

Securities class action litigation, defendant stock price revaluation, and industry spillover effects

Patrick Lieser^a, Sascha Kolaric^{a*}

^a Department of Business Administration, Economics and Law, Technische Universität Darmstadt, 64289 Darmstadt, Germany

Abstract

We analyze the stock price reaction to U.S. securities class action lawsuits for sued firms and their closest industry rivals surrounding the three most important dates during the litigation process: the revelation day of potential misconduct, the lawsuit filing day, and the day of the conclusion of the lawsuit, either through court dismissal of the class action or through a settlement. We are thereby the first to capture the shareholder wealth effects of all major events such a litigation process contains. The sample includes 1,004 observations for sued firms and 4,920 rival observations of concluded class action lawsuits between 1996 and 2014. The results show that the shareholders of both, defendant firms and their rivals, anticipate lawsuit events and that the stock price reaction is almost consistently negative. The magnitude of the shareholder wealth effects decrease for events that are located later in the litigation process, suggesting that new information is efficiently priced at the early stages of the process, with later events resolving residual uncertainty. Simultaneously this indicates that prior studies focusing only on the lawsuit filing event severely underestimated the economic impact of such litigation. In addition, we estimate the litigation risk and the probability of a settlement through logistic regression models and analyze their influence on the stock price around the filing and the settlement of class action lawsuits. The results suggest that investors are able to anticipate the incidence and the outcome of a lawsuit to a certain extent. The incentives for shareholders and their attorneys to sue as well as the historic share performance of a firm play an important role in explaining the observed return patterns.

Keywords: Class Actions · Litigation · Shareholder wealth · Event study · Rival reactions

JEL: G14, G30, K22, K41

* Corresponding author:

Sascha Kolaric

E-mail address: kolaric@bwl.tu-darmstadt.de

Phone number: +49 6151 1670986

Address: Department of Business Administration, Economics and Law, Technische Universität Darmstadt, Hochschulstrasse 1, 64289 Darmstadt, Germany

1. Introduction

U.S. securities class actions can have far-reaching consequences for corporations, as cases like Enron, WorldCom and, and others strikingly demonstrate. The recent example of Volkswagen underscores again the impact that fraudulent behavior and the resulting potential litigation can have on a firm's share price. With increasingly high monetary amounts in dispute, the revelation of a potential misconduct and the related litigation announcements frequently result in considerable equity market reactions. Securities class action lawsuits therefore attract a substantial amount of public attention and bind corporate resources sometimes for years. Even though the issues of securities class action lawsuits are controversially discussed, a global trend begins to emerge, as other countries start to adopt legal devices similar to the U.S. style securities class action. This highlights the importance of a proper understanding of cause and effect for policymakers, executives and shareholders.

In the recent years, securities class action litigation has increasingly been studied from a financial market perspective, with respect to related stock price reactions. The majority of research is focusing around three main questions: (i) What factors enhance the risk of a firm to become subject of litigation? (ii) What are the wealth implications of a lawsuit filing for shareholders? and (iii) What determines the outcome and the settlement amount of securities class actions?

While the research so far offers some answers to these questions, there are still multiple areas that have not been thoroughly investigated yet. The shareholder wealth effects on the lawsuit filing date are well examined, but the effects of other events in the litigation process, especially the revelation date and the lawsuit conclusion date, are still scarcely analyzed. In addition, researchers have only recently started to look beyond the boundaries of the sued firm and analyze what the industry-wide effects of class action litigation are. Gande and Lewis (2009) detect industry spillover effects of securities class action litigation events, indicating that drops in shareholder wealth are significantly underestimated, if only the defendant companies are examined. Furthermore, the robustness of the recent evidence is doubtful given the comparatively small sample sizes, thereby limiting the inferences that can be drawn.

The present paper addresses these issues, using a large sample of more than 1,000 class action and looking at the entire process with the three most prominent events, the revelation of potential misconduct, the lawsuit filing and the lawsuit conclusion, either through a dismissal or settlement. To the best of our knowledge, this is the first paper to capture all three dates and

therefore to evaluate the overall effect of shareholder-initiated class action lawsuits on the valuation of the defendant's equity. In addition, we also examine how these events affect the rivals of the defendant firm and whether market participants are able to anticipate the outcome of the litigation process and if so, which variables have the largest influence. We thereby offer a deeper and comprehensive analysis, not only on the defendant firms, but also on their industry rivals. In particular, we fill an important gap in the coverage of wealth effects related to the revelation and conclusion of shareholder-initiated class action lawsuits. In this way, we are able to offer a comprehensive picture on securities class action litigation from a financial market perspective.

The rest of this paper is structured as follows. Section 2 offers a brief introduction to the background and process of shareholder-initiated class action lawsuits. This section also includes an overview of the relevant literature with regard to the effects of litigation on stock prices, the drivers behind the observed reactions, and the factors that help explain the probability of a firm being sued. Section 3 describes the data selection process and the sample composition. It also explains the empirical methodology in detail. Section 4 presents the results of the empirical analysis and Section 5 provides a brief summary of the main findings and concludes the paper.

2. Background

Securities class actions are a special case of the U.S. class action that is based on Rule 23 of the Federal Rules of Civil Procedure and allows individual stakeholders to join their resources by forming a group in pursuit of their claims. A very distinctive feature of the U.S. class action is that one person represents the class as a whole and that the representatives' actions are binding for every class member, even if absent. The class action pursues four main regulatory objectives: (i) access to justice, (ii) safeguarding of rights and deterrence, (iii) procedural economy, and (iv) development of law and reform.

2.1 The class action lawsuit process

There are a number of requirements that have to be met in order to bring a claim forward as a class action known as commonality, numerosity, typicality and adequacy. In addition, the pursued claims must be assignable to one of the three class action categories defined in Rule 23(b) of the Federal Rules of Civil Procedure.

In order to bring a class action lawsuit forward, there must be a legal basis for the plaintiffs' claims. In the case of securities class actions, the two types of claims that most frequently arise relate to section 11 of the Securities Act of 1933 and to section 10(b) of the Securities Exchange

Act of 1934 (Baker & Griffith, 2009). While both types of claims typically relate to misstatements or omission of material fact, they differ in both their reach and relevance. Section 11 claims only arise in the context of registered offerings, while rule 10(b)-5 of the Exchange Act of 1934 is the most prevalent basis for securities class actions claims (Baker & Griffith, 2009). Related claims are brought forward by plaintiffs who suffered an economic loss in the consequence of the adjustment of inflated or deflated share prices following the revelation of misconduct. The claims brought forward under Rule 10(b)-5 must fulfil the requirements of scienter, materiality, reliance and loss causation (Baker & Griffith, 2009).

The typical shareholder-initiated class action follows a process that covers the stages of investigation and filing, class certification and lead plaintiff selection, motion to dismiss, discovery, trial preparation, and settlement, which can in turn further be broken down into the three phases of certification, decision and distribution of settlement funds (Baker & Griffith, 2009).

The class action process begins with a self-nominated class representative filing a complaint in federal court stating that the suit is being brought as a class action and making allegations sufficient to satisfy the requirements of Rule 23(a) and one or more categories of Rule 23(b). The selection of lead plaintiff and counsel has to be within 60 days, followed by the certification of the class. The class certification requires the prerequisites defined under Rule 23(a) and Rule 23(b) to be fulfilled. Certification can be and is increasingly challenged by the defendants. Most circuits allow some discretionary weighing of the merits at this early stage, effectively using the motion to dismiss as a screening for merit of the class action (Baker & Griffith, 2009). Once the class certification is granted, defendants are usually willing to enter into a stipulation of settlement to avoid the expenses associated with a prolonged litigation along with a costly discovery process. Plaintiffs are equally incentivized to engage into a stipulation at an early stage, since high litigation costs for the defendant potentially reduce available insurance limits and thus the sum available for settlement (Baker & Griffith, 2009). Therefore, the vast majority of cases are settled prior to summary judgement and almost never proceed to trial (Baker & Griffith, 2009). A settlement then leads to the creation of a compensation fund under judicial supervision. Finally, during the distribution phase, the settlement fund is distributed to the individual class members in proportion to the damages they suffered.

The three main actors in a class action are the defendant, the plaintiff and the plaintiffs' attorney. In small claims class actions, such as individual securities class actions, the plaintiffs' material interest is usually too low to justify the significant effort and expenses of a lawsuit. Therefore, the lead plaintiff usually leaves the effective representation of the class to his attorney. The

attorney then becomes the driving force behind the securities class action. The opportunity to earn a significant percentage of the settlement sum incentivizes him to actively monitor the market for attractive claims and reach out for claimants to act as named plaintiff. As the attorney usually bears the costs of the litigation, he is interested in being in control of strategic decisions. Defendants in a securities class action lawsuit find themselves faced with large litigation cost as well as potential reputational damages. As defendants in the U.S. are usually not remunerated for their litigation cost even if they win, the threat of a costly discovery and litigation process accompanied by media attention and the associated potential reputational losses puts defendants under pressure to settle even frivolous claims for economic reasons. However, the class action and its binding effect for all members of the class can also serve defendants, as they can achieve legal security and do not have to face subsequent claims on the same basis.

Due to its history of frivolous claims, securities class actions possess a series of distinguishing characteristics that are the consequence of legislative efforts to address this issue. Most notably, the Private Securities Litigation Reform Act of 1995 (PSLRA) provides a couple of central changes that differentiate the securities class action from the general class action. It significantly heightens pleading standards while simultaneously introducing a ‘safe harbor rule’ that safeguards companies making forward-looking disclosures from lawsuits as long as these disclosures are accompanied by meaningful cautionary language or if they are unknowingly false (Habib, Jiang, Bhuiyan, & Islam, 2014). Abolishing the first-come-first-served-principle in the selection of the lead plaintiff further reduces incentives for frivolous lawsuits. Now, the most adequate plaintiff is selected and appointed lead plaintiff by the court. A stay of discovery until after the decision on the motion to dismiss takes financial pressure off the defendant’s shoulders and is directed at inhibiting so called ‘fishing expeditions’ for evidence.

2.2. Related literature

Shareholder class action litigation has been shown to have a wide array of consequences for the sued firms. The literature, for example, shows that there is a relationship between securities class actions and firms’ investment decisions (Arena & Julio, 2015; McTier & Wald, 2011), firm reputation and cost of capital (Chava, Cheng, Huang, & Lobo, 2010; Deng, Willis, & Xu, 2014; Karpoff, Lee, & Martin, 2008). Security class actions significantly heighten a firm’s cost of capital, primarily through reputational losses. In addition, CEO turnover has been linked to

securities class actions (Crutchley, Minnick, & Schorno, 2015; Fich & Shivdasani, 2007; Helland, 2006; Humphery-Jenner, 2012), highlighting the monitoring effect of such litigation. The evidence on price effects of shareholder-initiated lawsuits consistently documents negative price reactions to shareholder litigation related events. The effect size, however, varies across the three most critical events in the timeline of shareholder litigation. Prior studies document significantly negative returns of -16.6% (Griffin, Grundfest, & Perino, 2004) to -24.99% (Ferris & Pritchard, 2001) on the revelation date of potential misconduct. The returns are still significantly negative on the lawsuit filing day, with approximately -4.1% (Griffin et al., 2004) or -5.95% (Fich & Shivdasani, 2007), but is much lower in magnitude than on the revelation date. Gande and Lewis (2009) additionally highlight that there are significant spillover effects within industries as a reaction to the lawsuit filing. Choi and Pritchard (2012) further show that private enforcement provides at least as much of a deterrent as SEC investigations. Prior research, however, largely neglects to investigate the stock price reactions to the conclusion of securities class actions. Only the study by Ferris and Pritchard (2001) examine price reaction to the conclusion of shareholder initiated class action lawsuits. They are not able to document a significant price reaction and consequently conclude that information contained in the decision on the motion to dismiss is not material.

A focus solely on firm-wide litigation effects may also significantly underestimate the effects of shareholder litigation as there may be spillover effects within a given industry. While studies on spillover effects of securities class actions are sparse, research in other areas suggests that such effects may indeed exist and that these effects warrant further examination. Lang and Stulz (1992) document that bankruptcy filings negatively affect the prices of rival firms in the same industry. In the context of firm acquisitions, Schipper and Thompson (1983) show that merger programs increase the likelihood of a takeover offer by another firm and that the shareholders of such potential target firms adjust prices in anticipation of a takeover event *ex ante*. Similar effects are therefore conceivable in the context of shareholder-initiated class action lawsuits. These lawsuits may send signals to rival firms' shareholders that the likelihood of litigation has risen. Gande and Lewis (2009) argue that this can come through two main channels. One, similar to the line of reasoning of Schipper and Thompson (1983), a rise in the general litigation activity heightens the litigation risk of a given firm. Second, firms in the same industry may share similarities across a variation of certain characteristics that determine the risk of litigation. A lawsuit in the same industry may therefore be a strong signal to rivals in the same industry that they are more likely to be sued. Gande and Lewis (2009) mention the example of depressed industries where management may be more susceptible to fraudulent

behavior, increasing the potential for securities fraud litigation. Building on this, Gande and Lewis (2009) document that the shareholder wealth implications of securities class actions are not confined to the defendant firm but that the sued firms' rivals also experience a significant decline in their share prices on the filing day of a lawsuit. Bonini and Boraschi (2010) confirm these findings for a sample of 739 securities class actions, finding cumulative abnormal rival returns of -0.2% and -0.65% during the three and eleven day event window surrounding the lawsuit filing, respectively.

