Securities Litigation Risk and Board Gender Diversity

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Abstract

Using panel data analyses from 1998 to 2017, we investigate the impact of board gender diversity on securities litigation risk. We find that securities litigation risk is inversely related to the fraction of female independent directors on a company board. Additionally, the effectiveness of female independent directors in reducing litigation risk is negatively related to the firm's monitoring cost and positively related to the firm's complexity. We further investigate the channels through which female independent directors may reduce litigation risk, and attribute it to improvement in board participation and accounting conservatism.

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Abstract

Using panel data analyses from 1998 to 2017, we investigate the impact of board gender diversity on securities litigation risk. We find that securities litigation risk is inversely related to the fraction of female independent directors on a company board. Additionally, the effectiveness of female independent directors in reducing litigation risk is negatively related to the firm's monitoring cost and positively related to the firm's complexity. We further investigate the channels through which female independent directors may reduce litigation risk, and attribute it to improvement in board participation and accounting conservatism.

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1. Introduction

A firm that endures securities litigation bears substantial expenses, mostly in the form of settlement costs.[1] These litigation costs might have a negative impact on liquidity, investment policies, external financing policy, credit worthiness, and payout policy of a firm (e.g., Autore et al., 2014; Arena and Julio, 2015; Arena and Julio, 2016; Arena, 2018). In addition, there are hidden costs of contracts, damage to the firm's image, and harm to the firm's relations with suppliers and customers (Engelmann and Cornell, 1988; Lawry and Shu, 2002). Considering the substantial costs of securities litigation risk, it is imperative that shareholders take steps to alleviate this risk. Shareholders may reduce securities litigation risk by effective monitoring of management which depends on the composition of board of directors. We consider one aspect of board composition, board gender diversity, and examine its effect on corporate securities litigation risk. We find that the presence of female independent directors on company boards reduces corporate securities litigation risk. Our analysis also shows that monitoring cost has a negative effect, and complexity of firm has a positive influence on the effectiveness of female independent directors in moderating securities litigation risk. Further analysis reveals that female independent directors enhance board participation and increase the firm's conditional accounting conservatism, thus improving monitoring function of a firm's board.[2]

Our argument to link the presence of female independent directors on a corporate board to a firm's litigation risk is based on theoretical evidence that higher monitoring of management

[1] According to the Audit Analytics database, publicly traded companies have paid an average of $223 million in settlement, but for some companies these costs are in billions of dollars and lead to their bankruptcy. Enron had to pay $7.1 billion in settlement whereas WorldCom had a settlement cost of $6.1 billion.
[2] Conditional accounting conservatism is the reflection of bad news on firms' earning reports quicker than good news.

aligns their interests to shareholders' and empirical evidence that female directors are tougher monitors. Agency theory by Jensen and Meckling (1976) states that the separation of ownership and management may lead to interest conflicts between management and shareholders. A company's board plays a crucial role in alleviating such interest conflicts by plying a liaison role between shareholders and management. As a representative of shareholders, the company board monitors the functioning of management, apprises the shareholders of management decisions in a timely manner, and stops the management from making decisions that affect the shareholders adversely. To increase the monitoring effectiveness of the board of directors, it is important to align directors' interests with shareholders'. One avenue to achieve this alignment is to exploit the reputational concern of independent directors (Fama, 1980; Fama and Jensen, 1983). As future careers of independent directors depend on their performance in the directorship they serve, there is an incentive for independent directors to execute their monitoring role effectively.

Since there is a glass ceiling phenomenon and women face more barriers to enter corporate boards, female independent directors might have more reputational concerns compared to their male counterparts, and their performance might be under tougher scrutiny (Lee and James, 2007; Lara et al., 2017). Therefore, female independent directors have more incentive to be active monitors. Moreover, since female independent directors do not belong to the "Old Boys' Club", in theory, they might be more relevant to the concept of board independence (Carter et al., 2003; Adams and Ferreira, 2009). Adams and Ferreira (2009) provide empirical evidence that female independent directors enhance monitoring function of a board. They find that female independent directors have less attendance problems than their male counterparts and they are more likely to join monitoring committees. Lara et al. (2017) show that there is a significant negative relationship between proportion of female independent directors and earning management practices suggesting improved monitoring in firms with female independent directors. Overall, there is agreement amongst researchers that inclusion of female independent directors on a firm board improves the monitoring function of the board. Since female independent directors provide better monitoring and better monitoring helps align management's interests with shareholders, we argue that presence of female independent directors on a board would curtail litigation risk. In our first hypothesis, we test if a higher fraction of female independent directors on a company board lowers the securities litigation risk.

To study the impact of female independent directors on firms' securities litigation risk, we use litigation data for S&P 1500 firms over the period of 1998 to 2017.[3] We find that the presence of female independent directors on a firm's board reduces the corporate securities litigation risk, while female non-independent directors have no impact on securities litigation risk.[4] Since female independent directors might self-select to serve on boards of firms that have better reputations and potentially lower litigation risk, endogeneity is a possible concern. We address endogeneity concerns by using various econometric methods: conditional fixed effects logit model, linear probability model (LPM) with firm fixed effects, two-stage instrumental variables (IV) probit model, Heckman correction model, and propensity score matching methodology. Our empirical tests consistently indicate that as the fraction of female independent directors on a board increases, the probability of a security lawsuit against the firm decreases.

Next, we examine if a firm's monitoring costs influence the effectiveness of female independent directors in moderating the securities litigation risk. Demsetz and Lehn (1985) suggest

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[3] Our sample of companies and the time period is driven by the limitations of the Institutional Shareholders Services (ISS) data for directors which is available for S&P 1500 firms starting from 1996. Since we lag the gender diversity variables up to two years, the time period for litigation data starts from 1998.

[4] Female independent directors are non-executive female directors who do not have any affiliation with the firm they work for.

that monitoring costs are higher for firms operating in unstable environments that have volatile prices, changing technology, and fluctuating market shares requiring managers to make frequent decisions about reallocation of firm's assets and resources. They argue that in such unstable environments, effects of managerial decisions on firm performance are compounded by effects of other, volatile exogenous factors, making it difficult and costly to monitor managerial behavior. Therefore, the higher the instability of a firm's operational environment, the less effective it is to impose intense monitoring on the firm's management. Several studies have shown that firms with higher monitoring costs have lower degrees of outside monitoring (e.g., Gillan et al., 2003; Coles et al., 2008) and imposing a high level of outside monitoring on the management of these firms has a negative impact on the performance (e.g., Wintoki, 2007; Balsam et al., 2016). As the effectiveness of monitoring is adversely related to monitoring costs, we argue that female independent directors would have less influence in curtailing litigation risk for firms with high monitoring costs. In our second hypothesis, we test if the effectiveness of female independent directors in moderating securities litigation risk is negatively related to a firm's monitoring costs. Similar to other researchers in this field (e.g., Gillan et al., 2003; Wintoki, 2007; Coles et al., 2008; Balsam et al., 2016), we use the standard deviation of returns, R&D expenditures and asset intangibility as proxies for the monitoring costs. Our findings indicate that the effectiveness of female independent directors in moderating the litigation risk substantially decreases with the increase in firms monitoring costs.

Further, we study if the complexity of a firm influences the effectiveness of female independent directors in reducing securities litigation risk. As a firm expands its operational scope and becomes more complex, agency costs increase. Therefore, imposing intense monitoring on managers plays a vital role to mitigate agency problems. Several studies find that firms with higher complexity impose higher degrees of outside monitoring on managers (e.g., Chhaochharia and Grinstein, 2007; Boone et al., 2007; Coles et al., 2008; Balsam et al., 2016). Moreover, researchers have shown that intense monitoring on managers adds value to more complex firms (Crutchley et al., 2004; Wintoki, 2007; Lehn et al., 2009; Balsam et al., 2016). Since female independent directors can provide better monitoring function, they will be more effective in lowering the litigation risk for complex firms. Conversely, in firms with lower complexity, there are less agency problems, making monitoring role of women independent directors less effective. In our third hypothesis, we test if the effectiveness of female independent directors in moderating securities litigation risk is positively related to the complexity of the firm. Following the existing literature (e.g., Lehn et al., 2009; Anderson et al., 2011; Balsam et al., 2016), we use market capitalization, number of business segments, number of employees, age, and internationalization factor as proxies for firm complexity.[5] Our results indicate that the effectiveness of female independent directors in reducing litigation risk is higher in firms with higher levels of complexity.

Finally, we explore the potential channels through which board gender diversity may reduce litigation risk. One channel through which female independent directors may reduce litigation risk is the improvement in board participation. Higher board participation may increase the monitoring effectiveness of a board, thereby reducing the litigation risk. Adams and Ferreira (2008) state that one of the key responsibilities of directors is to attend board meetings since it is the main mechanism for them to collect information and monitor management. Collecting data on what goes on in the boardroom is almost impossible since corporations do not usually disclose information about minutes of meetings and voting outcomes (Ferreira, 2010). Therefore, measuring the contribution of each director to the decision-making process and monitoring is not

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[5] Internationalization factor measures if a firm has income overseas.

feasible. The only exception in this regard is the measurement of board members' attendance since the U.S. Securities and Exchange Commission (SEC) mandates U.S. public firms to reveal the names of directors who attend less than 75 percent of the annual meetings. Using the director level attendance data, we find the directors and the firms that have board attendance problems i.e. the directors that attend less than 75 percent of board meetings and the firms they are in. We investigate if the presence of female independent directors influence board participation and find that inclusion of female independent directors on boards reduces board attendance problems. Our results are similar to Adams and Ferreira (2009), who find that the more gender-diverse the board is the fewer director attendance problems there are.

