Does Shareholder Litigation Risk Cause Public Firms to Delist? Evidence from Securities Class Action Lawsuits

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ABSTRACT

This paper examines whether shareholder litigation contributes to the decline in the number of U.S. stock market listings. We find that higher litigation risk induces firms to delist. We establish causality using two exogenous shocks to ex-ante litigation risk, including federal judge ideology and an influential judicial precedent. We find that the effect is at least partially driven by indirect costs of litigation and that being private can significantly reduce the threat of litigation. The results suggest that mitigating excessive litigation costs for public firms is crucial to ensure the continued vibrancy of the U.S. stock market.

Keywords: Shareholder litigation, Securities class action lawsuit, Stock market listing, Delisting

JEL Classification: D04, D22, G30, G38, K22

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"The solution to the competitive problem of U.S. capital markets lies, on the one hand, in reducing the burden of litigation …."

~ Report of The Committee on Capital Market Regulation (2006)[1]

"Class members who remain invested in the defendant companies are the real losers. The companies in which they're invested pay settlement and legal fees, leaving the shareholder with devalued stock."

~ The U.S. Chamber of Commerce Institute of Legal Reform (2005)

Securities class action (SCA) litigation is a governance device to discipline managers and mitigate agency problems in corporations (La Porta et al., 1998). Shareholders are entitled to file a lawsuit against the firm's managers and directors if they commit wrongdoing. However, mounting concerns have been raised with regard to the proliferation of abusive and meritless litigation practices.[2] According to Cornerstone Research's 2019 Review on SCA filings, the likelihood of litigation for U.S exchange-listed firms increased for seven consecutive years.[3] This rising trend has not only been observed in the frequency of litigation cases but also in the magnitude of shareholder value destruction. In aggregate, defendant firms experience substantial loss of their market values, up to US$ 280 billion in 2019 during their litigation

[1] The Committee on Capital Markets Regulation is an independent, bipartisan committee composed of 22 corporate and financial leaders from the investor community, business, finance, law, accounting, and academia.
[2] See Report "A Rising Threat – The New Class Action Racket That Harms Investors and the Economy", the U.S. Chamber of Commerce – Institute for Legal Reform, October 2018.
[3] We observe similar findings in our sample period. Figure 1 shows that the average annual litigation rate in the last 5 years accelerated more than 40% as compared to that of the preceding 5-year period and out of these cases, while Panel A of Table 1 shows that an average of more than 35% of litigation cases were dismissed.

period, more than double the 1997-2018 average.[4,5] This surge in litigation motivated the passage of the Private Securities Litigation Reform Act (PSLRA) in 1995 and inspired the recent approval by the U.S. House of Representatives for the Lawsuit Abuse Reduction Act (LARA) in 2017.[6] This paper examines the effect of SCA litigation on the delisting decisions of U.S. publicly listed firms. As delistings explain up to 46% of the recent reduction in the number of listed firms (Doidge, Karolyi, and Stulz, 2017), the study contributes to the debate on potential reasons for the recent shrinkage of the U.S. stock market.

A firm will consider delisting when the costs of being public exceed its benefits (Djama, Martinez, and Serve, 2014).[7] Shareholder litigation imposes significant *direct* costs, such as the legal expenses to settle a lawsuit, especially for unwarranted litigation but expensive to defend, and related human resources involved for protracted frivolous disputes. In our sample, the average settlement amount (which excludes some direct costs such as legal and consulting

[4] In Cornerstone Research's 2019 Review, the Disclosure Dollar Loss Index estimates the effect of all information revealed at the end of the class period (the period during which the unlawful conduct allegedly occurred) and is measured by the aggregate dollar value change in market values of defendant firms in all federal and state SCA filings between the trading day immediately preceding the end of the class period and the trading day immediately following the end of the class period.

[5] In recent decades a new practice has arisen whereby "plaintiffs' lawyers initiated and controlled the lawsuits, using professional plaintiffs who purchased a few shares of stock in multiple companies so they would be able to sue whenever called upon by the lawyers." ~A Rising Threat – The New Class Action Racket That Harms Investors and the Economy, the U.S. Chamber of Commerce – Institute for Legal Reform, October 2018.

[6] To date, the 2017 Act has not been passed by the Senate.

[7] Public corporations enjoy many economic benefits, including better access to finance (Saunders and Steffen 2011), lower cost of capital (Hail and Leuz, 2006), less information asymmetry with other market participants (Easley, Hvidkjaer, and O'Hara, 2002), higher liquidity, and a larger investor base (Merton, 1987). However, being public also carries costs. For instance, public firms must comply with strict reporting and disclosure requirements. Compliance costs, such as increased fees for hiring and retaining auditors, outside directors, and lawyers, can be substantial (Pagano et al. 1998; Ritter, 1987). Engel, Hayes, and Wang (2007) find that the frequency of U.S. firms going private increased after the passage of the Sarbanes–Oxley Act in 2002, suggesting that this law has increased the compliance burden. Furthermore, changes in a firm's competitive environment can increase the proprietary costs of disclosing valuable information to competitors (Campbell, 1979; Healy and Palepu, 2001).

fees), amounts to 0.45% of an average firm's total assets. Given that an average return on assets (ROA) in the sample is 2.7%, this cost is economically significant.[8] In addition, defendant firms are subject to substantial *indirect* costs. Upon the announcement of a SCA lawsuit, regardless of the merits, yet undecided, the market value of the defendant firm can shrink by an average of 3.6% in the first five days and by 100% within the first calendar year of the announcement date. This substantial loss of the defendant firms' market value during the litigation period significantly damages the firm's reputation, erodes investor confidence and hence harms the firm's ability to access financial markets. Moreover, these detrimental effects lead managers to suboptimally alter their behavior from long-term goals to avoid lawsuits. Given the reasons as discussed, we hypothesize that the burdens of shareholder litigation can exacerbate the listing costs of public firms and drive firms to delist.

Using a sample of 87,220 firm-year observations with 3,071 lawsuits from 1996 to 2017, we find that firms are more likely to delist after experiencing an SCA lawsuit. A shareholder lawsuit is associated with an increase in delisting probability by approximately 16.8% percentage points. This effect is economically substantial. For comparison, a one standard deviation increase in a firm's size is associated with a 2.7% percentage point lower delist rate. In the baseline specification, we consider all types of delistings, including voluntary and forced cases, and the occurrence of litigation suits to evaluate the burdens of both *direct* and *indirect*

[8] The effect of direct litigation costs can be substantial. It is possible that a firm could be forced to delist after draining its financial resources due to protracted frivolous disputes or unwarranted litigation but expensive to defend. In our analysis, up to approximately 14% of litigated firms delist within one year of an SCA lawsuit, potentially reflecting the impact of direct litigation costs.

litigation costs on firm delisting cases.[9] In subsequent analysis, discussed below, we adopt an ex-ante measure of litigation risk to remedy the endogeneity problem between litigation and performance, and confirm the causality of our baseline result.[10]

In the baseline specification, we control for important factors affecting a firm's delisting likelihood such as underperformance problem, industry competition (Kahle and Stulz, 2017), merger waves (Cartwright and Cooper, 1990), venture capital financing cycles (Ljungqvist et al., 2018), and common macro-economic shocks. The litigation effect remains qualitatively unchanged when controlling for potential governance effect[11], when using various estimation models, including probit and Cox hazard models, and under alternative subsamples that exclude extreme events such as the bursting of the dotcom bubble in 2001 and the financial crisis in 2008. Importantly, we show that the forward indicator of a litigation suit does not generate any impact on delisting rate. If we expect confounding factors, such as poor on-going or long-lasting operating issues, to trigger litigation suits and then delisting rate, we would expect to observe the opposite or the effect exists prior to the litigation event.

Nevertheless, a simple OLS specification likely has endogeneity problems. Firms with financial difficulties or operating issues are more likely to delist; these are also the firms that are likely most susceptible to shareholder litigation. To address the endogeneity concern we adopt two identification approaches.

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[10] While the adoption of an ex-ante proxy of litigation risk would help alleviate the endogeneity concern, it does not help to quantify the burden of direct litigation costs on delisting. As such, we include the analysis using both the actual occurrence of litigation suits and ex-ante measures of litigation risk in the paper.

[11] Firms may delist to strengthen managerial oversight (Muscarella and Vetsuypens, 1990).

The first identification approach exploits the surprise court ruling in the *In Re: Silicon Graphics Inc. Securities Litigation* case from the Ninth Circuit Court of Appeals on July 2, 1999 as a natural experiment. The 1999 ruling made the pleading standards to initiate an SCA lawsuit significantly more restrictive, thereby reducing the litigation risk for firms located in the Ninth Circuit.[12] We discuss the institutional details of the ruling and present validity testing of the ruling in the Section 3. We show that this decision resulted in a 26% drop in the number of SCA lawsuits in the Ninth Circuit area after 1999. The new, more stringent pleading standards for initiating an SCA lawsuit within the jurisdiction of the Ninth Circuit also reduced the propensity of treated firms to delist relative to a set of control firms residing outside the Ninth Circuit.[13]

To further demonstrate that reducing the litigation risk encourages firms to remain public, we analyze stock market reactions to delisting events following the Ninth Circuit ruling, when there was less incentive for firms to delist due to the reduced likelihood of SCA litigation. The cumulative abnormal returns (CARs) around delisting events are markedly lower for treated firms. Lower CARs around delisting events are consistent with a change in composition

[12] Cox et al. (2009) reports that it is impractical for litigants to sue a firm outside of its headquarter state because if the plaintiff does so, the defendant firm can immediately file a motion, which is likely to be approved, to relocate the suit. Hence, rather than engage in costly and potentially futile forum shopping, they file suit initially in the defendant company's home district. Indeed, Cox et al. (2009) show that 85% of securities fraud class actions are filed in the home circuit of the defendant firm.

[13] Although it is possible that firms could relocate their headquarters to mitigate their litigation risk, due to various binding constraints such as their local financial network, knowledge hub, or supply chain location, firms do not frequently move their headquarters. Using data from SEC Analytics and tracking historical headquarters locations for every firm that files financial statements with the SEC, we find that only 12.8% of Compustat firms relocate their headquarters during the 20-year sample period from 1996–2017.

towards lower quality firms delisting, and supports the hypothesis that lower litigation risk results in better quality firms remaining listed.[14]

The second identification approach uses the ideology of federal judge appointments as a shock to ex-ante litigation risk. When the law is ambiguous, different legitimate interpretations, driven by judicial political orientation, can influence judicial decision making. Prior literature documents that liberal judges (those appointed by Democratic presidents) tend to support individual investors, whereas conservative judges (those appointed by Republican presidents) tend to support big business and free and less regulated markets (e.g., Fedderke and Ventoruzzo, 2016; Staudt, Epstein, and Wiedenbeck, 2006). As such, liberal judges pose a higher litigation risk to firms than conservative judges (Huang, Hui, and Li, 2019).

We follow prior literature in legal studies and accounting to construct proxies for federal judges' political ideology and employ these as an exogenous shock to ex-ante litigation risk (e.g., Sunstein, Schkade, and Ellman, 2004; Fedderke and Ventoruzzo, 2016; Huang, Hui, and Li, 2019). The federal judge ideology identification strategy allows us to take advantage of cross-sectional and time series variation of federal judge composition at the Circuit court level to attenuate the potential confounding effects of corporate policy and performance on delisting choice.[15] Consistent with the previous analysis, the results show that when the judges in a firm's circuit are more liberal (higher litigation propensity), firms are more likely to delist.

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[14] Better quality firms would enjoy higher delisting CARs (Engel, Hayes, and Wang, 2007). For example, when Elon Musk, the CEO of Tesla, expressed his intention to take Tesla private, the stock market reacted positively. "Elon Musk Says Tesla May Go Private, and Its Stock Soars," *New York Times*, August 7, 2018 (https://www.nytimes.com/2018/08/07/ business/tesla-stock-elon-musk-private.html).

[15] The correlation between the proxies of federal judge ideology and the proportion of having a Democratic president is lower than 0.01, suggesting that our judge ideology variables have high location variation across firms. In addition, we include industry-year fixed effects in the analysis to control for common macro-economic shocks.