The existing literature identifies multiple factors that influence price reactions to litigation events. The variables are usually organized along several dimensions. A first general differentiation can be made between firm-level and industry-level characteristics. While most studies attempt to explain shareholder reactions based on firm-level characteristics, Gande and Lewis (2009) incorporate industry-specific information into their analysis and find that litigation intensity, measured as the number of lawsuits in the industry of the defendant firm in the six months prior to the lawsuit, significantly influences both the likelihood of a firm facing litigation and the price reaction if a litigation event occurs. They further show that the membership of a firm in a certain industry group plays a role in both determining litigation risk and the reaction to a lawsuit filing. They argue that firms in the financial industry have a higher probability of facing litigation due to their direct relationships with their customers, whereas other highly regulated firms carry litigation risk due to additional regulatory scrutiny. Following Field, Lowry, and Shu (2005), Gande and Lewis (2009) further hypothesize that retail firms may be less litigation prone as they release monthly sales figures and investors are hence less likely to be surprised. At the same time, retail firms sell products to individuals and employ large labor forces, resulting in a larger number of shareholders.

On the firm level, various characteristics are studied with regard to their impact on price reactions to litigation, litigation risk and the probability for a lawsuit to be settled. These can be organized around the major themes of lawsuit susceptibility, (operational) performance, information asymmetry, and potential for agency conflicts. Along those dimensions, Ferris and Pritchard (2001) report evidence that a number of firm level characteristics help to explain the return patterns around the main shareholder class action events. They capture a firm's susceptibility to a lawsuit using share turnover, firm size, beta, and skewness of returns, albeit only the latter two being significant. Information asymmetry and agency problems are assessed through free cash flow, ratio of debt-to-equity, the firm's market-to-book ratio, institutional equity holdings, the percentage of independent directors, and a dummy variable for Big 5 auditor. These variables largely significant, with the exception of Big 5 auditor. In addition, Ferris

and Pritchard (2001) assess several variables corresponding to the various allegation types and their effect on price reactions to securities class action events, but these variables lack significance. However, the results of the study of Ferris and Pritchard (2001) need to be carefully interpreted, as their sample size is comparatively small with only 89 observations.

Gande and Lewis (2009) assess similar firm-level characteristics and confirm the findings of Ferris and Pritchard (2001). They approximate the susceptibility to be sued using share turnover, return volatility, and the stock return during the six months preceding the lawsuit and find that these variables are significantly related to the shareholder wealth effects observed on the filing day of securities class action lawsuits. In addition, Gande and Lewis (2009) accompany this set of variables by measures for earnings performance, including discretionary accruals, return on assets, and standard unexpected earnings. They further include measures for agency conflicts by assessing the CEO compensation structure and CEO share ownership. They report a significant effect of these variables on the probability of a lawsuit, but their influence on the stock price reaction on the filing date is not statistically significant. They also show that the litigation history of a firm affects investors' anticipation and reaction to lawsuit events. Griffin et al. (2004) arrive at similar results, reporting that negative price reactions over shorter and longer time horizons are more pronounced for smaller firms. They further add that for firms with lower levels of analyst coverage negative price reactions are more pronounced in the short as well as long term.

Bonini and Boraschi (2010) extend the set of explanatory variables by examining the impact of the type of allegation made in the lawsuit filing. They find that securities class actions with accounting allegations do not suffer statistically significant abnormal returns and do not generate significant spillover effects within their industry. Additional variables that have been shown to be related to wealth effects related to shareholder class action events include the market-to-book ratio (Karpoff et al., 2008), free cash flow and leverage as proxies for agency conflicts (Karpoff et al., 2008), the ratio of intangible assets to total assets as a measure for opacity (Ferris & Pritchard, 2001), and sales growth for operational performance (Karpoff et al., 2008).

Prior empirical research with regard to class action litigation also focuses on the propensity of a firm to be sued and the probability of a settlement. This specific field on securities class actions is covered by multiple studies examining the factors that influence the propensity of a firm to be named as defendant in a shareholder-initiated class action lawsuit. For the most part, the identified variables overlap with those used to explain the variation in shareholder reactions to litigation events. For example, Gande and Lewis (2009) show that shareholders are able to

anticipate the risk of a firm to face securities class action litigation and that they incorporate these expectations into the pricing of the firm's stock.

A particularly common theme is that litigation risk is very closely related to the incentives of investors and lawyers to file a lawsuit, the key component being the size of the expected payoff. This in turn is determined by both the probability of the lawsuit to succeed as well as the height of potential damage awards. The literature therefore focuses on variables that attempt to measure potential recoverable damages and several corporate governance related factors that aim to capture the probability of the lawsuit to be meritorious.

McTier and Wald (2011) examine 7,224 public firms of which 910 faced shareholder lawsuits. They find that variables such as firm size and information asymmetry (measured by percentage of tangible assets, accrual quality, pay-outs, leverage, and analyst coverage) are linked to the likelihood of a firm to be sued. They further identify other factors, such as cash holdings, over-investment, and analyst forecast dispersion to play a significant role in the estimation of litigation risk, while they cannot find evidence that CEO characteristics, such as compensation, ownership, age, or tenure, significantly relate to the propensity of being sued.

Bonini and Boraschi (2010) report evidence in line with these results and find that, ex-ante, firms engaged in a corporate scandal exhibit higher levels of leverage and make greater use of equity financing compared to their industry average. Gande and Lewis (2009) further show that low profitability and inefficient financial management significantly increase a firm's litigation risk. This confirms the findings by Strahan (1998), who shows that firms that are more prone to suffer from agency problems carry higher litigation risk. He also documents a significant positive relationship between a firm's risk and size and its propensity to be sued. At the same time, higher age, higher market-to-book ratio, and the payment of dividends are negatively related to litigation risk. Kim and Skinner (2012) use the indicator variable for industry membership to estimate litigation risk¹, finding that the inclusion of additional firm characteristics, such as size and stock volatility, significantly improve the predictive ability of their model. They also show that the inclusion of proxy variables for corporate governance quality and agency problems to not significantly improve predictive quality.

In addition to examining the relation between shareholder wealth effects and the anticipated likelihood of litigation, it is also important to assess the probability of a lawsuit to be settled or

¹ See for example also Gande and Lewis (2009), who use membership in certain industries (Financial, Technology, Retail, Regulated and other) as proxy variables for litigation risk and as explanatory variables for investor reactions to the filing of a securities class action.

dismissed. Since the expected shareholder wealth loss imposed by a securities class action lawsuit is composed of both, the damage size and the likelihood of its realization, the probability of a settlement should play an important role in the determination of the losses anticipated by shareholder. This notion is reinforced by the study of Bradley, Cline, and Lian (2014), who report evidence that shareholders are indeed able to anticipate the merit of a class action lawsuit.

Compared to the area of litigation risk, the available research on variables that influence the outcome of securities class action lawsuits is scarce. Ferris and Pritchard (2001) analyze financial proxy variables (share turnover, firm size, beta, and return skewness), proxies for agency conflict (free cash flow, debt ratio and market-to-book ratio), ownership characteristics, governance characteristics, and allegation types with regard to their explanatory power in the prediction of the outcome of a lawsuit. They find that share turnover, percentage of independent directors, and board size, are the only variables that show statistical significance with regard to the likely outcome of the litigation process. Cox, Thomas, and Kiku (2006) as well as Cheng, Huang, Li, and Lobo (2010) further find that securities class actions with institutional owners as lead plaintiffs are less likely to be dismissed and to reach higher settlement amounts.

3. Data description and methodology

This section offers a brief description of the sample selection procedure, for both, the sample of firms named in shareholder-initiated class action lawsuits and for their direct competitors. In addition, this section offers the descriptive statistics of the sample as well as a description of the methodologies used for the event study, the analysis of a firm's propensity to be sued and the probability of a settlement, and the regression analysis with regard to the observed stock returns surrounding the filing and conclusion of class action securities lawsuits.

3.1 Sample selection and description

The initial sample of firms subject to securities class actions is collected from the Stanford Securities Class Action Clearinghouse (SCAC).² This initial sample is comprised of 3,976 securities class action lawsuits filed against 3,339 individual companies between 1996 and 2014.³ For each of those class actions, relevant supplementary information, such as filing date, case description, and case status information, is downloaded from the individual SCAC websites and stored in a database. The distribution of in-sample class action lawsuits over time and by

² See Stanford Law School Securities Class Action Clearinghouse: <http://securities.stanford.edu/>.

³ The number of class action lawsuits is greater than the number of individual companies as several companies have been sued multiple times.

outcome is reported in Table 1. Furthermore, we obtained allegation classifications for the individual class actions from the SCAC website that specifies if the class action involved allegations related to accounting fraud or others. These allegation classifications are not mutually exclusive, so the total number of allegations exceeds the number of securities class action filings. Table A - 1 in the Appendix gives an overview of the development of allegations over time.

Table 1: Distribution of in-sample securities class actions by outcome and year

Year	Dismissed		Settled		Total	
1996	9	43%	12	57%	21	1%
1997	17	29%	42	71%	59	3%
1998	29	33%	59	67%	88	5%
1999	37	42%	52	58%	89	5%
2000	41	41%	60	59%	101	6%
2001	31	11%	249	89%	280	16%
2002	50	42%	70	58%	120	7%
2003	53	49%	55	51%	108	6%
2004	55	49%	57	51%	112	6%
2005	44	48%	48	52%	92	5%
2006	29	41%	41	59%	70	4%
2007	44	42%	61	58%	105	6%
2008	59	51%	57	49%	116	7%
2009	48	65%	26	35%	74	4%
2010	65	64%	37	36%	102	6%
2011	76	68%	35	32%	111	6%
2012	44	41%	18	29%	62	4%
2013	36	86%	6	14%	42	2%
2014	18	95%	1	5%	19	1%
Total	785	44%	986	56%	1,771	100%

For each company included in our dataset, we hand-matched the International Securities Identification Number (ISIN) in order to obtain price data from Thomson Reuters Datastream. In total, 2,114 companies with an ISIN could be identified, which account for 2,595 class action litigations. To ensure comparability of firm's accounting statements and reactions to lawsuits, we further restricted the sample to U.S firms only. The sample is then restricted to lawsuits that are already concluded through either settlement or dismissal. This further reduced the sample to 1,771 securities class action lawsuits. The exclusion of firms due to poor quality of the stock data during the estimation and event window of the event further reduced the sample to 1,377 class action lawsuits available for the estimation of abnormal returns. This sample is then used to calculate stock price reaction to litigation events.

We also obtained the 4-digit primary Standard Industrial Classification (SIC) code associated with each firm in the sample in order to classify firms into certain industry types along the lines of Gande and Lewis (2009). Firms with SIC codes between 6000 and 6999 are classified as

Financial Institutions, companies with SIC codes between 4000 and 4999 as Regulated Firms. Technology Firms have SIC codes 2833-2836, 3570-3577, 3600-3674, 7371-7379, or 8731-8734. Firms with SIC codes between 5200 and 5961 are classified as Retail Firms. Table 2 provides an overview over the distribution of in-sample security class actions by industry and year.

Table 2: Distribution of in-sample securities class action filings by industry and year

Year	Financial		Other		Regulated		Retail		Technology		Total	
1996	3	14%	5	24	1	5%	0	0%	12	57%	21	1%
1997	10	17%	22	37	6	10%	2	3%	19	32%	59	3%
1998	13	15%	33	38	4	5%	2	2%	36	41%	88	5%
1999	11	12%	31	35	4	4%	6	7%	37	42%	89	5%
2000	12	12%	28	28	8	8%	4	4%	49	49%	101	6%
2001	20	7%	51	18	21	8%	16	6%	172	61%	280	16%
2002	15	13%	37	31	27	23%	3	3%	38	32%	120	7%
2003	21	19%	28	26	14	13%	4	4%	41	38%	108	6%
2004	15	13%	28	25	16	14%	7	6%	46	41%	112	6%
2005	7	8%	37	40	5	5%	5	5%	38	41%	92	5%
2006	7	10%	12	17	3	4%	5	7%	43	61%	70	4%
2007	21	20%	25	24	10	10%	7	7%	42	40%	105	6%
2008	44	38%	28	24	6	5%	3	3%	35	30%	116	7%
2009	19	26%	15	20	5	7%	5	7%	30	41%	74	4%
2010	17	17%	37	36	7	7%	3	3%	38	37%	102	6%
2011	10	9%	30	27	10	9%	10	9%	51	46%	111	6%
2012	5	8%	24	39	8	13%	5	8%	20	32%	62	4%
2013	5	12%	11	26	3	7%	6	14%	17	40%	42	2%
2014	2	11%	4	21	2	11%	2	11%	9	47%	19	1%
Total	257	15%	486	27%	160	9%	95	5%	773	44%	1,771	100%

It can be seen that the number of lawsuits tends to increase during periods of recession. As Table 2 only includes securities class actions that are already concluded, litigation activity in recent years only appears to decrease, since the share of on-going lawsuits that are not included in this sample increases substantially after 2012. From Table 2 it also becomes apparent that litigation activity varies considerably across the various industry types with industries that are characterized by higher uncertainty (i.e. Financial and Technology) showing much more litigation activity than their more regulated counterparts.