Another channel through which gender diverse boards may reduce litigation risk is conditional accounting conservatism. Under conditional conservatism, or asymmetric timeliness of earnings, firms reflect bad news in their earnings reports more quickly than good news (Basu, 1997). Conditional conservatism reduces the potential agency problems between shareholders and managers by timely recognition of losses in financial statements (e.g., Ball, 2001; Srivastava et al., 2015; and Basu and Liang, 2019), thereby lowering the likelihood of overvaluation of stocks and the subsequent potential dramatic fall of stock price. Therefore, conditional conservativeness reduces the likelihood of a securities lawsuit against a firm by making it more challenging for the shareholders to prove that they incurred financial losses through sharp stock price crashes (Ettredge et al., 2016). We follow Basu and Liang (2019) methodology to measure conditional accounting conservatism and investigate the influence of female independent directors on it. Our empirical tests reveal that firms with higher proportions of female independent directors on their boards exhibit higher conditional accounting conservativeness.

We make several contributions to the literature, and our findings provide important guidelines for policy makers and legislatures. First, we provide empirical evidence relating board gender diversity to corporate securities litigation risk.[6] To our knowledge, only Talley's (2009) work is somewhat related to our study. Using a panel dataset of public companies from 2001 to 2005, Talley (2009) explores whether a firm's structural governance choices predict its later susceptibility to securities class action litigation. He finds that governance factors (including board independence, separation of CEO and board chair positions, and percentage of female directors on a board) have negligible predictive value, both statistically and economically. These results that run counter to ours could be due to the small sample size (only 2001-2005) as compared to ours (1998-2017) and shortfall in the methodology employed. Talley (2009) ignored the inclusion of industry fixed effects in the regressions which may make his results biased as litigation risk is sensitive to industry classification. Second, we find that inclusion of female independent directors might not be helpful in reducing securities litigation risk for some firms. While firms with higher complexity and lower costs of intense monitoring can remarkably benefit from higher representation of female independent directors on their boards, inclusion of female independent directors in less complex firms and firms with higher monitoring costs might be ineffective in curtailing securities litigation risk. The differing effectiveness of female independent directors for different types of firms has policy implications as it suggests that governance requirements should not be uniform across firms.

The reminder of this paper is organized as follows. In Section 2, we describe the details of the data used. We explain the methodology in Section 3. In Section 4, we present the empirical

[6] In the context of non-security litigation risks, Liu (2018) finds that board gender diversity lowers the number of environmental lawsuits. Adhikari et al. (2019) find that firms in which women executives have more power face fewer operation-related lawsuits.

results of testing the effect of inclusion of female independent directors on securities litigation risk. Channels through which female independent directors may influence litigation risk are presented in Section 5. We provide our conclusion in Section 6.

2. Data

Our study covers S&P 1500 companies for the time period of 1998 to 2017. As is customary in this field of research, we exclude financial service companies (SIC codes from 4900 to 4999) and utility firms (SIC codes from 6000 to 69999). We use five data sources in our study: Audit Analytics Litigation Database, Institutional Shareholder Service Directors, Compustat, Center for Research in Security Prices, and Execucomp. We obtain data for securities lawsuits from Audit Analytics-Legal Case and Legal Parties, which provides case data on material civil litigation filed in federal district courts for public registrants under SEC regulation S-K §229.103. This information is supplemented with securities class action cases and SEC actions. In our study, we use only securities lawsuit cases that are indicated by security type 41 in the Audit Analytic Database. Securities lawsuits are based on a misleading action in violation of securities laws that deceive investors to trade based on false information, frequently resulting in losses. Securities frauds include a wide range of actions, including stock manipulation, financial misreporting, lying to corporate auditors, insider trading, front running, etc.

We use Institutional Shareholders Service Directors (formerly RiskMetrics) data related to individual board directors on universe of S&P 1500 companies. We obtain accounting data, market return information, and executive related information from Compustat, CRSP, and Execucomp, respectively.

3. Methodology

3.1 Base models

Kim and Skinner (2012) propose the following probit regression model to study the determinants of corporate litigation risk:

$$Security\ lit_t = \beta_0 + \beta_1\ (FPS_{t-1}) + \beta_2\ (Size_{t-1}) + \beta_3\ (Sales\ growth_{t-1}) + B_4(Return_{t-1}) + \beta_5\ (Return\ sd_{t-1}) + \beta_6\ (Return\ skew_{t-1}) + \beta_7\ (Turnover_{t-1}) + Y_t + \varepsilon_{i,t} \qquad (1)$$

Where the dependent variable, $Security\ lit_t$, is a binary variable that equals one if a securities lawsuit is filed against a firm in year t. Francis et al. (1994) suggest that firms in biotech, computer, electronics, and retail industries have higher litigation risks compared to other industries. To control for these industries, Kim and Skinner (2012) include a dummy variable, *FPS*, which is set to one if the firm is in any one of these four industries. Y_t represents year fixed effect. Detailed definitions of the other variables are in Appendix A.

To measure the effect of board gender diversity on corporate securities litigation risk, we expand Kim and Skinner's (2012) model and add variables related to gender diversity on a board. In addition, to address potential misspecification, we improve their model by controlling for additional board characteristics, CEO attributes, and firm-level controls. Moreover, we include industry fixed effects based on a two-digit SIC code in lieu of *FPS* dummy variable.[7] We use the following probit model:[8]

$$Security\ lit_{i,t} = \beta_0 + \beta_1(Female\ ind\ ratio_{i,t-1}) + \beta_2(Female\ non-ind\ \ ratio_{i,t-1}) + \theta\boldsymbol{X}_{i,t-1} + I_j + Y_t + \varepsilon_{i,t} \qquad (2)$$

[7] Our results stay the same even when we include FPS in our regressions.
[8] Our results stay the same when we use a logit model instead of a probit model.

Our variables of interest are *Female ind ratio* (ratio of female independent directors to the total number of directors at the end of year t-1) and *Female non-ind ratio* (ratio of female non-independent directors to the total number of directors at the end of year t-1) to capture the gender diversity on a board. Vector ***X*** embodies a series of additional controls including size, sales growth, stock turnover (Turnover), return, return volatility (Return sd), return skewness (Return skew), R&D intensity, free cash flow, leverage, capital expenditures (Capex), asset tangibility (Tangibility), Market-to-book ratio, return on assets (ROA), the proportion of male independent directors on a board (Male ind ratio), female CEO, female CFO, CEO tenure, CEO turnover, board size, CEO duality, board's average age, and board's age diversification. Following Kim and Skinner (2012) and Liu (2018), all explanatory variables are lagged by one year to address the potential endogeneity. In further robustness tests, we lag the key explanatory variable, *Female ind ratio*, by two years. I_j represents industry fixed effects based on a SIC two-digit code. Detailed definitions of variables are in Appendix A.

In addition, to address the unobserved heterogeneity, self-selection, and omitted-variable bias, we employ the conditional fixed effects logit model proposed by Chamberlain (1980). To further mitigate the potential bias caused by non-observed heterogeneity, we provide results using Linear Probability Model (LPM) with the inclusion of the firm fixed effects.

3.1.1 Two-stage IV Probit model

In assessing the effect of board gender diversity on litigation risk, there is a potential for endogeneity. Since female independent directors might be concerned more about their reputation, it is likely that they avoid joining firms that have higher litigation risk. To deal with the potential reverse causality, we use a two-stage instrumental variable probit model. We instrument *Female ind ratio* by two variables. Adams and Ferreira (2009) suggest the first instrument, *Male* *connection*. *Male connection* is the ratio of male directors who sit on other boards with at least one female director to the total number of male directors. This is a suitable instrument since the connection of male directors to women directors on other boards can increase the visibility of female directors as potential candidates for director appointments on additional company boards. Therefore, the greater the connection of male directors to women directors, the greater the proportion of female independent directors on boards should be. However, it is unlikely that *Male connection* directly affects the litigation risk of a firm. The second instrument, *County female ratio*, is the proportion of the total number of female directors in the county where a firm is headquartered to the total number of directors in that county, excluding the sample firm. This instrument also appears to be suitable because the proportion of female directors on local peers' boards is unlikely to affect the litigation risk of a firm directly. But, a higher supply of female directors in the county may be positively correlated with the proportion of female independent directors in the firm (Glaeser and Scheinkman, 2003 John and Kadyrzhanova, 2010; Anderson et al., 2011; Puthenpurackal and Upadhyay, 2013).

In the first stage, we regress *Female ind ratio* on these two instruments and other covariates [relation (3)]. In the second stage, we include the predicted value of *Female ind ratio* from the first stage in a probit regression model [relation (4)].

$$Female\ ind\ ratio_{i,t} = \beta_0 + \beta_1(Male\ connection_{i,t}) + \beta_2(County\ female\ ratio_{i,t}) + \theta \boldsymbol{X}_{i,t} + I_j + Y_t + \mu_{i,t} \quad (3)$$

$$Security\ lit_{i,t} = \beta_0 + \beta_1(\widehat{Female\ ind\ ratio}_{t-1}) + \theta \boldsymbol{X}_{i,t-1} + I_j + Y_t + \varepsilon_{i,t} \quad (4)$$

3.2 Alternative models

As a further check, we use the number of female independent directors on a board to capture the gender diversity of the corporate board. We use the model of Liu (2018) with some minor modifications. In Liu (2018), the dependent variable is a dummy that equals one if an environmental lawsuit is filed against the firm. Our dependent variable is a dummy that equals one if a securities lawsuit is filed against the firm. Liu (2018) uses the number of female directors while our focus is on the number of female independent directors. We employ the following probit model:

$$Security\ lit_{i,t} = \beta_0 + \beta_1(Female\ ind\ 1_{i,t-1}) + \beta_2(Female\ ind\ 2_{i,t-1}) + \beta_3(Female\ ind \geqslant 3_{i,t-1}) + \beta_4(Female\ non-ind_{i,t-1}) + \theta \boldsymbol{X}_{i,t-1} + I_j + Y_t + \varepsilon_{i,t} \tag{5}$$

Where, *Female ind* 1 is a binary variable that equals to one if a firm has exactly one female independent director. *Female ind* 2 is a binary variable that equals to one if a firm has exactly two female independent directors. *Female ind* ⩾3 is a binary variable that equals to one if a firm has three or more female independent directors. *Female non-ind* is a binary variable that equals to one if a firm has one or more non-independent female directors. To alleviate possible endogeneity concerns, we provide additional tests by lagging key explanatory variables, *Female ind 1*, *Female ind 2* and *Female ind ⩾3*, by two years. In addition, to address the unobserved heterogeneity and omitted-variable bias, we also employ the conditional fixed effects logit model and LPM with the inclusion of the firm fixed effects.

