procedure enables marginal (small) 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 that plaintiff law firms typically charge fees and expenses that amount to a considerable fraction of the settlement amount (Ferrell et al., 2021). As such, attorneys may be incentivized to take the initiative to build a class and go to court. This can lead to frivolous cases, where the allegation is not established and supported by firm evidence. For example, in the wake of the bursting of the dot-com stock market bubble, the number of securities class actions skyrocketed (Perino 2003). As a response, Congress passed the above mentioned PSLRA that aimed to reduce the number of non-meritorious filings. This Act was successful in the sense that the proportion of non-frivolous filings increased afterwards, suggesting that more substantiated cases reached courts. Another remaining issue is forum shopping: plaintiff law firms or reprehensive plaintiffs may choose their litigation to be heard in courts that are most likely to provide favorable judgments. 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).[6] 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, thus invalidate forum shopping.

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 by the executives that committed the fraud. This results in a wealth transfer between past and present shareholders and reduces social welfare. Ironically, long-term shareholders may suffer a loss thrice: first, when a fraud is committed; second, when fraud is revealed and stock prices drop; and third, when the company is eventually prosecuted[7] although

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

[7] The indicted firm pays the settlement from the firm's assets, which de facto are owned by the firm's shareholders, or the insurer pays the settlement amount if the firm has contracted D&O insurance (which is the case for most firms).

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. Class actions are thus necessary to safeguard all stakeholders' interests.

Some improvements to the current system are suggested by, amongst others, Spamann (2016) who theorizes that the limited liability of executives should be altered such that the prospect of legal action serves as a stronger deterrent against fraudulent behavior. Coffee (2015) calls for better coordination between supervisory bodies and plaintiff firms, and 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 available information on a case.

3.1.2. Class Action Procedures

Class actions are regulated under Rule 23 of the Federal Rules of Civil Procedure, which standardizes class action procedures across the US. Figure 1 shows a schematic representation of the class action procedure. The *class period* is the time over which plaintiffs claim to be defrauded by the defendant. The class period is usually well defined with an exact *start* and *end* date, or potentially further refined e.g., in case of allegations of intraday price manipulation. 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 plaintiffs. The exact date of this *discovery* is hard to pinpoint. In many cases, discovery is closely associated with the case filing, especially in cases where law firms take the initiative to set up a class action. 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 that law firms have become more active in launching litigation against firms suspected of fraud.

[Insert Figure 1 about here]

After the first complaint is filed, the court procedure begins. It is however possible that several complaints are filed at the same court related to the same case, or that these filings take place in

multiple districts. If all these cases claim similar damage, the filings are *consolidated* by the courts, which appoint a single judge to preside over the case in a chosen district court and a lead plaintiff law firm to head the process. Frequently, the lead plaintiff law firm is the law firms of the plaintiff who suffered the largest damage. 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 must 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 potential members of the class that were yet absent in the class action. 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. Any investor who held any number of shares during the certified class period can join the class.

The court procedure has three potential outcomes. First, it is possible that the plaintiff(s) and the defendant reach a *voluntary settlement* without any court order. Then, the parties file a *stipulation of settlement* and all further court proceedings are canceled, conditional on the court considering the settlement fair to all class members.[8] If the court considers the settlement fair, it arrives at the final judgement and closes the case (*final ruling*). Settlement 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 consider the case as unsubstantiated and *dismiss* it and close the case (*final ruling*). 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*). It is important to note that civil courts never pronounce defendants guilty. A settlement order only states that the plaintiffs' claim is meritorious, and the defendant is obliged to compensate plaintiffs. 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 even to the Supreme Court. Once a case is closed, either through one form of settlement or dismissal, and all appeal procedures are exhausted, the case cannot be brought to court again, not even by shareholders who did not join the class. In legal terms, the case is

[8] The (settlement) judge is most often actively involved in establishing the settlement fund, especially for large classes.

dismissed with prejudice. We provide an illustrative securities class action lawsuit example filed against Dropbox Inc. in Appendix B.

3.1.3 Basic Facts

The Stanford Securities Class Action Clearinghouse (SCAC) database comprises all securities class action filings since the enactment of the PSLRA in 1995.[9] Figure 2 shows the number of new class action filings per year, as well as the number of new cases that are dismissed by judges in any given year. The figure shows three peak periods in which fraud was more prevalent: the year the dot-com bubble burst (2000), the financial crisis of 2008, and the recent stock market growth (2016-2019).[10]

Turning to the spatial distribution of class action filings in Figure 3, we show that the occurrence of litigation filings varies significantly across states.[11] Panel A illustrates that the cases are concentrated in four states (in descending order): New York, California, Delaware, and Texas. Among these states, the number of cases by industries also, unsurprisingly, shows considerable variation: the financial sector is prominent in New York (116 out of 357 cases) as is technology in California (229 out of 639 cases). While New York and California appear to top the other states in terms of class action filings, the question arises whether class actions in these states are overrepresented in our sample. To answer this question, we compare the overall litigation intensity in each state by standardizing by the number of listed firms headquartered in the state.[12] Panel B of Figure 3 shows that the overall intensity of class actions is highest for New York, followed by California, Arizona, Washington, Florida, and New Hampshire. A possible explanation for this concentration may be that some large, specialized law firms file 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 actions in the SCAC database.

[9] We collect the information from the SCAC website by means of a web-crawler and then hand collect company identifiers in order to merge the data with other financial databases. As the SCAC database does not contain settlement amounts for all cases, we gather this information by conducting web searches.

[10] In the appendix C, Table C.1, we also show that filings in the technology and financial sectors reached their all-time high in the dotcom bubble (2001) and the financial crisis (2008). During the recent stock market growth, there was a high number of litigation cases in the technology and financial sectors, as well as the services and healthcare sectors.

[11] In total, there are 94 districts: 89 districts across the 50 states, and 5 in the territories (including American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and U.S. Virgin Islands).

[12] We focus on headquarter locations and not incorporations as the majority of firms are incorporated in Delaware. 69% of the Fortune 500 companies are incorporated in Delaware, but most are headquartered in other states. For instance, Meta (Facebook) is incorporated in Delaware, but its headquarters (and largest employee base) is in Menlo Park, California.

[Insert Figures 2 and 3 about here]

Investors' ultimate goal when filing class actions is the recovery of their (perceived) losses through damage claims. Appendix Table C.2 gives a breakdown of mean settlement amounts by industry and year.[13] The overall mean of settlement over our time window and across industries amounts to $34 million[14], with the largest amounts paid out by utilities ($355m), conglomerates ($106m), and financials ($81m). The high average for utilities is affected by the largest ever settlement: Enron which paid $7.2 billion in damages in 2008.

When we turn to the descriptive statistics of class actions, we find that the length of the class period amounts to 434 days (Table 1) and that the time to filing, the gap between the end of the class period and the first case filing date, averages to about 72 days (with a median of 11 days). The filing speed has been improving in recent years (2015-2019), with the mean case being filed no later than 46 days after the class period and a median of merely 2 days. For instance, there is no gap between class period end and first filing in Dropbox's litigation case. In another example, Volkswagen' s "dieselgate" 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. In contrast, 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, we observe that some cases are brought to court with longer delays; the filing date and the class period end can then be up to 6 months apart. Typically, four law firms are involved in a class action (Table 1), but with mega cases this number may be much higher, e.g., 33 law firms represented plaintiffs against Enron.

3.2. Additional Data

We gather our data from multiple sources. 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. We source data on analysts from I/B/E/S, and M&A information is collected from SDC Platinum. We also utilize product similarity

[13] Appendix C, Table C.1, exhibits the number of class action suits by industry.
[14] Our sample mean is lower than the $198 million reported by Dyck et al. (2010). Their sample is smaller and tilted towards mega cases. When we restrict settlements be larger than $10 million, we find that the mean settlement is about $123 million.

data from the Hoberg-Phillips Data Library to define horizontal relationships between firms (Hoberg and Philips 2016; 2010).

The ownership data are from Thomson Reuters' S12 (mutual funds) and S34 (all institutions). We restrict the sample of mutual funds to actively managed funds. We also follow Lou (2012) in using domestic equity funds' holdings.[15] These restrictions on mutual fund holdings exclude holdings from passive funds, fixed-income funds, international funds, and precious metal funds. As for other institutional holdings, we retain funds from banks, insurance companies, investment companies, investment advisors, and other institutions.[16]

4. Methodology and Sample Construction

In order to obtain a sample of firms comparable to the indicted ones, we use a matching algorithm, with replacement. The matching criteria include the 49 Fama-French industries[17], firm size (log of total assets), market-to-book ratio, and past stock return. We restrict control firms not to be involved in any class action litigation with the [-1, +3] year window around the indictment. The matching is done in each case at the time of litigation. Thus, a firm targeted by multiple cases in the indicted sample could be matched with different sets of control firms. For each potential indicted-control company pair, we calculate the Mahalanobis distance metric and retain the three closest matches.[18] The Mahalanobis score is a convenient measure of similarity as it does not require any modeling assumptions, which is the case for example with sorting or regression-based propensity score matching. Furthermore, the Mahalanobis metric considers the covariance between matching covariates, and if covariances are zero, the measure reduces to the Euclidean distance.

[15] Specifically, we retain funds with investment objective codes referring to aggressive growth, growth, growth and income, balanced, unclassified, or missing.

[16] Since the codes of the type of mutual funds in the S34 contain errors from December 1998, we apply the procedures by Koijen and Yogo (2019) to correct the type codes: When institutions were created prior to Dec. 1998, we use their type codes from the period before Dec. 1998 and replace the ones introduced subsequently. We identify the investment advisors from the historical archives of SEC Form ADV from June 2006 onwards and reassign type code 5 to 4 when an investment advisor is identified. We use the most recent type code for each institution to keep institutional type code unchanged throughout the sample. For institutions with type codes 3 through 5, we delete institutions if they are matched to S12. We assign those institutions to pension funds if we can find a match to the list of top 300. We assign type code 1 to banks, 2 to insurance companies, 3 and 4 to investment advisors. Pension funds are identified in the previous step. The remaining institutions are labelled as others.

[17] If we cannot find a match within 49 industries (which occurs for only 14 instances), we relax the classification to 17 industries.

[18] Our results are robust to retaining only the closest match for each indicted firm.

Our initial SCAC database comprises 5,059 individual cases and covers the period 1996-2019. After dropping cases initiated against private companies (e.g., mutual fund management firms, brokerage firms, or pension funds), we obtain 4,812 cases. For inclusion in the final sample, we require that a firm has available information in CCM. After merging the securities class action data with CCM databases, we then retain a sample of 4,191 fraud cases for 2,910 individual companies. We further restrict cases to indicted firms for which at least one matched non-indicted firm can be found. In the end, our sample consists of 3,638 cases for 2,910 firms. Of these cases, 205 were still ongoing at the time of our data collection.

The upper section of Table 1 contains the main matching variables. The test statistics show that the matching procedure worked well for past returns, as the test for the equality of means cannot be rejected. However, indicted firms appear to be, on average, larger and have a higher market-to-book than their matched counterparts. This result is not unexpected as the indicted firms are usually very large in size and their universe is usually the S&P 1500, which means that the average Fama-French industry is populated by about 30 firms.[19] Consequently, the number of potential matches is limited, especially in industries with multiple indicted firms. Still, even when a larger universe of possible matches were available, significant differences in the matching dimensions between treated and matched firms can emerge. The difference in market-to-book indicates that class actions target highly valued companies (Kempf and Spalt, 2023). This was especially the case during the dot-com bubble.

[Insert Table 1 about here]

5. Detection of Fraud

5.1. Univariate Results

Table 2 provides descriptive statistics for the indicted and control samples. Each indicted firm is matched with three similar companies of the same industry by means of the Mahalanobis distance metric based on size, market-to-book, and past stock market performance.

[19] The Fama-French industry classification can be somewhat restrictive. For example, our fraud sample contains Northrop Grumman which is classified as a "defense" company within the 49 industries. In this classification, the only match in the S&P 1500 is Raytheon. When using a broader industry classification (of 17 industries), Northrop Grumman falls into the "aviation" industry and then has more than the required 3 matches within the S&P 1500 universe.

[Insert Table 2 about here]

Compensation. It is a well-established fact in the literature that a higher level of executive compensation, especially of variable and equity-based compensation, may induce some managers to manipulate earnings or provide misleading information to investors (Bergstresser and Philippon, 2006; Burns and Kedia, 2006). Table 2 reveals that executives of indicted firms are paid more both in terms of base salary and equity-based compensation (stock options and restricted stock combined). While the difference in means of salary amounts to $0.1 million (=0.81-0.71) and is statistically significant, in economic terms, it is probably not high enough to outweigh the potential losses in a manager's reputation that would follow the discovery of (corporate) fraud (Aharony et al., 2015). Similarly, the $0.52 million difference in the value of equity-based compensation is statistically significant, but presumably still not enough of an economic incentive for management to breach acceptable business practices.

Board structure. The board serves as an important monitoring body, whose responsibility is to ensure that executives act in the best interest of investors. Table 2 shows that there are no significant differences between both samples in terms of independence of the chairman, board size, number of (independent) directors and male ratio of board members. In about half the firms, the CEO is also the chairman of the board, and in 43% of the sample there is an independent chairman. Indicted firms have directors who are better connected and have a considerably larger professional network size, relative to the control sample. Firms with class action suits have a more diverse board structure with more foreign nationals. Finally, indicted firms have somewhat younger CEOs, proxied by the time to retirement, who also have a shorter tenure in that position.

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 et al. (2003) argue that busier directors perform just as well as directors that sit on a single board. However, Falato et al. (2014) finds 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.

Visibility and outside monitors. External monitoring is important to limit or uncover corporate misconduct (e.g., Chen et al., 2016 or Dyck et al., 2010). We find that indicted companies are more visible as they are followed by more equity analysts. They have a larger institutional shareholder base (based on domestic equity funds).

Size and capital structure. Indicted firms are somewhat larger in terms of size and have fewer tangible assets, indicating that in addition to external monitoring associated with equity, they are also possibly screened to a larger extent by creditors.

Risk and profitability. In the context of securities class action litigation, firms are indicted either because they go through a period of business turmoil, their performance is inflated, or they deceive shareholders with false claims about the prospects of their business. We consider the first two possibilities by means of the measures of past performance, and the third one by inspecting the market's outlook for the firm. Indicted companies exhibit larger stock return volatility, a higher but not significantly different stock liquidity (measured by Amihud (2002)'s illiquidity measure), and operate less efficiently as their profitability measures are lower than those of non-indicted firms. Their investment opportunities (Tobin's Q) are also worse than those of non-indicted firms. In contrast, indicted firms' market share is considerably larger, both statistically and economically.