Additional data on the defendant firm and their potential rivals were also downloaded for the years 1993 to 2015. Potential rival firms, in this context, are defined as all firms with the same 4-digit SIC code as the defendant company. Price data, number of shares, market value, and trading volume are downloaded from Datastream. In total, daily data for 10,884 individual firms could be obtained between 1993 and 2015. For the subsequent regression analyses, additional data was obtained from Worldscope. However, as not all observations had all data items

available, the sample is further reduced to 1,004 class action lawsuits. Table 3 gives an overview of the variables for this sample of class actions lawsuit. Table 4 provides the respective set of summary statistics for the sample of identified rival firms on the lawsuit-filing event.

Table 3: Summary statistics for the filing date sample of sued firms

	n	Mean	Std. dev	0.25 quantile	0.5 quantile	0.75 quantile
CAR [-10;-2] (%)	1004	-0.06	0.23	-0.13	-0.03	0.03
CAR [-1;+1] (%)	1004	-0.03	0.15	-0.06	-0.01	0.02
CAR [-10;+1] (%)	1004	-0.07	0.27	-0.20	-0.05	0.03
CAR [+2;+10] (%)	1004	0.00	0.15	-0.06	0.00	0.05
Propensity to be sued	1004	0.03	0.02	0.02	0.02	0.03
Probability of settlement	1004	0.51	0.21	0.34	0.53	0.64
Settled	1004	0.51	0.50	0.00	1.00	1.00
Turnover	1004	0.83	0.24	0.75	0.93	0.99
Performance	1004	-0.07	0.97	-0.56	-0.22	0.14
Volatility	1004	0.04	0.02	0.02	0.04	0.06
Skew	1004	-0.09	2.13	-0.87	0.05	0.70
Kurtosis	1004	13.05	21.17	2.63	5.80	14.05
Technology	1004	0.45	0.50	0.00	0.00	1.00
Financial	1004	0.13	0.34	0.00	0.00	0.00
Regulated	1004	0.08	0.28	0.00	0.00	0.00
Retail	1004	0.06	0.24	0.00	0.00	0.00
Market capitalization (mio. \$)	1004	9,485.36	30,681.06	176.75	778.00	3841.25
Litigation intensity	1004	2.82	4.93	0.00	1.00	4.00
Previous lawsuit	1004	0.21	0.41	0.00	0.00	0.00
Recession	1004	0.24	0.43	0.00	0.00	0.00
Rapid filing	1004	0.34	0.47	0.00	0.00	1.00
ROA	1004	-4.19	36.29	-5.13	3.82	9.20
Debt-equity ratio	1004	107.89	509.51	0.57	28.71	96.50

The rival selection process was conducted as follows. For each event for a defendant firm i , we identify all of firm i 's rival firms with the same 4-digit SIC code. These firms are then required to have good return data quality during the estimation period as well as the relevant event windows. The number of potential rivals with the same 4-digit SIC code and good data availability is highly variable, so we restrict the number of selected rivals for each litigation event. Following Hankir, Rauch, and Ueber (2011), we select up to six peers out of the set of potential rivals that meet the above criteria based on similarity with the sued firm. Similarity is measured across three dimensions: Industry classification (4-digit SIC code), market capitalization, and return on assets (ROA), where a match in industry is already ensured by the above selection criteria.⁴ While Hankir et al. (2011) proceed in a stepwise procedure to further narrow the set

⁴ Hankir et al. (2011) in their study on US and European bank M&As require peer firms to share the same primary SIC code, have a market capitalisation of +/- 25% around that of the target/bidder firm in year $t-1$, headquarters in the same region and select the five most profitable rivals (as measured by ROE in year $t-1$) from those firms. However, as we focus solely on US firms, we do not need to control for the firm's headquarters. Deviating from the methodology of Hankir et al. (2011), we use ROA to measure profitability, as it is more frequently used in the litigation specific literature than ROE.

of peers by market capitalization requirements followed by return on asset restrictions, we measure similarity based on the Euclidean distance between the sued firm and its industry rivals across the two dimensions market capitalization and return on assets in order to select the six most similar peers. For this, we require the identified rivals to have values for both return on assets (ROA) and market capitalization on December 31st of year t-1, where t=0 is the event year. To measure the Euclidean distance along these two dimensions, we first normalize both the ROA values and the market values (MV) for the set of rivals identified for company i by subtracting the group mean for the given dimension and dividing by the respective standard deviation. The Euclidean distance is then computed as:

$$dist_{i,j,t} = \sqrt{(ROA_{norm,sued,j,t-1} - ROA_{norm,i,t-1})^2 + (MV_{norm,sued,j,t-1} - MV_{norm,i,t-1})^2} \quad (1)$$

The six firms in the same industry with the minimum distance to the sued firm are then selected as rival firm observations. For a sued firm, where less than six rivals meet the above criteria, this smaller subset is then used as a peer group. For sued firms that do not have either good ROA or market capitalization data in t-1, it is impossible to infer the similarity to peer firms. Events without both ROA and market capitalization are therefore dropped from the rival sample.

Table 4: Summary statistics for the filing date sample of identified rival firms

	n	Mean	Std. dev	0.25 quantile	0.5 quantile	0.75 quantile
CAR [-10;-2] (%)	6040	-0.00	0.13	-0.05	-0.00	0.04
CAR [-1;+1] (%)	6040	-0.00	0.07	-0.03	-0.00	0.02
CAR [-10;+1] (%)	6040	-0.01	0.14	-0.06	-0.01	0.05
CAR [+2;+10] (%)	6040	0.00	0.13	-0.05	-0.00	0.05
Propensity to be sued	6040	0.03	0.02	0.02	0.02	0.04
Probability of settlement	6040	0.50	0.22	0.32	0.50	0.63
Settled	6040	0.50	0.50	0.00	1.00	1.00
Turnover	6029	0.73	0.28	0.56	0.84	0.97
Performance	6040	0.09	1.92	-0.34	-0.01	0.30
Volatility	6040	0.04	0.06	0.02	0.03	0.05
Skew	6040	0.36	1.51	-0.12	0.31	0.78
Kurtosis	6040	7.73	15.41	1.69	3.42	7.62
Technology	6040	0.47	0.50	0.00	0.00	1.00
Financial	6040	0.17	0.37	0.00	0.00	0.00
Regulated	6040	0.09	0.28	0.00	0.00	0.00
Retail	6040	0.04	0.20	0.00	0.00	0.00
Market capitalization (mio. \$)	6040	8,156.89	24,728.53	186.75	868.00	3,376.25
Litigation intensity	6040	3.45	5.31	0.00	2.00	5.00
Previous lawsuit	6040	0.21	0.40	0.00	0.00	0.00
Recession	6040	0.26	0.44	0.00	0.00	1.00
Rapid filing	6040	0.33	0.47	0.00	0.00	1.00
ROA	6040	-6.54	278.28	-2.18	3.83	8.47
Debt-equity ratio	6027	115.52	849.30	0.25	23.47	86.39
Euclidean distance to sued firm	6040	1.13	1.21	0.17	0.68	1.93

3.2 Event study

We use the event study methodology to analyze the price reactions of firms to three separate events: (i) the revelation date (class period end), (ii) the date of the first identified complaint that initiates a class action lawsuit (the filing date), and (iii) the conclusion of the class action by either dismissal or settlement.

The information on those dates is gathered from the SCAC website. As filing date, we use the date reported under date of filing of first identified complaint, because this is the date when the information of a lawsuit filing first reaches the market (excluding potential leakage). For the revelation date of potential misconduct, or a similar bad news events that led to the filing of a securities class action, we use the class period end reported under the first identified complaint. For the settlement date, we employ the case status date information provided by the SCAC. Since only dismissed or settled cases are included in the sample, these dates coincide with either the date of settlement or the date of dismissal, marking the conclusion of the securities class action lawsuit.

In order to capture the effect of event j on firm i , abnormal returns are calculated around the event date. We compute abnormal returns around lawsuit events employing the Fama and French (2015) five-factor model, which is an extension of the Fama and French (1993) three-factor model. The fully specified five-factor model is given by the equation:

$$R_{it} - R_{Ft} = a_i + b_i(R_{Mt} - R_{Ft}) + s_iSMB_t + h_iHML_t + r_iRMW_t + c_iCMA_t + e_{it} \quad (2)$$

where R_{it} is the return of security i on day t , R_{Ft} is the risk free rate of return, R_{Mt} is the return on the value-weighted market portfolio. The SMB factor measures the difference between returns on diversified portfolios of small stocks and those on a diversified portfolios of big stocks. The factor HML captures the return differences of diversified portfolios of high versus low book-to-market value stocks. RMW measures return differences between diversified portfolios of stocks with robust and weak profitability. CMA measures return differences on diversified portfolios of high investment versus low investment stocks.⁵ The coefficients a_i , b_i , s_i , h_i , r_i , and c_i are the ordinary least squares estimates of the above five factor model for the firm i given the corresponding data over the estimation window, while e_{it} is the residual. The employed estimation window corresponds to the 252 trading day (one year) period from day $t=-263$ to day $t=-11$ where day $t=0$ is the event date (event being defined as either the revelation, filing, or conclusion of a class action lawsuit).

⁵ Refer to the explanations on French's data library website for details: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_5_factors_2x3.html.

We then compute abnormal returns (ARs) as the difference between the actually observed returns R_{it} during the event window and expected returns \hat{R}_{it} during the event window as estimated from the five-factor model.

$$AR_{it} = R_{it} - \hat{R}_{it} \quad (3)$$

It is possible for events to occur outside of the regular trading hours and therefore it cannot generally be expected that the date when the relevant information arrives at the market and the date on which the corresponding price adjustment takes place are always congruent. Therefore, in order to account for possible leakage and markets taking longer to fully adjust to the information contained in complex events, such as class action lawsuits, we estimate cumulative abnormal returns (CARs) for the following event windows: $[0]$, $[-10;-2]$, $[-1;+1]$, and $[+2;+10]$. Using these event windows, anticipation effects, event effects, and potential post-lawsuit drift of abnormal returns can be accounted for. The CAR calculation follows:

$$CAR_{i, [\tau_1; \tau_2]} = \sum_{t=\tau_1}^{\tau_2} AR_{it} \quad (4)$$

Average cumulative abnormal returns (ACARs) are calculated in the usual manner by summing the individual CARs of all n events for the event window $[\tau_1; \tau_2]$ using:

$$ACAR_{[\tau_1; \tau_2]} = \sum_1^n CAR_{i, [\tau_1; \tau_2]} \quad (5)$$

Following the methodology of Gande and Lewis (2009), we further estimate the economic dollar effect of each event, which is the dollar value that is associated with the abnormal returns. The daily economic effect in dollars for firm i on date t is consequently computed as:

$$DE_{it} = P_{it-1} \times AR_{it} \quad (6)$$

where P_{it-1} is the market capitalization of firm i 's equity on date $t-1$. For each event we accumulate the individual daily dollar effect over the event window $[\tau_1, \tau_2]$ by summation:

$$CDE_i[\tau_1, \tau_2] = \sum_{t=\tau_1}^{\tau_2} DE_{it}. \quad (7)$$

3.3 Regression analysis variable selection

Similar to Gande and Lewis (2009), we organize the explanatory variables around the themes of susceptibility of a firm to be sued, firm performance, and the potential for agency conflicts. Therefore, in order to approximate the susceptibility of a firm to be sued, we include industry characteristics as well as firm-level characteristics.

The first set of industry characteristics relates to the risk of a firm to be sued and the explanatory variables are dummy variables classifying firms by their industry membership (see also Section 3.1). The industry dummies take the value of 1, if the firm's SIC code falls in the respective range and 0 otherwise. In line with Gande and Lewis (2009) we expect regulated and retail firms to be less susceptible to shareholder litigation due to higher monitoring and transparency, respectively. In contrast, financial firms can be expected to show increased levels in litigation due to their direct customer relationships and the increased likelihood of being sued in the case of poor stock performance. However, we also expect that the litigation risk is higher for technology firms due to the associated business uncertainties and the greater opaqueness of these firms, which may lead to agency conflicts. A further proxy variable for industry-wide litigation risk is the litigation intensity in the firm's industry. The litigation intensity is calculated as the number of lawsuits against firms with the same 4-digit SIC over the one-year period preceding the observation date. We expect that litigation intensity is positively related to the likelihood of a firm being named defendant in a lawsuit and may therefore carry information about potential fraudulent business practices that may be frequent in that particular industry.