We next explore the underlying mechanics of why litigation causes firms to delist. First, we address the possibility that the main finding is driven by firms forced to delist due to financial distress caused by having to pay a SCA legal settlement amount. To evaluate the degree to which direct costs influence a firm's decision to delist, we categorize all delisting cases into forced and voluntary decisions and find that the effect of litigation is significant for both types. The idea is that forced delisting, especially for those who lost a SCA lawsuit, will likely incur high direct costs, while voluntary delistings will have low direct costs. The results show that the delisting effect is not only driven by forced responses to litigation costs but also by firms' voluntary decisions.

As an alternative approach to determine whether the indirect costs of litigation events can drive firms to delist, we focus on SCA lawsuits in which the case is subsequently dismissed versus those where the lawsuit is eventually settled. We find the propensity to delisting is elevated for both scenarios. The results show that even without a direct financial loss, the threat of low-quality lawsuits, where dismissal is likely, are sufficiently burdensome to encourage firms to delist.

In the final analysis, we test whether a firm being private can successfully decrease the likelihood of SCA litigation. Private firms can reduce their exposure to litigation suits for at least two reasons: (1) they have a concentrated ownership structure that can mitigate conflicts of interest and information asymmetry, and enhance monitoring between shareholders and managers (e.g., Asker, Farre-Mensa, and Ljungqvist, 2011, and Gao, Harford, and Li, 2013); and (2) they can limit their publicity and so avoid being targeted by opportunistic lawyers (Johnson, Kasznik and Nelson, 2000 and 2001). To evaluate the private firm hypothesis, we augment the main dataset with financial data on non-publicly listed firms from Compustat-

Capital IQ. Because non-publicly listed and public firms are different in terms of their size, profitability, growth, and cash ratio, we create a matched sample of public and non-publicly listed firms. The results show that the frequency of SCA lawsuits directed at non-publicly listed firms is substantially lower than those directed at their public counterparts. Relative to public firms, non-publicly listed firms experience a 32% lower rate of litigation. To ensure these differences are not driven by unobservable differences between public and non-publicly listed firms, we track the financial and litigation data of the same firm before and after an IPO. We find that the litigation rate increases dramatically after firms go public.

This paper makes two primary contributions. First, we contribute to the literature on the impact of the U.S. class action litigation system on the stock market.[16] Spiess and Tkac (1997) and Johnson, Kasznik, and Nelson (2000) show that following the enactment of the 1995 Private Securities Litigation Reform Act, the market values of firms prone to meritless class action lawsuits increase. Romano (1991) and Gande and Lewis (2009) examine share price reactions to SCA lawsuits. Gagnon and Karolyi (2018) and Licht et al. (2018) investigate U.S. cross-listed foreign firms' stock price reactions following the U.S. Supreme Court's ruling in the *Morrison* v. *National Australia Bank* case that limits the extraterritorial application of the Rule 10b-5 anti-fraud provision. Gande and Miller (2012) investigate stock price reactions of these firms following SCA lawsuits. Cheng, Srinivasan, and Yu (2014) compare the securities litigation rates between U.S. and U.S. cross-listed foreign firms.

[16] Another strand of literature documents the effect of litigation on corporate policies such as Johnson, Kasznik and Nelson (2000 and 2001), Rogers and Buskirk (2009), Crane and Koch (2018), Houston et al. (2019), Lin et al. (2019), and Lin et al. (2020).

Second, we contribute to the growing body of research offering explanations for the shrinkage of the U.S. stock market. Doidge, Karolyi, and Stulz (2017) report that U.S. firms are increasingly delisting because the net benefits of being listed have declined. Additional studies argue that the decision to delist is influenced by the trade-offs between the costs and benefits for the economic parties concerned (Kim and Weisbach, 2008; Pagano, Panetta, and Zingales, 1998). Leuz, Triantis, and Wang (2008) show that the 2002 Sarbanes–Oxley Act enabled firms "going dark" to protect private control benefits and decrease outside scrutiny. Doidge, Karolyi, and Stulz (2010) find evidence that the passage of the Sarbanes–Oxley Act increased listing costs for foreign firms, and so firms with a low demand for external capital would be more likely to terminate their Securities and Exchange Commission (SEC) registration.

We add to these literatures by examining the link between securities litigation risk and U.S. domestic firms' decisions to delist. While the prior literature documents the sizeable market reaction to SCA litigation, we focus on whether the threat of such litigation is sufficiently burdensome to influence firms' delisting decision. An important methodological contribution is that we utilize the relationship between judicial philosophy and litigation probability, documented in prior studies, to overcome endogeneity issues between delisting and firm-specific characteristics.[17]

[17] Huang, Hui, and Li (2019) shows evidence on the relationship between judges' liberal philosophy and litigation probability. Pinello (1999), Cross (2003), and Staudt, Epstein, and Wiedenbeck (2006) provide evidence in support of the important role of judicial ideology on liberal vs. conservative court rulings.

This paper highlights how the legal landscape governing the U.S. investing universe has an important role in influencing the composition of the stock market. The threat of excessive legal costs diminishes the attractiveness of being a publicly traded firm. For policymakers, striking the right balance between protecting shareholder rights and limiting the costs of being a public firm is critical to ensure the continued vibrancy of the U.S. stock market.

1. Data and Summary Statistics

Our sample consists of U.S. incorporated public firms included in the merged CRSP-Compustat database between 1996 and 2017. We start in 1996 because that is when data on SCA lawsuits become available. We exclude financial firms (SIC 4900–4999), utilities firms (SIC 6000–6999), and unclassified firms (SIC 9900–9999) from the sample. All continuous variables are winsorized at the 1st and 99th percentiles. The final sample comprises 11,280 firms and 87,220 firm-year observations.

We obtain data on SCA lawsuit filings from the ISS Securities Class Action Services (ISS-SCAS) database.[18] This database provides filing dates for each lawsuit and related information on the lawsuit's filings. The database includes lawsuits filed at federal and state courts from 1996 to 2017. According to Johnson (2012), the Securities Litigation Uniform Standards Act (SLUSA) and the Class Action Fairness Act (CAFA), enacted by Congress in 1998 and 2005,

[18] As we are interested in the litigation cases of both publicly listed and private or over-the-counter (OTC) firms, the Stanford Securities Class Action Clearinghouse (SCAC) database, which focuses only on lawsuits filed in federal courts, does not provide sufficient data coverage for our analysis.

respectively, relegate SCA cases to state courts if they primarily involve class actions related to securities that are not nationally traded.[19]

Panel A of Table 1 displays the yearly distribution of SCA lawsuits and the rates of litigation in the sample.

Insert Table 1 Here

The litigation rate equals the number of SCA lawsuits divided by the total number of firms. The average litigation rate in the sample is 3.52%. The litigation rate peaked in 2000 before the dotcom bubble burst. The litigation rate was then stable—between approximately 1% and 3%—from 2002 to 2008, and it rose to a range of 3% to 6% between 2009 and 2017.

In columns (4) to (7), we group the total SCA cases into dismissed and settled cases. A lawsuit is considered dismissed when the judge decides to grant a dismissal motion or the plaintiff decides to drop the case voluntarily. A case is classified as settled when a resolution is reached between the disputing parties. Classifications of individual cases as either dismissed or settled are given in the ISS-SCAS database. The sum of the dismissed and settled cases, shown in columns (4) and (7), does not add up to the total number of SCA cases in column (2) because there are active cases for which a resolution is still pending. On average, 37.7% of SCA cases are dismissed during the sample period. Column (8) reports the ratio of dismissed

[19] In particular, Johnson (2012) document that following the congressional restrictions embodied in SLUSA (1998) and CAFA (2005), SCAs in state courts involve: (1) claims relating to corporate governance or M&A transactions that are based on the law of the defendant's state of incorporation; (2) class actions related to securities that are not nationally traded; (3) class actions with a relatively small size of plaintiff class; and (4) class actions that solely feature claims under the 1933 Securities Act.

cases to settled cases. The ratio fluctuates throughout the sample. Note that in the final years of the sample the ratio spikes upwards. We do not try to make interpretations for the years 2014 onwards because there are still several pending cases in these years. In the sample, the average time from the date of a SCA's filing to its settlement is 1.7 years and 10% of the cases can take more than 3 years to settle.

Panel B of Table 1 shows the distribution of SCA litigation across one-digit SIC industries. We observe no meaningful differences in litigation rate across industries. The litigation rate varies from 2.31% in the construction industry to 3.98% in the services industry.

We obtain delisting information and stock prices and returns from the CRSP database. We follow Doidge et al. (2017) and consider a firm to delist in the year when it deregisters and is omitted from the CRSP database. Historical data on a firm's headquarters and state of incorporation are collected from Bill McDonald's website. McDonald extracts this information from 10-K reports in the SEC's EDGAR database and publishes it on his website.[20] Note that we cannot use the state of incorporation variable found in the Compustat database because it only contains information on a firm's current state of incorporation.

For each year, Panel A of Table 2 reports the total number of listed firms, the number of delisting firms, and the annual delisting rate.

Insert Table 2 Here

[20] https://sraf.nd.edu/data/augmented-10-x-header-data/.

The number of public firms in column (1) declines from 5,138 in 1996 to 3,181 in 2017. The delisting rate in column (3) fluctuates over the sample. It peaks in 2000 at 11.67%, hovers around 6% for most of the 2000s, and drops to around 5% for the 2010s.

In columns (4) to (7), we classify delisting cases as either forced or voluntary cases. We obtain delisting codes from the CRSP, and classify a delisting as voluntary when the CRSP delisting code is either in the category of 'merger' (codes 200 to 399) or the category of 'voluntary delisting' (codes 570 or 573). Fama and French, (2004) and Doidge et al., (2017) categorize these codes as 'delist due to cause' and 'delist due to merger.' Forced delistings include the categories of 'exchanges,' 'liquidation,' 'dropped,' 'expirations,' and 'domestic that became foreign' (codes 300 and above, excluding codes 570 and 573). We classify delistings due to merger as voluntary to reflect the recent phenomenon that many small or young start-up firms are willing to merge with another larger firm to avoid the heightened costs of being a standalone firm (De Loecker et al., 2020).[21] In column (5), we also observe the highest voluntary delisting rates during the dotcom bubble period. In column (7), the forced delisting rate peaked at 6.39% in 2000, the period of the dotcom bubble, but stabilized at 1.5% in the 2010s.

Panel B of Table 2 shows the distribution of delistings across one-digit SIC industries. Overall, there is reasonable representation across all industry groups. The service industry has the highest average delisting rate of 9.59%, and the mining and construction industries have

[21] Even though the litigation risk of a large public firm is not necessarily lower, a large parent company with its financial capabilities can cover excessive litigation costs incurred by its subsidiaries. With limited economies of scale, the burden of excessive litigation costs in a stand-alone firm can exceed its listing benefits. In addition, after the passage of various anti-takeover laws in the 1970s and 1980s, and the proliferation of corporate takeover defence tactics, the proportion of hostile takeovers is immaterial in our sample period from 1996-2017.

the lowest at 5.81% and 5.44%, respectively. To neutralize the difference in delisting rates across industries and to capture time-varying industry business outlook, which may also affect a firm's likelihood of delisting, we include industry-year fixed effects in the empirical design.

Table 3 reports the summary statistics for all key variables.

Insert Table 3 Here

The average delisting rate in the data is 7.3%. This is broadly consistent with Doidge et al. (2017), who report an average delisting rate for the period from 1975 to 2012 of 7.47%. On average, firms have a natural logarithm of total assets of 1.24. Total assets are measured in thousands of dollars and adjusted to 2010 dollars. The average firm has a leverage ratio of 22.2%, and a market-to-book ratio of 2.07. These figures are broadly consistent with Crane and Koch (2018), who report an average leverage ratio of 22% and an average market-to-book ratio of 1.67.