Cash, investments, and payout. Firms taken to court hold slightly more cash (by total assets), yet, they are more financially constrained (as pointed out by the HP-index (Hadlock and Pierce (2010)). The dividend and investment policies, and the operating expenses are not markedly different between the two samples.

Acquisitions. Wang (2013) shows that indicted firms have a higher level of M&A activity. Our sample shows the same pattern. 48% of the indicted firms complete at least one acquisition during the class period while only 30% of the control firms make one or more takeover deals. The deals by the indicted firms are significantly larger –almost 5 times- than those by non-indicted firms. We break down acquisitions into diversifying and focused takeovers; in the former the target and acquirer are in different 2-digit SIC industries, whereas in the latter category, firms both belong to the same 2-digit SIC industry. Table 2 shows that both indicted and control firms perform relatively more focused acquisitions than diversifying deals. Furthermore, irrespective of the acquisition type, indicted firms close more and larger takeover deals.

5.2. Multivariate Results

We first estimate the probability that a firm engages in fraud by including factors available prior to the start of the class period. This means that we examine which types of firms are more prone to fraud prior to the actual engagement in fraud. We then estimate the probabilities that a firm is

indicted by means of a class action suit and that a specific legal outcome arises (voluntary settlement, dismissal, settlement with court order). We distinguish between (i) ex ante and (ii) ex post detection variables as well as (iii) factors capturing the committing of fraud (Wang, 2013; Dyck et al., 2023).

Ex ante detection factors are "red flags" that draw heightened attention to the firm. A high level of real investments (CapEx) may induce managers to commit fraud through manipulating cash flow figures to reduce the cost of capital (Wang, 2005). Similarly, higher M&A activity can entice management to doctor the numbers (Erickson and Wang, 1999; Louis, 2004). Sophisticated players, such as institutional investors and equity analysts can be effective at uncovering fraud. Additionally, larger firms might be under stricter scrutiny, but at the same time, managers of such corporations might feel that they can hide fraud more easily.

Ex post detection factors could potentially increase the probability of detection, but their influence is harder to assess before or at the time of the fraud. Ex post means that the variables may be ex post to the commencement of fraud, but they are still ex ante with respect to our analysis of the litigation. We use industry litigation intensity to proxy for increased scrutiny from investors. In addition, we will include measures of performance shocks to control for unexpected changes in (i) profitability and (ii) stock returns. For the former, we take the residual from an AR(1) regression of ROA, where a positive residual translates into a positive shock. For the latter, the return shocks, we create an indicator variable that equals 1 if the firm had a stock return belonging to the lowest quartile of its industry in the year preceding the court filing. We also control for the one-year buy-and-hold return of firms, and their stock return volatility in the same period. Finally, we control for industry since the litigations cluster in 4 industries: financials, healthcare, services, and technology.

Committing fraud factors. In order to distinguish between need- or greed-induced fraud, we include leverage, external financing needs, and past profitability. We calculate the external financing need by means of the HP-index by Hadlock and Pierce (2010). Motives for the "need" to commit fraud can be financial constraints, the need to cover up financial distress, or problems following the acquisition of other firms. If managers were to engage in fraud out of need, we would expect that their firms have a very high leverage and external financing need, which entices them to commit fraud in order to avoid financial distress and potentially even bankruptcy. The "greed" motivation to commit fraud may be induced by executive compensation contracting, e.g., (overly)

strong equity-based incentives. If fraud is induced by greed, committing fraud is still likely even when a firm experiences periods of profitability or good performance in the stock market.

Models (1) and (6) of Table 3 present the results for the commitment of fraud and whether there are any firm characteristics prior to the class period (the period during which fraud was committed) that can predict fraud. Larger firms are less likely to commit fraud, which could be due to their better performance in operations or a generally lower cost of capital (which reduces "need" as a fraud motivation), or to better internal and external governance mechanisms. In relation to latter, we find that firms with a higher level of institutional holdings and higher transparency (more analyst coverage) are still more likely to engage in fraud, which erodes the external governance explanation. A firm's stock market performance does not affect the probability that it will be involved in fraud, but negative accounting returns, a negative profitability shock, or high volatility increases the probability of fraud, which is in line with "need" as a motivation to engage in fraud. We also find that when the firm is financially constrained (as measured by the HP-index), fraud is more likely, which also points to need as a motivation for fraud.

In Models (2) and (7) in Table 3, we examine which firm characteristics predict whether firms will be indicted or not. Ex ante detection factors have strong predicting power. Smaller companies, companies that invested large amounts in long-term assets and in acquisitions are indicted more. Firms with less institutional ownership and analyst coverage are also more likely to be indicted, which implies that less transparent firms and firm with few external monitors are more likely to be sued. As for the ex post detection factors, we also find predictive power: the probability that a firm will be indicted increases with its stock return (one year buy-and-hold return), but also when there are negative profitability shocks, high volatility, high leverage, and strong external financing needs increase the probability of being indicted. Overall, we find the securities class action acts as a corporate governance method, partly substitute for other governance such as debt holders, institutions, and analysts.

We then turn to which factors predict whether the indicted firm will pay a settlement (Columns (3) and (8) of Table 3). We observe that smaller firms and those investing more in long-term assets are more likely to settle, as are firms that experienced a negative shock in accounting returns and firms of which the stock return has done well over the previous year. Furthermore, high external financing needs (HP-index) also increase the probability of settlement. To further disentangle the two settlement types, the voluntary settlement which takes place before a court order is issued and

the ordered settlement, we estimate an ordered probit model and multinomial logit model whereby case dismissal is the benchmark (equal to 0), the voluntary and ordered settlement are respectively equal to 1 and 2. We show the average marginal effects (in brackets) on voluntary settlement and ordered settlement in columns (4) and (5). Small firms with high recent investments tend to settle the lawsuit voluntarily. The tendency to settle is increased if the firm experienced a negative profitability shock in ROA and is financially constrained. Firms that did well in terms of stock price returns also tend to settle more frequently. Columns (9) and (10) of mlogit model in Table 3 disclose that the probability to be indicted increases when firms have high stock price performance but are incurring a negative earnings shock.

From the multivariate analysis in Table 3, we arrive at the following results: (1) Firms engage in fraud mainly due to need rather than greed as ex ante poor performance and financial constraints correlate with future fraud. (2) Securities class action litigations act as a corporate governance substitute for other internal and external governance of firms as lack of transparency and fewer institutional investor holdings increase the probability of being indicted. (3) Firms are more likely to settle the case quickly, especially to reach an agreement with plaintiffs when they are less resilient to litigation pressure, or when they want to end poor performance in operations.

6. The Effects of Fraud Revelation on Stock Returns

News on class action lawsuits has a strong impact on the stock price of an indicted firm. For example, when the news broke about the "defeat devices"[20] in Volkswagen cars on 18 September 2015, the first class action case in the US against VW was initiated literally hours after the disclosure of the scandal. VW's stock fell by 35% in the subsequent week.

6.1. Short-term Returns

In order to gauge the market reaction to the revelation of a class action indictment, we estimate the abnormal returns around the filing of securities litigation class actions by means of the Fama-French-Carhart 4-factor model (Fama and French, 1993; Carhart, 1997).[21] Our broadest event window spans the period from up to one month before and after the court filing ([-20,20] trading

[20] https://www.nytimes.com/interactive/2015/business/international/vw-diesel-emissions-scandal-explained.html

[21] We use the factor return data from the website of Kenneth French. We estimate betas over the window spanning [-250, -31] days (relative to the event announcement day equal to zero). For IPO fraud allegations, we require at least 3 months' worth of data (no less than 60 trading days) for estimation purposes. Our results are robust to alternative models, such as the Fama-French 5-factor model (Fama and French, 2015).

days). It is hard to pinpoint the exact date of the discovery of the alleged fraud/problem, but it is reasonable to assume that discovery happens in the interval between the end of the class action period and the filing date. Empirically, we show that abnormal returns only start decreasing after day -20. In subsequent analyses, we allow for reversal patterns following the filing and hence also study long post-filing windows.

A class action indictment is bad news for shareholders. Figure 4 shows the abnormal returns and CARs for all the indictment cases (Panels A1 and A2), and the subsamples of voluntary and ordered settlements, and dismissed cases (respectively, Panels B1 and B2, C1 and C2, D1 and D2). Panel A1 shows that the abnormal returns are strongly negative on the day of the indictment including the preceding two weeks ([-10, 0] trading days). The CAR graph in Panel A2 shows that, corrected for risk, the market capitalization goes down by more than 12%. Panels B and C show similar patterns with strongly negative abnormal returns which culminate in the week prior to the indictment. The CARs of the voluntary and ordered settlement are respectively about 17% and 15% lower at the indictment date (from 20 trading days before the event until and including the event day). For the dismissed cases, we observe in Panel D2 that the fall in CARs amounts to 7%. Figure 4 calls for two remarks. First, the share price movements around the event are strongly significant and are induced by the event as the full lines in the graphs represent the CARs for the control sample of firms that were not indicted and do not show any significant movement in abnormal returns. Second, it should be noted that the event analysis for the subsamples is based on the ex post measure of (voluntary/ordered) settlement versus dismissal. At the time of the event study, it is yet unclear what the ultimate outcome of the indictment will be. These findings suggest that the market can already discriminate between the cases with most merit (the ones settled, voluntary or by court order) and those without (dismissed cases).

We provide the details behind Figure 4 in Panel A of Table 4, which also tests the significance in CAR differences by subsample. For instance, the more negative price reaction for voluntary settlements relative to that of ordered settlements is not always statistically significant (as it may be hard at the court filling which type of settlement may ultimate occur), but the difference between any type of settlement and dismissed cases is always strongly statistically significant. In order to assess whether the market reacts to other events in the court process, we also calculate CARs around the settlement filing and the final court order in Panels B and C of Table 4. Around the former date, we do not find any significant CARs which indicates that this event bears little

information. There is however one exception: the announcement of the creation of a voluntary settlement is greeted positively by the market (Panel B). The reason is that the shareholders then know that the firm will not continue to contest the indictment further but agrees to settle. While the firm legally does not admit past wrong-doing or guilt, de facto the firm does and desires to close the case quickly. This is good news for shareholders who no longer face uncertainty about the outcome. Panel B shows that only the CARs of broader event windows starting at [-10, 10 trading days] are statistically significant, which signifies that the reporting of the settlement date could be done with some more imprecision (or that the market is not very attentive). It should also be noted that the positive news of a voluntary settlement is relatively small (3.7% in the window [-20, 20]) and only makes up a small fraction of the CAR of -20.6% at the announcement of the indictment (Panel A). This implies there is a substantial negative net value loss for the firm when it is indicted. Panel C reports CARs around the final court order about settlement fund and closing the case. We find that this decision has no further informational value.

To assess the economic magnitudes of the abnormal returns around lawsuit filings, we calculate the value changes (losses) and contrast them with the eventual settlement amounts (which de facto boil down to penalties). We calculate $\Delta MV_t = MV_{t-1} \cdot AR_t$, where MV_{t-1} denotes the market value measured one trading day prior to date t and AR_t is the abnormal return calculated from the Fama-French-Carhart model. ΔMV_t is the abnormal market change on date t. We then aggregate ΔMV_t around the filing date to obtain the total market value change. For example, for the [-20, 20] window, we compute $Loss[-20, 20] = \sum_{t=-20}^{20} \Delta MV_t$.

We find that the average indicted firm loses almost $0.6 billion or about 12% of its market value. Firms with voluntary settlements face a loss of $0.93 billion, which represents 21% of their market value, and firms with ordered settlements incur a loss of $0.52 billion or 15% of their market value. In case of a settlement, this loss comes from several sources: shareholders adjust the firm's value after an assessment of the loss due to embezzled funds, lost growth opportunities, poor investments, the production of low quality or defective products, accounting manipulation, and the loss of reputation with customers, suppliers and other stakeholders. For dismissed cases, the fact that the value does not revert upwards at dismissal implies that despite the recognition that the case was non-meritorious, the company suffers from reputation damage. Losses are non-trivial for dismissed cases either, as over the [-20,20] window these firms also lose almost $383.5 million or

7% of their market value (respectively, Column (4) of Table 5 and Column (5) of Table 4 Panel A).

To sum up, we find that shareholders lose at the first court filing date when the disclosure of the expected fraud and indictment drive the stock prices down by more than 12% (adjusted for risk). The market seems to predict the ultimate outcome well, as settled cases experience a far larger stock market decline than dismissed ones. Strikingly, these initial losses are not reversed when the outcome of the court process is revealed, even for the cases that are dismissed by the court.

6.2. Long-term Returns

The question arises whether the large losses documented in Table 5 are lasting and whether there is any evidence of a reversal over the longer run. To answer this question, we perform a long-run event study around the lawsuit filing and throughout the court process. We estimate the 4-factor model (Fama-French-Carhart) using monthly data in a window spanning [-48, -2] months relative to the lawsuit filing (and require at least 24 months of data for the cases with IPO fraud allegations). Our long-term event window spans the period [-1, 36] months around the lawsuit filing because the average length of the court procedure amounts to about 3 years. Table 6 presents the return patterns over this horizon. The risk-adjusted returns keep decreasing over the entire length of the court case: from one month prior to the lawsuit filings up to three years subsequently, the returns dip from 22% in short run to 53% after three years. For both the voluntary and ordered settlements there is no significant reversal. Most striking is that for the dismissed firms (for which the initial negative price correction was more modest relative to the settled cases) the CARs keep going down for the entire three-year window. This lack of reversal and even continued share price decline show that these firms suffer from a long-lasting decline in reputation.[22] This indicates that in the long run, class action litigation filings have a similar impact on indicted firms, no matter what the eventual outcome is.

To sum up, we find that class action lawsuits induce significant and long-lasting changes to the market value of indicted firms. The lack of reversal in returns indicates a permanent reputational loss for affected firms.

6.3. The Cross-section of Returns

[22] The average CAR[-1, 36] is more negative for dismissed cases than those in the settled cases, but the differences are not statistically significant. The negative CARs for dismissed cases are not driven by a few extreme cases. When we winsorize the CARs either by 1/99% or even by 5/95%, the patterns remain similar.

We analyze the cross-section of abnormal returns by regressing the CARs on observable firm characteristics: risk characteristics, governance measures and metrics of M&A activities. The regressions are of the form:

$$CAR[-20, 20]_i = \alpha + \beta Indicted_i + \gamma X_i + \delta Indicted_i * X_i + \varepsilon_i. \quad (1)$$

Panel A of Table 7 documents different market reactions to indictment for firms with different risk characteristics. The sample used in the specifications comprises the indicted firms and for each indicted firm also three control firms. We include industry fixed effects due to the fact that some industries such as technology and healthcare witness higher than average securities class actions. We further include the abnormal litigation intensity in Column (3) to control for the industry wave of litigations (Choi et al., 2023). We find that indicted firms indeed have significantly lower CARs than non-indicted firms, but larger firms are more resilient to price drops; firms with higher external financing needs suffer more from the securities class actions. This signifies that firms that are ex ante more likely to successfully get through the class action litigation process experience less pronounced price drops. Strikingly, firms with more illiquid stocks suffer less from the securities class actions. This reflects that more liquid stocks are more targeted by securities class actions. Other factors, such as market-to-book, leverage, capital expenditure, cash holdings, dividend payment, sales growth and profitability do not affect the heterogenous market reactions to class action filings.