Schipper and Thompson (1983) and Gande and Lewis (2009) have shown in the context of merger activity and class action lawsuits, respectively, that significant spillover effects may be observed within the same industry as a result of these events. The descriptive statistics in Table 2 already suggest that litigation activity tends to be high during recessions and financial crises. Therefore, a dummy variable is included that takes the value of 1 if the observed lawsuits occur during a recession year and 0 otherwise.⁶

These industry-wide characteristics related to the susceptibility of a firm to be sued are further accompanied by several firm-level characteristics. The first of those values is firm size, measured as the logarithm of one plus the market capitalization of company i as reported at the end of year $t-1$. In addition, we further assess the litigation history of firm i up to the observation date in the form of a dummy variable that takes the value 1 if the firm has already been sued at least once before the relevant observation, and 0 otherwise.

The next set of firm-level variables, through which the susceptibility to a lawsuit is approximated, relate to the firm's stock return performance. Turnover describes the probability that a share was traded at least once during the one-year period prior to the observation date or year. For the estimation of litigation risk, turnover is calculated as

⁶ Information on recession years is downloaded from the website of the Federal Reserve Bank of St. Louis: <https://research.stlouisfed.org/fred2/series/USREC>.

$$1 - \Pi_t \left[1 - \frac{\text{volume traded}_t}{\text{total shares}_t} \right] \quad (8)$$

for all trading days t in the year prior to the lawsuit.⁷

For the estimation of the propensity to be sued, performance is calculated as the return on security i during the year prior to the class action. For all other regression models, performance is computed as the return on security i during the estimation period. Volatility is computed through the standard deviation of daily returns of firm i . For the estimation of the propensity to be sued, the daily returns in the calendar year prior to the observation year are used for the calculation, in all other cases, the daily returns during the estimation period are used.⁸ We further include skew and kurtosis of the daily returns of stock i as explanatory variables that are related to the susceptibility of a firm to be sued. For the estimation of the propensity to be sued, again, the daily returns in the calendar year prior to the observation year are used for calculation, in all other cases, the daily returns during the estimation period are used.

In order to assess the relation between a firms operational performance, litigation risk, the probability of a settlement, and the shareholder reactions to securities class action lawsuit related events, we include the firm's return on assets as reported at the end of the year preceding the observation year as an explanatory variable. Potential agency conflicts are assessed through the use of the debt-equity ratio. This ratio is computed as the debt of firm i in the year $t-1$ divided by the common equity of firm i in year $t-1$.

The use of additional variables varies by estimation model. For the regression analysis of the shareholder wealth effects and the logistic regression of the probability of a settlement, we include a rapid filing dummy that takes the value 1 if the securities class action lawsuit is filed within two weeks following the class period end. For the estimation of the probability that a given lawsuit will reach a settlement, we further include a set of dummy variables that take the value 1 if the examined securities class action lawsuit is classified by the SCAC to be related to allegations regarding accounting fraud, IPOs, merger activity and 0 if the filing is not related to any of those allegation types. Finally, the estimated probabilities from the models for litigation risk and probability of settlement are included into the regression analysis of the shareholder wealth effects. This allows us to assess whether shareholders were able to correctly

⁷ Please note that in all other models t denominates all trading days during the estimation window [-263, -11], with $t=0$ as the event date.

⁸ We use the daily standard deviation of returns rather than the estimated annual volatility, which would be obtained through multiplication with the scaling factor $\sqrt{252}$.

anticipate incidence and outcome of securities class action lawsuits. For a summary of the variables used in the regression analyses see also Table A - 2 in the Appendix.

3.4 Propensity to be sued and probability of settlement

Following the methodology used by Kim and Skinner (2012), for each of the 10,201 companies in both the sued firm sample and the rival firm sample for which the relevant information could be retrieved, we estimate the risk of the company to be named defendant in a securities class action in a given calendar year t using information that is available to investors in year $t-1$. For all years from 1995 to 2014, we collect entries for all companies that have available data for all relevant variables. This leads to 64,776 individual firm years from which the litigation risk of firm i in year t is estimated based on data from $t-1$ via a logistic regression. For each of these entries, the dependent variable is a dummy variable that takes the value 1 if the firm was sued during this specific year t and 0 if not. The explanatory variables used in the model are organized mainly around the incentives of shareholders to file a lawsuit as outlined by Gande and Lewis (2009) and Kim and Skinner (2012). All variables are observed in the year $t-1$ before the year of the lawsuit filing.

For the estimation of the probability for a lawsuit i to reach a settlement rather than being dismissed, we employ the same logistic regression methodology used for the estimation of litigation risk described above. In this model, the dependent variable takes the value 1 if lawsuit i will reach a settlement and 0 if the lawsuit will be dismissed. We estimate the probability of settlement based on our sample of 1,004 securities class action lawsuits. In addition to the variables used in the estimation model for litigation risk, three dummy variables related to specific types of allegations made in the first identified complaint are included. These aim to capture whether certain types of allegations tend to be adjudicated more favorably for either plaintiff or defendant.

3.5 Regression analysis

An ordinary least squares (OLS) regression is carried out to analyze the impact of the identified variables on the return patterns that can be observed surrounding the filing and conclusion of a securities class action lawsuit. We include the variables previously used to estimate the propensity of a firm to be sued. In contrast to this calculation, however, the variables are calculated over the one-year estimation window $[t-264, t-11]$ where $t=0$ is the day of the lawsuit filing.

In addition to the variables used in the prior analyses, we include the estimated propensity for firm i to be sued in the observation year as well as the estimated probability that the associated class action lawsuit will reach a settlement. To obtain indications about how shareholders react

to correctly and incorrectly predicted outcomes, the estimated probability of a settlement is interacted with a dummy variable that captures the lawsuit outcome. For the regression analyses of rival firm CARs, we further include the distance measure described in Section 3.1. This variable is used to assess whether firm similarity is related to the effect size of industry spillovers. Finally, in order to control for heteroskedasticity, we employ a weighted least squares regression model with White robust standard errors. Regressions are performed for the anticipation window [-10;-2], the event window [-1;+1] and the period [+2;+10] following the event for both, the filing and the conclusion of securities class actions.

4. Empirical results

This section describes the results of the event study and the logistic regression analyses aimed at identifying whether shareholder can anticipate class action lawsuits and whether they can anticipate the ultimate outcome of such an event. In addition, a cross-sectional regression analyses is conducted to identify the key drivers of the observed stock return patterns surrounding the three major litigation events.

4.1 Event study results

The event study results for the revelation event that later leads to the filing of a securities class action show that shareholders experience very large and economically as well statistically significant losses of -20.06% during [-1;+1] event window. This result is largely in line with Ferris and Pritchard (2001). Shareholders also appear to be capable of anticipating this event, as the cumulative abnormal returns during the [-10;-2] event window are significant at -4.59%. This corresponds to an average economic loss of about 306.75 million US dollars (see Table 5 Panel A). Slight differences can be observed depending on the lawsuit outcome, indicating that investors may be able to anticipate the outcome of the resulting lawsuit (see Figure 1). In this case however, the similarity in the magnitude of the stock price reaction for dismissed and settled cases is noteworthy.⁹ There are three factors that may help to explain this phenomenon. Firstly, the certainty with which investors are able to discriminate between meritorious and dismissed lawsuits may be too weak to warrant substantial differences in the valuation adjustment at this point in time. Secondly, the settlement cost may play a subordinate role in the adjustment of shareholder expectations. The previous findings by Karpoff et al. (2008), for

⁹ The results divided into the different outcomes of a lawsuit, i.e. settlement or dismissal, are not tabulated here for brevity, but are available from the authors upon request.

instance, suggest that the reputational damages associated with litigation far outweigh regulatory fines. Finally, litigation entails a large amount of sunk costs, regardless of the outcome. During the [+2;+10] day post-event window, abnormal returns remain significantly negative, indicating that not all information has been incorporated into the share prices until the end of the event window. A possible explanation may be that investors are not able to fully process the implications of the information contained in complex events, such as the revelation of potential misconduct, until the event date or that the information is incomplete and more details on the event only emerge after the revelation event.

Table 5: Abnormal return changes for sued firms around major class action events

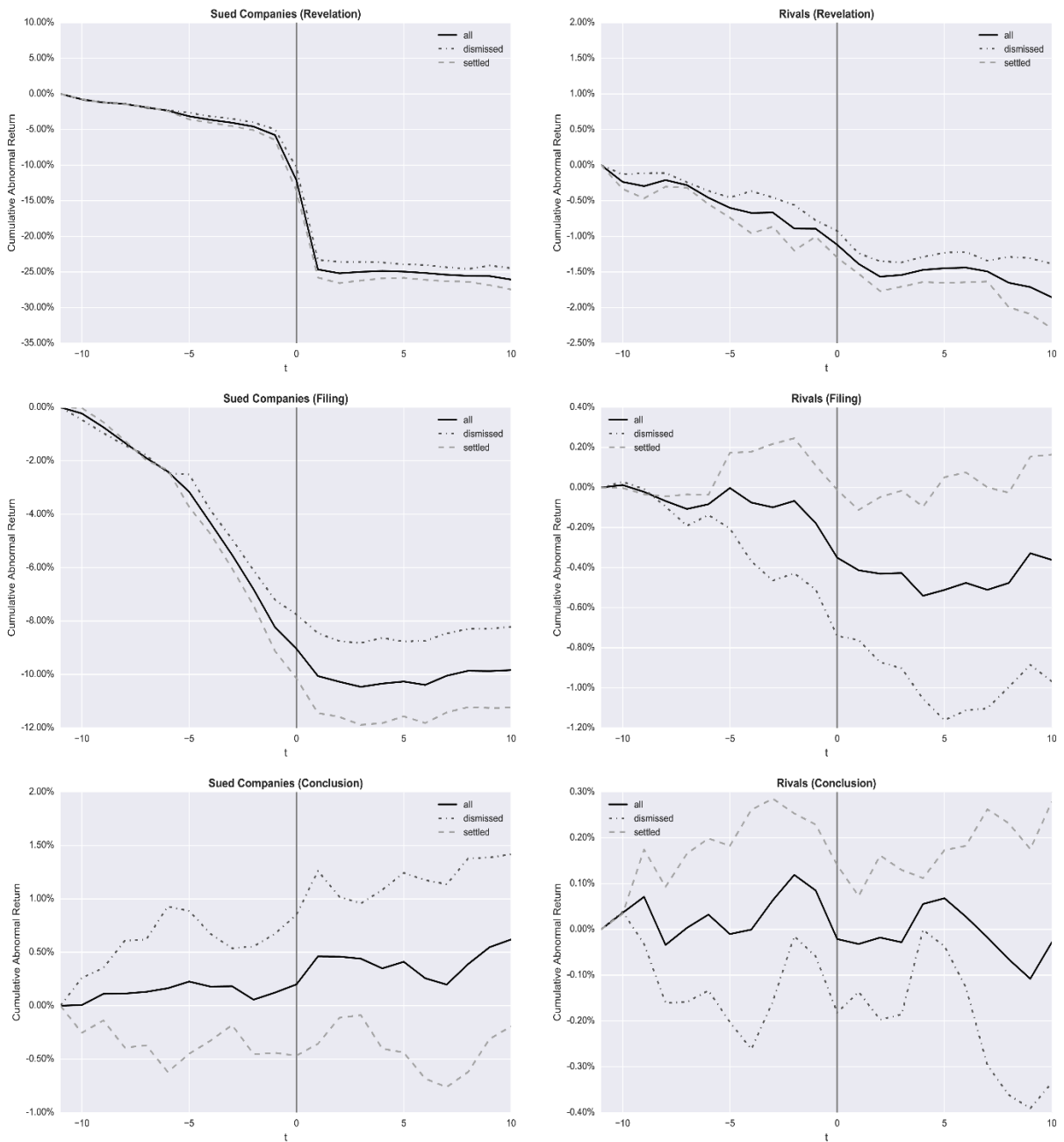
Event Window	Abnormal returns (%)				Δ in market value (million \$)				% Neg.	Obs.
	Mean	Median	t-stat	z-stat	Mean	Median	t-stat	z-stat		
Panel A: Revelation date										
[0;0]	-6.35%	-1.61%	-16.49***	-16.35***	-284.39	-9.45	-6.83***	-15.24***	67.47%	1377
[-1;+1]	-20.06%	-16.23%	-32.50***	-27.38***	-888.02	-112.42	-10.42***	-26.27***	85.26%	1377
[-10;-2]	-4.59%	-2.94%	-9.34***	-12.81***	-306.75	-17.77	-3.83***	-13.41***	65.07%	1377
[-10;+1]	-24.65%	-20.88%	-31.11***	-26.84***	-1,194.78	-157.14	-9.35***	-26.75***	85.77%	1377
[+2;+10]	-1.41%	-1.20%	-2.65***	-3.86***	-23.72	-3.63	-0.57	-4.32***	54.76%	1377
Panel B: Class action filing date										
[0;0]	-0.80%	-0.28%	-2.76***	-3.93***	-77.44	-0.66	-2.89***	-4.40***	55.67%	1349
[-1;+1]	-3.25%	-1.11%	-6.18***	-8.62***	-207.42	-2.77	-3.84***	-7.60***	58.56%	1349
[-10;-2]	-6.81%	-2.96%	-9.87***	-11.45***	-324.37	-12.11	-5.01***	-12.29***	63.53%	1349
[-10;+1]	-10.06%	-5.07%	-11.04***	-14.19***	-531.79	-24.12	-6.57***	-15.06***	67.01%	1349
[+2;+10]	0.22%	0.00%	0.45	-0.35	13.70	-0.81	0.30	-1.22	50.04%	1349
Panel C: Lawsuit conclusion										
[0;0]	0.08%	0.05%	0.77	-0.65	-1.99	0.08	-0.15	-1.33	49.03%	1081
[-1;+1]	0.40%	0.09%	2.26**	-1.49	-0.05	0.13	0.00	-0.81	48.57%	1081
[-10;-2]	0.06%	-0.15%	0.17	-0.82	-5.08	-0.70	-0.15	-0.74	51.16%	1081
[-10;+1]	0.47%	0.14%	1.13	-0.07	-5.13	-0.41	-0.13	-0.41	49.12%	1081
[+2;+10]	0.16%	-0.32%	0.48	-0.70	6.68	-1.70	0.13	-1.54	52.27%	1081

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.