3.2.1 Heckman's selection model

As we discussed earlier, it is possible that reputation-concerned female independent directors self-select to join boards of firms with lower potential litigation risk. We use Heckman's two-step approach (Heckman, 1979) to correct for this potential self-selection bias on the subsample of firms that have exactly one female independent director and those that do not have any female independent directors. In the first step, we run the following probit model:

$$Ind\ female\ 1_{i,t} = \beta_0 + \beta_1(Male\ connection_{i,t}) + \beta_2(county\ female\ ratio_{i,t}) + \theta \boldsymbol{X}_{i,t} + I_j + Y_t + \mu_{i,t} \quad (6)$$

Then, we calculate the inverse mills ratio from the first step probit regression and include it in the second step probit regression:

$$Security\ lit_{i,t} = \beta_0 + \beta_1(Female\ ind\ 1_{i,t-1}) + \beta_2(inversemills\ ratio_{i,t-1}) + \theta \boldsymbol{X}_{i,t-1} + I_j + Y_t + \varepsilon_{i,t} \quad (7)$$

In the next test, we keep firms that have exactly two female independent directors and those that do not have any female independent directors, i.e. we replace *Female ind 1* by *Female ind 2* in relations (6) and (7). In further tests, we keep firms that have three or more female directors and those that do not have any female independent directors, i.e. we replace *Female ind 1* by *Female ind ⩾ 3* in relations (6) and (7).

3.2.2 Propensity score-matched samples

To address potential concerns of endogeneity and self-selection bias, we employ a propensity score matching procedure to reduce any unobserved heterogeneities that might concurrently affect board gender diversity and securities litigation risk. We pair-match firm-year observations that have exactly one female independent director with firm-year observations that do not have any female independent directors. We do the matching by industry (two-digit SIC), size, sales growth, turnover, return, return standard deviation, return skew, Male ind ratio, board size, duality, board's average age, board's age diversification, R&D intensity, cash flow, leverage, capital expenditures, tangibility, market-to-book ratio, and ROA within each year.[9] We estimate the following probit regression using the propensity score-matched sample:

$$Security\ lit_{i,t} = \beta_0 + \beta_1(Female\ ind\ 1_{i,t-1}) + \theta \mathbf{X}_{I,t-1} + I_j + Y_t + \varepsilon_{i,t} \tag{8}$$

Similarly, we pair-match firm-year observations that have exactly two female independent directors with firm-year observations that do not have any female independent directors. Then, we replace *Female ind 1* by *Female ind 2* in relation (8) and re-run it by using the propensity score-matched sample. Finally, we pair-match firm-year observations that have three or more female independent directors with firm-year observations that do not have any female independent directors. Then, we replace *Female ind 1* with *Female ind ⩾3* in relation (8) and estimate it using the propensity score-matched sample.

3.3 Models for measuring the effect of monitoring cost and firm complexity

In order to investigate if the influence of female independent directors depends on monitoring cost and firm complexity, we construct a monitoring cost index (*MC index*) and a complexity index (*COM index*). Our approach to construct these indexes is similar to Wintoki (2007).

We form the *MC index* using the standard deviation of the firms' 12-month return (*Return sd*), R&D intensity (*R&D*), and asset intangibility (*Asset int*). Along each variable, we sort the firm-year observations into deciles in an ascending order. Next, we assign them a score of 1 to 10

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[9] We employ one-to-one nearest neighborhood matching.

based on the rank of their deciles. To construct the *MC index*, we sum the scores across the three dimensions (*Return sd*, *R&D* and *Asset int*). We then normalize this index by scaling it between 0 and 1.

We use a similar method and form the complexity index using five dimensions: Market capitalization, number of business segments, number of employees, firm age, and having a foreign business segment.[10]

To measure the impact of *MC index* and *Com index* on the effect of female independent directors on the litigation risk, we include these indexes and their interaction with *Female ind ratio* in relation (2). Therefore, we estimate the following probit models [relation (9) and (10)]:

$$Security\ lit_{i,t} = \beta_0 + \beta_1(Female\ ind\ ratio_{i,t-1}) + \beta_2(MC\ index_{i,t-1}) + \beta_3(Female\ ind\ ratio * MC\ index_{i,t-1}) + \theta \mathbf{X}_{I,t-1} + I_j + Y_t + \varepsilon_{i,t} \quad (9)$$

$$Security\ lit_{i,t} = \beta_0 + \beta_1(Female\ ind\ ratio_{i,t-1}) + \beta_2(COM\ index_{i,t-1}) + \beta_3(Female\ ind\ ratio * COM\ index_{i,t-1}) + \theta \mathbf{X}_{i,t-1} + I_j + Y_t + \varepsilon_{i,t} \quad (10)$$

Where, *Female ind ratio*MC index* in relation (9) is the interaction of *Female ind ratio* and *MC index.* The term *Female ind ratio*COM index* in relation (10) denotes the interaction of *Female ind ratio* and *COM index.*

The estimate of β_3 in relation (9) captures the impact of a firm's monitoring cost on the effects of female independent directors on the litigation risk. The estimate of β_3 in relation (10) reflects as the impact of a firm's complexity on the effects of female independent directors on the litigation risk.

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[10] We assign a score of 10 to firms that have a business segment overseas.

4. Empirical results

4.1 Summary statistics of the variables

Table 1 summarizes descriptive statistics of all the variables.[11] The average of *Female ind ratio* is 0.099 indicating that, on average, 9.9 percent of directors of firm-year observations in our sample are female independent directors. The average of *Female non-ind ratio* is 0.006 indicating that, on average, 0.6 percent of directors of firm-year observations in our sample are female non-independent directors. 35.5 percent of firm-year observations in our sample have exactly one female independent director. 19.2 percent of firm-year observations have exactly two female independent directors, and 6.5 percent of observations have three or more female independent directors. 5.6 percent of firm-year observations have at least one non-independent female director. Table 1 also shows that 4.4 percent of firm-year observations in our sample are involved in security litigations.

< Insert Table 1 here >

Table 2 provides the number and percentage of firm-year litigations in our sample by industry. Firms operating in educational services, agricultural production (crops), communications, and health services have the highest rate of securities litigation in our sample.

< Insert Table 2 here>

In Figure 1, we present the percentage of firms involved in material securities litigation for each year in our sample. The percentage of litigated firms has increased noticeably in recent years. There is a dramatic upward trend in litigation from 2015 to 2017 when the average percentage of firms involved in litigation increases from 3% to around 8%. A series of Delaware court decisions

[11] To reduce the influence of outliers, we winsorize all non-binary variables at 1st and 99th percentiles.

that signaled the state's courts' hostility to disclosure-only settlements in merger objection cases accounts for this sharp increase.[12] These decisions encourage plaintiffs to shift merger objection cases away from Delaware courts to federal court. However, merger objection cases are not the only reason for the recent increase in the percentage of litigated firms. Even if we ignore the merger objection cases in recent years, the percentage of involved firms is above the prior average annual rate from 1996 to 2015.

< Insert Figure 1 here >

4.2. Female independent directors and securities litigation risk

In our first hypothesis, we investigate if a higher fraction of female independent directors on a company board is associated with lower securities litigation risk. In Table 3, we provide empirical results for the test of hypothesis and estimate all six variants of relation (2) discussed in section 3.1. The first two variants are under a probit modeling procedure while the third and the fourth variants are under a fixed effects conditional logistic modeling. The fifth and the sixth variants are LPM that include firm fixed effects.

Column 1 and Column 2 of Table 3 report the results of probit models using *Female ind ratio* as the key explanatory variable, lagged by one and two years, respectively. Results indicate that the coefficients of $Female\ ind\ ratio_{t-1}$ and $Female\ ind\ ratio_{t-2}$ are negative and statistically significant at the 1 percent level. The marginal effects of $Female\ ind\ ratio_{t-1}$ and $Female\ ind\ ratio_{t-2}$ on the probability of filing a securities lawsuit against a firm (i.e., dy/dx) are -0.087 and -0.081, respectively. Both are statistically significant at the 1 percent level. The marginal effect of *Male ind ratio* on the probability of a lawsuit filing against a firm are -0.031

[12]For example, in the Trulia case, the Delaware Chancery Court did not approve the disclosure-only settlement of a lawsuit objecting the disclosures associated to Zillow's acquisition of Trulia.

and -0.025, statistically significant at the 5 percent level and the 10 percent level, respectively. These results show that the magnitude of the negative marginal effect of the fraction of female independent directors on the probability of a securities lawsuit is around three times higher than the magnitude of the marginal effect of the fraction of male independent directors on the board.

To mitigate the unobserved heterogeneity and omitted-variable bias, we apply the conditional fixed effects logit model proposed by Chamberlain (1980) and report our results in Columns 3 and 4 of Table 3. We include firm fixed effects in the models. The coefficients of $Female\ ind\ ratio_{t-1}$ and $Female\ ind\ ratio_{t-2}$ are negative and statistically significant at the 1 percent level. Finally, Columns 5 and 6 of Table 3 display the results of the LPM with the inclusion of the firm fixed effects. The average marginal effects of $Female\ ind\ ratio_{t-1}$ and $Female\ ind\ ratio_{t-2}$ on the probability of filing a securities lawsuit against a firm are -0.14 and -0.13, respectively. Both are statistically significant at the 1 percent level. In both the conditional fixed effects and LPM models, we find the coefficient for *Male ind ratio* to be statistically insignificant. Overall, the results of Table 3 indicate that the higher the fraction of female independent directors on a board, the lower the securities litigation risk. Female non-independent directors do not affect the litigation risk as indicated by the coefficient of the *Female non-ind ratio*, which is statistically insignificant in all the columns of Table 3.