2. The relation between SCA lawsuits and delisting propensity

To estimate the relationship between SCA lawsuits and the likelihood of delisting, we employ the following ordinary least squares (OLS) estimation model:

$$y_{it} = \alpha + \beta \times \mathbb{1}(SCA)_{it} + \lambda X_{it} + \delta_{jt} + \varepsilon_{it}\,, \qquad (1)$$

where *i* indexes firms, *j* indexes industries, and *t* indexes years. The dependent variable y_{it} is an indicator variable that equals one if firm *i* delists in year *t*, and zero otherwise. $\mathbb{1}(SCA_{it})$ is an indicator variable that equals one if firm *i* experiences an SCA lawsuit in year *t*, and zero otherwise. δ_{jt} represents industry-year fixed effects. The industries are based on Fama and French's (1997) 49-industry classification. The vector X_{it} includes time-varying firm characteristics that could affect the propensity to delist.

The main coefficient of interest is β. We hypothesize that β is positive: that firms are more likely to delist after experiencing SCA lawsuits. Despite the binary nature of the dependent variable, we estimate the specifications using an OLS regression as we have a large number of fixed effects along several dimensions and so using maximum likelihood estimators, such as a logit or probit, can produce an incidental parameters problem (Lancaster, 2000; Neyman and Scott, 1948).

The most rigorous specification includes industry-year fixed effects (δ_{jt}). These fixed effects absorb all variables that do not vary within a given industry and year, such as industry-wide investment opportunities and economy-wide business cycles. The inclusion of industry-year fixed effects controls for industry characteristics that could affect a firm's probability of delisting such as competition (Kahle and Stulz, 2017), merger waves (Cartwright and Cooper, 1990; Doidge et al., 2017), and venture capital financing cycles (Ljungqvist et al., 2018). Thus, the estimates compare changes in delisting propensity between firms before and after SCA lawsuits while controlling for any unobserved heterogeneity that varies across industries and years.

We include several covariates known to affect a firm's delisting propensity (Doidge et al., 2017; Leuz et al., 2008; Marosi and Massoud, 2007; Pour and Lasfer, 2013). We use *Firm size*, the natural logarithm of a firm's total assets, to control for firm size and *Market-to-book ratio* to control for a firm's growth opportunities. The effects of firm size and growth on delisting likelihood are unclear ex ante. On the one hand, large and high-growth firms tend to receive more attention from investors and thus face a higher litigation risk (Kim and Skinner, 2002). Therefore, the costs of staying public could be higher for these firms, which could incentivize delisting. On the other hand, small and low-growth firms could be more likely to delist because they are less able to utilize the liquidity advantage of public markets relative to private markets (Bolton and von Thadden, 1998; Doidge et al., 2017; Mehran and Peristiani, 2011).

We use *Leverage* (total debt divided by total assets) and *Cash flow volatility* (five-year rolling standard deviation of operating income before depreciation divided by total assets) to control for firm risk, because financial distress may prompt firms to delist. Finally, we control for a firm's profitability (*Return on assets*) because financial performance is an important requirement to list on a stock exchange.

All t-statistics are computed based on robust standard errors clustered at year level. The results are reported in Table 4.

Insert Table 4 Here

The model specifications vary across columns in terms of the set of fixed effects and control variables included. We start with a basic model in column (1) that includes only time-varying firm-level control variables. In columns (2) and (3), we include control variables and

alternatively add year (column (2)), and industry-year fixed effects (column (3)). In Panel A we use the indicator variable $\mathbb{1}(SCA)$, which is equal to one if a firm experiences an SCA lawsuit in year *t*, and zero otherwise. In Panel B the variable of interest, *#SCA*, is the number of SCA lawsuits that a firm experiences in year *t*.

We find that firms are more likely to delist following litigation events. Across all specifications in Table 4, the coefficients on $\mathbb{1}(SCA)$ and *#SCA* are positive and statistically significant at the 1% level. The effect is also economically large. For example, in the model including both firm-level control variables and industry-year fixed effects (column (3)), a litigation event is associated with a 16.8% percentage point increase in the probability of delisting. Furthermore, the magnitude of the coefficient estimates on $\mathbb{1}(SCA)$ remains stable across the model specifications, which implies that omitted variables at the industry level or aggregate business cycles are unlikely to contaminate the inferences.

The coefficients on the control variables have the expected signs. Firms that are smaller, less profitable, or have a higher leverage ratio are more likely to delist (Leuz et al., 2008; Mehran and Peristiani, 2011). Overall, the results indicate that when firms are sued by shareholders, they become more likely to delist from the stock market.[22]

[22] In unreported results, we conduct cross-sectional tests to identify the types of firms that are most disadvantaged by the occurrence of litigation. We postulate that firms that are young, small, and/or without long-term institutional investors are more vulnerable to delisting when facing heightened litigation costs. They either voluntarily delist and become private firms or agree to be acquired by another firm so that they can be protected. To test these hypotheses, we conduct cross-sectional tests by interacting the SCA indicator with the indicators of firm size, age, and institutional holdings. We find evidence suggesting that young firms and firms with low institutional ownership are particularly susceptible to delisting pressure due to SCA litigation. The effect of firm size is not statistically significantly different from zero.

Next, we test whether the delisting effect is transitory or long-lasting, and whether it can be attributed to confounding events. We replace the main variable of interest, *𝟙(SCA)*, in our baseline specification with the lead and lagged SCA, individually. The results are reported in Panel C of Table 4. As shown in columns (3) and (4), the 1-year and 2-year lagged effects of *𝟙(SCA)* remain significant but their magnitudes and statistical significance abate over time. Importantly, we show that the forward *𝟙(SCA)* and *#SCA* do not generate any impact on delisting rate. The finding alleviates the concern that confounding factors, such as on-going or long-lasting poor operating performance, trigger litigation events and then delisting.

To ensure the robustness of the relationship between SCA lawsuits and delisting propensity we conduct a number of robustness tests and report them in Table 5.

Insert Table 5 Here

In Panel A, instead of using an OLS estimation approach, we estimate duration and probit models, respectively. In columns (1) and (2), the dependent variable is the hazard ratio for the Cox regression, which is the probability that a firm will delist in the next unit of time. The advantage of using survival models is that they can account for both the event occurrence and the time to the event (Fama and French, 2004). Furthermore, a survival approach is useful to examine censored data and time-series data with different time horizons (Shumway, 2001). In column (2) we include variables that capture the industry sales growth rate and real GDP growth rate to control for industry conditions and economy-wide effects. Consistent with the OLS estimate, the hazard ratio is positively and statistically significantly related to the delisting propensity. Thus, the probability of delisting increases following SCA lawsuits. In columns

(3)-(6), we employ a probit model instead of the Cox model. The coefficient on 𝟙(*SCA*) remains positive and statistically and economically significant in this alternative model specification.

Panel B addresses the potential confounding effects of the 2008 global financial crisis and the bursting of the dotcom bubble. During these crisis periods, the likelihood of litigation and of delisting are increased. While the baseline model addresses this by incorporating industry-year fixed effects, we further examine whether the results are robust to the exclusion of these periods. The results are in Panel B. In column (1), we remove observations for the years 2001 and 2002, representing the dotcom bubble. In column (2), we remove observations for the global financial crisis period of 2007–2009. In column (3), we remove observations for both the periods of the dotcom bubble and the financial crisis. We find consistently positive and statistically significant coefficients for 𝟙(*SCA)* on the delisting rate, indicating a positive relationship between SCA litigation and the propensity of firms to deregister from the stock market.

In the third robustness analysis we consider the effect of governance improvements on firms' delisting decisions. Firms may be incentivized to delist, for example via a leveraged buy-out (LBO), not to lower frivolous litigation risk but to strengthen managerial oversight with a more concentrated ownership structure (Muscarella and Vetsuypens, 1990). To address this alternative rationale for delisting, we augment the baseline specification with additional controls for governance variables, including governance (G index) and entrenchment (E index) indexes, and the percentage of institutional ownership to reflect the firm's ownership structure. The results are in Panel C and show that the coefficient on 𝟙(*SCA)* remains positive and statistically significant across the three models controlling for the governance variables.

In conclusion, regardless of the econometric design we use to estimate litigation risk, of the exclusion of crisis periods, or of explicitly controlling for governance effects, the results show a statistically significant and positive relation between the occurrence of SCA litigation and a firm delisting.

3. The causal relation between SCA lawsuits and delisting propensity

An important concern related to the results so far is that the occurrence of SCA litigation is subject to selection bias. Underperforming firms may be both more likely to be litigated against and more likely to delist due to financial difficulties, and this could drive the positive association between SCA litigation and the rate of delisting. To mitigate this potential problem in the baseline specification (Equation (1)) we control for the observed factors that may be associated with SCA litigation. In this section we further address this important concern using two approaches. We first use the influential ruling of the *In Re: Silicon Graphics Inc. Securities Litigation* case from the Ninth Circuit Court of Appeals on July 2, 1999, as a natural experiment to establish the causal link between SCA litigation and the decision to delist. In the second approach we employ federal judge's ideology to estimate a firm's ex-ante litigation risk. Both identification approaches show that an increase in litigation risk increases a firm's propensity to delist.

3.1 Ninth Circuit ruling

In December 1995, Congress enacted the Private Securities Litigation Reform Act (PSLRA) to protect corporations from abusive and frivolous securities litigation. However, the U.S. circuit

courts interpreted the pleading standard established by this law in different ways. The Ninth Circuit's interpretation in the *In Re: Silicon Graphics Inc. Securities Litigation* case on July 2, 1999, is the most stringent. According to the court, in order to allege facts, plaintiffs are required to establish evidence that the defendants acted with "deliberate recklessness." The *In Re: Silicon Graphics Inc. Securities Litigation* ruling disproportionately affected firms headquartered in the Ninth Circuit, which includes the states of Alaska, Washington, Oregon, Idaho, Montana, California, Nevada, Arizona, and Hawaii.[23]

The Ninth Circuit ruling is plausibly exogenous to firms' propensity to delist. As discussed in Crane and Koch (2018), the Ninth Circuit ruling came from judges with lifelong appointments. Consequently, this ruling is likely based on their own views of legislation, precedent, and the Constitution, rather than on the needs of stock market participants such as owners, managers, and shareholders.[24] Moreover, Johnson et al. (2000) finds that following the ruling technology firms located in the Ninth Circuit enjoyed positive and statistically significant announcement returns, suggesting that the ruling was unexpected. Therefore, the 1999 Ninth Circuit Court ruling offers a plausibly exogenous experiment through which to evaluate the influence of SCA litigation risk on the propensity to delist.

We employ the Ninth Circuit ruling in 1999 as a natural experiment to examine the causal link between the probability of SCA litigation and the propensity to delist. We restrict the sample period to 1996 to 2002, which encompasses the three years before and after the 1999

[23] Even though SCA litigation can be filed in any of the federal circuit courts (because shareholders are often geographically dispersed), Cox et al. (2009) show that 85% of securities fraud class actions are filed in the home circuit of the defendant firm. They also report that the circuits' pleading standards do not affect plaintiffs' choice of court venue.
[24] See Crane and Koch (2018) for a detailed discussion.

Ninth Circuit ruling. As discussed above, the 1999 ruling substantially tightened the pleading standards to initiate an SCA lawsuit, thereby mitigating the litigation risk for firms located in the Ninth Circuit region.

We first test whether the Ninth Circuit ruling impacted firms' propensity of experiencing a lawsuit. We implement the following difference-in-differences model to investigate the court ruling's impact on a firm's probably of being in a lawsuit:

$$y_{it} = \alpha + \beta \mathbb{1}(9th\ Circuit)_i \times \mathbb{1}(> 1999)_t + \eta \mathbb{1}(9th\ Circuit)_i + \delta_{jt} + \lambda X_{it} + \varepsilon_{it}. \qquad (2)$$

$\mathbb{1}(9th\ Circuit)_i$ is an indicator variable used to differentiate the treatment and control firms, and is equal to one for a firm headquartered in the Ninth Circuit Court of Appeals region (the states of Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and Washington), and zero for other firms. $\mathbb{1}(> 1999)_t$ is the year indicator variable, equal to one when the fiscal year is after 1999, and zero otherwise. Note that the inclusion of $\mathbb{1}(> 1999)_t$ is not strictly necessary as it is already captured by the inclusion of industry-year fixed effects. The dependent variable is $\mathbb{1}(SCA_{it})$, an indicator variable that equals one if firm *i* experiences an SCA lawsuit in year *t*, and zero otherwise. The rest of the model is identical to the baseline model in Equation (1).