The observed shareholder wealth effects on the filing date of securities class action lawsuits continue to align with expectations based on the findings in the literature. While significantly smaller than on the revelation date, abnormal returns are still significantly negative with an average abnormal return of -3.25% during the three day event window surrounding the filing date. This corresponds to an average economic effect of -207.42 million dollars. While seemingly small in absolute terms when compared to the effects on the revelation date, the shareholder wealth effects resulting from the resolved uncertainty of a resulting filing are substantial. As for the revelation of the adverse information, shareholders appear to anticipate the incidence of a lawsuit filing, leading to an even higher abnormal returns of -6.81% associated with a 324.37 million dollar loss (see Table 5 Panel B). This difference underlines the fact that measuring shareholder wealth effects of securities class action lawsuit without incorporating shareholder anticipations would dramatically understate the true wealth loss. Post-event, abnormal

returns are no longer significantly different from zero, indicating that the relevant information has been incorporated until the end of the filing event.

Figure 1: Sued companies and rival shareholder wealth effects surrounding the three major litigation events in a class action



As depicted in Figure 1, shareholders still appear to anticipate the outcome of the lawsuit, leading to a less pronounced reaction for cases that are eventually dismissed relative to the abnormal returns for lawsuits that will be settled. The difference here is more pronounced than for the revelation date.¹⁰

The event study results for the conclusion of shareholder class action lawsuits are presented in Table 5 Panel C. The results for the joined sample of settled and dismissed lawsuits show a slight positive return of 0.4% during the [-1;+1] event window, mostly driven by the trading day after the conclusion date. However, this positive return is only significantly positive according to the parametric t-test and not the nonparametric Wilcoxon test statistic, indicating that this result may not be robust. Moreover, the economic effects on the conclusion date for the joint sample do not reach significance for any of the event windows that aim to measure anticipation, event, and post-event effects. Given that for this event, the joint sample of dismissed and settled lawsuits contains subsamples for which opposing abnormal returns are to be expected, this result is not really surprising. The results in Figure 1 suggest that the sign of abnormal returns do indeed depend on the outcome of the lawsuit.

The results for the subset of dismissed class action lawsuit does indeed show that those firms receive significant abnormal returns of 0.71% during the three days surrounding the announcement of a dismissal.¹¹ The returns during the days leading up to this decision are also positive, but lack significance. In contrast, the returns surrounding settled lawsuits are not significantly different from zero. This, in combination with the observations made for dismissed lawsuits, suggest that shareholders appear to anticipate that a class action lawsuit will eventually be settled and therefore the actual settlement announcement is no new information to market participants. However, this may also be due to the way conclusion dates are reported by the SCAC. The reported conclusion date in case of a settlement usually coincides either with the date of a stipulation of a settlement between plaintiff and defendant or with the date on which the stipulation of settlement is confirmed by the court. This, however, usually takes place some time after the certification date that is reported for dismissals. This certification date constitutes the most decisive date for the question of whether or not a case will be settled or dismissed and thus the date on which the relevant information is available to the market participants. The

¹⁰ The results divided into the different outcomes of a lawsuit, i.e. settlement or dismissal, are not tabulated here for brevity, but are available from the authors upon request.

¹¹ The results divided into the different outcomes of a lawsuit, i.e. settlement or dismissal, are not tabulated here for brevity, but are available from the authors upon request.

measured abnormal returns can therefore not realistically be expected to significantly differ from zero as the corresponding information may already be incorporated into the share price. The shareholder wealth effects for the rivals of the sued firms around the revelation date, the filing date, and the date of the conclusion of the lawsuit are presented in Table 6 and the right hand side of Figure 1. Similar to the sued firms, abnormal returns around the revelation of bad news that will later lead to the filing of a lawsuit are significantly negative for rival firms. During the $[-1;+1]$ event window a negative abnormal return of -0.50% is observed, which corresponds to an economic loss of 41.38 million dollars, both highly statistically significant (see Table 6 Panel A). As for the revelation event effects observed for sued firms, shareholders seem to anticipate the incidence of bad news event, as a negative abnormal return of -0.89% is observed during the $[-10; -2]$ event window. Abnormal returns persevere to be significantly negative even after the revelation event, indicating the same delay in the information diffusion as for sued firms.

The filing of a lawsuit also leads to significant abnormal returns due to industry spillovers as well. During the $[-1;+1]$ event window, rival firms experience a statistically significant abnormal return of -0.35% corresponding to a 24.39 million dollar economic loss (see Table 6 Panel B). Negative effects from anticipation are -0.07% , but are not statistically significant. Following the lawsuit filing, mean rival returns are slightly positive with 0.05% , but also lack significance. On the other hand, median rival returns are negative and significant according to the Wilcoxon test statistic, indicating that the overall results may be driven by a few rival firms that experience statistically significant positive returns.

The conclusion of shareholder class action litigation lawsuits also yields significant negative abnormal returns for rival firms in the joint sample of both dismissed and settled lawsuits.¹² While these effects are small with -0.15% or 4.74 million dollars during the $[-1;+1]$ event window, it is remarkable that reaction is negative (see Table 6 Panel C). A closer examination of the dismissed and settled subsets shows that during the $[-1;+1]$ event window this effect persists across all subsets, being slightly more pronounced for lawsuits that are settled. Post-suit, abnormal returns continue to be very slightly negative and significant, albeit only according to the Wilcoxon test statistic. This results from the mean negative effect of -0.21% for dismissed lawsuits almost cancelling out the post-lawsuit abnormal return for settled lawsuits, which is

¹² The results divided into the different outcomes of a lawsuit, i.e. settlement or dismissal, are not tabulated here for brevity, but are available from the authors upon request.

0.28%. A noteworthy tendency that can be observed for the rival returns surrounding the conclusion of shareholder class actions is that the tendency for negative results appears to be driven by a smaller number of large effects, which are being reversed following the announcement, as the median abnormal return is usually more negative than the average abnormal return.

Table 6: Abnormal return changes for the sued firms' rivals around major class action events

Event Window	Abnormal returns (%)				Δ in market value (million \$)				% Neg.	Obs.
	Mean	Median	t-stat	z-stat	Mean	Median	t-stat	z-stat		
Panel A: Revelation date										
[0;0]	-0.22%	-0.22%	-3.79***	-7.67***	-20.95	-0.51	-4.12***	-8.30***	54.81%	5798
[-1;+1]	-0.50%	-0.55%	-4.90***	-8.80***	-41.38	-1.39	-4.92***	-11.02***	55.88%	5798
[-10;-2]	-0.89%	-0.67%	-5.45***	-8.01***	-88.92	-2.58	-5.62***	-10.37***	54.64%	5798
[-10;+1]	-1.39%	-1.16%	-7.29***	-10.34***	-130.29	-3.92	-7.16***	-13.87***	56.30%	5798
[+2;+10]	-0.47%	-0.41%	-2.72***	-4.45***	-23.35	-1.47	-1.63	-5.35***	52.40%	5798
Panel B: Class action filing date										
[0;0]	-0.17%	-0.14%	-3.30***	-5.58***	-10.25	-0.30	-2.61***	-5.56***	53.46%	6057
[-1;+1]	-0.35%	-0.40%	-3.89***	-6.78***	-24.39	-0.84	-3.17***	-7.57***	54.45%	6057
[-10;-2]	-0.07%	-0.45%	-0.40	-4.61***	-40.81	-1.45	-2.77***	-7.82***	52.77%	6057
[-10;+1]	-0.41%	-0.75%	-2.18**	-5.87***	-65.20	-2.29	-4.22***	-9.55***	54.02%	6057
[+2;+10]	0.05%	-0.29%	0.31	-2.84***	-19.56	-1.11	-1.34	-5.30***	51.66%	6057
Panel C: Lawsuit conclusion										
[0;0]	-0.11%	-0.12%	-2.03**	-4.63***	5.91	-0.29	1.96*	-3.35***	53.02%	5245
[-1;+1]	-0.15%	-0.23%	-1.71*	-4.47***	-4.74	-0.59	-0.73	-3.87***	53.02%	5245
[-10;-2]	0.12%	-0.26%	0.80	-2.22**	-24.73	-0.82	-2.37**	-3.99***	51.97%	5245
[-10;+1]	-0.03%	-0.35%	-0.19	-2.86***	-29.47	-1.43	-2.35**	-4.57***	52.32%	5245
[+2;+10]	0.00%	-0.25%	0.02	-2.07**	15.32	-0.82	1.53	-2.73***	51.82%	5245

***, **, * denotes significance at the 1%, 5%, and 10%-level of significance, respectively.

4.2 Anticipation of lawsuits

Using the identified variables that may potentially relate to litigation risk in Section 3.3, a logistic regression is performed to estimate the probability of a firm to be sued. The results of this regression are reported in Table 7.

Most of the litigation environment related variables are significantly related to the risk of litigation. Both, recession years and a higher number of lawsuits filed in the same industry within the previous year significantly increase the propensity of a firm to be sued. The firm's own litigation history, however, does not appear to have an impact on litigation risk. The industry classification adopted from Gande and Lewis (2009) does provide some information on the risk of being sued.

As firm-specific variables related to a firm's susceptibility for a lawsuit, return volatility, skew, and kurtosis reach statistical significance in their predictive ability. As expected, the risk to be sued increases with negative performance and increased volatility in the preceding year. The positive association between kurtosis and the likelihood of a lawsuit, as well as the negative relationship between skew and propensity to be sued, is intuitive, as a more negative price performance increase shareholders' incentives to file a lawsuit. Contrary to prior expectations,

share turnover during the year preceding the observation is not significantly related to a firm's litigation risk. In contrast, firm size is highly significant in the prediction of litigation. Return on assets, as a measure of operational profitability for the sample, is not significantly related to the propensity of a firm to be sued, indicating that well performing firms are no less likely to be sued than less profitable firms. This is somewhat surprising, as poor operating performance could potentially pressure the company's management to engage in fraudulent activity. The debt-equity ratio as a measure of potential for agency conflicts also fails to significantly contribute to the predictive power of the model.

Table 7: Logistic regression results for the probability of a firm to be sued

Variable	Coefficient	Standard error	z-Value	Pr(> z)
Intercept	-5.6620***	0.1148	-49.3360	< 0.0001
Turnover	0.0000	0.0000	0.0400	0.9679
Performance	-0.0727**	0.0356	-2.0420	0.0412
Volatility	0.4010**	0.1565	2.5630	0.0104
Skew	-0.0742***	0.0182	-4.0800	< 0.0001
Kurtosis	0.0086***	0.0016	5.2430	< 0.0001
Technology	0.2415***	0.0763	3.1660	0.0016
Retail	0.0912	0.1308	0.6980	0.4855
Financial	-0.6424***	0.1004	-6.3950	< 0.0001
Regulated	-0.2125*	0.1199	-1.7720	0.0763
Litigation intensity	0.0360***	0.0063	5.7250	< 0.0001
Previous lawsuit	0.0194	0.0780	0.2490	0.8034
Recession	0.4151***	0.0722	5.7530	< 0.0001
ROA	0.0000	0.0000	0.0880	0.9296
Debt-equity ratio	0.0000	0.0000	-0.0350	0.9719
Size	0.2319***	0.0143	16.2090	< 0.0001

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.
Null deviance: 11,423 on 64,775 degrees of freedom. Residual deviance: 10926 on 64760 degrees of freedom.

4.3 Anticipation of the litigation outcome

Table 8 reports the logistic regression results for the probability of a lawsuit to settle. The model uses the variables identified to be related to lawsuit susceptibility as well as to shareholder wealth effects resulting from litigation events. This set of variables is further expanded by variables that specifically test certain allegation types for an influence on the lawsuit outcome. In line with expectations, these allegation types are among the most relevant variables in the classification of a lawsuit outcome. While merger related allegations tend to be dismissed more often, allegations that involve accounting fraud or IPO related accusations tend to have a higher rate of settlement. According to the model, larger firms tend to be more successful when it comes to the dismissal of shareholder class action lawsuits. The greater resources these firms have to defend themselves, including better counsel, may drive this effect. Another explanation

may be that large firms attract more frivolous lawsuits due to the larger potential recovery payments that may be obtained by the counsel of a lead plaintiff in the case of a successful lawsuit.