[Insert Table 7 about here]

Panel B of Table 7 presents different market reactions to indictment for firms with different governance measures. Overall, we find little impact of the corporate governance devices on the CARs measured over the period starting 20 trading days prior and ending after the indictment announcement. However, when we compare indicted and non-indicted firms, we find that salary and equity incentives are positively related to CARs for indicted firms. This indicates that incentive devices help indicted firms to weather the impact of indictment. Most board characteristics, however, do not affect CARs. Finally, turning to outside monitors, we find little impact by either analysts or most institutional investors. The significance of investment company holdings may indicate that investment companies, mainly hedge funds, are able to process the information contained in lawsuits better, and their holdings are indicative of a firm being more resilient to

litigation (Jiao et al, 2016). Therefore, we conclude that the internal and external corporate governance mechanisms have limited impact on the CARs of indicted firms.

In Panel C of Table 7, we focus our attention on the takeover activity by indicted firms prior to the indictment. The panel shows that the number and value of completed deals between the class start date and the filing date does not have a significant effect on stock returns around class action filings.

7. The Real Effects of Indictments

In this section, we examine the impact of indictments on trading activity, institutional ownership, firm's operating performance, and financial policies. In the end of this section, we conduct a portfolio analysis to check whether one can trade on the information conveyed by securities class action lawsuits.

7.1. Trading

Given that the market strongly reacts to the indictment filing, the trading of the indicted firms' stock should experience a substantial increase around the filing dates. We investigate this conjecture by comparing share turnover ratios of indicted vs. non-indicted firms.

Table 8 presents the results of stock turnover ratios around the first filing date. Column (1) informs that market turnover indeed increases for the indicted firms in the [-20, 20] window around the first filing. We do not see any change in the turnover of non-indicted firms in the same time frame. In column (3), we notice that turnover ratios of indicted firms increase 35% more than those of non-indicted firms. We confirm our results by checking the abnormal turnover ratios between indicted firms and non-indicted firms. The abnormal turnover ratios are calculated by subtracting the average turnover ratios over a window of [-6, -2] months relative to the filing dates. Abnormal turnover ratios of indicted firms increase 9.5 times more than those of non-indicted firms.

[Insert Table 8 about here]

7.2. Institutional Ownership

Institutional investors are often considered as smart market participants. If they sell the shares of indicted/fraudulent firms, the financing of these firms as well as their corporate governance could deteriorate. Although we cannot directly examine the impact of institutional investors on

fraudulent firms, we can study the change in institutional investors' equity positions. To do so, we estimate difference-in-differences models around the filing of the lawsuit where the treatment effect is 1 for indicted firms and 0 for the control group. We consider the equity positions in the [-4, 4] quarters around the quarter of the lawsuit (quarter 0); $Post_t$ stands for the five quarters in and after the lawsuit initiation quarter.

$$Y_{it} = \alpha + \beta Post_t + \gamma Indicted_i + \delta \cdot Post_t \times Indicted_i + X_{it} + +\eta_i + \nu_t + \varepsilon_{it} \qquad (2)$$

Y_{it} represents different measures on institutional investor holding positions for stock i at quarter t: the equity stake held by institutional investors. We also split all institutional investors into five categories: banks, insurance companies, investment companies, pension funds, mutual funds, and other institutions. As before, the coefficient of interest is δ which captures the effects of the announcement of a class action suit (measured relatively to their matched peers). We also control for firm size and market-to-book, and firm, industry, quarter fixed effects.

The results, shown in Table 9, indicate that institutional investors decrease their shareholdings in indicted firms by 2% after the indictment. For banks, insurance companies, and mutual funds, we observe slight decrease in shareholdings of the indicted firms ranging between 0.2-0.5%. The very long-term investors, such as pension funds, do not change their positions in indicted firms. The decrease in institutional holdings remains limited, which is due to fact that most firms in our sample are contained in some major stock index used as a benchmark by many funds. Since institutions overall tend not to change their positions (thus the market is inelastic as in Gabaix and Koijen (2021)), the small changes in Table 9 are indeed economically significant.

[Insert Table 9 about here]

7.3. Operations

We document that the stock prices of indicted firms experience sharp decreases in a short period around the indictment revelation but do not experience a reversal over the long run, not even after the case is dismissed. Moreover, the loss in market value after a lawsuit filing is much higher than the actual settlement amount. We consider this gap as a loss in reputation due to lawsuit filing. Indicted firms are punished for a larger amount than the settlement as investors may consider that a poor reputation will result in poorer perspectives resulting from damaged relations with customers, suppliers, providers of funds and other stakeholders. The poor reputation may be lastingly damaging. Further evidence on reputational loss is given by the fact that, even when the

case against a firm is dismissed, stock prices do not revert upwards. We investigate whether the stock price decrease reflects expected operational problems of indicted firms. We examine different measures on firm operations: (i) the first set comprises measures of profitability (ROA, Tobin's Q) as a lower lasting profitability may explain lower stock prices, (ii) the second measure is sales, as lower sales will be reflected in lower future cash flows, and hence in a lower stock price (assuming a constant cost of capital), (iii) the third set relates to expenses (operational expenses).

We estimate difference-in-differences models around the filing of the class action lawsuit, which is a shock to the indicted (treated) firm, and use the matched firms, which are similar to the indicted firms with exception of the indictment, as the control sample. For operational measures, we consider the [-3, 3] years around the lawsuit announcement date, such that the time indicator variable is 1 starting in the year of the lawsuit filing and for the 3 subsequent years (e.g., $Post_t = 1$), and 0 for the years prior to the lawsuit filing.

$$Y_{it} = \alpha + \beta Post_t + \gamma Indicted_i + \delta \cdot Post_t \times Indicted_i + X_{it} + \eta_i + \nu_t + \varepsilon_{it} \qquad (3)$$

Y_{it} represents different measures of the firm operations (as listed above). The coefficient of interest is δ which shows the effect of the revelation of expected fraud for the indicted firms, relative to their matching peers. We also control for firm size and market to book, and introduce industry and year fixed effects. The key assumption for consistency of the difference-in-differences estimator is the zero-correlation assumption (e.g., parallel trend assumption). Economically, this condition means that in the absence of treatment, the average change in the response variable would have been the same for both the treatment and control groups. We verify the parallel trend assumption by investigating the trends of response variables prior to the indictment.[23] We show in Table 10 the difference-in-differences estimation results for firm operations in Columns (1) to (8). Relative to the matching peers, the indicted firms tend to show a larger decrease in operational measures: ROA and Tobin's Q both go down in the three years after the indictment. These decreases are economically significant. For instance, indicted firms decrease by 2.7% and 0.716 in ROA and Tobin's Q (Columns (2) and (4)), respectively, after the indictment relative to non-indicted firms. As for sales, the indicted firms incur an unexpected increase relative to the matched sample, this

[23] Figure C.1 in the appendix presents the trends for the indicted firms and their matched peers. First, the average operation measures, especially the ROA, for the indicted firms and their peers are similar before treatment. Second, the average operation measures for both types of firms are trending at the same rate during the pretreatment period, which corroborates the parallel trend assumption.

increase disappears after we control for firm fixed effects (Column (8)).[24] Table 10 also shows that operational expenses go up by 4.2% in the years after the indictment (Column (6)).

We also partition the indicted firm sample into sub-samples based on the lawsuits' outcomes: dismissed cases, voluntary settlements, and ordered settlements. In Appendix Table D.3, we document that the results on the impact on a firm's operations are largely upheld by outcome type (Columns (1)-(8)). The settled indictments predominantly have significant influence on firm operations for the dismissed lawsuits, which is slightly milder than settled cases.

[Insert Table 10 about here]

7.4. Financial Policies

We verify whether firms' financial policies change after an indictment. We would expect that an indicted firm hoards cash after the lawsuit filing for precautionary purposes. First, there is a probability that the indicted firm will need cash to pay the lawsuit costs and the settlement. Second, as we mentioned in the above subsection, if the reasons for the indictment are valid (e.g., fraud, misstatement of financial information), the firm may in reality experience lower profitability and face relatively higher expenses. Hence, higher cash holdings may be necessary to weather a tougher economic situation over the subsequent years. We also examine whether an indicted firm's leverage is impacted as the firm may suffer from financial constraints resulting from the loss of reputation that may spill over to the product market (lower margins, decreased customer loyalty). To test this hypothesis, we use the difference-in-differences models with cash holdings and leverage as dependent variables. Again, the coefficient of interest is δ and shows the financial policy effects of an indictment (and possible fraud revelation), relative to matched peer companies. We also control for firm size, market-to-book, and industry and year fixed effects.

Columns (9)-(12) of Table 10 reveal that indicted firms tend to decrease leverage ratios after the lawsuit announcement. These decreases are economically significant because a decrease of 0.03 in leverage means 14% decrease in the average leverage ratios by all firms. In contrast, the cash holdings of the indicted firms do not significance change in the years after the indictment.

[24] von Meyerinck et al., (2021) find that consumer visits decline after indictments, which can drive down sales, but we do not observe sales reductions for indicted firms.

7.5. Trading on Indictment News

Given that litigation has a statistically and economically significant effect on the returns of indicted firms, the question arises whether an investor can profit from trading on the information that a lawsuit brings to the market. To answer this question, we devise a simple long-short portfolio trading strategy with indicted (short) and control (long) firms. This equally-weighted portfolio is created in the month following the lawsuit filing, and held until the court process is completed (by a voluntary settlement, a dismissal, or on ordered settlement and their final rulings). Our trading strategy is rather conservative, given the lag between indictment and portfolio formation (possibly up to a full month of difference). A specialized investor, e.g., a hedge fund, may earn considerably higher returns than presented here by timing the court procedure better. Importantly, such a strategy is implementable, as stock market liquidity does not dry up around indictments, as discussed in Section 7.1.

Panel A of Table 11 shows the annualized returns and portfolio size for the above trading strategy for different periods. In a typical month, there is about 47 stocks in the portfolio. The portfolio has positive returns through the entire sample period, even in the post-dotcom bubble period with a generally declining stock market (2000-2002), the Great Recession (2008-2009), and the recent financial market growth (2016-2019). The mean annualized return is 16.6% over the entire period. In the most severe financial crisis (2008-2009), this strategy obtains a return of 17.4%.

Panel B of Table 11 shows the risk-adjusted returns of the trading strategy. We 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 type of risk adjustment. Our trading strategy obtains monthly alphas of 0.6% using CAPM and FF3 adjustments, and of 0.5% using FF-Carhart 4-factor and FF5 adjustment, which translates into annualized alphas of 7.4%, 7.1%, 6.4% or 6.2% using CAPM, FF3, FF-Carhart and FF5 risk adjustments, respectively.

[Insert Table 11 about here]

To sum up, securities class action filings are tradable, and our long-short portfolio of indicted and control firms can obtain significantly positive returns, even in severe market crises.

8. The Effects of an Indictment on Competing Firms

Class action lawsuits may have spillover effects on rival firms. As Lang and Stulz (1992) point out, the announcement of negative events (e.g., bankruptcy) reveals that the affected firm has become less efficient and that the competitive position of its rivals has improved. Indicted firms' competitors may benefit from the detection of potential fraud, if they can increase their market share due to the reputational losses caused by the court procedure. We call this positive effect (at least in the eyes of a competitor) as the "competitive effect." At the same time, there may be negative contagion effects among rivals of the affected firm. Such negative contagion effects may extend to competitors if their investments and cash flows are correlated with those of the indicted firm. If consumers or investors consider competitors to be equally susceptible to fraud as the indicted firm, then the sales and external financing opportunities of the former may also decline. We regard this negative effect as the "contagion effect."

We investigate the peer effects by comparing stock returns for competitors and their control firms (which are neither competitors nor indicted) around the indictments. For each securities class action lawsuit, we select competitors of the indicted firm using their product similarities, by means of the Hoberg-Phillips Data Library, prior to the first filing.[25] This product-based definition allows us to go beyond the industry code-based matching and examine directly how cash flows might be affected at the most granular level possible. The control group consists of firms that share the same two-digits SIC code as the indicted firm and are not classified as competitors. Therefore, for each litigation case, we compare different market reactions for competitors vs. their control firms around the lawsuit filing against an indicted firm.

We analyze the cross-section of abnormal returns by regressing the CARs on observable firm characteristics: risk characteristics, governance measures and metrics of M&A activities. The regressions are of the form:

$$CAR[-20,20]_i = \alpha + \beta Competitor_i + \gamma X_i + \delta \cdot Competitor_i * X_i + \varepsilon_i. \quad (4)$$

[Insert Table 12 about here]

[25] Product based industry classifications can be found on Hoberg-Phillips Data Library http://hobergphillips.tuck.dartmouth.edu/.

Panel A of Table 12 documents different market reactions to indictment for competitors and control firms with various risk characteristics. Panel A shows the parameter estimates of the interaction terms. We find that competitors indeed have significantly more negative CARs than their control firms (*contagion effect*). Larger competitors are more resilient to price drops. These firms can improve their competitive positions when rivals are indicted. However, firms that experience profitability shocks or firms with higher needs of external financing will suffer more from the negative contagion effects as their stock prices decline more. The market may consider them as less resilient to bad events (such as rivals' indictments which may increase the market's suspicion that a specific firm may be liable to the same problems). Higher abnormal industry litigation intensity will also make competitors more resilient to price declines. Other factors, such as market-to-book, leverage, past stock returns and cash holdings do not affect the heterogenous market reactions to class action filings. Overall, the results here suggest that competitors mainly experience negative contagion effects from rivals' indictments and competitors are more resilient to price declines if they can improve their competitive positions after rivals' indictments.

Panel B of Table 12 presents the market reactions to indictment for rival firms with different governance measures. We expect smaller price drops when the governance devices function better. However, we observe little impact of the corporate governance devices in competitor companies on their CARs measured over the period 20 trading days prior and after the indictment announcement. The board characteristics do not affect CARs. Turning to outside monitors, analysts and institutional investors, we find little impact. The positive effect on CARs of the presence of investment companies could imply that they, mainly hedge funds, are able to reallocate funds away from worse rivals of indicted firms or that their presence can improve rival firms' resilience to negative events. We conclude that both the internal and external corporate governance mechanisms seem to have limited impact on CARs of firms that are competitors of indicted firms.