Similar to the baseline model, we control for industry-year fixed effects, δ_{jt}. These fixed effects address the impact of the dotcom bubble on the delisting rate of technology firms around the year 2000. In other words, the analysis compares the delisting rate of firms in the same industry and year but contrasts firms in the Ninth Circuit with firms in other Circuits. In

addition, the inclusion of the industry-year fixed effects soaks up the effect of any merger waves within an industry.

The results are in Panel A of Table 6.

Insert Table 6 Here

In the three specifications, we alternatively include the firm and year fixed effects in column (1), firm, year, and headquarter fixed effects in column (2), or industry-year fixed effects as in the baseline specification in column (3). We additionally control for firm fixed effects in column (1) and headquarter fixed effects in column (2) to compare the average change in litigation likelihood within firms and within state before and after the Ninth Circuit ruling. The result shows that the interaction effect between $\mathbb{1}(\textit{9th Circuit})$ and $\mathbb{1}(>\textit{1999})$ is negative and statistically significant, indicating a decrease in the propensity of SCA lawsuits in the Ninth Circuit area relative to other areas after the ruling. The results confirm the prediction that firms in the Ninth Circuit the *In Re: Silicon Graphics Inc. Securities Litigation* ruling experience a reduced frequency of litigation.

Having showed that the court ruling decreased lawsuits for the impacted firms, we use the same difference-in-differences set up to test whether the ruling impacted firms' probability of delisting. The regression specification's dependent variable, $\mathbb{1}(\text{Delist})_{it}$, is an indicator variable that equals one if firm *i* delists in year *t*, and zero otherwise. Panel B of Table 6 reports the results. In columns (1) and (2), we include the whole sample. In columns (3) and (4), we exclude technology firms to further address the concern that the bursting of the dotcom bubble in the post 2000 period could disproportionately affect firms located in the Ninth Circuit area,

especially the state of California, which may confound the court ruling effect.[25] Technology firms are defined as firms whose 3-digit SIC is either 283, 357, 366, 367, 382, 384, 361, 362, 386, or 387 (Carpenter and Petersen, 2002). Across the four columns, the interaction effects of the Ninth Circuit ruling and post-1999 indicators are negative and statistically significant.[26] The results show that decreasing litigation risk decreases firms' propensity to delist.[27]

Panel A of Table 6 shows the Ninth Circuit's more stringent pleading standard decreases the frequency of litigation. When litigation risk is lower, high quality but litigation-vulnerable firms can remain public, the composition of delisting firms will shift towards poor performing firms that fail stock exchange requirements (i.e. lower quality firms). Since lower quality firms experience lower delisting CARs (Engel, Hayes, and Wang, 2007)[28], the average delisting CAR should decrease. We expect delisting returns to deteriorate following the Ninth Circuit ruling.

We obtain stock return data by linking the CRSP and Compustat datasets using the CRSP/Compustat Merged-Fundamentals Annual file. We limit the dataset to stocks listed on

[25] Note that the effect of the dotcom bubble bursting in the post 2000 period would be expected to bias against finding a reduction in delisting among treated firms. Consistent with the technology firms working against us, when we exclude these firms (columns (3) and (4)), the magnitudes of the coefficients increase.

[26] In untabulated results, we find qualitatively similar results if we exclude delistings due to mergers from the analysis.

[27] In untabulated results, we conduct a falsification test. We repeat the analysis in Panel B columns (1) and (2) for data between 1991 and 1997 and replace the 𝟙(>1999) indicator variable with the indicator variable 𝟙(>1994), which takes the value one in years 1995, 1996, and 1997, and the value zero in 1992, 1993, and 1994. If there is a time trend driving the results, this falsification test will produce a negative and statistically significant coefficient on the interaction term, 𝟙(9th Circuit) x 𝟙(>1999). We find that the interaction term's coefficient is not statistically significant, and thus conclude the results are not driven by a broader time trend. In a second untabulated test, we repeat the exercise in Panel B using a matched sample based on the independent variables in the baseline regression in Equation (1) over the three years prior to the ruling period. We match treated firms with control firms based on the nearest propensity score with replacement. The results are qualitatively the same.

[28] The argument is that delisting returns capture the potential additional value that will be generated once the firm becomes private. Therefore, high quality firms will have higher CAR when delisting.

the NYSE, AMEX, or NASDAQ exchanges with a CRSP share code of 10 or 11 (i.e., ordinary common shares). We winsorize the daily returns of all stocks at the 1st and 99th percentiles.

We employ the Fama and French three-factor model as the benchmark return model. The event date is the stock's delisting date. The Fama–French three-factor loadings are estimated based on trading days [–252, –21], where day 0 is the delisting date. After estimating individual firms' CARs for various event windows, we calculate value-weighted average CARs for all stocks of delisting firms in four subsamples, which are firms headquartered in the Ninth Circuit region and in other regions, for the periods before and after 1999. Since not every delisting firm has trading data in CRSP around its delisting date, we are only able to obtain and compute the abnormal returns for 3,215 firm delisting. We report the CARs of the Ninth Circuit portfolios before and after 1999 in Table 7 Panel A.

Insert Table 7 Here

CARs are calculated for various windows from 1, 5, 9, 13, 17, or 21 days prior to the delisting up to the delisting date. As shown in the panel, the CARs for delisted stocks in the Ninth Circuit area decline significantly after 1999. For the six-day window [-5,0], the average CAR after 1999 is 1.7 percentage points lower than that before 1999. Even larger magnitudes are observed for the other event windows.

Panel B presents the cross-sectional regression analysis of the [-5,0] CAR event window. We control for other financial characteristics that may affect a firm's stock returns, including firm size, leverage, return on assets, market-to-book ratio, cash flow volatility, and industry-year fixed effects. Because firms may stop submitting financial filings in years before their

delisting, we use the latest financial data that are available for the delisting year or the year prior to the delisting date. The number of observations in Panel B is slightly lower than 3,215 firms reported in Panel A because there are 105 firm-year observations that are missing at least one control variable, and so the regressions contain 3,110 observations. The treated firms include observations for firms in the Ninth circuit area after 1999. We add control variables and finally industry-year fixed effects across the columns. In all specifications, the coefficient on the treatment group, 𝟙(9*th Circuit*) x 𝟙*(>1999)*, is negative and statistically significantly different from zero. Delisting returns are lower for stocks of firms in the Ninth Circuit area after 1999, indicating the more stringent pleading standards prevents higher quality firms from delisting.

To summarize, we show that the Ninth Circuit's heightened pleading standards for SCA lawsuits reduces the propensity of firms in the Ninth Circuit to delist. We find evidence suggesting it is higher quality firms that delist less frequently. Next, we provide supporting evidence using a separate shock to ex-ante litigation risk.

3.2 Federal judge philosophy

Legislation and legal statutes are not always explicit and clear. Indeed, they are often vague or ambiguous, giving rise to potentially inconsistent judicial interpretations when they are applied to resolve legal disputes.[29] For example, a fervently contested provision in federal securities

[29] According to Grundfest and Pritchard (2002), legislation is sometime intended to be vague so that legislators can avoid excessive details and enhance flexibility and applicability. In addition, when facing legislative coalitions with divergent interests, legislators need to carefully craft ambiguous statutory language as a tool of compromise to accumulate a majority of supporting votes in Congress. Lastly, legislative ambiguity can also arise over time as a result of unforeseen economic, technological, or social developments.

law is the statue of "strong inference" in the PSLRA, which was crafted in an attempt to discourage meritless securities litigation. The provision demands private plaintiffs "state with particularity facts giving rise to a strong inference that the defendant acted with the required state of mind."[30] This obscure provision has generated varying judicial interpretations and applications across courts.

When the law is ambiguous, judges' views on the underlying policy of the laws can influence their decision making in complex legal disputes. The indeterminacy of the applicable laws allows different and legitimate interpretative approaches and policy considerations in deciding legal outcomes. As a result, judges' political philosophy or their position on the political spectrum can play a role in the judicial decision-making process.[31]

Prior studies widely adopt the political affiliation of the appointing President as a proxy for judicial partisan preferences (Flemming, Holian, and Mezey, 1998; Gerber and Park, 1997). Because presidents often nominate judges whose philosophy reflects the views of their partisanship and contribute to advancing the President's political agenda, judges appointed by Democratic Presidents are generally more liberal in their judicial decisions and interpretations than those appointed by Republican Presidents (e.g., Cross and Tiller, 1998; Sunstein, Schkade, and Ellman, 2004).[32] If ideology plays a role in the selection of the judges, it may also influence

[30] 15 U.S. Code §78u–4(b)(2).

[31] We do not imply that the judges distort the law in order to achieve predetermined personal agenda or political policy goals, but rather that they choose from legitimate interpretations that are consistent with ambiguous legislation.

[32] Cross and Tiller (1998) document that a panel consisting of a majority of Republican appointed judges have a tendency to render a conservative decision (e.g., reverse the agency in favor of a conservative challenger such as nongovernmental public interest organization challenging the agency position.). In contrast, a panel with a majority of Democrats tend to render a liberal decision (e.g., reverse the agency in favor of a liberal challenger such as an industry group challenging a federal regulation.). Sunstein, Schkade, and Ellman (2004) report that panels with all-Republican are more likely to reject campaign finance regulations, while panels with all-

their decision making, especially regarding the statutory provisions that are vague and ambiguous.

The prior literature on the impact of political affiliation in the judiciary across a wide variety of court levels and litigation areas suggests that Democratic-appointed or liberal judges may be more likely to favor investors (plaintiffs), whereas Republican-appointed or conservative judges may be more protective of firms (defendants). For example, Staudt, Epstein, and Wiedenbeck (2006) find that in taxation cases in the Supreme Court, liberal (conservative) Justices are more likely to vote with the government (corporate taxpayers). Focusing on the decisions of the U.S. Circuit Courts of Appeals in all criminal cases, Cross (2003) offers further evidence to support the important role of political ideology in judicial decision making. Pinello (1999) conducts a meta-analysis, finding that the political party affiliation of judges in the Circuit Courts of Appeals explains around 24% of Circuit court rulings.

Motivated by this line of literature, we use measures of the dominance of Democratic-appointed judges at the Circuit court level as an exogenous shock to ex-ante litigation risk. Because judge composition stems from the structure of the legal environment, it is less endogenously correlated with other factors that influence corporate policy and performance. As such, it can attenuate the confounding effect between litigation risk and delisting choice, serving as an exogenous shock to ex-ante litigation risk. Huang, Hui, and Li (2019) report that an increase in the liberal ideology of judges from the first to the third quartile results in a 33.5% relative increase in the ex-ante probability of being litigated. Fedderke and Ventoruzzo (2016),

Democratic panels are more likely to uphold affirmative action programs that aim to support underrepresented parts of society.

investigating the enforcement of securities laws, show that liberal Justices are more inclined to favor investors, whereas conservative Justices are more incline to favor side with big business and support 'free and less regulated' markets. Therefore, liberal judges pose a higher litigation risk to firms than conservative judges.

Following prior literature, we measure judges' political orientation at the circuit court level. Even though the Supreme Court, the highest court in the American judicial system, is more preeminent, monitoring and review by the Supreme Court of SCA lawsuits are extremely rare, close to non-existent (Pritchard, 2011).[33] In addition, judges in a circuit court can review and overrule a district court judge's decision. Therefore, circuit courts are the courts of last resort for most, if not all, SCA lawsuits. Hence, the ideology of a circuit court has the greatest influence on *expected* lawsuit outcomes (Bowie and Songer, 2009; Choi, Gulati, and Posner, 2012). Prior work show that in civil liberties and economic cases the rulings of district court judges reflect the ideological preferences of the circuit court's judges (Randazzo, 2008; Choi, Gulati, and Posner, 2012).