Table 8: Logistic regression results for the probability of a lawsuit settlement

Variable	Coefficient	Standard error	z-Value	Pr(> z)
Intercept	0.6031**	0.2920	2.0660	0.0388
Accounting allegation	0.6550***	0.0900	7.2750	< 0.0001
IPO allegation	1.8390***	0.3083	5.9650	< 0.0001
Merger allegation	-0.4156**	0.1839	-2.2590	0.0239
Technology	-0.0738	0.1110	-0.6650	0.5063
Financial	-0.0282	0.1484	-0.1900	0.8495
Regulated	-0.1197	0.1697	-0.7050	0.4808
Retail	-0.4930**	0.1972	-2.5000	0.0124
Rapid filing	0.1755*	0.0978	1.7950	0.0726
Debt-equity ratio	-0.0001	0.0001	-1.1940	0.2326
Litigation intensity	0.0027	0.0123	0.2170	0.8283
Previous lawsuit	-0.1298	0.1081	-1.2010	0.2298
Recession	0.2116*	0.1281	1.6520	0.0985
ROA	-0.0004	0.0016	-0.2690	0.7878
Size	-0.0777***	0.0235	-3.3010	0.0010
Performance	0.0650	0.0505	1.2860	0.1984
Turnover	-0.3909**	0.1885	-2.0740	0.0381
Kurtosis	0.0009	0.0021	0.4100	0.6817
Skew	-0.0021	0.0229	-0.0900	0.9280
Volatility	-3.7610	2.8860	-1.3030	0.1924

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.
Null deviance: 1,391.1 on 1,003 degrees of freedom. Residual deviance: 1,182.1 on 984 degrees of freedom.

Turnover also significantly related to the lawsuit outcome. High turnover decreases the likelihood of settlement. This is not be expected under the current legal doctrine as the outcome of a lawsuit should be determined based on the facts connected to the allegations alone. Yet, a possible explanation may use similar reasoning as in the case of firm size. Higher turnover, which has repeatedly shown to be related to litigation risk, may attract frivolous lawsuits through the incentives it creates for the lead counsel. If these frivolous suits are later detected and dismissed, this may help explain the observed effect. The rapid filing dummy and the recession dummy reach weak statistical significance. Both have a tendency to increase the probability of a settlement. A rapid filing of a lawsuit might signal that it is a highly attractive lawsuit for the lead counsel, because the claims are meritorious. The positive sign of the recession dummy may be caused by various factors, including a higher probability of misconduct and resulting merit of claims in times of recession. The indication of statistical significance for this variable, however, is particularly weak. Other factors related to the price behavior of the stock

price during the year prior to the settlement, the litigation environment, and other firm-specific factors are not significantly related to the outcome of a securities class action lawsuit.

4.4 Regression analysis of the observed return patterns

Table 9 shows the results for the regression analysis of the cumulative abnormal returns for defendant firms around the event of the lawsuit filing date. Separate regression results are reported for the CARs over the three event windows that aim to capture anticipation ($[-10;-2]$), event ($[-1;+1]$), and post-event ($[+2;+10]$) return patterns. All regression results are reported with White heteroskedasticity robust standard errors along with the corresponding t-statistics for the explanatory variables.

The first result is that the model used in this analysis is rejected for the $[+2;+10]$ post-event window. The lack of predictive power indicates that all relevant information in relation to the lawsuit filing is already factored into the price of the firm's stock at this point. The results for the regression analysis of the cumulative abnormal returns over the $[-10;-2]$ anticipation window, however, allow for some clearer conclusions with regard to the drivers of the observed return patterns. Here, variables that are hypothesized to be connected with a firm's susceptibility to be sued as well as merit related variables are partially confirmed to be significant at the 10%-level of significance or higher. Firstly, the estimated probabilities for the incidence of a lawsuit and the probability of the resulting lawsuit to be successful can be shown to be significantly related to the CARs during the $[-10;-2]$ event window. Not surprisingly, both a higher expectation for a lawsuit to be filed against the firm and for this lawsuit to be successful lead to more pronounced losses as a result of the anticipation of a lawsuit. In addition, if a lawsuit is rapidly filed within the first two weeks following the revelation event, losses are amplified as well, potentially signaling that the lawsuit is either meritorious or the litigation value is large enough to cause increased competition among attorneys. Contrary to expectations, the litigation intensity within the firm's industry as well as most of the industry dummy variables fail to significantly contribute to the explanation of the anticipation CAR variance, with the exception of financial firms, who show a tendency for more negative abnormal returns in anticipation of a lawsuit filing. Furthermore, the majority of variables that attempt to capture the incentives of plaintiffs to sue, based on the development of stock prices during the year preceding the event, reach statistical significance. The signs of the estimated coefficients for kurtosis and volatility, however, are contrary to prior expectations, indicating that firms whose stock experienced high volatility and fat-tailed returns face smaller losses in the anticipation of a lawsuit. In contrast, higher turnover and a higher value for skew being more detrimental to shareholder wealth in

anticipation of a lawsuit is well in line with the hypothesis that those variables provide an incentive for plaintiffs to sue. Despite of the increased probability for larger firms to face shareholder litigation, larger firm size dampens the negative abnormal returns preceding the filing of a shareholder-initiated class action lawsuit. The greater resources available to these firms to defend themselves may again serve as an explanation for this observation. Firm-level characteristics that capture a firm's operational profitability and potential agency conflicts fail to achieve statistical significance.

Table 9: Regression results of returns for sued firms on the lawsuit filing date (n=1004)

Dependent variable Variable	CAR [-10;-2]		CAR [-1;+1]		CAR [+2;-10]	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Intercept	-0.0115	-0.1560	-0.0394	-1.1640	-0.0797*	-1.9530
Propensity to be sued	-1.2070*	-1.7540	-0.8364**	-2.0140	-1.1670*	-1.7460
Probability of settlement	-0.1566**	-2.3650	0.0136	0.4320	0.0110	0.2760
Settled	-0.0649	-1.5950	0.0123	0.5830	-0.0005	-0.0200
Turnover	-0.0522*	-1.6500	-0.0119	-0.6080	0.0631***	2.8410
Performance	-0.0182	-0.9850	-0.0168*	-1.7260	-0.0106	-1.1310
Volatility	1.0710**	2.2600	-0.5545*	-1.9120	-0.4328	-1.1180
Skew	-0.0063*	-1.7580	0.0018	0.9040	-0.0002	-0.0750
Kurtosis	0.0011***	4.0080	0.0008***	4.0640	0.0001	0.6290
Technology	-0.0084	-0.4240	0.0008	0.0610	0.0275*	1.9250
Financial	-0.0468*	-1.8140	-0.0278	-1.5970	-0.0107	-0.5430
Regulated	-0.0138	-0.3980	0.0422**	2.5600	0.0165	0.9060
Retail	0.0226	0.8910	0.0217	1.2760	0.0151	0.9350
Size	0.0143*	1.9460	0.0066*	1.7940	0.0074	1.4040
Litigation intensity	-0.0016	-0.9640	0.0033**	2.4800	0.0004	0.3100
Previous lawsuit	-0.0022	-0.1510	0.0146	1.3140	0.0098	0.8860
Recession	0.0139	0.6030	0.0367**	2.5170	0.0070	0.3320
Rapid filing	-0.1379***	-8.0210	-0.0690***	-6.0000	-0.0014	-0.1090
ROA	-0.0002	-1.1530	0.0004	1.4170	-0.0001	-0.2210
Debt-equity ratio	0.0000	1.4650	0.0000***	3.0280	0.0000	0.7950
Settled × Probability of settlement	0.1193	1.3980	-0.0468	-1.0940	-0.0056	-0.1060
Adj. R-Squared	0.1385		0.1156		0.0093	
F-value	8.554***		5.057***		1.324	

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.

During the three-day event window around the lawsuit filing, the main findings for the explanation of anticipation CARs persist with some minor changes. Here, the industry litigation intensity and the recession dummy reach significance at the 5%-level. The debt-equity ratio achieves an even higher level of significance. All those variables have positive signs, suggesting that the pricing effect at this point in time is potentially less related to shareholders' perceptions of increased litigation risk but rather to merit related questions, as the incidence of litigation in such an environment may carry less company-specific information. The positive sign for the debt-to equity ratio fits those assumptions, implying that shareholders believe firms

with less manager discretion to be less vulnerable to meritorious lawsuits with severe consequences. At the same time, shareholders do not seem to be able to successfully anticipate the outcome of the lawsuit at the time of the lawsuit filing, as indicated by the statistically insignificant dummy variable that captures the later success of a lawsuit.

Table 10: Regression results of returns for sued firms on the conclusion date of a lawsuit (n=1004)

Dependent variable Variable	CAR [-10;-2]		CAR [-1;+1]		CAR [+2;-10]	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Intercept	-0.0175	-0.6140	0.0097	0.5960	-0.0330	-1.2410
Propensity to be sued	-0.7095*	-1.8370	-0.2547	-1.2860	-0.6448	-1.6040
Probability of settlement	-0.0221	-0.7830	-0.0256	-1.4260	0.0198	0.6110
Settled	-0.0071	-0.3520	-0.0236**	-2.1260	-0.0072	-0.3370
Turnover	0.0152	0.9550	0.0124	1.1390	-0.0071	-0.3560
Performance	-0.0180***	-3.4590	-0.0070**	-2.1910	-0.0193***	-3.1690
Volatility	0.0858	0.2500	-0.0145	-0.0820	0.8609**	2.2730
Skew	-0.0033	-1.2560	-0.0007	-0.4750	-0.0044	-1.1500
Kurtosis	0.0005*	1.7480	0.0002	1.0730	0.0004	1.1410
Technology	0.0118	1.1860	0.0014	0.2380	0.0018	0.1860
Financial	-0.0152	-1.2720	0.0070	0.9900	-0.0168	-1.1560
Regulated	0.0004	0.0360	-0.0034	-0.5510	-0.0058	-0.6350
Retail	-0.0204	-1.1150	0.0045	0.5510	-0.0169	-1.2860
Size	0.0052*	1.8070	0.0003	0.1650	0.0091***	2.6000
Litigation intensity	0.0015	0.9400	0.0010	1.4690	-0.0013	-0.8320
Previous lawsuit	-0.0122	-0.9320	0.0002	0.0230	-0.0384**	-2.4720
Recession	0.0096	0.7400	0.0010	0.1390	-0.0047	-0.3700
Rapid filing	-0.0012	-0.1440	-0.0016	-0.3590	0.0001	0.0130
ROA	0.0001	0.3240	0.0000	-0.2950	0.0000	-0.1730
Debt-equity ratio	0.0000	0.1390	0.0000	1.5210	0.0000	-1.1070
Settled × Probability of settlement	0.0218	0.5610	0.0383	1.6430	0.0082	0.1870
Adj. R-Squared	0.0199		0.0115		0.0273	
F-value	3.701***		3.923***		1.279	

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.

The results for the regression analysis of cumulative abnormal returns around the conclusion date of shareholder initiated class action lawsuits are presented in Table 10. As in the case of the lawsuit-filing event, the model explaining cumulative abnormal returns during the [+2;+10] post-event window is rejected. During the [-10;-2] anticipation [-1;+1] event windows, only few variables can be related to the observed returns. Most notably, during the three-day window immediately surrounding the conclusion of a lawsuit, shareholders seem to anticipate the litigation outcome while at the same they do not appear to obtain this information during the anticipation window. In line with prior assumptions, lawsuit settlements yield significantly negative cumulative abnormal returns during the event window. While narrowly rejected at the 10% level, the interaction variable capturing confirmed investor expectations of a settlement

still indicates that successfully anticipated settlement events suffer less negative abnormal returns. This may also imply that negative surprises could lead to more pronounced losses in shareholder wealth. However, given the lack of significance, this has to be left open for further examination in later studies. The relationship between the performance during the preceding year and the returns observed around the conclusion of a lawsuit is also highly significant. Firms that performed well during the year prior to the lawsuit conclusion tend to experience higher losses in shareholder wealth as a result of the conclusion than firms whose stock performance was poor.

In summary, shareholders of sued firms appear to anticipate the incidence of a securities class action lawsuit against their firm and incorporate litigation risk into the stock price. The relevance of explanatory variables measuring litigation risk identified in the previous literature can be confirmed. The highest relevance is thereby found for variables related to historic share price developments and other factors related to the incentives of plaintiffs to sue. Evidence on the relevance of industry membership and other firm-level characteristics frequently mentioned in the literature are weak though. Further, shareholders appear to be able to anticipate the outcome of a lawsuit to a certain extent. While the influence of the estimated probability of lawsuit success is weak, other merit-related factors point into the direction that the perceived probability of a lawsuit to be meritorious seems to play an important role for shareholders of the defendant firm. Shareholders seem to incorporate all relevant information until one day after the actual event, leaving the regression model used for the explanation of returns following the event without explanatory power. This also indicates, that there are no arbitrage opportunities from securities class action litigation related events.