In Panel C of Table 12, we focus our attention on the M&A activity of competitors and study the different market reactions for competitors with different M&A activity prior to a litigation filing. We investigate whether competitors' M&A activities over a time span starting at the class period of an indicted rival firm and the litigation filing date affect these competitors' CARs measured around the event date of the rival's indictment. Looking at the number and value of completed deals, we find that M&A activity has a significant effect on competitors' stock returns around class

action filings. Expanding before rivals' litigation announcements improves competitors' competitive positions after their rivals' indictments.

To sum up, we find evidence of both contagion effects and competitive effects when firms are indicted. Competitors mainly experience contagion effects, but they are more resilient to these negative effects when they can improve their competitive positions after rivals' indictments.

9. Conclusion

We perform a comprehensive analysis of class action lawsuits in the US spanning the period between 1996 and 2019. Our study sheds light on the role of litigation as an alternative corporate governance device, on the market's reaction to filings, and on the resulting changes in firms' as well as their competitors' operations. We have identified several important findings.

Firstly, we find that (alleged) fraud is widespread. Our investigation into the factors behind the engagement in and the detection of fraud reveals that firms with a higher need of external financing and poorer performance are more likely to be fraudulent. Interestingly, class action litigation acts as a substitute for other corporate governance mechanisms. Firms with a higher degree of analyst coverage and greater institutional holdings are less likely to be indicted, suggesting that these mechanisms provide some level of deterrence.

Secondly, our analysis of market reactions to lawsuit filings demonstrates that firms taken to court experience significant negative abnormal returns. Poor stock market performance starts within the month prior to the first court date when the class is built, and cannot be attributed to other broader market movements, as similar firms experience no such peril in the same period. Negative returns persist throughout the entire court process and do not recover even if the final ruling is in favor of the indicted firm. The negative returns at the announcement of the indictment are more pronounced for firms that end up paying (ex post) a settlement, suggesting that the market is efficient in predicting the eventual case outcome to some degree. However, the lack of price recovery suggests a lasting tarnishing effect on indicted firms' reputation.

Additionally, we find that the large declines in stock prices are warranted, given the ensuing decline in fraudulent firms' operational performance. Examining the three years following the lawsuit filing, we find that profitability declines, expenses increase, and affected firms depend

more on external financing. This indeed indicates that the effects of class action indictments extend beyond stock price movements.

Moreover, we observe an abnormally high level of trading activity surrounding the first court date. On the one hand, this indicates a heightened price discovery process, on the other hand it indicates that liquidity does not dry up as a result of securities litigation. We devise a conservative trading strategy based on a long portfolio of non-indicted firms and a short portfolio of indicted ones and find that one can trade around class action filings profitably.

Lastly, our research highlights the broader real economy implications of class action lawsuits. Analyzing the performance of indicted companies' peers, we find indications of both competitive and contagion effects. We find that, on the balance, repercussions dominate. However, peers with relatively stronger ex ante competitive positions might end up benefiting if their competitors face securities litigation.

Overall, our study contributes insights into the role of securities class action as an alternative corporate governance device and its implications for the stock market, firms' operating performance, and the wider industry. Our findings are relevant for investors, regulators, as well as corporate decision makers to understand the consequences of class action litigation on firms, and the market.

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Figure 1. Class Action Timeline

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

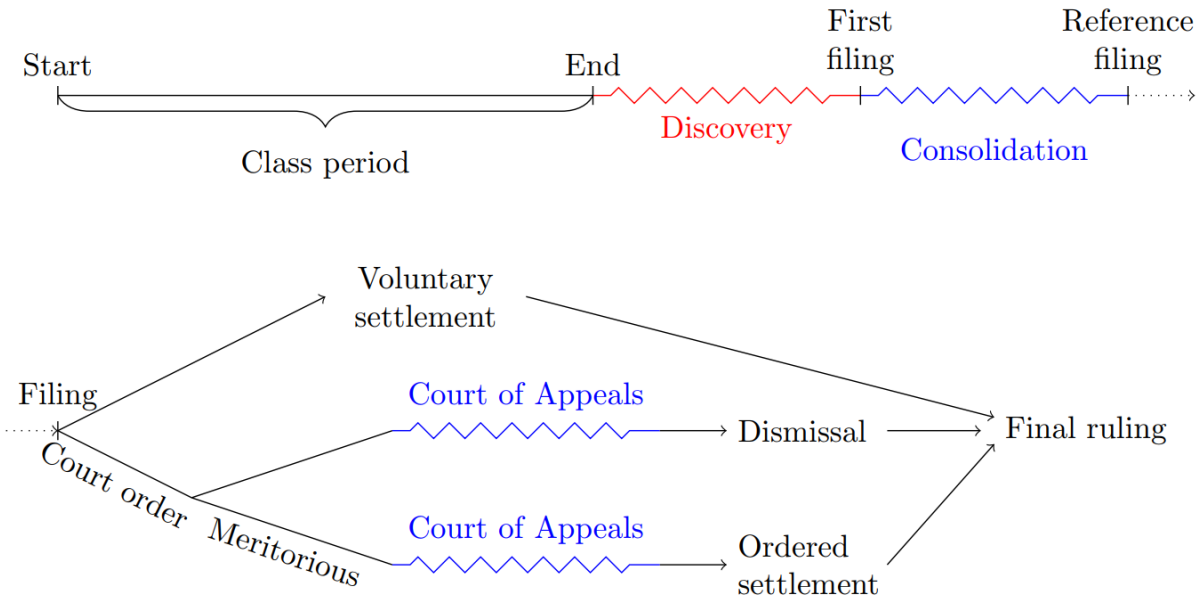


Figure 2. Class Action Occurrence and Dismissal of New Filings

The figure shows the number of new class action lawsuits and dismissed cases over time in our sample. The frequencies of the new filing are based on first identified complaint filing. Dismissed cases are defined as the class action lawsuits which are dismissed by court (prior to the time when we collected the data from SCAC).

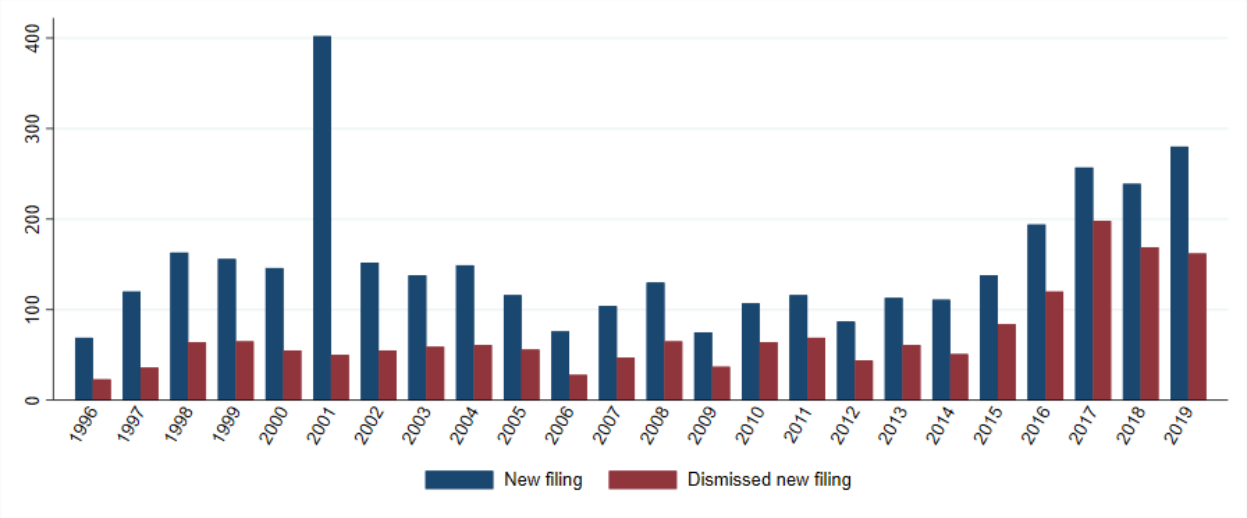
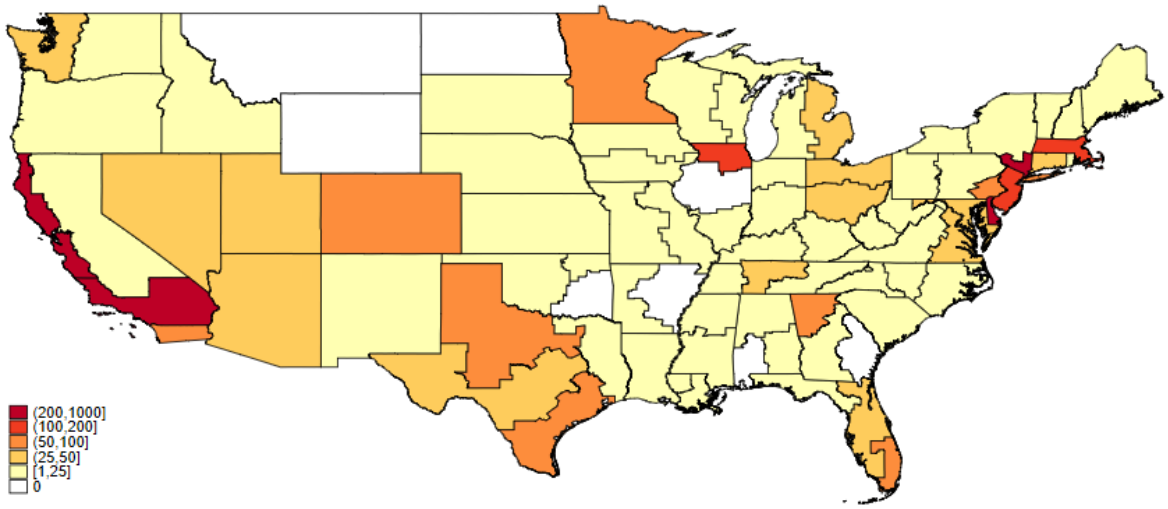


Figure 3. Spatial Distribution of Securities Class Action Filings

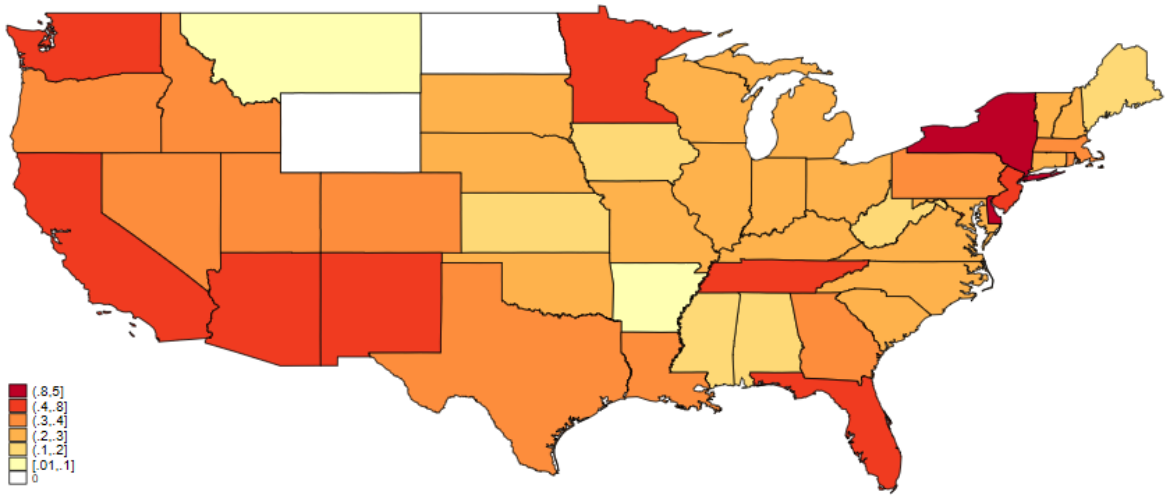
The figure shows the geographical dispersion of securities class action filings across the contiguous US area and federal court districts. Panel A presents the total number of filings across federal court districts. Panel B shows the intensity of filings across US states. Class action filing frequencies are based on first identified complaint filings. The filing intensity is the ratio of the total number of class action filings and the total number of firms headquartered in each state. The sample period is 1996 to 2019.

Panel A: Total Number of Filings



Other territories: AK: 0; HI: 2; PR: 2; VI: 1.

Panel B: Intensity of Filing



Other territories: AK: 0; HI: 0.09; PR: 0.18; VI: 0.83.

Figure 4. Abnormal Returns and Cumulative Abnormal Returns around Securities Class Action Filings

The figure shows the average [-20,20]-trading-day abnormal returns (top row of figures) and cumulative abnormal returns (bottom row) around securities class action filings for all cases, voluntarily settled cases, cases settled by court order, and dismissed cases, respectively. Settled cases are either settled through an agreement between the parties, e.g., the voluntary settlement, or through a final judgment and order by the court, e.g., the ordered settlement. Dismissed cases are dismissed by the court as non-meritorious. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model with a beta estimation window of [-250, -31] trading days relative to the filing date. The sample period is 1996 to 2019.