Each case in a circuit court is assigned to a panel consisting of three randomly selected judges from the circuit. The panel decides the case based on a majority of opinions. Following prior studies (e.g., Cross and Tiller, 1998; Sunstein, Schkade, and Ellman, 2004), we measure the ideology of the circuit's judges based on the prevalence of appointees of Democratic presidents. We estimate this in two ways: (1) by computing the percentage of judges that are appointed by Democratic presidents in a firm's circuit court (that is, the circuit court with

[33] Unlike circuit court appeals, the Supreme Court is not obliged to hear any individual appeal. Parties may file a "writ of certiorari" to the court, asking for an appeal, but this is rarely granted. Less than 1% of appeals to the Supreme Court are actually granted a certiorari (Bowie and Songer, 2009).

jurisdiction over the state where the firm's headquarter is located) (*Liberal judges*); and (2) by calculating the probability that a three-judge panel in a firm's circuit court will comprise at least two Democratic appointees (*Liberal panel*). To identify the appointing president of individual circuit court judges, we obtain judges' biographical data from the Federal Judicial Center's website. The probability of a three-judge panel having at least two Democratic appointees is:

$$Liberal\ panel = [C(p, 3) + C(p, 2) \times C(y - p, 1)] / C(y, 3), \quad (3)$$

where $C(n, r)$ denotes a binomial coefficient indicating the number of possible ways to choose a subset of r objects from a larger set of n distinct objects. p is the number of Democratic appointees in the circuit, and y is the total number of judges in the circuit. Both p and y are counted at the end of each month. The first term $C(p, 3)/C(y, 3)$ calculates the probability that the three judge panel comprises all Democratic appointees, and the second term $[C(p, 2) \times C(y - p, 1)]/C(y, 3)$ estimates the probability that the panel comprises two Democratic appointees and one Republican appointee. A higher value of *Liberal panel* indicates that the circuit is more likely to be dominated by liberal judges.

We compute the variable *ΔLiberal judges* as the change from the previous year in the percentage of federal judges who were appointed by a Democratic president in the Circuit court in which the firm's headquarter is located, and the variable *ΔLiberal panel* as the change from the previous year in the probability that judges appointed by Democratic presidents dominate a panel of three judges randomly selected from the Circuit. We include each variable as an additional independent variable in separate regressions.

In other words, we examine the change, not the base level, in the federal judge ideology at a firm level to proxy for the firm's ex-ante litigation risk. In addition, we adopt three different models including OLS as in the baseline result in Table 4, Cox and Probit models as in Panel A, Table 5. The results are presented in Table 8.

Insert Table 8 Here

The coefficients on *ΔLiberal judges* and *ΔLiberal panel* across the three different regression models are all positive and statistically significant, consistent with our expectations.[34] Because liberal judges are expected to pose a higher litigation risk to firms, the dominance of liberal judges at a circuit court level is positively associated with the likelihood of delisting. The results using the ideology shocks reinforce the causal positive impact of litigation risk on delisting propensity.

4. Why does the risk of litigation drive firms to delist?

Having established that higher litigation risk increases delistings we turn to exploring why the risk of litigation leads firms to delist. We first consider two possible drivers of why SCA litigation leads to firms delisting. Firms may delist because of the direct cost of litigation or the indirect costs, such as the perceived potential for future frivolous litigation. By examining

[34] 'The number of observations in Table 8 is less than that in Table 4 because of missing judge biographical data from the Federal Judicial Center's website.

voluntary and forced delisting and dismissed versus settled lawsuits, we find evidence that both mechanisms matter. Finally, we examine whether firms delist because they are less likely to face litigation when being an OTC firm. We compare the litigation rates of OTC and public firms, and the results show that OTC firms have a substantially lower likelihood of being involved in an SCA lawsuit.

4.1 Direct versus indirect costs

When the likelihood of SCA litigation increases, firms are more likely to delist. There are at least two reasons why this may be the case. The first is that when there is a lawsuit, the direct costs are significant enough such that a firm views the risk of incurring similar costs in the future too great to remain listed. In the sample, the average settlement amount (which excludes some direct costs such as legal and consulting fees), amounts to 0.45% of an average firm's total assets. Given that an average return on assets in the sample is 2.7%, this cost is economically significant.

Alternatively, the indirect costs of litigation, such as distracting managers' from focusing on long-term goals that maximize shareholder value, may induce firms to delist. Observing the direct and indirect litigation costs is not feasible. As such, we assess the direct versus indirect impacts circuitously, by investigating the motivation for delisting and the merits of the litigation.

First, to evaluate whether direct or indirect costs influence firms to delist, we examine whether the delisting was voluntary or forced. We argue that direct costs are more important for forced delistings and that indirect costs are more important for voluntary delistings. If indirect costs affect firms' decisions, we expect to find an impact of litigation on voluntary

delisting decisions. To conduct this test, we adopt a multinominal logit model where we regress the category variable of delisting types that equals one for forced delists, two for voluntary delists, and zero for active firms (the base group). We apply this model because the delisting choices either voluntary or forced are not related to each other. In addition, the advantage of this model is that it does not assume normality of the dependent variable, linearity relationship, or homoscedasticity in error terms. The results are reported in Table 9.

Insert Table 9 Here

The magnitude of the effect of 𝟙(*SCA*) and *#SCA* remain statistically significant across the forced and voluntary delists. A one unit increase in 𝟙(SCA) or the occurrence of an SCA is associated with a 2.4% increase in the relative risk of a firm being forced delisted. The impact of litigation on voluntary delistings is also statistically significant. The results on voluntary delistings help rule out the concern that the main finding is simply driven by firms being forced to delist due to financial distress caused by the impending payment of a legal settlement. If this was the case, we would expect to observe that the litigation effect becomes negligible in voluntary delisting cases. However, we observe the opposite.

Second, to quantify how direct and indirect costs of litigation affect firms' delisting decisions, we consider the merit of SCA litigation actions. In particular, we determine whether a lawsuit is subsequently dismissed or settled by relying on a judge's decision to grant a motion of dismissal or a plaintiff's decision to drop a case voluntarily. We interpret a case that is dismissed as being frivolous, while one that is settled as being legitimate (Kempf and Spalt, 2019).

Table 1 shows that a large proportion of SCA lawsuits are dismissed. From Table 1, the overall percentage of SCA lawsuits that are dismissed is 37.7%. Concerns about the widespread propagation of frivolous cases motivated the passage of the PSLRA in 1995 and subsequently triggered the approval by the House of Representatives for the Lawsuit Abuse Reduction Act in 2017. Meritless cases not only drain corporate financial resources but also waste managers' time and effort in long-lasting legal disputes. We expect that if this indirect pressure from frivolous litigation influences firm delistings we should observe a statistically significant effect on delisting even for dismissed SCA lawsuits. In Table 10 we decompose lawsuits into those that are dismissed and those that are settled. The results are in Table 10.

Insert Table 10 Here

We define two new variables, $\mathbb{1}$*(Dismissed SCA)* and $\mathbb{1}$*(Settled SCA)*. $\mathbb{1}$*(Dismissed SCA)* takes the value one if the firm in the year t experiences a lawsuit that is eventually dismissed, and zero otherwise. $\mathbb{1}$*(Settled SCA)* takes the value one if the firm in the year t experiences a lawsuit that is eventually settled, and zero otherwise. We create analogous variables that capture the number of dismissed or settled lawsuits.

In columns (1) and (2) we consider the impact of dismissed SCAs. In columns (3) and (4) we investigate the impact of settled cases. We report the results using both the SCA indicator variable and the number of cases. The coefficients on the measures of dismissed cases are statistically significant and economically meaningful, equivalent to an increase of 4.2% of an average delisting rate. The statistically significant effect of dismissed SCA cases implies that the intensity of frivolous cases imposes a heavy burden on public firms.

In column (5) we consider the effect of the settlement amount on the decision to delist. The settlement amount is the total cash amount made available to investors for recovery; it quantifies the direct financial burden of a lawsuit on a firm. We expect that the settlement amount will be positively correlated with the delisting decision, and the result in column (5) confirms this. In column (6), we examine whether the settlement amount exerts an incremental effect when we condition the delisting rate on the occurrence of SCA lawsuits. We augment the baseline model with the variables $\mathbb{1}(SCA)$ and *Settlement amount*. Column (6) shows that the coefficient on *Settlement amount* is positive and statistically significant, indicating that litigation cost has a direct impact on the rate of delisting. Interestingly, the coefficient on $\mathbb{1}(SCA)$ remains positive and statistically significant, demonstrating that the direct cost of a settlement does not subsume the effect of the occurrence of litigation itself on a firm's decision to delist, again suggesting evidence on the potential effect of other indirect costs.

4.2 Does being a non-publicly listed firm reduce litigation risk?

In this section, we investigate whether public firms may delist from the stock market because over the counter (OTC) or not-pubicly-listed firms face a lower threat of litigation. We obtain financial data on public and private firms from the Compustat-Capital IQ database. We identify non-publicly listed firms as those with stock exchange codes 0, 1, 3, 13, 19, and 20 in the database, which indicate that firms are either a non-traded company or security, were subject to a leveraged buyout, or are traded on the OTC Bulletin Board or other OTC exchanges.[35]

[35] Private firms may voluntarily report financial data if they plan an IPO in the near future. In addition, the requirement of SEC reporting is mandatory for OTC firms that exceed certain thresholds in terms of firm size or

After excluding financial, utility, and unclassified firms, the sample with non-missing control variables includes 7,023 non-publicly listed firms and 8,577 public firms, with 126,385 firm-year observations for the period from 1996 to 2017.

non-publicly and publicly listed firms may be different in many regards and so we conduct propensity score matching based on size, return on assets, cash ratio, and sales growth.[36] We match the treated (non-publicly listed) and control (public) firms based on the nearest propensity score with replacement and present the average firm characteristics for 3,206 matched pairs and SCA lawsuit variables in Panel A of Table 11.

Insert Table 11 Here

Columns (1) to (4) present the statistics of the sample before matching. Before matching, the differences in firm characteristics between non-publicly listed and public firms are statistically and economically significant. After matching, the results in columns (5) to (9) show that the systematic differences in the firm characteristics of the control and treated firms disappear, yet non-publicly listed firms still experience a statistically significantly lower SCA litigation rate.

To eliminate the possibility that it is unobserved firm characteristics that drive the differences in litigation rates between public and non-publicly listed firms we consider only

the number of record holders or the existence of public debt issuance. For further discussion on OTC regulatory regimes, please refer to Brueggemann, Kaul, Leuz, and Werner (2018).

[36] Given it is difficult to establish the market value of private firms, we replace the *Market-to-book ratio* variable with *Sales growth* as an independent variable to capture a firm's growth opportunities.

those firms that begin as private and then we observe going public through an initial public offering (IPO). We obtain the IPO data from the SDC Platinum database. The IPO data are manually matched by name and year with the Compustat-Capital IQ database. We again remove financial (SIC 4900–4999), utility (SIC 6000–6999), and unclassified firms (SIC 9900–9999) from the sample. We only include IPO firms that contain financial data before and after their IPO. The final sample contains 2,360 IPO firms. In Panel B we conduct a univariate comparison for this subset of firms. The results show that the litigation rate increases dramatically after a firm goes public. Compared to before its IPO, a firm is 717% more likely to be involved in a lawsuit.

With the same sample of firms, we extend the analysis to a multivariate setting, reported in Panel C. The IPO indicator is positive and statistically significant across the varying specifications, indicating that the litigation rate increases after firms' IPOs. The results are consistent with being a non-publicly listed firm as being an effective method to reduce litigation risk.

5. Conclusion

This paper has empirically examined whether and to what extent the costs associated with shareholder litigation incentivize firms to delist from public markets. We find that firms become more likely to delist following an SCA lawsuit and this effect is both statistically significant and economically meaningful. The baseline effect remains robust to the adoption of ex-ante measures of litigation risks to control for possible endogeneity, the use of various

regression models, and alternative subsample time periods. We also show that when Circuit courts heighten pleading standards for SCA lawsuits, propensity of firm delisting declines.

The effect remains robust when firms voluntarily delist and even when SCA cases are dismissed or their settlement amount negligible. These results offer evidence on the impact of indirect costs from legal exposure that even without direct financial loss, the occurrence of low-quality lawsuits is sufficiently burdensome to disincentivizes firms from listing in public stock markets. Such a strategy is successful; by not publicly listing, firms can enjoy a lower litigation rate.