The results of the regression analysis of the abnormal returns around the filing of shareholder initiated class action lawsuits for rival firms are presented in Table 11. In contrast to the regression analyses performed on the events for sued firms, the estimated model cannot be rejected for any of the examined event windows surrounding the filing of a lawsuit, including the [+2;+10] post-lawsuit event window. The fact that significant predictions about post-event cumulative abnormal returns can be made is somewhat counterintuitive, as this implies that arbitrage opportunities exist with regard to rival firms after a lawsuit filing. However with an adjusted R-squared of less than 6%, predictability appears to be weak at most. Nevertheless, this result may also indicate that it takes the shareholders of rival firms somewhat longer to understand the true implications of the lawsuit filing for their company and they therefore adjust their price expectations later than the shareholders of the sued firm.

Table 11: Regression results of returns for rival firms on the lawsuit filing date (n=6017)

Dependent variable Variable	CAR [-10;-2]		CAR [-1;+1]		CAR [+2;-10]	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Intercept	0.0250**	2.0180	-0.0046	-0.6650	-0.0059	-0.4670
Propensity to be sued	-0.1436	-0.9000	-0.3026***	-3.9770	-0.4093***	-2.5890
Probability of settlement	-0.0324**	-2.2630	0.0027	0.3400	0.0174	1.1090
Settled	-0.0051	-0.5370	-0.0053	-1.0720	0.0244**	2.5340
Turnover	-0.0127*	-1.9180	-0.0001	-0.0210	-0.0037	-0.5310
Performance	-0.0088**	-2.0510	-0.0009	-1.0310	-0.0111**	-2.2410
Volatility	0.2755	1.5940	-0.0437	-0.5700	0.2949*	1.7460
Skew	-0.0031**	-2.4310	-0.0028***	-4.8500	-0.0034**	-2.5680
Kurtosis	0.0000	0.3510	0.0000	0.2860	-0.0001	-0.7070
Technology	0.0114***	2.6560	0.0038	1.6400	0.0070	1.5870
Financial	-0.0078	-1.3570	-0.0025	-0.8620	0.0028	0.5250
Regulated	-0.0035	-0.6230	0.0028	0.8390	0.0088	1.0980
Retail	-0.0002	-0.0310	0.0084**	2.0300	0.0082	1.3370
Size	-0.0014	-0.8270	0.0018***	2.5930	-0.0005	-0.3780
Litigation intensity	-0.0011**	-2.1100	-0.0001	-0.4640	0.0004	0.7890
Previous lawsuit	0.0039	0.7850	-0.0001	-0.0540	-0.0028	-0.6470
Recession	-0.0032	-0.5410	-0.0026	-0.9000	0.0029	0.4300
Rapid filing	-0.0054	-1.5310	-0.0059***	-3.0790	0.0037	0.9920
ROA	0.0000	-0.6320	0.0000***	-3.0820	0.0001**	2.2520
Debt-equity ratio	0.0000	-0.1230	0.0000	0.6170	0.0000	-0.7620
Euclidean distance to sued rival	0.0009	0.6870	-0.0011	-1.3850	0.0036**	1.9690
Settlement × Probability of settlement	0.0230	1.1890	0.0113	1.0950	-0.0535***	-2.5890
Adj. R-Squared	0.0216***		0.0282***		0.0554***	
F-value	5.119		23.45		39.01	

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.

During the [-10;-2] event window, the majority of significant variables are related to the industry litigation environment and other variables that capture lawsuit susceptibility, which are associated to turnover and share price performance. In line with prior expectations, turnover and skew are inversely related to the returns in anticipation of a lawsuit, indicating that the rival firm itself may run an increased risk of being sued as well. Contrary to expectations, technology firms tend to be less susceptible to litigation related spillover effects, as indicated by the significantly positive coefficient for the technology variable throughout all event windows surrounding the filing event.

During the three-day event window surrounding the filing date, the estimated probability for the rival firm to face litigation gains in importance, reaching high statistical significance. As anticipated, rival firms that are estimated to carry a higher litigation risk experience larger losses around the lawsuit filing date. In line with their sued counterparts, the negative returns are higher in the case of a rapid filing. A further similarity to sued firms is the positive effect of rival firm size on the filing-related returns. In addition, retail firms tend to experience less pronounced losses immediately surrounding the lawsuit filing against one of their competitors. It is however noteworthy that rival firms with high operational profitability suffer greater losses

around the day that a lawsuit is filed against one of their competitors. But, this effect is reversed during the post-event window where highly profitable rivals tend to experience considerably higher returns. Post-lawsuit, several variables not significantly related to the returns during the other event windows gain in relative importance. During the [+2;+10] day event window, shareholders of rival firms anticipate the outcome of the lawsuit against their competitor, leading to an appreciation of the stock price if the lawsuit against the other firm will be successful. This indicates that rival firms profit from successful lawsuits against their industry peers, who suffer losses resulting from both increased litigation cost and recovery payments. The more similar the sued firm is to its rival, as measured by the Euclidean distance composed of ROA and market capitalization, the greater the positive effect of litigation for the rival firm. At the same time, the interaction variable for the probability of lawsuit success and a later settlement indicates that correctly anticipated settlements lead to stronger shareholder wealth losses for rival firms. While this may seem to run contrary to expectations at first, particularly in light of the above findings, this effect may result from lawsuits that are both predictable and meritorious, implying more serious implications for the risk of rival firms to be susceptible to similar meritorious lawsuits, which may stem from industry-wide business practices.

The results with regard to the shareholder wealth effects around the conclusion date of class actions for rival firms are presented in Table 12. Similar to the results for rival firm CARs around the filing event, the regression model for the CARs of rival firms around the conclusion event cannot be rejected for any of the related event windows. This raises the same concerns regarding the predictability of post-event returns as in the previous analysis. Yet, as with the previous analysis, the overall explanatory power of the models remains rather low. Explanatory power is greatest for rival returns during the anticipation window with an adjusted R-squared of slightly above 3%.

During the [-10;-2] day event window, variables with regard to the outcome of the settlement seem to play the greatest role in the prediction of rival abnormal returns. The higher the estimated probability of a settlement, the greater are the losses that can be observed in anticipation of the lawsuit conclusion. Shareholders seem to be able to correctly anticipate the lawsuit outcome, leading to more aggressive discounts on rival shares in the case of a successful lawsuit. At the same time, the interaction variable capturing correct anticipation of successful lawsuits indicates that such correctly anticipated outcomes lead to better abnormal performance for the rival firms. Further, rivals that have previously been sued experience more negative returns around the conclusion of a lawsuit during both, the [-10;-2] as well as during the [+2;10] day event window. Firms with a higher debt-to-equity ratio suffer smaller losses in anticipation

of the conclusion, but this effect is then compensated during the three day event window surrounding the conclusion date. Similarly, rivals in the financial sector, while relatively less affected during the [-1;+1] day event window, face considerably larger losses during the days immediately following the lawsuit conclusion (i.e. the [+2;+10] day event window). Another noteworthy variable is the performance of the rival's stock during the year preceding the lawsuit conclusion event. Rivals with better stock performance experience significantly negative returns throughout the entire period surrounding the lawsuit conclusion of their competitors. Furthermore, contrary to the findings surrounding the lawsuit filing event, similarity between the rival firm and its sued competitor does not seem to play a role in the explanation of the rival returns around the conclusion of shareholder class action lawsuits.

Table 12: Regression results of returns for rival firms on the conclusion date of a lawsuit (n=4920)

Dependent variable Variable	CAR [-10;-2]		CAR [-1;+1]		CAR [+2;-10]	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Intercept	0.0172	1.4250	-0.0040	-0.6390	-0.0102	-0.9600
Propensity to be sued	-0.0019	-0.0150	0.0161	0.2630	-0.1112	-1.0310
Probability of settlement	-0.0379**	-2.3940	-0.0009	-0.1510	0.0065	0.5770
Settled	-0.0303***	-3.3110	-0.0047	-1.0630	0.0162*	1.7810
Turnover	0.0076	1.1960	-0.0009	-0.2720	-0.0154**	-2.2570
Performance	-0.0243***	-6.4400	-0.0080***	-5.3010	-0.0140***	-5.0750
Volatility	0.0499	0.3080	-0.0090	-0.0940	0.1056	0.6000
Skew	-0.0009	-0.6990	-0.0003	-0.5040	-0.0039***	-3.4270
Kurtosis	0.0000	-0.0600	0.0000	0.0740	0.0000	-0.0180
Technology	0.0033	0.8100	-0.0022	-0.9810	0.0025	0.6450
Financial	-0.0036	-0.7910	0.0057**	2.3390	-0.0092**	-2.1860
Regulated	-0.0057	-1.3020	0.0000	-0.0160	0.0018	0.3850
Retail	-0.0072	-1.0700	0.0009	0.2120	0.0013	0.2220
Size	0.0000	-0.0010	0.0007	1.0620	0.0032***	2.9080
Litigation intensity	-0.0001	-0.2120	0.0002	0.7490	0.0003	0.4120
Previous lawsuit	-0.0090***	-2.8780	0.0010	0.5310	-0.0101***	-3.3120
Recession	-0.0102**	-2.0700	-0.0034	-1.1850	0.0000	0.0090
Rapid filing	0.0033	0.8350	0.0030*	1.8040	-0.0003	-0.1030
ROA	0.0000	-0.3880	0.0000	0.5160	0.0000	0.6810
Debt-equity ratio	0.0000***	2.7690	0.0000***	-3.1820	0.0000	1.0050
Euclidean distance to sued rival	0.0011	0.7450	-0.0001	-0.1950	-0.0006	-0.4650
Settlement × Probability of settlement	0.0637***	3.5810	0.0079	0.9150	-0.0273	-1.5880
Adj. R-Squared	0.0302		0.0176		0.0198	
F-value	5.138***		3.52***		4.657***	

***, **, * denotes significance at the 1%-, 5%-, and 10%-level of significance, respectively.

In summary, there is evidence that shareholders of rival firms incorporate the information contained in litigation related events against their competitors into the firms' share price. Rival shareholders seem to be able to predict the litigation outcome to some degree and experience a wealth increase after the filing of a lawsuit against a competitor if this lawsuit will eventually be successful. This effect increases with the similarity between the sued firm and the rival

firms. At the same time, information that signals a heightened susceptibility of the rival firm to similar lawsuits leads to a reduction in the share price of the rival firm. In addition, we find evidence that post-event returns for rival firms are predictable to a certain degree. However, this predictability appears rather weak and it remains a question for further research if related arbitrage opportunities really exist in the face of transaction costs.

5. Summary and conclusion

This study examines shareholder wealth effects of shareholder-initiated class action lawsuits for sued firms and their closest industry rivals. Based on the process of shareholder-initiated class action lawsuits, three critical events are identified that are expected to have a significant impact on stock prices. First, the revelation date of a potential misconduct: This date provides shareholders with a basis for potential claims against the firm, as it becomes clear that the firm did not act in accordance to the law. Second, the actual filing of a class action lawsuit. This filing should resolve any residual uncertainty that may still remain following the revelation, as it is not clear on the revelation date whether a lawsuit will actually be filed. Third, the date of the conclusion of the lawsuit, either by dismissal or settlement. On this day, any remaining uncertainty with regard to the litigation outcome should be resolved and therefore again impact the share price of the defendant firm.

We find that shareholders are able to anticipate these critical events during a securities class action process and adjust their price expectation of the defendant firms' shares accordingly. We conduct multiple event studies for sued firms and their closest rivals. In line with expectations, we find that the revelation of potential misconduct and the following filing event of shareholder class action lawsuits lead to consistently negative shareholder wealth effects. With an average of -20.06% abnormal return during the three days surrounding the revelation date of potential misconduct, losses are much larger in magnitude than the -3.25% during the three days surrounding the filing date. Both these results are highly significant and economically relevant. In addition, this results also shows that only investigating the filing day of a lawsuit potentially underestimates the actual losses in shareholder wealth. In a similar fashion, we also observe significant losses for the firms' closest industry rivals surrounding these days. The average loss of -0.50% during the [-1;+1] event window surrounding the revelation day and -0.35% during the same event window surrounding the filing day are also highly significant, indicating that industry spillover effects can be observed. Shareholders of both, defendant firms as well as rival firms, appear to be able to anticipate those events and

capitalize a part of the losses in advance, leading to even higher aggregate shareholder wealth losses during the days prior to those events.

On the other hand, the event study results for the conclusion of class action lawsuits are less clear for the sued firms and their rivals. Defendant firms experience a slight positive price reaction during the three day period surrounding the conclusion day, primarily driven by lawsuits that are dismissed. Rival firms, in contrast, experience weakly significant negative returns of -0.15% during that time period that largely disappear when combined with the returns during the day prior to the event. Furthermore, the results of the event studies also indicate that shareholders are capable of anticipating the outcome of securities class action lawsuits, showing a consistent pattern of larger negative returns for securities associated with lawsuits that will eventually be settled rather than dismissed. The pattern of a decreasing magnitude of abnormal returns with the progression of the lawsuit in time implies that shareholders efficiently incorporate the relevant information that becomes available at earlier stages, with subsequent events resolving residual uncertainty. At the same time, the hypothesis of industry spillover effects can also be clearly confirmed.