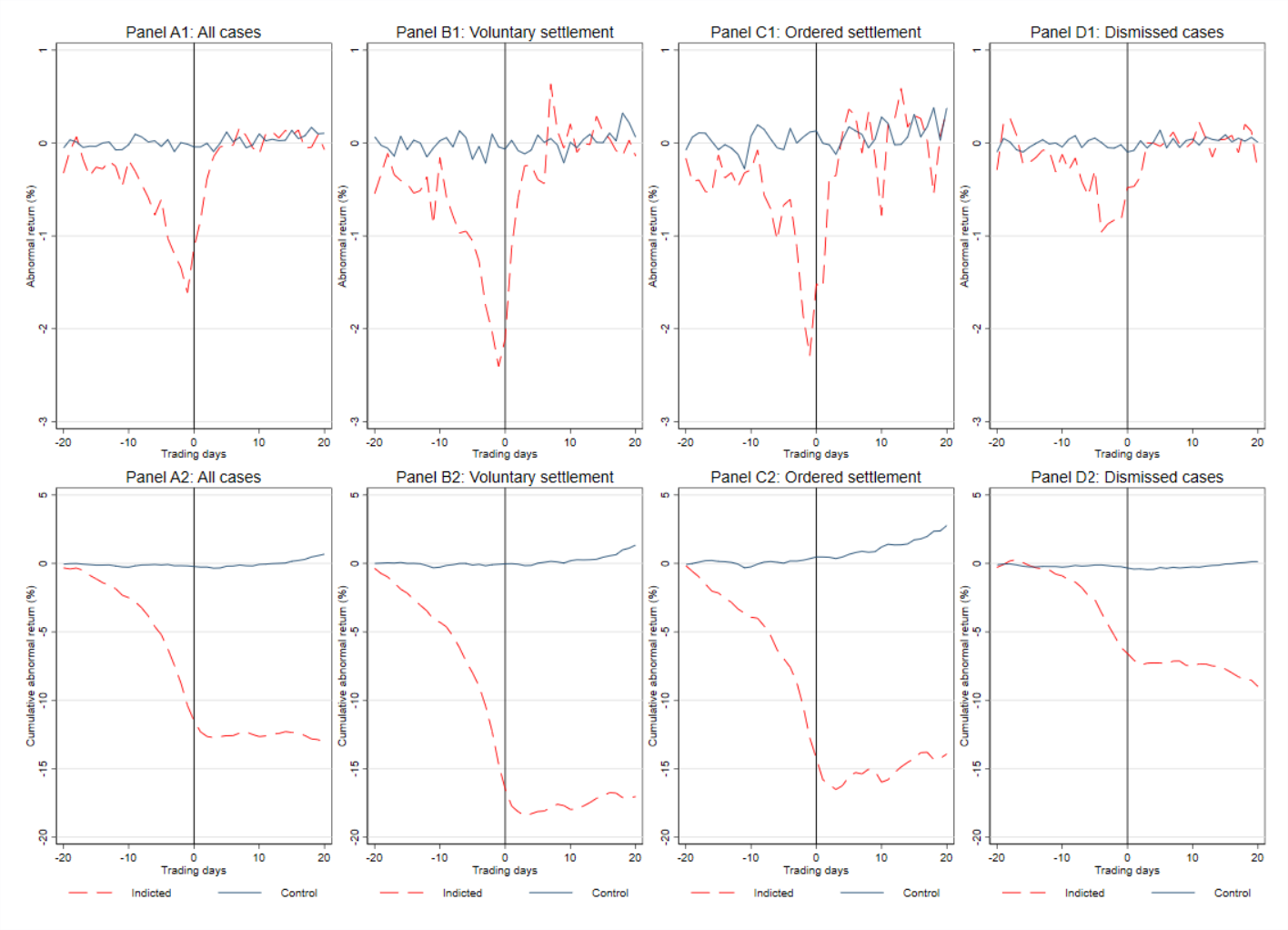


Table 1. Summary Statistics for Matching Variables and Litigation Characteristics

This table reports summary statistics for matching variables and litigation characteristics. For each observation (case), the variable is lagged by one year before the first filings. For all engaged companies, we select three matching pairs (with replacement) by means of Mahalanobis distance metric matching. The distance is determined by industry, size (log of total assets), past returns (one year buy-and-hold return) and market-to-book ratio. The t-tests compare the means between the indicted and the control group. We report p-values for the t-test. Class period length is the number of days between the start and end of the class period. Time to filing (days) spans the number of days between the end of the class period and the first filing date. Law firms (Nr) is the number of law firms hired by plaintiffs. Voluntary settlement is an indictor which is one if the defendant and plaintiffs enter a stipulation of agreement. Settled is an indictor which equals one if the case is eventually settled, either voluntary or ordered. Settlement amount is the dollar amount (in millions) of settlement. Industry litigation intensity is the number of class action cases by industry per year. The sample period is 1996 to 2019.

	Indicted						Control		Δ
Variable	Obs.	Mean	St. dev.	25%	Median	75%	Obs.	Mean	t-test
Matching variables:									
Log(total assets)	3,638	6.65	2.30	4.99	6.36	8.00	10,331	6.35	[0.000]
Buy-and-hold return	3,638	0.19	3.40	-0.45	-0.07	0.31	10,331	0.10	[0.106]
Market-to-book	3,638	3.67	19.28	1.25	2.34	4.47	10,331	2.81	[0.001]
Fraud characteristics:									
Class period length (days)	3,637	433.82	426.97	118.00	311.00	592.00			
Time to filing (days)	3,637	72.19	185.42	0.00	11.00	101.00			
Plaintiff law firms (Nr)	2,739	3.94	3.39	2.00	3.00	5.00			
Voluntary settlement	3,638	0.24	0.43	0.00	0.00	0.00			
Settled (voluntary and court order)	3,638	0.47	0.50	0.00	0.00	1.00			
Settlement amount ($ million)	1,693	33.81	216.74	1.40	4.70	14.47			
Industry litigation intensity	3,638	55.73	66.51	19.00	38.00	64.00			

Table 2. Univariate Comparison: Indicted vs. Control Groups

This table reports the univariate comparisons between the indicted and control groups. For each case, we show the variable lagged by one year before the first filing. For all indicted companies, we select three matching pairs (with replacement) by means of Mahalanobis distance metric matching. The distance is determined by industry, size (log of total assets), past returns (one year buy-and-hold return) and market-to-book ratio. The t-tests compare the means between the indicted and the control groups. We report p-values for the t-test. All variable definitions are in Appendix A. The sample period is 1996 to 2019.

	Indicted						Control		Δ
Variable	Obs.	Mean	St. dev.	25%	Median	75%	Obs.	Mean	t-test
Compensation:									
Salary ($ million)	1,483	0.81	0.46	0.50	0.75	1.00	3,971	0.71	[0.000]
Total equity incentives ($ m.)	3,638	1.24	4.08	0.00	0.00	0.00	10,331	0.72	[0.000]
Board structure:									
Independent Chairman	2,104	0.43	0.50	0.00	0.00	1.00	6,044	0.45	[0.260]
CEO duality	2,104	0.48	0.50	0.00	0.00	1.00	6,044	0.46	[0.041]
Directors	2,104	8.75	2.71	7.00	8.00	10.00	6,044	8.64	[0.103]
Independent directors	2,104	7.28	2.61	5.00	7.00	9.00	6,044	7.17	[0.085]
Previous board seats	2,104	1.86	2.46	0.00	1.08	2.71	6,044	1.70	[0.006]
Other board seats	2,104	0.38	0.79	0.00	0.00	0.47	6,044	0.32	[0.001]
Time on board	2,104	6.28	3.98	3.21	5.91	8.73	6,044	7.41	[0.000]
CEO tenure (years)	2,071	4.09	4.43	1.20	2.80	5.30	5,887	4.87	[0.000]
CEO retirement	2,104	9.93	5.10	6.60	9.45	13.00	6,044	8.81	[0.000]
Network size	2,104	1612	994	919	1441	2042	6,044	1335	[0.000]
Male ratio	2,104	0.88	0.11	0.82	0.89	1.00	6,044	0.89	[0.110]
Nationality mix	2,027	0.11	0.18	0.00	0.00	0.20	5,713	0.09	[0.004]
Outside monitors:									
Analysts (Nr)	2,147	8.24	6.46	3.40	6.42	11.75	5,622	6.58	[0.000]
All institutional holding (dom. eq.)	2,627	0.55	0.29	0.31	0.60	0.80	7,610	0.52	[0.000]
Bank holding (dom. eq.)	2,828	0.07	0.05	0.02	0.06	0.10	7,976	0.06	[0.000]
Insurance holding (dom. eq.)	2,828	0.02	0.03	0.00	0.01	0.03	7,976	0.02	[0.178]
Investment advisory holding (id)	2,827	0.19	0.15	0.07	0.17	0.29	7,973	0.17	[0.000]
Pension holding (dom. eq.)	2,828	0.02	0.02	0.00	0.01	0.03	7,976	0.02	[0.546]
Other holding (dom. eq.)	2,828	0.02	0.04	0.00	0.00	0.02	7,976	0.01	[0.000]
Mutual fund holding (active mgt)	2,756	0.07	0.09	0.01	0.02	0.10	7,510	0.07	[0.510]
Size and capital structure:									
Log of sales	3,546	5.94	2.48	4.41	5.86	7.53	10,084	5.68	[0.000]
Log of market equity	3,633	6.70	2.05	5.31	6.55	7.94	10,297	6.15	[0.000]
Book leverage	3,638	0.29	0.76	0.00	0.15	0.46	10,331	0.28	[0.787]
Tangibility	3,570	0.18	0.21	0.04	0.10	0.23	10,110	0.21	[0.000]
Risk and profitability:									
Volatility	3,614	0.61	0.44	0.33	0.50	0.77	10,264	0.55	[0.000]
Amihud's ILLIQ	3,638	0.19	3.40	-0.45	-0.07	0.31	10,331	0.10	[0.106]
ROA	3,636	0.48	5.83	0.00	0.00	0.03	10,320	2.01	[0.000]
ROE	3,635	-0.14	1.74	-0.15	0.01	0.06	10,319	-0.08	[0.004]
Asset turnover	3,635	-0.08	2.31	-0.24	0.04	0.14	10,319	-0.13	[0.303]
Sales growth (annual)	3,635	0.79	0.83	0.23	0.62	1.06	10,319	0.82	[0.028]
Market share	3,165	0.65	9.20	0.00	0.05	0.30	9,549	0.19	[0.001]
Profit margin	3,633	0.00	0.01	0.00	0.00	0.00	10,315	0.00	[0.000]
Tobin's Q	3,635	-0.14	1.74	-0.15	0.01	0.06	10,319	-0.08	[0.004]
Cash, investment, and payout:									
Cash	3,601	0.18	0.20	0.03	0.11	0.25	10,150	0.16	[0.000]
CapEx	3,582	0.05	0.07	0.01	0.03	0.06	10,085	0.05	[0.124]
OpEx	3,635	0.80	0.81	0.31	0.61	1.03	10,319	0.81	[0.330]
Dividend yield	3,621	0.02	0.07	0.00	0.00	0.01	10,299	0.02	[0.208]
Dividend payout	3,624	0.36	10.26	0.00	0.00	0.00	10,293	0.47	[0.722]
KZ-index	3,182	0.08	8.85	-0.39	0.16	1.02	9,217	0.09	[0.965]
HP-index	3,638	12.39	12.26	4.45	9.36	17.19	10,331	10.09	[0.000]

To be continued

Continued

	Indicted						Control		Δ
Variable	Obs.	Mean	St. dev.	25%	Median	75%	Obs.	Mean	t-test
Acquisitions:									
Acquisitions	3,638	0.48	1.34	0.00	0.00	0.00	10,331	0.30	[0.000]
Acquisition value	3,638	454.39	4203.33	0.00	0.00	0.00	10,331	86.72	[0.000]
Acquisitions/assets	3,638	0.10	0.82	0.00	0.00	0.00	10,331	0.04	[0.000]
Diversifying acquisitions	3,638	0.21	0.93	0.00	0.00	0.00	10,331	0.12	[0.000]
Diversifying acquisition value	3,638	130.36	1624.94	0.00	0.00	0.00	10,331	27.82	[0.000]
Diversifying acq./assets	3,638	0.04	0.28	0.00	0.00	0.00	10,331	0.01	[0.000]
Focused acquisitions	3,638	0.27	0.79	0.00	0.00	0.00	10,331	0.18	[0.000]
Focused acquisition value	3,638	324.03	3584.88	0.00	0.00	0.00	10,331	58.89	[0.000]
Focused acq./assets	3,638	0.07	0.73	0.00	0.00	0.00	10,331	0.03	[0.000]

Table 3. Engagement in Fraud, Indictment, and Settlement

This table shows the results of probit and logit regressions of engagement in fraud, indictment, and settlement outcomes. Columns (1) to (5) present probit or ordered probit regression results, while columns (6) to (10) shows similar results using logit or mlogit regressions. Columns (1) and (6) report the factors *before* the class start which predict whether a firm is engaged in fraud. Columns (2) and (7) investigate the factors which predict whether a firm is indicted. The difference between Columns (1) and (6) and Columns (2) and (7) is that for former pair possible predictors are sought from the period prior to the class period, whereas for the latter pair the most recent data prior to the indictment are taken (and are hence mostly in the class period). Columns (3) and (8) study the factors that predict whether the class action case is settled (voluntarily or by court order). Columns (4)-(5) and (9)-(10) provide the regression results for the ordered probit or mlogit regressions that present the factors predicting the type of litigation outcomes. The table reports regression coefficients and their corresponding average marginal effects in brackets. Standard errors are robust to heteroskedasticity and clustered at the firm level. All variable definitions can be found in the Appendix A. The sample period is 1996-2019. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Probit	Probit	Probit	Ordered Probit		Logit	Logit	Logit	Mlogit	
	Engaged in Fraud vs. Non-engaged	Indicted vs. Non-indicted	Settled vs. dismissed	Voluntary Settlement vs. dismissed	Ordered Settle. vs. dismissed	Engaged in Fraud vs. Non-engaged	Indicted vs. Non-indicted	Settled vs. dismissed	Voluntary Settle. vs. dismissed	Ordered Settle. vs. dismissed
Ex ante factors:										
Size	-0.101***	-0.061***	-0.075**	-0.088***		-0.173***	-0.122***	-0.129**	-0.075	
	[-0.030]	[-0.008]	[-0.023]	[-0.006]	[-0.019]	[-0.031]	[-0.008]	[-0.024]	[-0.002]	[-0.022]
CapEx	0.059	0.713***	-0.774**	-0.714**		0.098	1.281***	-1.214**	-1.019	
	[0.018]	[0.098]	[-0.236]	[-0.047]	[-0.155]	[0.017]	[0.088]	[-0.223]	[-0.103]	[-0.114]
Acquisition value	0.03	0.025***	0.04	0.04		0.045	0.042**	0.068	0.053	
	[0.009]	[0.003]	[0.012]	[0.003]	[0.009]	[0.008]	[0.003]	[0.012]	[0.005]	[0.007]
Institutional holding	0.347***	-0.285***	0.024	0.051		0.612***	-0.572***	0.041	-0.012	
	[0.105]	[-0.039]	[0.007]	[0.003]	[0.011]	[0.109]	[-0.039]	[0.007]	[-0.009]	[0.018]
Analysts	0.026***	-0.007***	-0.009	-0.009		0.044***	-0.015***	-0.015	-0.015	
	[0.008]	[-0.001]	[-0.003]	[-0.001]	[-0.002]	[0.008]	[-0.001]	[-0.003]	[-0.001]	[-0.004]
Ex post factors:										
ROA	-0.153*	-0.006	-0.012	-0.002		-0.26	-0.011	-0.019	-0.026	
	[-0.046]	[-0.001]	[-0.004]	[-0.000]	[-0.000]	[-0.046]	[-0.001]	[-0.004]	[-0.004]	[0.001]
Profitability shock	-0.148***	-0.098***	-0.143***	-0.131***		-0.258***	-0.215***	-0.231***	-0.195**	
	[-0.045]	[-0.013]	[-0.044]	[-0.009]	[-0.029]	[-0.046]	[-0.015]	[-0.042]	[-0.019]	[-0.023]
Return shock	0.001	-0.006	-0.012	-0.017		0.002	-0.016	-0.018	-0.009	
	[0.000]	[-0.001]	[-0.004]	[-0.001]	[-0.004]	[0.000]	[-0.001]	[-0.003]	[0.001]	[-0.005]
Buy-and-hold return	-0.032	0.251***	0.140***	0.143***		-0.055	0.497***	0.224***	0.172*	
	[-0.010]	[0.035]	[0.043]	[0.009]	[0.031]	[-0.010]	[0.034]	[0.041]	[0.016]	[0.024]
Volatility	0.292***	0.199***	0.069	0.086		0.494***	0.354***	0.105	0.047	
	[0.088]	[0.027]	[0.021]	[0.006]	[0.019]	[0.088]	[0.024]	[0.019]	[0.001]	[0.015]
Ab_litigation intensity	-0.110*	-0.012	0.089	0.152**		-0.19	0.059***	0.156	-0.154	
	[-0.033]	[-0.002]	[0.027]	[0.010]	[0.033]	[-0.034]	[0.004]	[0.029]	[-0.033]	[0.028]
Committing fraud factors:										
HP-index	0.023***	0.014***	0.011*	0.011**		0.039***	0.028***	0.018*	0.015	
	[0.007]	[0.002]	[0.003]	[0.001]	[0.002]	[0.007]	[0.002]	[0.003]	[0.001]	[0.002]
Book leverage	-0.001	-0.008*	0.061	0.055		-0.002	-0.014*	0.097	0.091	
	[-0.000]	[-0.001]	[0.019]	[0.004]	[0.012]	[-0.000]	[-0.001]	[0.018]	[0.010]	[0.009]
Sample	Both	Both	Indicted	Indicted	Indicted	Both	Both	Indicted	Indicted	Indicted
Obs.	8,068	46,618	3,610	3,610	3,610	8,068	46,618	3,610	3,610	3,610
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE		Y					Y			