Overall, this study highlights that frivolous shareholder litigation hurts the competitiveness of U.S. equity markets. Striking the right policy balance between the governance benefits of litigation and the costs of excessive litigation on firms' performance is desirable; indeed, such moderation seems vital to preserving the continued effectiveness and vigor of the U.S. stock market.

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Appendix

Variable description

Variable	Definition	Source
Litigation variables		
𝟙(SCA)	An indicator variable that equals one if a firm experiences a shareholder class action lawsuit, and zero otherwise.	ISS-SCAS database
#SCA	The number of shareholder class action lawsuits that a firm experiences in a year.	ISS-SCAS database
𝟙(Dismissed SCA)	An indicator variable that equals one if a firm's shareholder class action lawsuit originating in year *t* are dismissed, and zero otherwise.	ISS-SCAS database
𝟙(Settled SCA)	An indicator variable that equals one if a firm's shareholder class action lawsuit originating in year *t* that are settled, and zero otherwise.	ISS-SCAS database
#Dismissed SCA	The number of shareholder class action lawsuits originating in year *t* that are dismissed.	ISS-SCAS database
#Settled SCA	The number of shareholder class action lawsuits originating in year *t* that are settled.	ISS-SCAS database
Settlement amount	The ratio of settlement amount to total assets. Settlement amount is the total cash amount made available to investors for recovery.	ISS-SCAS database
𝟙(Delist)	An indicator variable that equals one if a firm deregisters from the stock exchange in year *t*, and zero otherwise.	CRSP
𝟙(Delist – Forced)	An indicator variable that equals one if a firm's CRSP delist code is 300 or above, but not code 570 or 573, and zero otherwise.	CRSP
𝟙(Delist – Voluntary)	An indicator variable that equals one if a firm's CRSP delist code is either within the range 200–299 or is 570 or 573, and zero otherwise.	CRSP

Variable	Definition	Source
Legal changes		
𝟙(9th Circuit)	An indicator variable that equals one if a firm is headquartered in a state of the Ninth Circuit Court of Appeals (Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, or Washington).	SEC filings and Compustat
𝟙(>1999)	An indicator variable that equals one for the years after 1999, and zero otherwise.	
ΔLiberal judges	Change from the previous year in the percentage of federal judges who were appointed by a Democratic president in the circuit court of the firm's headquarters.	Federal Judicial Center's Website
ΔLiberal panel	Change from the previous year in the probability that judges appointed by a Democratic president dominate a panel of three judges randomly selected from the circuit.	Federal Judicial Center's Website
Firm controls		
Market-to-book ratio	Market value of equity divided by book value of equity.	CRSP/Compustat Merged
Firm size	Natural logarithm of total assets (in thousands of dollars, adjusted to 2010 values).	CRSP/Compustat Merged
Leverage	Total debt divided by total assets.	CRSP/Compustat Merged
Return on Assets	Earnings before interest and taxes (EBIT) over total assets.	CRSP/Compustat Merged
Cash flow volatility	The standard deviation of operating income before depreciation divided by total assets over the previous five years.	CRSP/Compustat Merged
Sales growth	Sales value in year t minus sales value in year t–1 divided by sales value in year t–1.	CRSP/Compustat Merged
𝟙(IPO)	An indicator variable that equals one for the year of a firm's IPO, and zero otherwise.	CRSP/Compustat Merged
Cash ratio	Cash and cash equivalents over total assets.	CRSP/Compustat Merged

Table 1: Distribution of SCA lawsuits

Panel A reports the yearly frequency of SCA lawsuits and the total number of public firms for the period from 1996 to 2017. Panel B presents the distribution of SCA lawsuits across one-digit SIC sectors. Data on SCA lawsuits are obtained from the ISS Governance database. In Panel A, the litigation rate in column (3) equals the number of lawsuits divided by the total number of firms. The litigation rates in columns (5) and (7) equal the numbers of dismissed and settled lawsuits, respectively, over the total number of SCA cases. The total number of dismissed and settled lawsuits (columns (4) and (6)) does not add up to the number of SCAs (column (1)) because pending cases are not included in either category. The litigation rate in column (8) is the ratio of dismissed SCAs to settled SCAs.

Panel A: SCA lawsuits by year

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All firms	SCA		Dismissed SCA		Settled SCA		SCA
		#	%	#	% SCA	#	% SCA	Dis/Set
1996	5,138	92	1.79%	27	29.35%	64	69.57%	42.19%
1997	5,481	121	2.21%	33	27.27%	87	71.90%	37.93%
1998	5,377	155	2.88%	43	27.74%	111	71.61%	38.74%
1999	5,025	169	3.36%	78	46.15%	90	53.25%	86.67%
2000	4,902	399	8.14%	243	60.90%	150	37.59%	162.00%
2001	4,753	140	2.95%	52	37.14%	88	62.86%	59.09%
2002	4,443	73	1.64%	30	41.10%	42	57.53%	71.43%
2003	4,148	120	2.89%	37	30.83%	83	69.17%	44.58%
2004	4,000	98	2.45%	40	40.82%	57	58.16%	70.18%
2005	3,921	89	2.27%	26	29.21%	63	70.79%	41.27%
2006	3,808	78	2.05%	26	33.33%	52	66.67%	50.00%
2007	3,660	106	2.90%	45	42.45%	57	53.77%	78.95%
2008	3,596	97	2.70%	33	34.02%	63	64.95%	52.38%
2009	3,395	110	3.24%	32	29.09%	74	67.27%	43.24%
2010	3,269	152	4.65%	54	35.53%	97	63.82%	55.67%
2011	3,201	110	3.44%	32	29.09%	76	69.09%	42.11%
2012	3,155	135	4.28%	54	40.00%	76	56.30%	71.05%
2013	3,146	138	4.39%	59	42.75%	61	44.20%	96.72%
2014	3,151	186	5.90%	64	34.41%	67	36.02%	95.52%
2015	3,265	192	5.88%	59	30.73%	38	19.79%	155.26%
2016	3,205	181	5.65%	51	28.18%	27	14.92%	188.89%
2017	3,181	130	4.09%	42	32.31%	10	7.69%	420.00%
Total	**87,220**	**3,071**	**3.52%**	**1,160**	**37.77%**	**1,533**	**49.92%**	**75.67%**

Panel B: SCA lawsuits by industry

	(1)	(2)	(3)
Sector	Total firms	SCAs	SCA rate
Agriculture, Forestry, & Fishing	349	12	3.44%
Construction	1,213	28	2.31%
Manufacturing	44,071	1,570	3.56%
Mining	5,975	168	2.81%
Retail Trade	6,346	185	2.92%
Services	18,383	732	3.98%
Transportation & Communications	7,467	264	3.54%
Wholesale Trade	3,416	112	3.28%
Total	**87,220**	**3,071**	**3.52%**

Table 2: Distribution of delistings

Panel A reports the yearly frequency of delisting firms and the total number of public firms. Data for delistings for the period from 1996 to 2017 are taken from CRSP. The delisting rate (%) equals the number of delistings divided by the total number of firms. Panel B reports the distribution of delistings across industry sectors (1-digit SIC). The delisting rate equals the number of delistings in an industry divided by the total number of firms in that industry.

Panel A: Number of delistings by year

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	All firms	Delistings		Delist – Voluntary		Delist – Forced		Delist – Merge	
		#	%	#	%	#	%	#	%
1996	5,138	409	7.96%	255	4.96%	154	3.00%	251	4.89%
1997	5,481	570	10.40%	319	5.82%	251	4.58%	315	5.75%
1998	5,377	624	11.60%	344	6.40%	280	5.21%	338	6.29%
1999	5,025	547	10.89%	323	6.43%	224	4.46%	318	6.33%
2000	4,902	572	11.67%	259	5.28%	313	6.39%	244	4.98%
2001	4,753	378	7.95%	156	3.28%	222	4.67%	132	2.78%
2002	4,443	350	7.88%	144	3.24%	206	4.64%	127	2.86%
2003	4,148	239	5.76%	151	3.64%	88	2.12%	143	3.45%
2004	4,000	235	5.87%	156	3.90%	79	1.98%	143	3.58%
2005	3,921	255	6.50%	184	4.69%	71	1.81%	179	4.57%
2006	3,808	264	6.93%	201	5.28%	63	1.65%	194	5.09%
2007	3,660	249	6.80%	150	4.10%	99	2.70%	137	3.74%
2008	3,596	219	6.09%	118	3.28%	101	2.81%	94	2.61%
2009	3,395	202	5.95%	136	4.01%	66	1.94%	123	3.62%
2010	3,269	188	5.75%	133	4.07%	55	1.68%	131	4.01%
2011	3,201	162	5.06%	111	3.47%	51	1.59%	104	3.25%
2012	3,155	142	4.50%	104	3.30%	38	1.20%	102	3.23%
2013	3,146	136	4.32%	90	2.86%	46	1.46%	86	2.73%
2014	3,151	166	5.27%	119	3.78%	47	1.49%	118	3.74%
2015	3,265	199	6.09%	135	4.13%	64	1.96%	133	4.07%
2016	3,205	168	5.24%	124	3.87%	44	1.37%	121	3.78%
2017	3,181	118	3.71%	82	2.58%	36	1.13%	80	2.51%
Total	**87,220**	**6,392**	**7.33%**	**3,794**	**4.35%**	**2,598**	**2.98%**	**3,613**	**4.14%**

Panel B: Industry distribution

	(1)	(2)	(3)
Sector	All firms	Delistings	Delisting rate
Agriculture, Forestry & Fishing	349	24	6.88%
Construction	1,213	66	5.44%
Manufacturing	44,071	2,891	6.56%
Mining	5,975	347	5.81%
Retail Trade	6,346	498	7.85%
Services	18,383	1,763	9.59%
Transportation & Communications	7,467	522	6.99%
Wholesale Trade	3,416	281	8.23%
Total	**87,220**	**6,392**	**7.33%**

Table 3: Summary statistics

The table presents summary statistics for the main variables used in the study. The sample period is from 1996 to 2017. Financial, utilities, and unclassified firms are excluded. Definitions of all variables are included in the Appendix. Continuous variables are winsorized at the 1% level. Non-ratio variables are reported in CPI-adjusted 2010 dollars.

	(1) Obs.	(2) Mean	(3) S.D.	(4) 25th percentile	(5) 50th percentile	(6) 75th percentile
Firm characteristics						
Firm size	87,220	1.239	2.150	-0.352	1.128	2.722
Leverage	87,220	0.222	0.223	0.013	0.178	0.352
Return on assets	87,220	0.027	0.268	0.006	0.099	0.159
Cash flow volatility	87,220	0.090	0.099	0.029	0.054	0.106
Market-to-book ratio	87,220	2.069	1.691	1.082	1.494	2.337
SCA lawsuits						
𝟙(SCA)	87,220	0.031	0.174	0.000	0.000	0.000
𝟙(Dismissed SCA)	87,220	0.012	0.111	0.000	0.000	0.000
𝟙(Settled SCA)	87,220	0.016	0.127	0.000	0.000	0.000
#SCA	87,220	0.035	0.214	0.000	0.000	0.000
#Dismissed SCA	87,220	0.013	0.123	0.000	0.000	0.000
#Settled SCA	87,220	0.018	0.147	0.000	0.000	0.000
Delisting						
𝟙(Delist)	87,220	0.073	0.261	0.000	0.000	0.000
𝟙(Delist – Voluntary)	87,220	0.043	0.204	0.000	0.000	0.000
𝟙(Delist – Forced)	87,220	0.030	0.170	0.000	0.000	0.000