We additionally estimated a logistic regression model that aims to explain securities litigation risk the multiple variables that the prior literature identified as potentially having an impact on the likelihood of a firm being sued. We find that there is a significant relationship between the characteristics of the historic returns of a firm and its litigation risk. Historic stock price performance, return volatility, as well as skew and kurtosis of returns, are significantly related to the incidence of litigation. The size of the firm as a proxy variable for solvency and the potential size of the recovery that can be achieved in a settlement also increases litigation risk. Several industry-wide characteristics, such as membership in the financial sector or the technology industry are also descriptive of a company's risk litigation risk. In addition, the litigation environment, driven by recession and industry-wide litigation trends, is shown to translate into a firm's susceptibility to be sued, giving further evidence of industry spillover effects. Yet, other firm-wide characteristics, such as profitability and leverage cannot be confirmed to be significant determinants of litigation risk.

A logistic regression analysis of the determinants of the litigation outcome provides evidence that company size plays a significant role in the ability of a company to defend itself against class action litigation. The results also indicate that certain types of allegations are more likely to lead to a settlement, such as accounting or IPO related claims. Merger related allegations, on the other hand, are less likely to lead to a successful lawsuit outcome in the form of a settlement.

Multiple cross-sectional regression analyses of the observed abnormal returns surrounding the days of a lawsuit filing and its conclusion further confirm the ability of shareholders to anticipate the incidence of securities class action lawsuits. The relevance of explanatory variables measuring the litigation risk are confirmed to help estimate the observed abnormal returns around litigation events. Variables capturing the historic share price performance of the sued firms play a central role. The majority of variables related to industry membership and additional firm-level characteristics do not significantly contribute to the explanation of abnormal returns. While the estimated probability of lawsuit success with the previously developed model is not significantly related to abnormal returns, some indications for merit-related factors are of significance with shareholders appearing to be capable of anticipating the outcome of a lawsuit to a certain extent. The regression analysis for the observed returns for defendant firms also shows that information is efficiently incorporated until one day after the event. Therefore, there are no arbitrage opportunities during the post-event days.

The regression analyses for the abnormal returns of the industry rivals suggest that they experience a slight increase in their stock price when a lawsuit against one of their competitors is filed. This effect increases with the similarity of the sued firm to its rival across the dimensions of market capitalization and return on assets. Simultaneously, information indicating an increased susceptibility of the rival firm to potentially face a similar lawsuit as the defendant firms leads to share price reductions. Finally, there is some evidence that post-event abnormal returns for rival firms are at least somewhat predictable. The statistical predictability is however weak and this apparent arbitrage opportunity may be explainable by market frictions such as transaction costs.

References

- Arena, M., & Julio, B. (2015). The effects of securities class action litigation on corporate liquidity and investment policy. *Journal of Financial and Quantitative Analysis*, 50(1-2), 251-275.
- Baker, T., & Griffith, S. J. (2009). How the merits matter: directors' and officers' insurance and securities settlements *University of Pennsylvania Law Review*, 157(3), 755-832.
- Bonini, S., & Boraschi, D. (2010). Corporate scandals and capital structure. *Journal of Business Ethics*, 95(2), 241-269.
- Bradley, D., Cline, B. N., & Lian, Q. (2014). Class action lawsuits and executive stock option exercise. *Journal of Corporate Finance*, 27, 157-172.
- Chava, S., Cheng, C. S. A., Huang, H., & Lobo, G. J. (2010). Implications of securities class actions for cost of equity capital. *International Journal of Law and Management*, 52(2), 144-161.
- Cheng, C. S. A., Huang, H. H., Li, Y., & Lobo, G. (2010). Institutional monitoring through shareholder litigation. *Journal of Financial Economics*, 95(3), 356-383.

- Choi, S., & Pritchard, A. C. (2012). SEC investigations and securities class actions: an empirical comparison. *Law & Economics Working Papers*, Paper 55.
- Cox, J. D., Thomas, R. S., & Kiku, D. (2006). Does the plaintiff matter? An empirical analysis of lead plaintiffs in securities class actions *Columbia Law Review*, 106(7), 1587-1640.
- Crutchley, C. E., Minnick, K., & Schorno, P. J. (2015). When governance fails: Naming directors in class action lawsuits. *Journal of Corporate Finance*, 35, 81-96.
- Deng, S., Willis, R. H., & Xu, L. (2014). Shareholder litigation, reputational loss, and bank loan contracting. *Journal of Financial and Quantitative Analysis*, 49(4), 1101-1132.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56.
- Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics*, 116(1), 1-22.
- Ferris, S. P., & Pritchard, A. C. (2001). Stock price reactions to securities fraud class actions under the private securities litigation reform act. *The University of Michigan Law and Economics Research Paper No. 01-009*.
- Fich, E. M., & Shivdasani, A. (2007). Financial fraud, director reputation, and shareholder wealth. *Journal of Financial Economics*, 86(2), 306-336.
- Field, L., Lowry, M., & Shu, S. (2005). Does disclosure deter or trigger litigation? *Journal of Accounting and Economics*, 39(3), 487-507.
- Gande, A., & Lewis, C. M. (2009). Shareholder-initiated class action lawsuits: shareholder wealth effects and industry spillovers. *Journal of Financial and Quantitative Analysis*, 44(4), 823-850.
- Griffin, P. A., Grundfest, J. A., & Perino, M. A. (2004). Stock price response to news of securities fraud litigation: an analysis of sequential and conditional information. *Abacus*, 40(1), 21-48.
- Habib, A., Jiang, H., Bhuiyan, M. B. U., & Islam, A. (2014). Litigation risk, financial reporting and auditing: A survey of the literature. *Research in Accounting Regulation*, 26(2), 145-163.
- Hankir, Y., Rauch, C., & Ueber, M. P. (2011). Bank M&A: A market power story? *Journal of Banking & Finance*, 35(9), 2341-2354.
- Helland, E. (2006). Reputational penalties and the merits of class-action securities litigation. *The Journal of Law & Economics*, 49(2), 365-395.
- Humphery-Jenner, M. L. (2012). Internal and external discipline following securities class actions. *Journal of Financial Intermediation*, 21(1), 151-179.
- Karpoff, J. M., Lee, D. S., & Martin, G. S. (2008). The cost to firms of cooking the books. *Journal of Financial and Quantitative Analysis*, 43(3), 581-612.
- Kim, I., & Skinner, D. J. (2012). Measuring securities litigation risk. *Journal of Accounting and Economics*, 53(1-2), 290-310.
- Lang, L. H. P., & Stulz, R. M. (1992). Contagion and competitive intra-industry effects of bankruptcy announcements: an empirical analysis. *Journal of Financial Economics*, 32(1), 45-60.
- McTier, B. C., & Wald, J. K. (2011). The causes and consequences of securities class action litigation. *Journal of Corporate Finance*, 17(3), 649-655.
- Schipper, K., & Thompson, R. (1983). Evidence on the capitalized value of merger activity for acquiring firms. *Journal of Financial Economics*, 11(1-4), 85-119.
- Strahan, P. E. (1998). Securities class actions, corporate governance and managerial agency problems. *Federal Reserve Bank of New York Research Papers*, No. 9816.

Appendix

Table A - 1: Distribution of allegations made in first identified complaints over time

Year	Accounting		IPO		Merger		Other		Total	Failure to disclose		Misrepresentations		Total		
1996	11	50%	0	0%	1	5%	10	45%	22	1%	7	35%	13	65%	20	1%
1997	29	48%	0	0%	3	5%	28	47%	60	3%	19	34%	37	66%	56	4%
1998	48	53%	1	1%	5	6%	36	40%	90	5%	32	38%	52	62%	84	6%
1999	52	58%	1	1%	2	2%	34	38%	89	5%	44	52%	41	48%	85	6%
2000	68	66%	0	0%	5	5%	30	29%	103	5%	48	49%	50	51%	98	7%
2001	175	45%	188	49%	1	0%	22	6%	386	20%	62	70%	27	30%	89	6%
2002	76	63%	2	2%	1	1%	42	35%	121	6%	74	63%	43	37%	117	8%
2003	72	66%	1	1%	1	1%	35	32%	109	6%	75	72%	29	28%	104	7%
2004	60	53%	2	2%	3	3%	48	42%	113	6%	53	55%	43	45%	96	7%
2005	51	55%	0	0%	2	2%	39	42%	92	5%	49	57%	37	43%	86	6%
2006	43	59%	1	1%	6	8%	23	32%	73	4%	27	61%	17	39%	44	3%
2007	46	43%	4	4%	1	1%	55	52%	106	6%	34	45%	42	55%	76	5%
2008	51	44%	3	3%	5	4%	58	50%	117	6%	30	50%	30	50%	60	4%
2009	39	51%	2	3%	5	7%	30	39%	76	4%	23	61%	15	39%	38	3%
2010	46	45%	2	2%	28	27%	27	26%	103	5%	64	96%	3	4%	67	5%
2011	43	37%	3	3%	33	28%	38	32%	117	6%	62	60%	41	40%	103	7%
2012	20	32%	4	6%	7	11%	32	51%	63	3%	59	53%	53	47%	112	8%
2013	10	24%	5	12%	4	10%	23	55%	42	2%	37	49%	39	51%	76	5%
2014	4	20%	2	10%	4	20%	10	50%	20	1%	18	50%	18	50%	36	2%
Total	944	50%	221	12%	117	6%	620	33%	1,902	100%	817	56%	630	44%	1,447	100%

Table A - 2: Logistic and OLS regression variable description

Variable	Variable description
Accounting allegation	Takes the value 1, if the class action is classified to have accounting related allegations made by the plaintiff through the SCAC and 0 else.
Debt-equity ratio	Debt of the firm <i>i</i> in the year <i>t</i> -1 divided by the common equity of firm <i>i</i> in year <i>t</i> -1 (Worldscope item WCOB231).
Distance	Euclidean distance of the rival firm to <i>i</i> its sued peer. The distance measure is based on market capitalization and ROA.
Financial IPO allegation	Takes the value 1, if the firm is classified as a technology firm via SIC and 0 else.
Kurtosis	Takes the value 1, if the class action is classified to have IPO related allegations made by the plaintiff through the SCAC and 0 else.
Litigation intensity	Kurtosis of daily returns on the stock of firm <i>i</i> . For the estimation of the propensity to be sued, the daily returns in the calendar year previous to the observation year are used for calculation, in all other cases, the daily returns in the estimation period [t-263, t-11] (in days) are used.
Merger allegation	Number of securities class action filings in the industry with the same 4-digit SIC code as firm <i>i</i> over the previous year.
Performance	Takes the value 1, if the class action is classified to have merger related allegations made by the plaintiff through the SCAC and 0 else.
Previous lawsuit	Performance is calculated as the return of security <i>i</i> during the year prior to the event for the estimation for the propensity to be sued. In all other models, performance is computed as the price of the security during the one year estimation period.
Probability of settlement	Takes the value 1, if company <i>i</i> has been sued before the observation date and 0 else. In the estimation model for the propensity to be sued, this variable is based on annual observations (takes the value 1 if the firm <i>i</i> , observed in year <i>t</i> has faced a previous lawsuit until and including year <i>t</i> -1).
Propensity to be sued	Probability of lawsuit <i>i</i> to reach a settlement rather than being dismissed, as estimated via a logistic regression model.
Rapid filing	Probability of firm <i>i</i> to be sued in a securities class action lawsuit in year <i>t</i> , as estimated via a logistic regression model.
Recession Regulated	Takes the value 1, if the first identified complaint was filed within 10 trading days after the class period end as reported by the SCAC and 0 else.
Retail	Takes the value 1, if the observation year is a recession year and 0 else.
ROA	Takes the value 1, if the firm is classified as a technology firm via SIC and 0 else.
Settled	Takes the value 1, if the firm is classified as a technology firm via SIC and 0 else.
Size	Takes the value 1, if the lawsuit is settled and 0 if it is dismissed.
Skew	Market capitalization is measured as the logarithm of one plus the market capitalization (Worldscope item WCOB001) of company <i>i</i> as reported at the end of year <i>t</i> -1.
Technology Turnover	Skew of daily returns on the stock for firm <i>i</i> . For the estimation of the propensity to be sued, the daily returns in the calendar year prior to the observation year are used for calculation, in all other cases, the daily returns in the estimation period are used.
Volatility	Takes the value 1, if the firm is classified as a technology firm via SIC and 0 else.
	Turnover describes the probability that a share was traded at least once in the one-year period previous to the lawsuit filing. $1 - \prod_t [1 - \text{volume traded} / \text{total shares}_t]$ for all trading days <i>t</i> in the year previous to the lawsuit for the estimation of litigation risk. In all other models, <i>t</i> denominates all trading days during the estimation period.
	Standard deviation of daily returns on the stock of firm <i>i</i> . For the estimation of the propensity to be sued, the daily returns in the calendar year prior to the observation year are used for the calculation, in all other cases, the daily returns during the estimation period are used.