<Insert Table 3 here>

To address the potential reverse causality, we run a two-stage IV probit regression discussed in section 3.1.1. We utilize instruments *Male connection* and *County female ratio* that are correlated with *Female ind ratio* but uncorrelated with litigation risk. Table 4 presents the results of the first stage [relation (3)] and the second stage [relation (4)] of the IV approach. Column 1 reports the results of the first stage where *Female ind ratio* is regressed on the above two instruments (*Male connection* and *County female ratio*) and other covariates described in relation (2). The estimated coefficients of *Male Connection* and *County female ratio* are 0.0957 and 0.0399, respectively, both statistically significant at the 1 percent level. We also run the relevance test to examine the strength of our instruments. The partial F-statistic of 340.91 indicates that these instruments have a strong first stage and that they have more than adequate explanatory power for the *Female ind ratio*. The typical rule for adequacy of an instrument is to have minimum F-statistic of 10 (See for example, Stock et al., 2002).

In Column 2 of Table 4, we present the results of the second stage of IV probit model [relation (4)]. The coefficient of the *Predicted female ind ratio* is -1.598, which is statistically significant at the 5 percent level. These results confirm that *Female ind ratio* has a significant negative effect on securities litigation risk, even after controlling for endogeneity.[13]

< Insert Table 4 here>

As we discussed in section 3.2, in alternative models, we use the number of female independent directors to capture gender diversity on a corporate board. In Column 1 of Table 5, we estimate relation (5) discussed earlier in section 3.2. The marginal effect of $Female\ ind\ 1_{t-1}$ is not significantly different than zero. The marginal effect of $Female\ ind\ 2_{t-1}$ is -0.016, statistically significant at 5 percent level. The marginal effect of $Female\ ind \geqslant 3_{t-1}$ is -0.0322, statistically significant at 1 percent level. The marginal effect of $Female\ non-ind\ _{t-1}$ is statistically insignificant.

For further robustness, we lag key explanatory variables by two years and report our results in Column 2 of Table 5. The marginal effects of $Female\ ind\ 1_{t-2}$, $Female\ ind\ 2_{t-2}$ and

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[13] As a robustness, we use each of these two instruments variables individually and find similar result.

$Female\ ind \geqslant 3_{t-2}$ are -0.0122, -0.0153 and -0.0323, and they are statistically significant at the 5 percent, 5 percent and 1 percent levels, respectively. We further use conditional fixed effects logit models (Columns 3 and 4 of Table 5) and LPM (Columns 5 and 6 of Table 5) and obtain similar results. These results suggest that the effectiveness of having three or more female independent directors in reducing litigation risk is substantially higher than the effectiveness of having only one or two female independent directors.

< Insert Table 5 here>

To correct for the self-selection bias, we use Heckman's correction models, as discussed in section 3.2.1. We report our results in Table 6. As Column 1 indicates, the coefficients of *Female ind 1* is not statistically different than zero after including inverse mills ratio in the second stage of Heckman's model. However, as Columns 3 and 5 indicate, the coefficients of *Female ind 2* and *Ind female⩾3* are still negative and statistically significant at 1 percent after correction for the self-selection bias.

To further control for the potential concerns of endogeneity and self-selection bias, we run the litigation probit models using the propensity score-matched samples discussed in section 3.2.2. Column 2 of Table 6 shows that the coefficients of *Female ind 1* is not statistically different than zero. However, Columns 4 and 6 display that the coefficients of *Female ind 2* and *Female ind⩾3* are negative and statistically significant at 1 percent.

< Insert Table 6 here>

4.3. Firm's monitoring costs and effectiveness of female independent directors

In our second hypothesis, we test if the effectiveness of female independent directors in moderating securities litigation risk decreases as firm's monitoring costs increase. For our empirical test, we estimate probit model specifications based on relation (9) as discussed in section

3.3 and present our results in Column 1 of Table 7. Relation (9) includes *MC index* and the interaction of *MC index* and female independent ratio (*Female ind ratio*MC index*) as explanatory variables. The coefficient of *Female ind ratio*MC index* is positive and statistically significant, indicating that the effectiveness of female independent directors in reducing the litigation risk dilutes in firms with high monitoring costs. Next, in Column 2 of Table 7, we replicate the above analysis using the interaction of *Male ind ratio* and *MC index* (*Male ind ratio*MC index*) to examine if a firm's monitoring costs influence male independent directors' effects on litigation risk. The coefficient of *Male ind ratio*MC index* is statistically insignificant, indicating that the firm's monitoring costs do not affect the impact of male independent directors on litigation risk.

We further estimate the marginal effect of *Female ind ratio* on the probability of lawsuits against firms for different levels *of MC index* and present our results in Column 1 of Table 8. As the *MC index* increases from 0 to 1, the average marginal effects of *Female ind ratio* on litigation risk increases monotonously from -0.12 to +0.02. The average marginal effects of *Female ind ratio* on litigation risk are negative and statistically significant when the *MC index* is below 0.6. However, when the *MC index* is higher than 0.6, the average marginal effect of the *Female ind ratio* becomes statistically insignificant. In Column 2 of Table 8, we present the average marginal effects of *Ind male ratio* on litigation risk for different levels of *MC index*. We do not observe any patterns relating the effect of male independent directors to a firm's monitoring costs.

<Insert Table 7 here>

<Insert Table 8 here>

4.4. Firm's complexity and effectiveness of Female Independent Directors

In our third hypothesis, we test if the effectiveness of female independent directors in moderating securities litigation risk improves as the complexity of the firm increases. In Column

3 of Table 7, we estimate probit model specifications based on relation (10) as discussed in section 3.3. Relation (10) includes firm *COM index* and the interaction of firm *COM index* and female independent ratio (*Female ind ratio*COM index*) as explanatory variables. We find the coefficient of *Female ind ratio*COM index* to be negative and statistically significant, indicating that the effectiveness of female independent directors in reducing the litigation risk improves with firm complexity. In addition, in Column 4, we replicate the above analysis using the interaction of *Male ind ratio* and *COM index* (*Male ind ratio*COM index*) to examine if male independent directors' effects on litigation risk is influenced by firm complexity. The coefficient of *Ind male ratio*COM index* is not statistically significant, indicating that the firm's complexity does not influence the impact that male independent directors have on litigation risk.

We further estimate the marginal effect of *Female ind ratio* on the probability of lawsuits against the firm for different levels of firm complexity index and report our results in Column 3 of Table 8. As the firm *Com index* increases from 0 to 1, the average marginal effects of *Female ind ratio* on litigation risk decreases monotonously from +0.05 to -0.11. The average marginal effects of *Female ind ratio* on litigation risk is statistically insignificant when the *COM index* is below 0.5. However, for a *COM index* higher than 0.5, the average marginal effect of *Female ind ratio* is negative and statistically significant. In Column 4 of Table 8, we present the average marginal effects of *Male ind ratio* on litigation risk for different levels of monitoring cost index. We do not observe any relation between a firm's complexity and male independent directors' influence on litigation risk.

In Figure 2, we show the marginal effects of *Female ind ratio* and *Male ind ratio* on litigation risk for different levels of *MC index* and *COM index*. The plot in Figure 2 confirms the findings of Tables 7 and 8.

<Insert Figure 2 Here>

5. Channels through which board gender diversity may reduce litigation risk

5.*1. Higher Board Participation*

As we discussed in the introduction section, one potential channel through which female directors may affect litigation risk is board attendance. In order to measure the effect of board gender diversity on board attendance, we use an approach similar to Adams and Ferreira (2009). They analyze gender effect on each individual directors' participation, while we investigate the effect of board gender diversity on board participation. We employ the following probit models:

$$Att\ issue_{i,t} = \beta_0 + \beta_1(Female\ ind\ ratio_{i,t}) + \beta_2(Female\ non-ind\ ratio_{i,t}) + \theta \boldsymbol{Z}_{i,t-1} + I_j + Y_t + \varepsilon_{i,t} \quad (11)$$

The dependent variable (*Att issue*) is a dummy, which equals one if at least one of the firm's directors attends less than 75 percent of the annual meetings. We use the ratio of female independent directors and female non-independent directors on a board as the gender diversity variables. Vector $\boldsymbol{Z}$ represents other controls, including the proportion of male independent directors on a board (*Male ind ratio*), female CEO, female CFO, CEO tenure, CEO turnover, board size, CEO duality, board's average age, board's age diversification, Log(sale), volatility (*Return sd*), Tobin's Q, and ROA. Our choice of controls is similar to Adams and Ferreira (2009).

In Table 9, we present the results of probit regression based on relation (11). The coefficient of *Female ind ratio* is negative and statistically significant at the 5 percent level. The average marginal effect of *Female ind ratio* on the probability that a firm has a board attendance problem (one of the directors attends less than 75 percent of the annual meetings) is -0.07 and statistically significant at the 5 percent level. However, the coefficients of *Female non-ind ratio* and *Male ind* *ratio* is statistically insignificant. Our empirical results indicate that a higher female presence on a company board is associated with higher board participation, which may lead to improved monitoring and hence lower litigation risk.

5.2. Conditional Conservatism

Conditional accounting conservatism is another potential mechanism through which board gender diversity may reduce litigation risk. Following Basu and Liang (2019), we use the following model to measure conditional conservatism:

$$Earn_{i,t} = \beta_1(Ret_{i,t}) + \beta_2(Bad_{i,t}) + \beta_3(Ret * Bad_{i,t}) + \alpha_i + Y_t + \varepsilon_{i,t} \quad (12)$$

Where, *Earn* is the income before extraordinary items scaled by beginning-of-year market value of equity. *Ret* is the market-adjusted stock return over the fiscal year (starting from three months after the fiscal year starts). *Bad* is a dummy that equals 1 if *Ret* < 0, and 0 otherwise. *Ret * Bad* is the interaction of *Ret* and *Bad*. α_i and Y_t represent firm and year fixed effects. β_3 in relation (12) captures the conditional accounting conservativeness (the difference in earning timeliness between good news and bad news).