Table 4: Effect of SCA lawsuits on firm delisting rate

This table reports OLS results estimating the effect of SCA lawsuits on a firm's propensity to delist for the period from 1996 to 2017. The dependent variable is 𝟙(*Delist*), an indicator variable that equals one if the firm deregisters from a stock exchange in the year, and zero otherwise. In Panel A, 𝟙(*SCA*) is an indicator variable that equals one if a firm experiences an SCA lawsuit in a year, and zero otherwise. In Panel B, *#SCA* is the number of SCA lawsuits that a firm experiences in a year. In Panel C, *F2*. 𝟙(*SCA*) and *F1*. 𝟙(*SCA*) are indicator variables that equal one if a firm experiences an SCA lawsuit two years or one year after the delisting event, respectively, and zero otherwise. *L2*. 𝟙(*SCA*) and *L1*. 𝟙(*SCA*) are indicator variables that equal one if a firm experiences an SCA lawsuit two years or one year prior to the delisting event, respectively, and zero otherwise. *F2.#SCA* and *F1.#SCA* are the number of SCA lawsuits that a firm experiences two years or one year after the delisting event, respectively. *L2.#SCA* and *L1.#SCA* are the number of SCA lawsuits that a firm experiences two years or one year prior to the delisting event. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Panel A: SCA lawsuit indicator

	(1)	(2)	(3)
𝟙(SCA)	0.168***	0.168***	0.168***
	(6.00)	(5.67)	(5.67)
Market-to-book ratio	-0.011***	-0.011***	-0.010***
	(-10.61)	(-10.38)	(-10.35)
Firm size	-0.016***	-0.013***	-0.013***
	(-18.89)	(-18.71)	(-18.15)
Leverage	0.114***	0.108***	0.106***
	(10.46)	(10.98)	(11.61)
Return on assets	-0.083***	-0.090***	-0.104***
	(-5.03)	(-5.77)	(-7.11)
Cash flow volatility	0.018	0.024*	0.038***
	(1.36)	(1.88)	(3.06)
Year FE	No	Yes	No
Industry-year FE	No	No	Yes
Observations	87,220	87,220	87,220
Adjusted R^2	0.047	0.052	0.055

Panel B: SCA lawsuit intensity

	(1)	(2)	(3)
#SCA	0.120***	0.119***	0.118***
	(5.12)	(4.77)	(4.75)
Market-to-book ratio	-0.010***	-0.011***	-0.010***
	(-10.54)	(-10.30)	(-10.27)
Firm size	-0.016***	-0.013***	-0.013***
	(-18.93)	(-18.55)	(-17.93)
Leverage	0.114***	0.108***	0.106***
	(10.51)	(11.03)	(11.70)
Return on assets	-0.083***	-0.090***	-0.103***
	(-5.05)	(-5.77)	(-7.09)
Cash flow volatility	0.019	0.026*	0.040***
	(1.45)	(1.94)	(3.10)
Year FE	No	Yes	No
Industry-year FE	No	No	Yes
Observations	87,220	87,220	87,220
Adjusted R^2	0.044	0.049	0.052

Panel C – Time evolution of the litigation effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DSCA				NSCA			
F2. 𝟙(SCA)	0.000							
	(0.28)							
F1. 𝟙(SCA)		0.000						
		(0.06)						
L1. 𝟙(SCA)			0.022**					
			(2.34)					
L2. 𝟙(SCA)				0.012*				
				(1.77)				
F2. #SCA					-0.000			
					(-0.25)			
F1. #SCA						0.001		
						(0.71)		
L1. #SCA							0.016*	
							(1.73)	
L2. #SCA								0.008
								(1.27)
Market to book ratio	-0.000***	-0.000***	-0.009***	-0.009***	-0.000***	-0.000***	-0.009***	-0.009***
	(-5.01)	(-4.59)	(-9.02)	(-8.54)	(-4.96)	(-4.65)	(-9.01)	(-8.55)
Firm size	0.000	0.000	-0.012***	-0.012***	0.000	0.000	-0.012***	-0.012***
	(1.49)	(1.47)	(-16.02)	(-16.82)	(1.51)	(1.44)	(-16.09)	(-16.85)
Leverage	0.005***	-0.000	0.106***	0.109***	0.005***	-0.000	0.106***	0.109***
	(2.85)	(-0.58)	(11.52)	(11.46)	(2.85)	(-0.58)	(11.53)	(11.47)
Returns on assets	-0.003***	-0.002***	-0.103***	-0.102***	-0.003***	-0.002***	-0.103***	-0.102***
	(-3.39)	(-2.98)	(-6.93)	(-7.17)	(-3.39)	(-2.99)	(-6.93)	(-7.17)
Cash flow volatility	0.007*	0.006*	0.046***	0.034**	0.007*	0.006*	0.046***	0.034**
	(1.95)	(1.93)	(3.69)	(2.71)	(1.95)	(1.92)	(3.72)	(2.71)
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71,503	78,987	86,725	80,157	71,503	78,987	86,725	80,157
Adjusted R^2	0.003	0.000	0.043	0.041	0.003	0.000	0.043	0.041

Table 5: Other robustness tests

This table reports the estimated effect of SCA lawsuits on a firm's propensity to delist. The dependent variable is 𝟙(*Delist*), an indicator variable that equals one if the firm deregisters from a stock exchange in the year, and zero otherwise. In Panel A, we employ Cox and probit models. In Panel B, we run the regressions on various subsample periods. In column (1), we remove the period in the sample that could be affected by the dotcom bubble (2001–2002). In column (2), we remove the period around the 2008 global financial crisis (2007–2009). In column (3), we remove the periods around both the dotcom bubble and global financial crisis. In Panel C, we additionally control for the potential effect of corporate governance on delisting. 𝟙(*SCA*) is an indicator variable that equals one if a firm experiences an SCA lawsuit in a year, and zero otherwise. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Panel A: Cox and probit models

	(1)	(2)	(3)	(4)	(5)	(6)
	Cox model		Probit model			
			Coefficient	Marginal	Coefficient	Marginal
𝟙(SCA)	1.461***	1.456***	0.907***	0.116	0.913***	0.116
	(8.34)	(8.18)	(7.93)		(7.77)	
Market-to-book ratio	-0.187***	-0.191***	-0.094***	-0.012	-0.100***	-0.012
	(-11.13)	(-11.53)	(-9.81)		(-10.83)	
Firm size	-0.210***	-0.206***	-0.132***	-0.016	-0.124***	-0.015
	(-9.73)	(-9.34)	(-15.94)		(-12.70)	
Leverage	1.268***	1.259***	0.756***	0.097	0.736***	0.094
	(19.47)	(18.84)	(17.06)		(16.64)	
Return on assets	-0.826***	-0.850***	-0.457***	-0.058	-0.498***	-0.063
	(-8.12)	(-8.47)	(-5.79)		(-6.22)	
Cash flow volatility	0.020	0.004	-0.006	-0.001	0.018	0.002
	(0.14)	(0.03)	(-0.07)		(0.23)	
Industry sales growth		0.103			0.152*	0 .026
		(0.63)			(1.86)	
Real GDP growth		5.999**			5.508***	0.692
		(2.01)			(3.09)	
Observations	84,147	84,147	87,216		87,216	
Log pseudolikelihood	-49,114	-49,083	-20,994		-20,894	

Table 5: continued

Panel B: Subsample testing

	(1) Excluding dotcom bubble	(2) Excluding global financial crisis	(3) Excluding both
𝟙(SCA)	0.186***	0.161***	0.170***
	(5.72)	(5.26)	(5.11)
Market-to-book ratio	-0.011***	-0.011***	-0.011***
	(-11.90)	(-11.37)	(-10.60)
Firm size	-0.013***	-0.013***	-0.012***
	(-17.69)	(-16.06)	(-15.98)
Leverage	0.100***	0.104***	0.095***
	(11.03)	(9.90)	(9.29)
Return on assets	-0.097***	-0.108***	-0.097***
	(-6.19)	(-6.51)	(-5.28)
Cash flow volatility	0.043***	0.038**	0.039**
	(3.22)	(2.80)	(2.64)
Industry-year FE	Yes	Yes	Yes
Observations	74,843	73,388	64,192
Adjusted R^2	0.055	0.054	0.052

Panel C: Controlling for governance

	(1) Institutional holdings	(2) G-index	(3) E-index
𝟙(SCA)	0.166***	0.175***	0.184***
	(5.61)	(5.42)	(5.40)
Institutional ownership	0.034***		
	(7.37)		
G Index		0.000	
		(0.79)	
E Index			-0.000
			(-0.56)
Market-to-book ratio	-0.011***	-0.010***	-0.011***
	(-11.06)	(-6.77)	(-6.88)
Firm size	-0.014***	-0.015***	-0.015***
	(-19.64)	(-11.65)	(-14.60)
Leverage	0.108***	0.051***	0.053***
	(11.94)	(5.11)	(5.26)
Return on assets	-0.108***	-0.047*	-0.067**
	(-7.57)	(-1.88)	(-2.60)
Cash flow volatility	0.042***	0.052	0.046
	(3.37)	(1.24)	(1.09)
Industry-year FE	Yes	Yes	Yes
Observations	87,220	20,116	18,537
Adjusted R^2	0.057	0.041	0.055

Table 6: Effect of the Ninth Circuit ruling

This table reports the effect of the Ninth Circuit ruling on firms' probability of experiencing an SCA lawsuit and propensity to delist for the period, using data from 1996 to 2002. Panel A presents the effect of the Ninth Circuit ruling on the probability of experiencing SCA litigation. The dependent variable in Panel A is 𝟙(SCA), an indicator variable that equals one if a firm experiences a SCA lawsuit in a given year, and zero otherwise. Panel B presents a comparison of average statistics between the control and treated firms without and with propensity score matching. The matched variables include all control variables in Table 4. Panel C reports the difference-in-differences regression on the whole matched sample in columns (1) and (2) and on the sample with technology firms excluded in columns (3) and (4). The dependent variable in Panel C is 𝟙(*Delist*), an indicator variable that equals one if the firm deregisters from a stock exchange in the year, and zero otherwise. 𝟙(*9th Circuit*) is an indicator variable that equals one for firms whose headquarters are in the Ninth Circuit area, and zero otherwise. 𝟙(*>1999*) is an indicator variable that equals one for the years after 1999, and zero otherwise. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Panel A – Probability of an SCA lawsuit

	(1)	(2)	(3)
	𝟙(SCA)	𝟙(SCA)	𝟙(SCA)
𝟙(9th Circuit) x 𝟙(>1999)	-0.008*	-0.008*	-0.008**
	(-2.20)	(-2.22)	(-2.70)
𝟙(9th Circuit)	-0.008	-0.007	0.007**
	(-1.07)	(-0.50)	(2.60)
Market-to-book ratio	0.006***	0.006***	0.005***
	(5.32)	(5.43)	(6.61)
Firm size	0.031***	0.031***	0.011***
	(7.48)	(7.47)	(4.47)
Leverage	-0.023	-0.024*	0.001
	(-1.83)	(-1.99)	(0.22)
Return on assets	-0.004	-0.003	0.005*
	(-0.76)	(-0.60)	(2.16)
Cash flow volatility	0.032	0.027	0.038**
	(0.97)	(0.79)	(2.57)
Firm FE	Yes	Yes	No
Year FE	Yes	Yes	No
Headquarters FE	No	Yes	No
Industry-year FE	No	No	Yes
Observations	29,909	29,909	29,909
Adjusted R^2	0.046	0.046	0.026

Table 6 Continued

Panel B – Difference-in-differences - Probability of delisting

	(1)	(2)	(3)	(4)
	All firms		Exclude technology firms	
𝟙(9th Circuit) x 𝟙(>1999)	-0.013**	-0.014*	-0.021**	-0.022**
	(-2.06)	(-1.93)	(-2.27)	(-2.46)
𝟙(9th Circuit)	0.008*	0.007	0.011	0.008
	(1.86)	(1.55)	(1.64)	(1.15)
𝟙(>1999)	-0.006		-0.028***	
	(-1.29)		(-5.53)	
Market to book ratio	-0.012***	-0.011***	-0.012***	-0.013***
	(-8.42)	(-9.15)	(-9.86)	(-10.44)
Firm size	-0.009***	-0.010***	-0.012***	-0.013***
	(-7.64)	(-8.15)	(-7.89)	(-8.51)
Leverage	0.144***	0.137***	0.151***	0.149***
	(13.22)	(13.60)	(11.08)	(14.17)
Returns on assets	-0.122***	-0.122***	-0.230***	-0.218***
	(-5.76)	(-7.67)	(-12.21)	(-10.65)
Cash flow volatility	0.075***	0.063***	0.071**	0.062*
	(3.39)	(2.87)	(2.21)	(1.96)
Industry-year FE	No	Yes	No	Yes
Observations	29,909	29,909	23,479	23,479
Adjusted R^2	0.054	0.061	0.064	0.067