Table 4. Cumulative Abnormal Returns around Key Lawsuit Filings

This table shows the cumulative average abnormal returns (CAARs) for various event windows related to specific securities class action filing dates. Panels A, B and C show the CARs around the first filing date, around the settlement date, and around the final ruling date, respectively. Settled cases are either settled voluntarily through an agreement between the parties or through a court order. Dismissed cases are dismissed by the court as non-meritorious. For all indicted companies, we select three matching pairs (with replacement) as control group by means of Mahalanobis distance metric matching. The distance is determined by industry, size (log of total assets), past returns (one year buy-and-hold return) and market-to-book ratio. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model with an estimation window if [-250, -31] trading days relative to the filing date (day 0). *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Full sample All indictments		Control group		Voluntary settlements		Ordered settlements		Dismissed cases		Differences			
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	t-test			
	Panel A: CARs around Case Filing (First Filing)													
	(1)		(2)		(3)		(4)		(5)		1 vs. 2	3 vs. 5	4 vs. 5	3 vs. 4
CAR[-1,1]	-0.036***	(0.148)	-0.001	(0.078)	-0.056***	(0.175)	-0.053***	(0.174)	-0.018***	(0.113)	17.462***	6.665***	6.020***	0.349
CAR[-1,3]	-0.041***	(0.166)	-0.002	(0.097)	-0.065***	(0.197)	-0.061***	(0.198)	-0.021***	(0.127)	16.831***	6.616***	5.845***	0.419
CAR[-5,5]	-0.083***	(0.252)	-0.001	(0.150)	-0.132***	(0.272)	-0.098***	(0.304)	-0.051***	(0.197)	22.693***	8.501***	4.528***	2.382**
CAR[-10,10]	-0.105***	(0.315)	0.000	(0.207)	-0.162***	(0.325)	-0.128***	(0.382)	-0.066***	(0.251)	22.344***	8.140***	4.758***	1.913*
CAR[-20,20]	-0.123***	(0.415)	0.006*	(0.286)	-0.206***	(0.407)	-0.146***	(0.490)	-0.072***	(0.354)	20.071***	8.512***	4.256***	2.655***
Obs.	3,479		9,765		828		760		1,675					
	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	(0.070)	0.001	(0.067)	-0.003	(0.084)	0.003	(0.069)	0.002	(0.063)	0.028	1.329	-0.330	1.202
CAR[-1,3]	0.002	(0.086)	0.002	(0.083)	0.002	(0.091)	0.003	(0.095)	0.002	(0.081)	-0.202	-0.012	-0.156	0.115
CAR[-5,5]	0.003	(0.127)	0.001	(0.124)	0.009	(0.136)	0.001	(0.137)	0.001	(0.119)	-0.881	-1.193	0.012	-0.886
CAR[-10,10]	0.007	(0.198)	-0.003	(0.169)	0.026***	(0.209)	-0.011	(0.210)	0.004	(0.188)	-2.217**	-2.117**	1.393	-2.710***
CAR[-20,20]	0.006	(0.279)	-0.002	(0.247)	0.037***	(0.295)	-0.015	(0.295)	-0.002	(0.266)	-1.154	-2.645***	0.844	-2.668***
Obs.	2,052		6,767		507		408		1,119					
	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]	0.002	(0.063)	0.001	(0.065)	0.001	(0.058)	0.000	(0.074)	0.002	(0.062)	-0.225	0.198	0.480	-0.265
CAR[-1,3]	0.000	(0.084)	0.001	(0.080)	-0.001	(0.084)	-0.001	(0.093)	0.002	(0.081)	0.295	0.672	0.623	-0.010
CAR[-5,5]	0.002	(0.127)	0.000	(0.119)	0.002	(0.141)	0.002	(0.135)	0.001	(0.118)	-0.632	-0.186	-0.128	-0.038
CAR[-10,10]	0.005	(0.190)	-0.004*	(0.161)	0.008	(0.181)	0.003	(0.207)	0.004	(0.188)	-2.121**	-0.398	0.164	-0.450
CAR[-20,20]	0.000	(0.262)	-0.001	(0.245)	0.002	(0.236)	0.000	(0.283)	-0.002	(0.265)	-0.085	-0.288	-0.106	-0.135
Obs.	2,021		6,668		483		401		1,119					

Table 5. Market Value Loss around Lawsuit Filings

This table the shows the market value loss in $millions of indicted firms around the first filings of securities class actions. 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 settlement expenses (=settlement funds plus attorney fees) for settled cases (see row "Settlement expenses"). The table also shows the change in market value over the -20 to 20 trading days around filings relative to the market value of the firm two months prior to the filing date (see row "Loss proportion"). The market value changes in each period are adjusted for the Fama-French-Carhart 4-factor model. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Market Value changes ($)	Full sample		Voluntary settlement		Ordered settlement		Dismissed case		Differences		
	Mean	Sd. dev.	Mean	Sd. dev.	Mean	Sd. dev.	Mean	Sd. dev.	t-test		
	(1)		(2)		(3)		(4)		2 vs. 4	3 vs. 4	2 vs. 3
Loss[-1,1] (in $)	-162.1***	(1982.1)	-305.0***	(1958.6)	-186.9**	(2554.9)	-83.7**	(1336.5)	2.931***	1.050	1.027
Loss[-1,3] (in $)	-159.3***	(1944.3)	-338.0***	(2020.3)	-185.8**	(2478.6)	-59.7**	(1219.6)	3.648***	1.331	1.334
Loss[-5,5] (in $)	-355.0***	(2752.3)	-651.9***	(3173.4)	-283.3***	(2893.6)	-203.1***	(2079.5)	3.697***	0.688	2.421**
Loss[-10,10] (in $)	-433.7***	(3556.5)	-745.0***	(3580.7)	-407.6***	(3863.2)	-281.1***	(2394.0)	3.373***	0.833	1.800*
Loss[-20,20] (in $)	-593.8***	(4244.8)	-932.0***	(4414.0)	-516.1***	(4997.7)	-383.5***	(3159.1)	3.194***	0.673	1.752*
Settlement expenses (in $)			60.5	(330.9)	19.2	(61.0)					-3.529***
Loss proportion	-0.359	(2.578)	-0.464	(0.991)	-0.426	(1.128)	-0.207	(0.662)	6.751***	4.971***	0.717
Obs.	3,479		828		760		1,675				

Table 6. Long-term CARs around Lawsuit Filings

This table shows the CARs for various event windows (for up to three years) around securities class action filings. 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. For all indicted companies, we select three matching pairs (with replacement) as control group by means of Mahalanobis distance metric matching. The distance is determined by industry, size (log of total assets), past returns (one year buy-and-hold return) and market-to-book ratio. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model estimated over [-48, -2] months relative to the filing date. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	Full sample		Control group		Voluntary settlement		Ordered settlement		Dismissed		Differences			
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	t-test			
CARs [months]	(1)		(2)		(3)		(4)		(5)		1 vs. 2	3 vs. 5	4 vs. 5	3 vs. 4
CAR[-1,1]	-0.222***	(0.430)	-0.035***	(0.295)	-0.253***	(0.371)	-0.237***	(0.634)	-0.199***	(0.358)	20.604***	2.614***	1.268	0.462
CAR[-1,6]	-0.278***	(0.686)	-0.050***	(0.507)	-0.304***	(0.652)	-0.288***	(0.931)	-0.263***	(0.589)	15.046***	1.161	0.527	0.296
CAR[-1,12]	-0.329***	(0.953)	-0.069***	(0.709)	-0.366***	(0.913)	-0.316***	(1.244)	-0.319***	(0.840)	12.258***	0.954	-0.060	0.684
CAR[-1,18]	-0.378***	(1.234)	-0.084***	(0.906)	-0.392***	(1.306)	-0.335***	(1.520)	-0.398***	(1.048)	10.812***	-0.089	-0.797	0.579
CAR[-1,36]	-0.531***	(2.011)	-0.115***	(1.364)	-0.518***	(2.447)	-0.454***	(2.218)	-0.582***	(1.588)	9.890***	-0.573	-1.089	0.383
Obs.	1,683		6,079		512		335		799					

Table 7. Cross Section of Different Market Reaction to Indictments

The table shows the cross-sectional differences of securities class action filings' abnormal returns with respect to observable firm characteristics. Panel A investigates the different effects induced by some accounting and stock price properties. Panel B studies the different reactions due to firms' governance characteristics. Panel C looks at the investment activities during the class periods. The dependent variable is CAR[-20,20]. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model with an estimation window of [-250, -31] trading days relative to the filing date. The control sample is determined by Mahalanobis distance metric matching. For all indicted companies, we draw three matching pairs with replacement. The Mahalanobis distance is determined based on industry, size (log of total assets), past returns (one year buy-and-hold return) and market-to-book ratio. Control variables in Panel B and C contains size and market-to-book. Standard errors are robust to heteroskedasticity, and clustered at the firm and the year-month level. All variable definitions can be found in the Appendix A. The sample period is 1996-2019. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A. Risk Characteristics

Dep. Var. CAR[-20, 20]	(1)	(2)	(3)
Indicted	-0.402***	-0.403***	-0.404***
Size	-0.018	-0.019	-0.018
Market-to-book	-0.001	-0.001	-0.001
Book leverage	-0.001	-0.001	-0.001
CapEx	0.039	0.076	0.034
Cash	0.012	0.009	0.011
Dividend payout	-0.000	-0.000	-0.000
Sales growth	-0.001*	-0.001**	-0.001*
Volatility	-0.051	-0.050	-0.055
Return shock	0.067**	0.067**	0.068**
Profitability shock	0.045**	0.045**	0.045**
HP-index	0.002	0.002	0.002
Amihud's ILLIQ	0.000	0.000	0.000
Indicted*Size	0.053**	0.053**	0.053**
Indicted*Market-to-book	0.002	0.002	0.002
Indicted*Book leverage	0.011	0.012	0.010
Indicted*CapEx	-0.316	-0.321	-0.308
Indicted*Cash holding	0.019	0.022	0.018
Indicted*Dividend payout	0.000	0.000	0.000
Indicted*Sales growth	-0.001	-0.001	-0.001
Indicted*Volatility	-0.016	-0.016	-0.005
Indicted*Return shock	0.004	0.004	0.003
Indicted*Profitability shock	-0.006	-0.007	-0.007
Indicted*HP-index	-0.006**	-0.006**	-0.006*
Indicted*Amihud's ILLIQ	0.001**	0.001**	0.001**
Ab_litigation intensity			0.000
Obs.	9179	9179	9179
Adj. R-sq	0.04	0.04	0.04
Year FE	Y	Y	Y
Industry FE	Y	N	Y

Panel B. Governance Characteristics

CAR[-20, 20]	(1)	(2)	(3)
Indicted	-0.216***	-0.137	-0.224***
Salary	-0.046**		
Total equity incentives	-0.000		
Directors		-0.001	
Independent chairman		0.003	
CEO/Chair		0.000	
Male ratio		-0.051	
Nationality mix		-0.009	
Analysts			-0.000
Institutional holding			-0.024
Bank holding			-0.115
Insurance holding			0.106
Investment holding			0.039
Pension holding			0.339
Mutual fund holding			-0.259**
Indicted*Salary	0.072**		
Indicted*Total equity incentives	0.003*		
Indicted*Directors		-0.003	
Indicted*Independent chairman		0.025	
Indicted*CEO/Chair		-0.015	
Indicted*Male ratio		-0.062	
Indicted*Nationality mix		0.034	
Indicted*Analysts			0.003
Indicted*Institutional holding			-0.121
Indicted*Bank holding			0.047
Indicted*Insurance holding			-0.332
Indicted*Investment company holding			0.366***
Indicted*Pension holding			-0.210
Indicted*Mutual fund holding			-0.202
Obs.	5036	6963	8772
Adjusted R-squared	0.02	0.02	0.04
Controls	Y	Y	Y
Year FE	Y	Y	Y
Industry FE	Y	Y	Y

Panel C. Investment Characteristics

CAR[-20, 20]	(1)	(2)	(3)	(4)	(5)	(6)
Indicted	-0.399***	-0.400***	-0.401***	-0.403***	-0.400***	-0.399***
Acquisitions	-0.002					
Acquisition value		-0.007				
Focused acquisitions			-0.005			
Focused acquisition value				0.039		
Diversifying acquisitions					0.001	
Diversifying acquisition value						-0.047
Indicted*Acquisitions	-0.003					
Indicted*Acquisition value		-0.014				
Indicted*Focused acquisitions			0.001			
Indicted*Focused acquisition value				-0.010		
Indicted*Diversifying acquisitions					-0.009	
Indicted*Diversifying acquisition. value						-0.026
Obs.	9179	9179	9179	9179	9179	9179
Adj. R-sq	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 8. Stock Turnovers around Lawsuit Filings