In order to measure the effect of board gender diversity on conditional accounting conservativeness, we interact every term except fixed effects in relation (12) with *Female ind ratio* and estimate the following regression model:

$$Earn_{i,t} = \beta_1(Ret_{i,t}) + \beta_2(Bad_{\ i,t}) + \beta_3(Ret * Bad_{i,t}) + Ind\ female\ ratio_{i,t}\ [\beta_4 + \beta_5(Ret_{i,t}) + \beta_6(Bad_{i,t}) + \beta_7(Ret * Bad_{i,t})] + \alpha_i + Y_t + \varepsilon_{i,t} \quad (13)$$

β_7 in relation (13) captures the effect of *Female ind ratio* on conditional accounting conservativeness.

Further, the conditional conservativeness measured through relation (13) might arise from operating accruals (*Accr*) and/or operation cash flows (*Ocf*). Several researchers argue that only asymmetric timeliness of *Accr* can be interpreted as conditional conservativeness (e.g., Hsu et al., 2012; and Collins et al., 2014). To address this concern, following Collins et al. (2014), we replace the dependent variable in relation (13) with *Accr* or *Ocf* and estimate it again.

In Table 10, we present the results for the regression model based on relation (13). In Column 1, the dependent variable is *Earn.* The coefficient of interaction of *Ret, Bad* and *Female ind ratio* (*Ret * Bad * Female ind ratio*) is positive and statistically significant at 5 percent level. In Column 3, we replace the dependent variable with *Accr*. The coefficient of *Ret * Bad * Female ind ratio* is still positive and statistically significant at 1 percent level. However, when we replace the dependent with *Ocf* in Column 5, the coefficient of *Ret * Bad * Female ind ratio* is statistically insignificant. These results indicate that firms with higher representation of female independent directors on their boards exhibit higher conditional accounting conservativeness. These findings come from the operating accruals, which is more relevant to the concept of conditional conservatism.

In addition, we run similar analyses by replacing *Female ind ratio* with *Male ind ratio* and present our results in Columns 2, 4 and 6 of Table 10. Coefficient of *Ret * Bad * Male ind ratio* is not statistically different from zero in all specifications. These results indicate that firms with higher representation of male independent directors on their boards do not exhibit higher conditional accounting conservativeness.

Overall we find that firms with higher representation of female independent directors on their boards are more conservative in their earnings reports. Therefore, their stocks are less likely to be overvalued, and subsequently, the likelihood of dramatic stock price crashes that can trigger securities litigation is lower.

6. Conclusions

The shareholders of firm that are target of securities litigation incur substantial losses. The effective monitoring of management is one of the ways that shareholders may exploit to reduce the probability of securities litigation. There is empirical evidence that female independent directors are tougher monitors compared to their male counterparts (See for example, Adams and Ferreira, 2009). In this paper, we argue that if presence of female independent directors on a corporate board improves monitoring, it should alleviate firm's litigation risk. Using securities litigation data for S&P 1500 firms over a period from 1998 to 2017, we investigate if a higher representation of female independent directors on company board reduces its securities litigation risk. We find that the larger the fraction of female independent directors on company boards, the lower the litigation risk.

Literature shows that one-size-fits-all governance remedy of intense monitoring of management to reduce agency costs is suboptimal. Intense monitoring of management is less effective in firms with higher monitoring costs and firms with lower complexity (e.g. Coles, 2008; Wintoki, 2007). Therefore, we test if monitoring costs and complexity of a firm influence the effectiveness of female independent directors in moderating the securities litigation risk. Our empirical analysis shows that the effectiveness of female independent directors in reducing litigation risk is negatively related to a firm's monitoring costs and is positively related to a firm's complexity.

We further identify potential channels through which gender diversity on a board may lower the litigation risk. We find that a higher fraction of female independent directors on a board enhances board participation, which may improve monitoring of management thereby reducing litigation risk. In addition, we explore conditional accounting conservatism as another potential channel through which board gender diversity reduces litigation risk. Our findings indicate that firms with higher representation of female independent directors on their boards exhibit higher conditional accounting conservativeness. Conditional conservatism can lower the likelihood of overvaluation of stocks, and hence the subsequent potential dramatic stock price falls, reducing the likelihood of securities lawsuits against a firm.

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Appendix A. Definitions of variables

Variables	Definitions
$Accr_{t}$	Accruals, defined as the change in non-cash current assets minus the change in non-debt current operating liability minus depreciation scaled by beginning-of-year market value of equity defined as common share price times common shares outstanding at beginning of year t.
$Att\ issue_{t}$	Equals 1 if at least one board director of the firm attends less than 75 percent of annual meetings during year t.
Bad_{t-1}	An indicator for bad cash flow news. This variable takes the value of 1 when market-adjusted stock return (Ret) is negative and is 0 otherwise.
$Board\ Size_{t-1}$	Natural log of one plus number of executive directors, supervisory directors or all of the directors at the end of year t-1.
$Board\ age\ diversification_{t-1}$	Standard deviation of the ages of all the directors at the end of year t-1.
$Board\ average\ age_{t-1}$	Average age of board's directors at year t-1.
$Board\ ind_{t-1}$	The ratio of independent board directors to total number of board directors at the end of year t-1.
$CEO\ tenure_{t-1}$	Log of one plus the number of years served by a CEO in current position.
$CEO\ turnover_{t-1}$	Equals 1 if a firm reports a new CEO, and 0 otherwise.
$COM\ index_{t-1}$	Complexity index. Construction of COM index is explained in section 3.3.
$Capex_{t-1}$	Capital expenditure in year t-1 divided by beginning year t-1 total assets.
$County\ female\ ratio_{t-1}$	The ratio of total number of female directors in the county of the firm's headquarters to the total number of directors in that county after excluding the sample firm in question at year t-1.
$Duality_{t-1}$	Equals 1 if CEO is chairman at year t-1, and 0 otherwise.
$Earn_{t}$	Earnings, defined as income before extraordinary items scaled by beginning-of-year market value of equity defined as common share price times common shares outstanding at beginning of year t.
$Female\ CEO_{t-1}$	Equals 1 if firm CEO of the firm is female at year t-1, and 0 otherwise.

$Female\ CFO_{t-1}$	Equals 1 if firm CFO of the firm is female at year t-1, and 0 otherwise.
$Foreign\ Segment_{t-1}$	Equals 1 if firm has a business segment in a foreign country at year t-1, and 0 otherwise.
$Firm\ age_{\mathrm{t}}$	Age is constructed as the number of years the firm has existed on the CRSP database at year t.
$Free\ cash_{\mathrm{t-1}}$	Free cash flow calculated as year t-1 operating income before depreciation less total taxes less interest expenses and dividends scaled by beginning of year t-1 total assets.
$Female\ ind\ 1_{t-1}$	Equals 1 if firm has only one female independent director at year t-1, and 0 otherwise.
$Female\ ind\ 2_{t-1}$	Equals 1 if firm has only two female independent directors at year t-1, and 0 otherwise.
$Female\ ind\ 3_{t-1}$	Equals 1 if firm has three or more female independent directors at year t-1, and 0 otherwise.
$Female\ ind\ ratio_{t-1}$	The ratio of female independent directors to total number of board directors at the end of year t-1.
$Female\ ind\ ratio * COM\ index_{\mathrm{t-1}}$	Interaction of $Female\ ind\ ratio_{\mathrm{t-1}}$ and $COM\ index_{\mathrm{t-1}}$.
$Female\ ind\ ratio * MC\ index_{\mathrm{t-1}}$	Interaction of $Female\ ind\ ratio_{\mathrm{t-1}}$ and $MC\ index_{\mathrm{t-1}}$.
$Insider\ own_{\mathrm{t-1}}$	Total number of shares owned by firm's directors divided by total number of outstanding shares at the end of year t-1.
$Leverage_{\mathrm{t-1}}$	Sum of long-term debt and debt in current liabilities at the end of year t-1 divided by total asset at the end of year t-1.
Log(Sale) $_{\mathrm{t}}$	Natural log of year t total sales.
$MC\ index_{\mathrm{t-1}}$	Monitoring cost index. Construction of MC index is explained in section 3.3.
$Male\ connection_{\mathrm{t-1}}$	The ratio of male directors who sit on other boards with at least one female director to the total number of male directors at year t-1.
$Male\ ind\ ratio_{t-1}$	The ratio of male independent board directors to the total number of board directors at the end of year t-1.
$Female\ non-ind\ _{t-1}$	Equals 1 if firm has one or more female non-independent directors at year t-1, and 0 otherwise.
$Female\ non-ind\ ratio_{t-1}$	The ratio of female non-independent directors to total number of board directors at the end of year t-1.
$Ocf\ _{t}$	Operating cash flows, defined as the difference between earnings (Earn) and accruals (Accr) for year t.