Table 7: Delisting returns after the Ninth Circuit ruling

This table reports CARs for delisting events with sufficient data. Panel A compares CARs for stocks in the Ninth Circuit area before and after 1999. Panel B shows cross-sectional regression results on the [–5,0] CAR window. 𝟙(*9th Circuit*) x 𝟙(*>1999*) is an indicator variable equal to one for observations after 1999 for firms whose headquarters are in the Ninth Circuit area, and zero otherwise. Control variables are as defined in the Appendix. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Panel A – Ninth Circuit before and after 1999

Window	Before 1999	After 1999	Difference	t-stat
[–1,0]	–0.38%	–2.23%	0.018**	2.24
[–5,0]	–1.45%	–3.24%	0.017**	1.71
[–9,0]	–2.04%	–5.68%	0.036***	2.81
[–13,0]	–2.88%	–7.57%	0.046***	3.32
[–17,0]	–4.29%	–7.17%	0.028**	1.81
[–21,0]	–4.95%	–8.72%	0.037**	2.11

Panel B – Cross-sectional regression

Cumulative abnormal returns	(1)	(2)	(3)	(4)	(5)	(6)	(7)
𝟙(9th Circuit) x 𝟙(>1999)	-0.024**	-0.024**	-0.030***	-0.029***	-0.029**	-0.028**	-0.026**
	(-2.21)	(-2.21)	(-2.72)	(-2.72)	(-2.70)	(-2.63)	(-2.15)
Firm size		0.001	0.002	0.002	0.002	0.002	0.002
		(0.50)	(1.32)	(1.07)	(1.19)	(1.30)	(1.44)
Leverage			-0.065***	-0.065***	-0.064***	-0.062***	-0.075***
			(-4.62)	(-4.61)	(-4.59)	(-4.45)	(-5.63)
Returns on assets				0.007	0.010	0.020*	0.011
				(0.62)	(1.01)	(1.89)	(0.91)
Market-to-book ratio					0.002	0.002	0.001
					(1.42)	(1.22)	(0.35)
Cash flow volatility						0.020***	0.020***
						(3.65)	(3.44)
Industry-year FE	No	No	No	No	No	No	Yes
Observations	3,110	3,110	3,110	3,110	3,110	3,110	3,110
Adjusted R^2	0.002	0.001	0.011	0.011	0.011	0.014	0.011

Table 8: Federal judge ideology

This table reports the OLS results that estimate the effect of liberal judges on firms' propensity to delist for the period from 1996 to 2016. The dependent variable is 𝟙(*Delist*), an indicator variable that equals one if a firm deregisters from a stock exchange in the year, and zero otherwise. In columns (1) and (2), we use an OLS specification with industry-year fixed effects. In columns (3)-(8), we employ Cox and probit models. *ΔLiberal judges* is the change in percentage of federal judges who were appointed by a Democratic president in the Circuit court of the firm's headquarters. *ΔLiberal panel* is the change in probability that judges appointed by Democratic presidents dominate a panel of three judges randomly selected from the Circuit. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS		Cox		Probit			
					Coefficient	Marginal	Coefficient	Marginal
ΔLiberal judges	0.278***		3.415***		1.515***	0.218		
	(3.70)		(4.31)		(13.07)			
ΔLiberal panel		0.158**		1.980***			0.879***	0.126
		(2.79)		(3.39)			(10.51)	
Market-to-book ratio	-0.011***	-0.011***	-0.170***	-0.171***	-0.090***	-0.012	-0.090***	-0.012
	(-8.60)	(-8.60)	(-9.40)	(-9.43)	(-18.64)		(-18.69)	
Firm size	-0.012***	-0.012***	-0.152***	-0.152***	-0.105***	-0.015	-0.105***	-0.015
	(-12.84)	(-12.92)	(-7.28)	(-7.21)	(-24.81)		(-24.77)	
Leverage	0.114***	0.114***	1.183***	1.188***	0.714***	0.102	0.716***	0.103
	(12.45)	(12.42)	(16.86)	(17.09)	(24.67)		(24.75)	
Return on assets	-0.116***	-0.116***	-0.867***	-0.872***	-0.501***	-0.072	-0.504***	-0.072
	(-7.47)	(-7.48)	(-8.42)	(-8.42)	(-16.40)		(-16.53)	
Cash flow volatility	0.047***	0.047***	0.246*	0.250*	0.090	0.012	0.088	0.012
	(3.62)	(3.63)	(1.91)	(1.95)	(1.01)		(1.00)	
Industry-year FE	Yes	Yes	No	No	No		No	
Observations	72,991	72,991	69,797	69,797	72,991		72,991	
Adjusted R^2	0.047	0.046						
Log pseudolikelihood			-45,659	-45,698	-19,601		-19,632	

Table 9: Voluntary versus forced delisting

This table reports multinominal logit results estimating the effect of SCA lawsuits on firms' types of delist, whether forced or voluntary. The dependent variable is *Delist types*, which equals one if a firm's CRSP delist code is 300 or above and not 570 or 573 (forced delist); two if a firm's CRSP delist code is within the range 200–299 or is 570 or 573 (voluntary delist), and zero if a firm is active and has not delisted (the base group). 𝟙(*SCA*) is an indicator variable that equals one if a firm experiences an SCA lawsuit in a year, and zero otherwise. *#SCA* is the number of SCA lawsuits that a firm experiences in a year. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

	(1)	(2)	(3)	(4)
	Coefficient	Marginal	Coefficient	Marginal
Base model – Active firms				
Forced delists				
𝟙(SCA)	1.082***	0.024		
	(5.49)			
#SCA			0.916***	0.021
			(4.94)	
Market to book ratio	-0.426***	-0.010	-0.425***	-0.010
	(-18.14)		(-18.05)	
Firm size	-0.526***	-0.013	-0.526***	-0.013
	(-15.09)		(-15.14)	
Leverage	3.199***	0.080	3.199***	0.080
	(30.04)		(29.87)	
Returns on assets	-1.705***	-0.043	-1.703***	-0.043
	(-9.80)		(-9.81)	
Cash flow volatility	0.355	0.010	0.363*	0.010
	(1.62)		(1.65)	
Voluntary delists				
𝟙(SCA)	1.919***	0.076		
	(8.48)			
#SCA			1.281***	0.051
			(5.38)	
Market to book ratio	-0.117***	-0.004	-0.107***	-0.003
	(-5.21)		(-5.00)	
Firm size	-0.164***	-0.005	-0.159***	-0.005
	(-7.36)		(-7.05)	
Leverage	0.152	0.001	0.149	0.001
	(1.45)		(1.39)	
Returns on assets	0.248	0.012	0.246	0.012
	(1.56)		(1.56)	
Cash flow volatility	-0.859***	-0.035	-0.812**	-0.033
	(-2.78)		(-2.57)	
Observations	87,220		87,220	
Log pseudolikelihood	-24,008		-24,156	

Table 10: Dismissed verses settled SCA lawsuits and settlement amount

This table reports OLS results estimating the effect of SCA lawsuits on firms' propensity to delist. The dependent variable is 𝟙(*Delist*), an indicator variable that equals one if the firm deregisters from a stock exchange in the year, and zero otherwise. 𝟙(*Dismissed SCA*) is an indicator variable that equals one if the firm's SCA lawsuits originating in a year are dismissed, and zero otherwise. 𝟙(*Settled SCA*) is an indicator variable that equals one if the firm's SCA lawsuits originating in a year are settled, and zero otherwise. #*Dismissed SCA* is the number of SCA lawsuits originating in a year that are dismissed. #*Settled SCA* is the number of SCA lawsuits originating in a year that are settled. *Settlement amount* is the ratio of the settlement amount to market value of equity. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
𝟙(Dismissed SCA)	0.042**					
	(2.25)					
#Dismissed SCA		0.034*				
		(1.81)				
𝟙(Settled SCA)			0.264***			
			(6.64)			
#Settled SCA				0.199***		
				(5.07)		
Settlement amount					0.788**	0.373***
					(2.76)	(3.91)
𝟙(SCA)						0.172***
						(5.45)
Market to book ratio	-0.010***	-0.010***	-0.010***	-0.010***	-0.009***	-0.010***
	(-9.27)	(-9.28)	(-9.49)	(-9.47)	(-8.94)	(-10.12)
Firm size	-0.012***	-0.012***	-0.012***	-0.012***	-0.012***	-0.013***
	(-16.85)	(-16.79)	(-17.09)	(-17.02)	(-16.32)	(-17.65)
Leverage	0.106***	0.106***	0.105***	0.106***	0.107***	0.106***
	(11.64)	(11.64)	(11.47)	(11.53)	(11.72)	(11.76)
Returns on assets	-0.103***	-0.103***	-0.104***	-0.103***	-0.104***	-0.105***
	(-6.99)	(-7.00)	(-7.28)	(-7.24)	(-7.14)	(-7.30)
Cash flow volatility	0.044***	0.044***	0.040***	0.040***	0.044***	0.039***
	(3.49)	(3.49)	(3.25)	(3.23)	(3.64)	(3.25)
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87,220	87,220	87,220	87,220	86,925	86,925
Adjusted R^2	0.043	0.043	0.060	0.056	0.044	0.056

Table 11: Litigation rate of OTC firms

Panel A presents the comparison of firm characteristics and litigation rates for public and OTC firms before and after the propensity score matching. Panel B reports the comparison of the litigation rates of firms before and after IPO. Panel C reports the regression results on the sample of firms before and after IPO. The dependent variable in Panel C is 𝟙(*SCA*), an indicator variable that equals one if a firm experiences an SCA lawsuit in a given year, and zero otherwise. 𝟙(*IPO*) is an indicator that equals one in a year that a firm goes public, and zero otherwise. Control variables are as defined in the Appendix. Standard errors are clustered by year and t-stats are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Panel A – Cross-section analysis

	(1)	(1)	(3)	(4)	(5)	(6)	(7)	(8)
	Averages - Entire sample				Averages - Matched sample			
Variable	OTC	Public	Diff.	t-stat	OTC	Public	Diff.	t-stat
Firm characteristics								
Firm size	–0.438	1.435	–1.872***	–137.210	0.966	0.949	0.016	0.440
Sale growth	34.55%	27.56%	6.98%***	10.820	28.87%	27.54%	1.32%	0.720
Return on assets	–30.52%	5.72%	–36.24%***	–78.590	–5.24%	–2.88%	–2.36%	–1.530
Cash ratio	18.39%	20.51%	–2.11%***	–15.940	20.09%	19.69%	0.40%	0.980
SCA lawsuits								
𝟙(SCA)	1.29%	2.85%	–1.56%***	–18.230	1.84%	2.71%	–0.86%***	–3.110
#SCA	0.016	0.032	–0.016***	–15.15	0.022	0.029	–0.007**	–1.97

Panel B – Within-firm univariate analysis

	Before IPO	After IPO	Difference	t-stat
𝟙(SCA)	0.70%	5.02%	–4.32%	–15.183
#SCA	0.008	0.056	–0.048	–14.253

Panel C – Within-firm multivariate analysis

	(1)	(2)	(3)	(4)	(5)	(6)
𝟙(IPO)	0.044***	0.039***	0.039***	0.036***	0.039***	0.038***
	(8.034)	(6.664)	(6.657)	(7.131)	(5.545)	(3.939)
Firm size		0.005***	0.006***	0.007***	0.009***	0.011***
		(4.846)	(5.315)	(5.435)	(6.575)	(5.916)
Return on Assets			–0.008***	–0.015***	–0.018***	–0.017***
			(–3.583)	(–3.896)	(–4.747)	(–4.334)
Leverage				–0.024***	–0.027***	–0.021***
				(–3.277)	(–3.728)	(–3.473)
Sale growth					0.017**	0.012**
					(2.667)	(2.586)
Industry-year FE	No	No	No	No	No	Yes
Observations	24,176	22,297	22,093	22,093	19,306	19,206
Adjusted R^2	0.009	0.009	0.009	0.011	0.018	0.036