The table shows the stock turnover ratios around the litigation filing dates. Columns (1) to (3) investigate different turnover ratios around filing dates vs. other dates, for indicted or/and non-indicted firms. The *Event* is defined as one if the date locates between 20 trading days before and after the filing date. Columns (4) to (6) compares abnormal turnover ratios between indicted and non-indicted firms. Abnormal turnovers are estimated by subtracting the average stock turnovers over a window of [-6, -2] months relative to the filing date. Ab_Turn[-1,3], Ab_Turn[-3,3], and Ab_Turn[-3,20] are average abnormal stock turnovers in the windows [-1,3], [-3,3] and [-3, 20] trading days around the filing date. The control group is determined by Mahalanobis distance metric matching. For all indicted companies, we draw three matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return and market-to-book ratio. The sample period is 1996-2019. Standard errors are heteroskedasticity robust, clustered at the firm and year level, and reported in brackets. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Turnover Ratio			Ab_Turn[-1,3]	Ab_Turn[-3,3]	Ab_Turn[-3,20]
Event	0.011***	-0.002	-0.002			
	(0.001)	(0.003)	(0.003)			
Indicted				0.024***	0.024***	0.012***
				(0.007)	(0.006)	(0.004)
Indicted*Event			0.012***			
			(0.002)			
Sample	Indicted	Non-indicted	Both	Both	Both	Both
Year FE	Y	Y	Y	Y	Y	Y
Industry FE				Y	Y	Y
Firm FE	Y	Y	Y			
N	12,523,081	38,706,652	51,229,733	13,672	13,674	13,674
adj. R-sq	0.04	0.00	0.00	0.00	0.00	0.00

Table 9. Difference-in-Difference Estimation for Institutional Holdings

The table shows difference-in-difference estimation for institutional investors' equity holdings. Institutions in the sample include banks, insurance companies, investment companies, pension funds, mutual funds, and other institutions. The control sample is determined by Mahalanobis distance metric matching. For all indicted companies, we draw three matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past returns and market-to-book. $Post_t$ equals one for the quarters of the lawsuit filing or for quarters after the filing and is zero otherwise. The dependent variables are the percentage equity stake held by institutions. The estimation period spans [-4, 4] quarters relative to the filing date. Control variables include size and market-to-book. The sample includes both indicted firms and non-indicted firms. The sample period is 1996 to 2019. Standard errors are robust to heteroskedasticity, clustered at the firm and at the year-quarter level, and are shown in the bracket. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	All Institutions		Banks		Insurance Company		Investment Company		Pension Fund		Mutual Fund		Other Institutions	
Indicted	0.011		0.002		0.001		0.012***		0.000		0.004**		0.003***	
	(0.008)		(0.001)		(0.001)		(0.003)		(0.000)		(0.002)		(0.001)	
Post	-0.002	-0.003	-0.001	-0.001***	-0.000	-0.000**	-0.001	0.001	0.000	0.000	-0.003***	-0.003***	-0.000	0.000*
	(0.004)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Indicted*Post	-0.024***	-0.020***	-0.002***	-0.003***	-0.002***	-0.002***	-0.006***	-0.001	0.000	0.000	-0.003***	-0.005***	0.001*	0.000
	(0.004)	(0.004)	(0.001)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Year-Quarter FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y		Y		Y		Y		Y		Y		Y	
Firm FE		Y		Y		Y		Y		Y		Y		Y
Obs.	125880	133537	125880	133537	125880	133537	125880	133537	125880	133537	125880	133537	97191	103828
Adj. R-squared	0.11	0.72	0.11	0.79	0.04	0.67	0.25	0.78	0.05	0.73	0.25	0.72	0.13	0.66

Table 10. Difference-in-Difference Estimation for Firm Operations and Financial Policies

The table shows difference-in-difference estimation for firm operations and financial policies. The control sample is determined by Mahalanobis distance metric matching. For all indicted companies, we draw three matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past returns and market-to-book. $Post_t$ equals one for the quarters of the lawsuit filing or for quarters after the filing and is zero otherwise. Columns (1) to (8) shows' firm operations. Columns (9) to (12) show firms' financial policies. The estimation period spans [-3;3] years relative to the filing date. Control variables include size and market-to-book. Variable definitions can be found in the Appendix A. The sample includes the indicted firms and matching firms. The sample period is 1996-2019. Standard errors are robust to heteroskedasticity, and clustered at the firm and year level. The standard errors are shown in brackets. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Operations								Financial Policies			
	ROA		Tobin's Q		Operational Expenses		Log(Sales)		Cash Holdings		Leverage	
Indicted	-0.019**		0.700***		-0.020		0.271***		0.019***		0.011	
	(0.008)		(0.135)		(0.017)		(0.069)		(0.006)		(0.008)	
Post	-0.034**	-0.042**	-0.399**	-0.428**	0.019*	0.023*	0.207***	0.183***	-0.007***	-0.009***	0.019***	-0.039***
	(0.014)	(0.017)	(0.159)	(0.156)	(0.010)	(0.011)	(0.022)	(0.017)	(0.002)	(0.002)	(0.005)	(0.009)
Indicted*Post	-0.023***	-0.027***	-0.533***	-0.716***	0.038***	0.042***	0.148***	0.021	0.003	-0.002	0.009	-0.030**
	(0.005)	(0.006)	(0.105)	(0.136)	(0.013)	(0.010)	(0.042)	(0.021)	(0.003)	(0.003)	(0.006)	(0.012)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y		Y		Y		Y		Y		Y	
Firm FE		Y		Y		Y		Y		Y		Y
Obs.	89318	89146	88857	88676	89317	89144	87513	87317	87962	87770	89435	118264
Adj. R-squared	0.15	0.58	0.12	0.47	0.38	0.84	0.27	0.95	0.26	0.70	0.19	0.52

Table 11. Portfolio Analysis

The table shows portfolio characteristics of an investment in indicted and non-indicted firms. The portfolio is an equal weighted investment comprising short positions in indicted companies and long positions in control firms. Stocks enter the portfolio one month after a firm is indicted and are held until the closure of the court procedure. Panel A reports descriptive portfolio characteristics. Portfolio size is the number of stocks in the portfolio each month. Panel B shows risk-adjusted returns. The control sample is determined by Mahalanobis distance metric matching. For all indicted companies, we draw three matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past return, and market-to-book ratio. The sample period is 1996-2019. Standard errors are heteroskedasticity robust and reported in brackets. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Portfolio statistics

	Full	1996-2005	2006-2016	Dotcom	Housing	2016-2019
Annualized return	0.166	0.196	0.145	0.188	0.174	0.152
	(0.525)	(0.562)	(0.498)	(0.549)	(0.902)	(0.275)
Portfolio size (Nr)	47.084	51.176	44.185	73.111	32.250	72.708
	(32.731)	(41.963)	(23.876)	(66.717)	(15.859)	(20.129)
Obs.	287	119	168	36	24	48

Panel B: Risk-adjusted returns

	(1)	(2)	(3)	(4)
	CAPM	FF 3	FF-Carhart 4	FF 5
MKT-RF	-6.203	-4.736	-1.236	-1.100
	(5.378)	(5.651)	(6.016)	(6.399)
SMB		-1.896	-2.889	0.708
		(8.189)	(7.655)	(8.567)
HML		11.625	15.416	3.920
		(9.351)	(9.902)	(12.011)
RMW			0.087*	
			(0.048)	
CMA				9.859
				(11.040)
Momentum				11.089
				(14.622)
Constant	0.006***	0.006**	0.005**	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Obs.	287	287	287	287
Adjusted R-squared	0.00	0.00	0.01	0.00
Annualized alpha	7.38%	7.13%	6.39%	6.16%

Table 12. Peer Effects of Indictments

The table shows the peer effects of securities class action filings and the cross-sectional differences in peer effects. The table presents the abnormal returns for competitors with respect to their observable firm characteristics. Panel A investigates the different effects induced by some accounting and stock price properties. Panel B studies the different reactions due to firms' governance characteristics. Panel C looks at the investment activities during the class periods. Competitors of an indicted firms are identified by product similarity, introduced by (Hoberg and Phillips 2016). The control group of competitors includes firms who share the same SIC2 code with the indicted firms. The dependent variable is CAR[-20,20]. Abnormal returns are estimated using the Fama-French-Carhart 4-factor model with an estimation window of [-250, -31] trading days relative to the filing date. Control variables in Panel B and C contains size and market-to-book. Standard errors are robust to heteroskedasticity, and clustered at the firm and the year level. All variable definitions can be found in the Appendix A. The sample period is 1996-2019. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively

Panel A. Risk Characteristics

Dep. Var. CAR[-20, 20]	(1)	(2)	(3)
Competitor	-0.038*	-0.039*	-0.037*
Size	0.001	0.001	0.001
Market-to-book	0.000***	0.000***	0.000***
Book leverage	0.000	0.000	0.000
CapEx	-0.052	-0.050	-0.050
Cash holding	-0.002	-0.001	-0.002
Dividend payout	0.000**	0.000**	0.000**
Sales growth	-0.000	-0.000	-0.000
Volatility	0.012	0.012	0.013
Return shock	-0.041***	-0.042***	-0.042***
Profitability shock	0.014***	0.014***	0.014***
HP-index	-0.000	-0.000	-0.000
Amihud's illiquidity	0.000***	0.000***	0.000***
Ab_litigation intensity			0.010***
Competitor*Size	0.007*	0.007*	0.007*
Competitor*Market-to-book	-0.000	-0.000	-0.000
Competitor*Book leverage	0.000	0.000	0.000
Competitor*CapEx	-0.030	-0.021	-0.037
Competitor*Cash holding	0.009	0.012	0.008
Competitor*Dividend payout	-0.000	-0.000	-0.000
Competitor*sales growth	0.000	0.000	0.000
Competitor*Volatility	0.006	0.006	0.001
Competitor*Return shock	0.002	0.002	0.000
Competitor*Profitability shock	-0.008*	-0.008*	-0.007*
Competitor*HP-index	-0.001*	-0.001*	-0.001
Competitor*Amihud's ILLIQUID	-0.000***	-0.000***	-0.000***
Competitor*Ab_litigation intensity			0.010***
Year FE	Y	Y	Y
Obs.	1,120,880	1,120,880	1,120,880
adj. R-sq	0.01	0.01	0.01

Panel B. Governance Characteristics

CAR[-20, 20]	(1)	(2)
Competitor	-0.026*	-0.013**
Directors	-0.001	
Independent chair	-0.004	
CEO duality	-0.004	
Male ratio	-0.009	
Nationality mix	-0.003	
Analyst coverage		-0.000
Institutional holding		0.013
Bank holding		-0.030
Insurance holding		-0.053**
Investment company holding		-0.007
Pension holding		0.100
Mutual fund holding		-0.000
Competitor*Directors	0.001	
Competitor*Independent chair	0.001	
Competitor* CEO duality	0.001	
Competitor* Male ratio	0.007	
Competitor* Nationality	-0.001	
Competitor* Analyst coverage		-0.000
Competitor* Institutional holding		-0.009
Competitor* Bank holding		0.069
Competitor* Insurance holding		-0.002
Competitor* Investment company holding		0.048***
Competitor* Pension holding		0.040
Competitor* Mutual fund holding		-0.004
Controls	Y	Y
Year FE	Y	Y
Obs.	548,444	773,005
adj. R-sq	0.01	0.00

Panel C. Investment Characteristics

CAR[-20, 20]	(1)	(2)	(3)	(4)	(5)	(6)
Competitor	-0.039**	-0.038**	-0.038**	-0.038**	-0.039**	-0.038**
Acquisitions	-0.006***					
Acquisition value		-0.005				
Focused acquisitions			-0.007***			
Focused acquisition value				-0.005		
Diversifying acquisitions					-0.006**	
Diversifying acquisition value						-0.006
Competitor *Acquisitions	0.003					
Competitor *Acquisition value		0.005***				
Competitor *Focused acquisitions			0.002			
Competitor *Focused acquisition value				0.006***		
Competitor *Diversifying acquisitions					0.004*	
Competitor *Diversifying acquisition. value						0.005*
Year FE	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y
Obs.	1,120,880	1,120,880	1,120,880	1,120,880	1,120,880	1,120,880
Adj. R-sq	0.01	0.01	0.01	0.01	0.01	0.01

11. Appendices

Appendix A

Table A.1. Variable Definitions

Variable	Description
Fraud characteristics:	
Class period length (days)	Span of time period (days) over which plaintiffs claim to be defrauded as defined in the case filing.
Time to filing (days)	Time between class period end and first case filing date (days).
Law firms (Nr)	Number of law firms at the plaintiff side.
Voluntary settlement	The defendant and plaintiffs enter a stipulation of agreement under supervision of the court. Indicator variable (1 if voluntary settlement, 0 if dismissal or ordered settlement)
Ordered settlement	The defendant and plaintiffs enter a stipulation of agreement under court order. Indicator variable (1 if voluntary settlement, 0 if dismissal or ordered settlement)
Settlement amount ($million)	Settlement amount ($ million).
Industry litigation intensity	Number of litigation cases by industry per year, based on the entire SCAC universe.
Ab_litigation intensity	Abnormal litigation intensity is the number of litigation cases by industry of the year minus the annually average number of cases by industry over years
Compensation:	
Salary ($million)	Base salary ($ million).
Total equity incentives ($million)	Equity and option compensation ($ million).
Board structure:	
Independent Chairman	Chairman has no executive status, indicator variable (1 if independent)
CEO duality	CEO is not also the chairman of the board, indicator variable (1 if duality)
Directors	Number of executive directors (managers/officers) and non-executive directors on the board
Independent director	Non-executive directors on the board who are independent: they do not currently have an advisory agreement with the firm and did not hold an executive position in the firm in the past.
Previous board seats	Number of board positions held in the past (in listed and unlisted companies)
Other board seats	Number of currently held other board positions
Time on board	Tenure in current board position (years)
CEO tenure	Tenure as CEO (years).
CEO retirement	Years to retirement of CEO (years)
Network size	Network size of a director defined as direct connections to other directors.
Male ratio	Ratio of male directors to total directors in a firm
Nationality mix	Proportion of directors with international status on the board (0 means that all directors are US nationals)
Outside monitors:	
Analysts	Number of analysts issuing EPS estimates
Mutual fund holding	Percentage of market value held by actively managed domestic equity mutual funds
Institutional holding	Percentage of market value held by all institutional investors (domestic equity funds)
Institutions by type:	
Advisory firm holding	Percentage of market value of equity held by independent investment advisory firms (domestic equity funds)
Bank holding	Percentage of market value of equity held by banks (domestic equity funds)
Insurance holding	Percentage of market value of equity held by insurance companies (domestic equity funds)
Investment holding	Percentage of market value of equity held by investment companies (domestic equity funds)
Miscellaneous holding	Percentage of market value of equity held by other institutions (domestic equity funds)
Risk and profitability:	
Volatility	Average daily stock return volatility over the year, annualized.
Buy-and-hold return	1-year buy-and-hold return
Amihud's ILLIQ	1-year mean Amihud's illiquidity measure
ROA	Net income/Total assets
ROE	Net income/Book equity
Asset turnover	Sales/Total assets
Sales growth (annual)	$\text{Sales}_t/\text{Sales}_{t-1} - 1$
Market share	Revenues/Total industry revenues
Profit margin	Net income/Total assets
Market-to-book	Market equity/Book equity
Tobin's Q	(Market equity + Long term book debt)/(Book equity + Long term book debt)

To be continued

Size and capital structure:	
Size	natural log of Total assets
Log of sales	natural log of sales
Log of market equity	natural log of market equity
Book leverage	Long term book debt/(Long term book debt + Book equity)
Tangibility	Plant, property and equipment/Total assets
Cash, investment and payment:	
Cash	Cash/Total assets
CapEx	Capital expenditures/Total assets
OpEx	Operating expenses/Total assets
Dividend yield	Total dividends/(Market value of equity + Preferred equity)
Dividend payout	Total dividends/Net income
HP-index	HP index $= -.737\ln(\text{assets}_t) + .043\ln(\text{assets}_t)^2 - .04\text{age}_t$
Acquisitions:	
Acquisitions	Number of acquisitions in the class action period, globally, worth at least $50 million (in $ million)
Acquisition value	Value of all acquisitions
Acquisitions/assets	Value of all acquisitions over total assets
Diversifying acquisitions	Number of acquisitions in other 2-digit SIC industries; diversifying.
Diversifying acquisition value	Value of diversifying acquisitions
Diversifying Acquisition value/assets	Value of diversifying acquisitions over total assets
Focused acquisitions	Number of acquisitions in same 2-digit SIC industries
Focused acquisition value	Value of focused acquisitions
Focused acquisition value/assets	Value of focused acquisitions over total assets
Profitability shock	The residual from an AR(1) regression of ROA: Profitability shock = ROA-(α+β*ROA_{t-1}+β*ROA_{t-2}). A positive residual indicates a positive shock.
Negative 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
Serial offender	Whether the firm in present filing has at least one case filing before the current filing (1 if yes)
Indictments by state (Nr)	Number of indictments by state

Appendix B.