$R\&D_{t-1}$	Research and development expenses in year t-1 scaled by beginning of year t-1 total assets.
Ret_{t}	Market-adjusted stock return, defined as buy-and-hold stock return over the fiscal year (starting from three months after the fiscal year starts) adjusted by the value-weighted stock return over the same period.
$Ret * Bad_{t}$	Interaction of *Bad* and *Ret*.
Return sd_{t-1}	Standard deviation of the firm's 12-month return for year t-1.
$Return\ skew_{t-1}$	Skewness of the firm's 12-month return for year t-1.
$Return_{t-1}$	Market-adjusted 12-month stock return. The accumulation period ends with year t-1 fiscal year-end month.
ROA_{t-1}	Return on assets, defined as year t-1 net income scaled by beginning of year t-1 total assets.
$\text{Sales growth}_{t-1}$	Year t-1 sales less year t-2 sales scaled by beginning of year t-1 total assets.
$Security\ lit_{t}$	Equals 1 if a security lawsuit filing against the firm occurred during the year t, and 0 otherwise.
$Size_{t-1}$	Natural log of total assets at the end of year t-1.
$Tangibility_{t-1}$	Net total property, plant and equipment at year t-1 scaled by beginning year t-1 total assets.
$Tobin's\ Q_{t}$	Ratio of (Market value of equity + Book value of debt) to book value of assets at the end of year t.
$Turn\ over_{t-1}$	Trading volume accumulated over the 12-month period ending with the fiscal year-end before lawsuit filing (for sued firms), and year t-1 fiscal year-end month (for non-sued firms) scaled by beginning of year t-1 shares outstanding.

Figure 1. Litigation trends

This figure shows the annual percentage of firms involved in securities litigation in our sample.

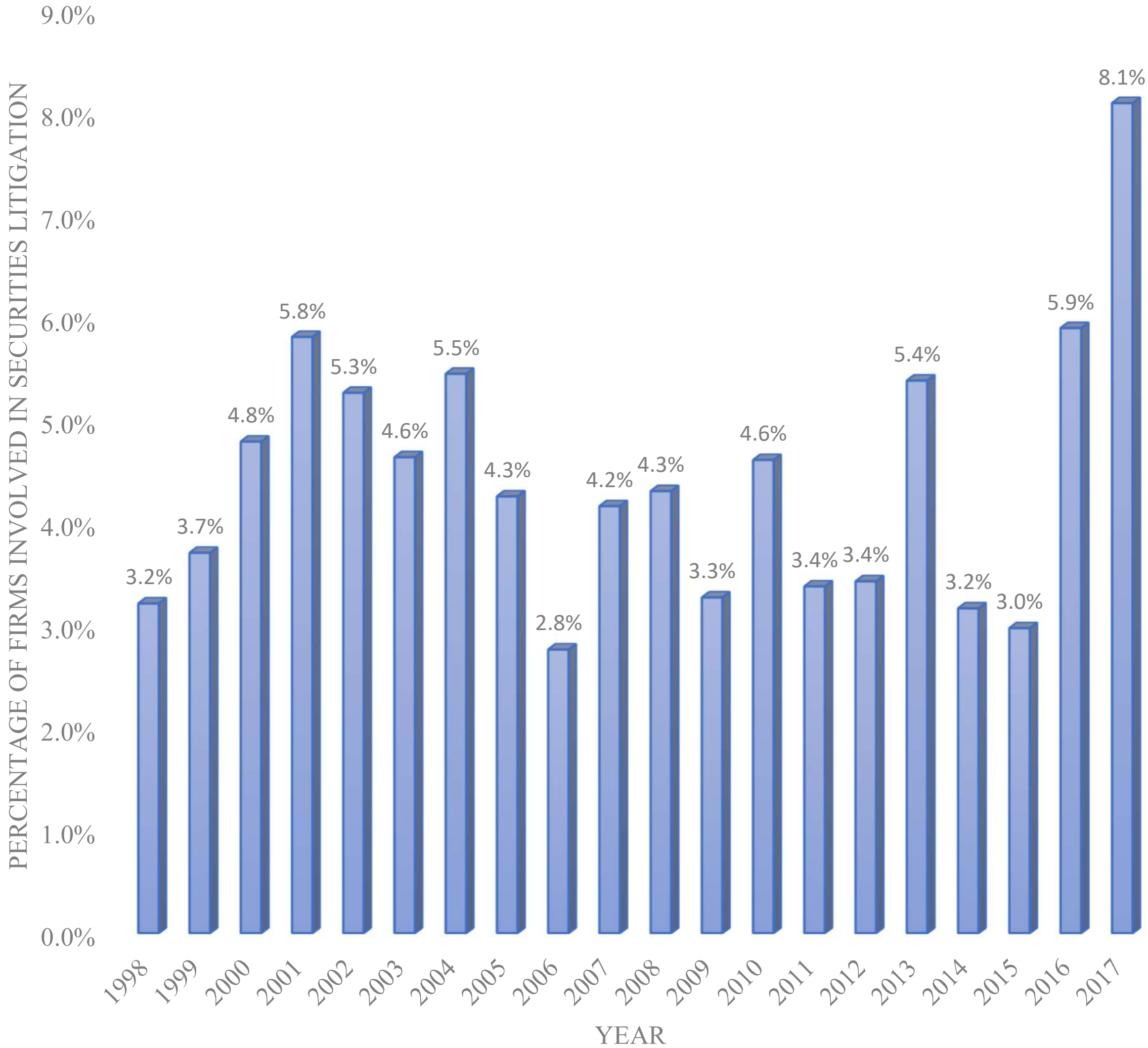

Figure 2. Average marginal effect of female independent ratio on the probability of filing a security lawsuit

Average marginal effects of Female ind ratio and Male ind ratio on the probability of a security lawsuit filing against a firm are depicted for different levels of MC index and COM index in Figures 2.a and 2.b, respectively. Female ind ratio is the ratio of female independent directors to total number of board directors at the end of year t-1 and Male ind ratio is the ratio of male independent board directors to the total number of board directors at the end of year t-1. The MC index is the Monitoring cost index and COM index is the Complexity index. Construction of MC index and COM index is explained in section 4.3. These marginal effects are based on the estimates presented in Table 8. The average marginal effects are shown by solid black lines. The 95 percent confidence intervals for the average marginal effects are shown by dashed lines. The hashed area indicates where the marginal effects are negative and statistically significant at the 5 percent level.

Figure 2.a

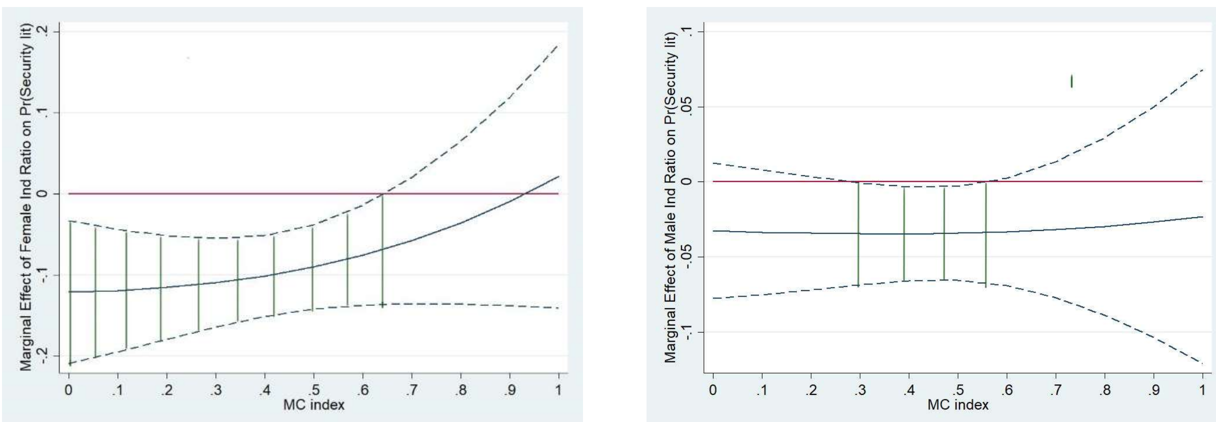

Figure 2.b

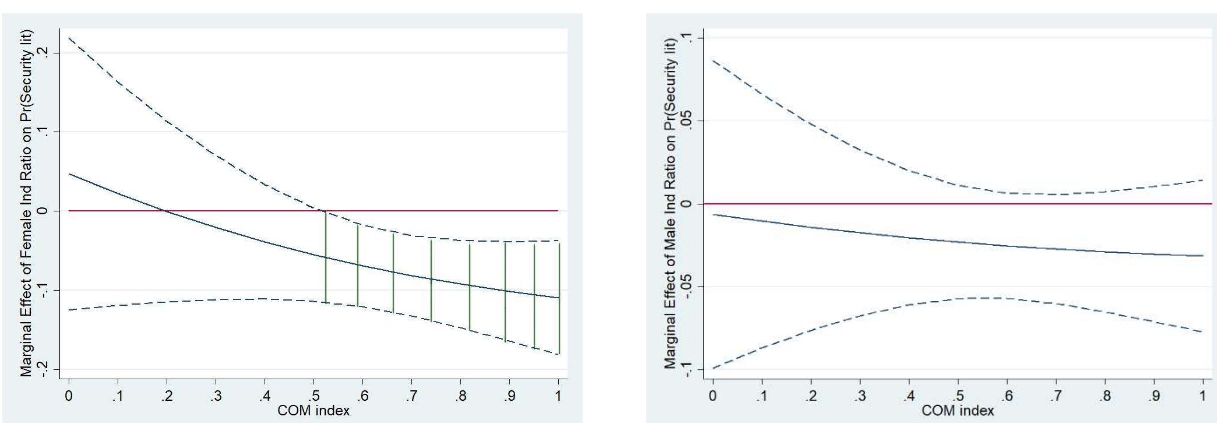

Table 1. Summary statistics

This table summarizes descriptive statistics of the major variables used in this study. N is number of observations. Mean is the average of firm-year observations. Min is minimum of firm-year observations. Max is maximum of firm-year observations. SD is the standard deviation of firm-year observations. We provide the definition of each of these variables in Appendix A.