Case Study: "Jason Michael Deinnocentis, et al. v. Dropbox, Inc., et al."

Dropbox Inc., a worldwide platform providing online file hosting service, filed a registration statement on the Form S-1 for IPO at SEC on February 23, 2018. On March 23, 2018, Dropbox added the prospectus for IPO on Form 424B4, which is a part of the registration statement. According to the registration statement, Dropbox offered 41.1 million class A shares at $21 per share for over $869 million in gross offerings.

On October 4, 2019, plaintiffs Jason Michael Deinnocentis, on behalf of all investors who purchased Dropbox A shares, individually filed a complaint against Dropbox Inc (*first filing*). He alleged that Dropbox's registration statement was badly prepared and contained untrue statements or omitted facts that rendered the statement misleading. The complaint also stated that the registration statement was not prepared in accordance with SEC's rule and regulations. The class period stated in his filing was from March 23, 2018 to October 4, 2019.

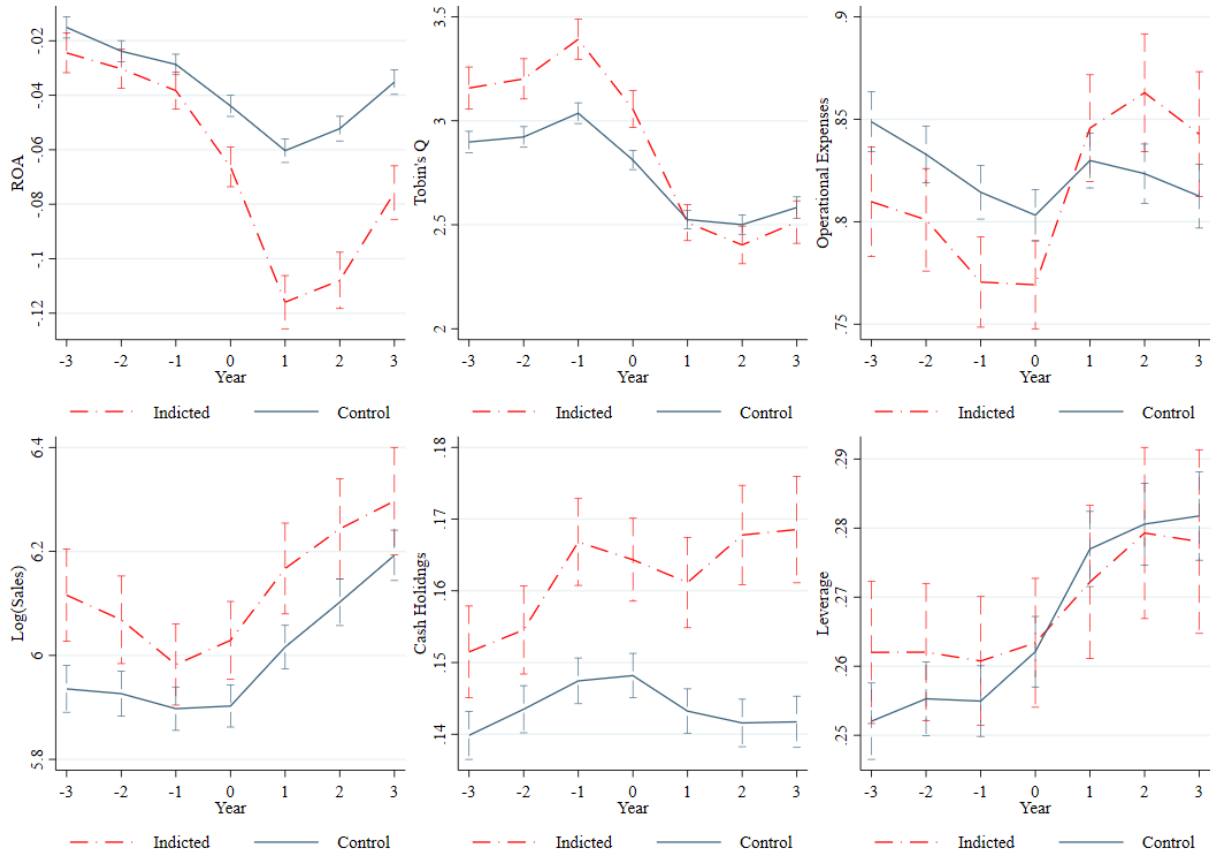
Independently from the original filing, but related to it, four other motions (by, amongst others, investor Ognjen Kuraica) were also filed on December 3, 2019 to complain about Dropbox Inc. The cases were consolidated under one docket and Ognjen Kuraica was appointed lead plaintiff, and Levi & Korsinsky, LLP was approved as lead counsel on January 16, 2020. The lead plaintiff then submitted the consolidated complaint on March 2, 2020 (*reference filing*).

The parties filed a stipulation of settlement on May 14, 2021 (*settlement*), which was preliminary approved by the court on August 3. On December 8, 2021, the court granted final approval of the settlement fund as fair to all class members, granted attorneys' fees and expenses, and entered Final Judgement (*final ruling*), which closed the case.

Appendix C.

Figure C.1. The Trend of Operations and Financial Policies for Indicted and Control Firms around First Filings

The figure shows the trend of firm operations and financial policies for the indicted firms and matched non-indicted firms around securities class action filings. The graph also depicts the 95% confidence intervals. The panel shows firms' operations: ROA, Tobin's Q, Operational Expenses, and Sales, as well as firms' financial: Cahs Holdings and Leverage. Year 0 is the year of the first identified complaint filing.



Appendix D

Table D.1. Filings by Industry and by Year

This table shows the distribution of new securities class action filings by industry and by year. The industry definitions used are taken from the SCAC database.

	Basic Materials	Capital Goods	Conglomerates	Consumer Cyclical	Consumer Non-Cyclical	Energy	Financial	Healthcare	Services	Technology	Transportation	Utilities	Total
1996	0	3	0	1	4	1	6	7	16	29	2	0	69
1997	3	3	0	8	3	1	9	11	31	47	3	1	120
1998	2	2	0	5	4	3	13	30	38	62	3	1	163
1999	2	4	3	15	10	3	12	18	37	51	1	0	156
2000	4	4	2	7	8	2	16	10	26	63	0	4	146
2001	6	4	0	6	6	1	14	22	81	257	2	3	402
2002	3	3	2	4	1	4	25	25	28	42	1	14	152
2003	3	3	1	8	2	2	27	33	24	31	0	4	138
2004	4	10	1	6	2	2	16	30	33	39	4	2	149
2005	4	0	1	6	6	1	14	24	21	39	0	0	116
2006	1	2	0	2	4	0	6	13	15	32	1	0	76
2007	1	3	0	5	3	2	22	18	26	22	1	1	104
2008	3	2	2	3	5	4	54	17	14	22	1	3	130
2009	4	3	2	3	1	1	20	17	15	9	0	0	75
2010	5	5	0	2	2	8	17	31	23	13	1	0	107
2011	9	3	0	5	6	9	13	18	20	27	3	3	116
2012	5	2	0	5	3	7	7	24	16	15	0	3	87
2013	4	3	0	8	1	7	14	27	19	29	0	1	113
2014	5	5	0	3	6	6	18	27	22	17	2	0	111
2015	9	6	0	4	4	9	17	30	19	32	3	5	138
2016	7	8	0	7	15	5	28	57	28	34	1	4	194
2017	9	15	0	12	11	13	45	62	36	44	4	6	257
2018	11	17	0	13	9	8	34	51	45	43	2	6	239
2019	15	14	1	11	9	17	36	68	46	52	4	7	280
Total	119	124	15	149	125	116	483	670	679	1,051	39	68	3,638

Table D.2. Settlements by Industry and Year

This table shows the distribution of the mean settlement amounts of securities class action cases by industry and year. The year is defined as the year of first filing. Firms in the sample are those firms whose settlement (both voluntary settlement and settlement by court order) gets final approval from the court. The industry classification is that from the SCAC database. Settlement figures are in nominal $ millions. Conglom stands for Conglomerates. At the time of data collection (2020), the settlement amounts of the cases of 2017-2019 were not yet available.

	Basic Materials	Capital Goods	Conglom.	Consumer Cyclical	Consumer Non-Cyclical	Energy	Financial	Healthcare	Services	Technology	Transport.	Utilities	Overall
1996		18.4		10	1.73		11.08	7.4	8.02	7.73	5		8.05
1997	5.28	55.25		6.61	3.09		60.59	5.4	34.74	16.94	17.76	0	24.03
1998	4.03			16.02		25.87	82.93	26.88	13.52	16.85	11.59		23.87
1999	2.5	22.5	410	15.77	250.37	14.9	18.64	13.47	36.26	5.67	15		33.6
2000	3.72	3.48	53.25	186.08	43.58		30.27	33.79	29.18	28.08			39.45
2001	18.9	3.94		3.44	19.08	1.3	12.17	12.04	11.21	18.43	6.75	3,620.59	36.43
2002	41.4	2.38	38.76	24.33	19	36.35	41.04	51.98	42.48	30.58		88.6	43.56
2003	22	31.03		5.59	4.25	2.7	43.18	60.74	12.88	6.88		42.47	30.65
2004	8.25	4.63		6.23			153.22	68.27	23.93	12.89	4.02	17.35	42.67
2005	10.18			3.88	13.7	10.5	37.09	14.13	7.64	11.78			14.34
2006	8	8.5		10			335.42	10.68	9.32	41	1.2		44.2
2007	2.15	27.75		12.15			123.54	26.25	10.33	33.36		7	45.88
2008	23	24		22.5	10.5	4.81	119.26	115.54	13.22	21.56		4	71.24
2009		11.25	40	1.5		5.2	263.04	9.79	24.99	16.4			77.1
2010	2.25	1.55		1		70.61	41.88	45.06	10.37	3.41			32.57
2011	2.07	11.71		0.8	14.34	3.42	123.72	18.13	5.34	14.03	0		26.16
2012	6.67	0		5.5	5	8.44	66.75	9.87	62.48	51.13		146.25	37.16
2013	1.17	1.02		10.73	0	1.17	101.11	8.6	9.68	2.61		0	17.58
2014	34.37	12.75		0	7.83	11.95	25.02	14.31	10.4	4.25	0		13.51
2015	29.98	3.87		2.5	1.83	2.85	9.3	94.87	5.68	19.61		1.71	31.72
2016		3.06			6.1		43.38	22.48	21.04	10.9			20.94
2017	NA												
2018	Idem												
2019	Idem												
Overall	14.51	11.85	105.67	23.41	33.37	17.38	80.68	34.27	19.58	18.57	7.05	355.05	33.81

Table D.3. Difference-in-Difference Estimation for Firm Operations and Financial Policies of Different Outcomes

The table shows difference-in-difference estimation for firm operations and financial policies of different lawsuit outcomes. Only the interaction coefficients are presented. The results for dismissed lawsuits, voluntary settlement lawsuits, and ordered settlement lawsuits are presented in the upper, middle, and lower panel respectively. The control sample is determined by Mahalanobis distance metric matching. For all indicted companies, we draw three matching pairs with replacement. The Mahalanobis distance is determined based on industry, size, past returns, and market-to-book. $Post_t$ equals one for the quarters of the lawsuit filing or for quarters after the filing, and is zero otherwise. Columns (1) to (8) shows' firm operations. Columns (9) to (12) show firms' financial policies. The estimation period spans [-3;3] years relative to the filing date. Control variables include size and market-to-book. Variable definitions can be found in the Appendix Table A.1. The sample includes the indicted firms and matching firms. The sample period is 1996-2019. Standard errors are robust to heteroskedasticity, and clustered at the firm and year level. The standard errors are shown in brackets. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Operations								Financial Policies			
	ROA		Tobin's Q		Operational Expenses		Log(Sales)		Cash Holdings		Leverage	
Dismissed:												
Indicted*Post	-0.006	-0.019***	-0.374***	-0.649***	0.024*	0.027***	0.250***	-0.001	0.005	0.001	0.009	-0.052**
	(0.006)	(0.006)	(0.105)	(0.113)	(0.013)	(0.009)	(0.056)	(0.021)	(0.004)	(0.004)	(0.008)	(0.019)
Voluntary settlement:												
Indicted*Post	-0.044***	-0.041***	-0.458***	-0.639***	0.060***	0.059***	0.045	0.011	0.007*	0.002	0.007	-0.022***
	(0.005)	(0.005)	(0.092)	(0.117)	(0.018)	(0.013)	(0.053)	(0.030)	(0.004)	(0.003)	(0.009)	(0.007)
Ordered settlement:												
Indicted*Post	-0.018	-0.025	-1.081***	-1.209***	0.084***	0.081***	0.153***	0.081	-0.010	-0.015	0.011	0.008
	(0.022)	(0.024)	(0.288)	(0.342)	(0.022)	(0.021)	(0.052)	(0.059)	(0.009)	(0.012)	(0.008)	(0.019)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y		Y		Y		Y		Y		Y	
Firm FE		Y		Y		Y		Y		Y		Y