Variables	N	Mean	Min	Max	SD
Dependent Variables					
Security lit	18,334	0.0438	0.0000	1.0000	0.2050
ATT issue	18,334	0.0891	0.0000	1.0000	0.2849
Earn	17,645	0.0330	-0.4724	0.2107	0.0892
Accr	15,535	-0.0516	-0.5645	0.1807	0.1007
Ocf	15,535	0.0826	-0.3183	0.5157	0.1086
Board & CEO Characteristics					
Female ind ratio	18,334	0.0990	0.0000	0.5450	0.0962
Female non-ind ratio	18,334	0.0066	0.0000	0.3330	0.0287
Female ind 1	18,334	0.3550	0.0000	1.0000	0.4790
Female ind 2	18,334	0.1920	0.0000	1.0000	0.3930
Female ind ⩾ 3	18,334	0.0646	0.0000	1.0000	0.2460
Female non-ind	18,334	0.0557	0.0000	1.0000	0.2290
Female CEO	17,746	0.0277	0.0000	1.0000	0.1640
Female CFO	17,746	0.0545	0.0000	1.0000	0.2270
CEO turnover	17,746	0.1080	0.0000	1.0000	0.3110
CEO tenure	17,746	0.8620	0.0000	3.9890	1.0820
Male ind ratio	18,334	0.6300	0.0000	1.0000	0.1510
Board age diversification	18,334	7.8832	3.1270	14.7022	2.4285
Board average age	18,334	60.8600	49.400	70.8571	4.2367
County ratio	16,803	0.1180	0.0000	0.6250	0.0567
Connection ratio	18,334	0.2760	0.0000	0.9100	0.2390
Duality	18,334	0.4200	0.0000	1.0000	0.4940
Board ind	18,334	0.7290	0.0000	1.0000	0.1590
Insider own	18,328	0.0819	0.0000	14.9500	0.1890
Board size	18,334	2.2770	1.3860	3.0910	0.2260
Firm Characteristics					
Foreign segment	18,334	0.6630	0.0000	1.0000	0.4730
Free cash	17,109	0.0862	-0.1800	0.2660	0.0657
Bad	18,331	0.5117	0.0000	1.000	0.4999
Capex	18,232	0.0514	0.0000	1.2050	0.0529
leverage	18,262	0.2160	0.0000	0.7640	0.1760
R&D	18,334	0.0316	0.0000	0.2310	0.0502
Tangibility	18,315	0.2600	0.0018	0.8790	0.2140
ROA	18,333	0.0473	-0.3600	0.2460	0.0900
Size	18,333	7.5520	4.7380	12.4600	1.5240
Sales growth	18,333	0.0594	-0.5600	0.5970	0.1740
Turnover	18,326	24.2600	2.2210	91.5600	17.4800
Sd12	18,324	0.0990	0.0258	0.3190	0.0566
Skew12	18,299	0.1300	-1.5060	1.8920	0.6650
Ret	18,331	0.0354	-0.7782	1.7387	0.4095
Return	18,326	0.0070	-0.0778	0.0976	0.0300
Frim age	18,334	24.3400	0.0000	67.0000	15.7000
Tobin's Q	18,328	2.0674	0.7886	7.4266	1.2448
Log(sale)	18,333	7.4567	4.0822	11.4733	1.5259
Market to book	18,281	3.2400	-9.6330	24.4200	3.7910
MC index	18,305	0.5040	0.0000	1.0000	0.2820
COM index	18,253	0.5530	0.0000	1.0000	0.2790

Table 2. Breakdown of security lawsuits by industry

This table provides the number and percentage of firm-year observations in our sample that are involved in security litigations against firms by industry. The industry classification is based on two-digit SIC codes. Percentages are calculated by dividing the number of lawsuits in each industry by the total number of firm-year observations for that industry.

SIC Code	Description	Number of firm years in sample	Number of firm years involved in litigation	Percentage of firm years involved in litigation
01	Agricultural Production - Crops	28	3	10.71%
02	Agricultural Production - Livestock and Animal Specialties	9	0	0.00%
07	Agricultural Services	13	0	0.00%
10	Metal Mining	51	4	7.84%
12	Coal Mining	23	2	8.70%
13	Oil and Gas Extraction	730	25	3.42%
14	Mining and Quarrying of Nonmetallic Minerals, Except Fuels	72	2	2.78%
15	Construction - General Contractors & Operative Builders	205	3	1.46%
16	Heavy Construction, Except Building Construction, Contractor	119	4	3.36%
17	Construction - Special Trade Contractors	44	1	2.27%
20	Food and Kindred Products	637	27	4.24%
21	Tobacco Products	62	2	3.23%
22	Textile Mill Products	83	0	0.00%
23	Apparel, Finished Products from Fabrics & Similar Materials	214	7	3.27%
24	Lumber and Wood Products, Except Furniture	159	2	1.26%
25	Furniture and Fixtures	145	3	2.07%
26	Paper and Allied Products	355	7	1.97%
27	Printing, Publishing and Allied Industries	255	1	0.39%
28	Chemicals and Allied Products	1676	105	6.26%
29	Petroleum Refining and Related Industries	174	5	2.87%
30	Rubber and Miscellaneous Plastic Products	231	5	2.16%
31	Leather and Leather Products	96	2	2.08%
32	Stone, Clay, Glass, and Concrete Products	134	3	2.24%
33	Primary Metal Industries	395	9	2.28%
34	Fabricated Metal Products	356	3	0.84%
35	Industrial and Commercial Machinery and Computer Equipment	1396	58	4.15%
36	Electronic & Other Electrical Equipment & Components	1700	74	4.35%

37	Transportation Equipment	670	28	4.18%
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	1320	60	4.55%
39	Miscellaneous Manufacturing Industries	180	10	5.56%
40	Railroad Transportation	82	1	1.22%
41	Local & Suburban Transit & Interurban Highway Transportation	7	0	0.00%
42	Motor Freight Transportation	198	5	2.53%
44	Water Transportation	74	2	2.70%
45	Transportation by Air	190	5	2.63%
47	Transportation Services	83	3	3.61%
48	Communications	392	37	9.44%
50	Wholesale Trade - Durable Goods	530	13	2.45%
51	Wholesale Trade - Nondurable Goods	290	15	5.17%
52	Building Materials, Hardware, Garden Supplies & Mobile Homes	64	5	7.81%
53	General Merchandise Stores	257	16	6.23%
54	Food Stores	104	7	6.73%
55	Automotive Dealers and Gasoline Service Stations	163	4	2.45%
56	Apparel and Accessory Stores	375	7	1.87%
57	Home Furniture, Furnishings and Equipment Stores	136	5	3.68%
58	Eating and Drinking Places	412	11	2.67%
59	Miscellaneous Retail	373	23	6.17%
60	Depository Institutions	1633	109	6.67%
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	45	2	4.44%
72	Personal Services	95	7	7.37%
73	Business Services	2287	129	5.64%
75	Automotive Repair, Services and Parking	66	4	6.06%
78	Motion Pictures	60	4	6.67%
79	Amusement and Recreation Services	117	4	3.42%
80	Health Services	352	33	9.38%
82	Educational Services	88	13	14.77%
83	Social Services	12	0	0.00%
87	Engineering, Accounting, Research, and Management Services	318	14	4.40%
99	Non-classifiable Establishments	68	8	11.76%
	Total	**18770**	**832**	**4.43%**

Table 3. Board gender diversity and litigation risk - Base models

This table presents results of six binary regression models, where the dependent variable Security lit, is a dummy that equals 1 if a security lawsuit filing against the firm occurred during the year, and 0 otherwise. The key explanatory variable, Female ind ratio, is lagged one and two years in turn. Columns 1 and 2 present results of probit regression models. Columns 3 and 4 present results of conditional fixed logit models. Columns 5 and 6 present results of linear probability models. dy/dx indicates average marginal effects of Female ind ratio and Male ind ratio on the probability of a security lawsuit filing against a firm. Variables are defined in the Appendix A. t-statistics reported in parentheses is computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

Variables	(1) Probit	(2) Probit	(3) Cond Logit	(4) Cond Logit	(5) LPM	(6) LPM
$Female\ ind\ ratio\ _{t-1}$	-1.083***		-3.287***		-0.136***	
	(-3.459)		(-3.012)		(-2.760)	
$Female\ ind\ ratio\ _{t-2}$		-1.008***		-3.119***		-0.126***
		(-3.211)		(-2.988)		(-2.730)
$Female\ non-ind\ ratio\ _{t-1}$	0.271	0.316	-1.398	-0.968	-0.0183	-0.00614
	(0.256)	(0.301)	(-0.376)	(-0.261)	(-0.0966)	(-0.0327)
$Male\ ind\ ratio\ _{t-1}$	-0.389**	-0.313*	-0.704	-0.328	-0.0306	-0.0146
	(-2.022)	(-1.680)	(-1.125)	(-0.554)	(-1.199)	(-0.620)
dy/dx (Female ind ratio)	-0.0878***	-0.0817***				
	(-3.459)	(-3.211)				
dy/dx (Male ind ratio)	-0.03150**	-0.0254*				
	(-2.022)	(-1.680)				
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	No	No	Yes	Yes
Fixed Effects	Industry	Industry	Firm	Firm	Firm	Firm
Pseudo R^2\Adj R^2	0.1138	0.1135	0.0467	0.0462	0.1860	0.1859
Observations	13,479	13,479	4,454	4,454	13,629	13,629

Table 4. Board gender diversity and litigation risk - IV approach

This table presents results of the two-stage IV probit model. Column (1) presents results of first stage IV regression, where Female ind ratio is regressed on two instrumental variables, Male connection and County female ratio, and other covariates. Male connection is the ratio of male directors who sit on other boards with at least one female director to the total number of male directors. County female ratio is the ratio of total number of female directors in the county of the firm's headquarters to the total number of directors in that county after excluding the sample firm in question. Column (2) presents results of the probit regression model, where the dependent variable Security lit, is a dummy that equals 1 if a security lawsuit filing against the firm occurred during the year, and 0 otherwise. Predicted value of Female ind ratio from first stage regression in Column (1) is included in the second stage probit regression presented in Column (2). Variables are defined in Appendix A. t-statistics reported in parentheses is computed based on firm-level clustered standard errors and adjusted for heteroskeadasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

Variables	**(1) IV 1st stage**	**(2) IV 2nd stage**
$Pred\ \ female\ ind\ ratio_{\ t-1}$		-1.598**
		(-1.982)
$Female\ non-ind\ ratio_{\ t-1}$	-0.125***	0.0288
	(-3.401)	(0.0243)
$Male\ ind\ ratio_{\ t-1}$	-0.262***	-0.508
	(-39.04)	(-1.389)
$Male\ connection_{\ \ t-1}$	0.0957***	
	(25.89)	
$County\ female\ ratio_{\ t-1}$	0.0399***	
	(2.625)	
F (2, 1106)	340.91	
Other Controls	Yes	Yes
Year Dummies	Yes	Yes
Intercept	Yes	Yes
Fixed Effects	Industry	Industry
Adj R^2 \Pseudo R^2	0.450	0.1159
Observations	12,441	12,441

Table 5. Board gender diversity and litigation risk – Alternative models

This table presents results of six binary regression models, where the dependent variable Security lit, is a dummy that equals 1 if a security lawsuit filing against the firm occurred during the year, and 0 otherwise. The key explanatory variables, Female ind 1, Female ind 2 and Female ind ⩾3 are lagged one and two years in turn. Columns (1) and (2) present results of probit regressions models. Columns (3) and (4) present results of conditional fixed logit models. Columns (5) and (6) present results of linear probability models. dy/dx indicates average marginal effects of board gender diversity variables on probability of a security lawsuit filing against a firm. Variables are defined in Appendix A. t-statistics (reported in parentheses) are computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

Variables	**(1) Probit**	**(2) Probit**	**(3) Cond Logit**	**(4) Cond Logit**	**(5) LPM**	**(6) LPM**
$Female\ ind\ 1_{t-1}$	-0.0948		-0.449**		-0.0177**	
	(-1.552)		(-2.250)		(-2.244)	
$Female\ ind\ 2_{t-1}$	-0.197**		-0.573**		-0.0241**	
	(-2.515)		(-2.184)		(-2.061)	
$Female\ ind\ \geqslant 3_{t-1}$	-0.397***		-1.061***		-0.0445**	
	(-3.448)		(-2.943)		(-2.431)	
$Female\ ind\ 1_{t-2}$		-0.150**		-0.670***		-0.0243***
		(-2.499)		(-3.460)		(-3.153)
$Female\ ind\ 2_{t-2}$		-0.188**		-0.588**		-0.0219*
		(-2.432)		(-2.397)		(-1.896)
$Female\ ind\ \geqslant\ 3_{t-2}$		-0.405***		-1.069***		-0.0440***
		(-3.508)		(-3.128)		(-2.611)
$Female\ non-ind_{t-1}$	-0.137	-0.130	-0.526	-0.491	-0.0144	-0.0131
	(-1.140)	(-1.075)	(-1.234)	(-1.141)	(-0.872)	(-0.803)
$Male\ ind\ ratio_{t-1}$	-0.392**	-0.331*	-0.625	-0.309	-0.0255	-0.0126
	(-2.046)	(-1.779)	(-1.006)	(-0.520)	(-1.007)	(-0.532)
dy/dx (Female ind 1)	-0.0077	-0.0122**				
	(-1.552)	(-2.499)				
dy/dx (Female ind 2)	-.0160**	-0.0153**				
	(-2.515)	(-2.432)				
dy/dx(Female ind ⩾ 3)	-0.0322***	-0.0323***				
	(-3.448)	(-3.508)				
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	No	No	Yes	Yes
Fixed Effects	Industry	Industry	Firm	Firm	Firm	Firm
Pseudo R^2\Adj R^2	0.1139	0.1142	0.0467	0.0495	0.1860	0.1864
Observations	13,479	13,479	4,454	4,454	13,629	13,629

Table 6. Board gender diversity and litigation risk – Heckman and propensity score matching models

This table presents results from addressing endogeneity using the Heckman two-step procedure and propensity score matching. Columns (1), (3) and (5) present the results of second stage of Heckman correction model, where the dependent variable is Security lit, a dummy that equals 1 if a security lawsuit filing against the firm occurred during the year, and 0 otherwise. Columns (2), (4) and (6) present the result of probit regression using a propensity score matched sample, where the dependent variable is Security lit. Variables are defined in Appendix A. t-statistics (reported in parentheses) are computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

	Ind female 1		**Ind female 2**		**Ind female ⩾ 3**	
Variables	**(1) Heck 2^{nd} stage**	**(2) PSM**	**(3) Heck 2^{nd} stage**	**(4) PSM**	**(5) Heck 2^{nd} stage**	**(6) PSM**
$Female\ ind\ \ 1_{\ t-1}$	-0.0930	-0.0867				
	(-1.417)	(-1.368)				
$Female\ ind\ 2_{\ t-1}$			-0.259***	-0.263***		
			(-2.778)	(-2.693)		
$Female\ ind\ \geqslant 3_{\ t-1}$					-0.639***	-0.621***
					(-4.096)	(-2.855)
$Female\ non-ind_{\ t-1}$	-0.0337	-0.0910	-0.307	-0.167	-0.441**	-0.441
	(-0.229)	(-0.649)	(-1.620)	(-0.913)	(-2.061)	(-1.299)
$Inverse\ mills\ ratio_{\ t-1}$	-0.168		0.0353		0.0296	
	(-1.111)		(0.438)		(0.513)	
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.1141	0.1139	0.1309	0.1288	0.1275	0.1789
Observations	7,509	7,771	5,687	4,996	3,888	1,421

Table 7. Monitoring cost and firm complexity indices, and effect of female independent directors on litigation risk

This table presents results of probit regression of security litigation on Female ind ratio and other covariates. In all specifications, the dependent variable is Security lit, a dummy that equals 1 if a security lawsuit filing against the firm occurred during the year, and 0 otherwise. In Column (1), MC index is monitoring cost index and Female ind ratio*MC index is the interaction of Female ind ratio and monitoring cost index. In Column (2), Male ind ratio*MC index is the interaction of Male ind ratio and monitoring cost index. In Column (3), COM index is firm complexity index and Female ind ratio*COM index is the interaction of Female ind ratio and firm complexity index. In Column (4), Male ind ratio*COM index is the interaction of Male ind ratio and firm complexity index. Variables are defined in Appendix A. t-statistics (reported in parentheses) are computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

Variables	(1)	(2)	(3)	(4)
$Female\ ind\ ratio_{t-1}$	-2.316***	-1.095***	0.412	-0.887***
	(-3.707)	(-3.492)	(0.544)	(-2.744)
$MC\ index_{t-1}$	0.306	0.306		
	(0.974)	(0.559)		
$Female\ ind\ ratio * MC\ index_{t-1}$	2.485**			
	(2.234)			
$COM\ index_{t-1}$			-0.136	-0.0724
			(-0.685)	(-0.158)
$Female\ ind\ ratio * COM\ index_{t-1}$			-2.079*	
			(-1.909)	
$Female\ non-ind\ ratio_{t-1}$	0.179	0.261	0.256	
	(0.169)	(0.245)	(0.235)	
$Male\ ind\ ratio_{t-1}$	-0.402**	-0.641	-0.311	-0.0583
	(-2.091)	(-1.539)	(-1.565)	(-0.134)
$Male\ ind\ ratio * MC\ index_{t-1}$		0.459		
		(0.649)		
$Male\ ind\ ratio * COM\ index_{t-1}$				-0.426
				(-0.630)
Other Controls	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes
Fixed Effects	Industry	Industry	Industry	Industry
Pseudo R^2	0.1161	0.1156	0.1162	0.1163
Observations	13,479	13,479	13,452	13,452

Table 8. Average marginal effects of female independent directors on security litigation risk for different levels of monitoring cost and firm complexity indices

This table presents average marginal effects of Female ind ratio and Male ind ratio on probability of a security lawsuit filing against a firm for different levels of MC Index and COM index based on probit regression models in Table 7. dy/dx (F) in Columns (1) and (3) indicates average marginal effects of Female ind ratio for different levels of MC Index, and COM index, respectively. dy/dx (M) in Columns (2) and (4) indicates average marginal effects of Male ind ratio for different levels of MC Index and COM index, respectively. Variables are defined in Appendix A. t-statistics (reported in parentheses) are computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

MC index	**(1) dy/dx (F)**	**(2) dy/dx (M)**	**COM index**	**(3) dy/dx (F)**	**(4) dy/dx (M)**
0	-0.1212***	-0.0325	0	0.047	-0.0064
	(-2.69)	(-1.41)		(0.54)	(-0.13)
0.1	-0.1193***	-0.0335	0.1	0.0221	-0.0105
	(-3.09)	(-1.57)		(0.31)	(-0.27)
0.2	-0.1156***	-0.0342*	0.2	-0.0004	-0.0142
	(-3.54)	(-1.77)		(-0.01)	(-0.45)
0.3	-0.1098***	-0.0346**	0.3	-0.0207	-0.0175
	(-3.93)	(-2.00)		(-0.44)	(-0.69)
0.4	-0.1014***	-0.0346**	0.4	-0.0388	-0.0205
	(-3.98)	(-2.17)		(-1.05)	(-0.99)
0.5	-0.0902***	-0.0342**	0.5	-0.0548*	-0.0231
	(-3.41)	(-2.14)		(-1.82)	(-1.32)
0.6	-0.0758**	-0.0333*	0.6	-0.0690***	-0.0254
	(-2.41)	(-1.82)		(-2.62)	(-1.57)
0.7	-0.0578	-0.0318	0.7	-0.0814***	-0.0273
	(-1.45)	(-1.38)		(-3.14)	(-1.63)
0.8	-0.0358	-0.0297	0.8	-0.0922***	-0.0290
	(-0.7)	(-0.98)		(-3.27)	(-1.57)
0.9	-0.0095	-0.0268	0.9	-0.1014***	-0.0304
	(-0.14)	(-0.68)		(-3.17)	(-1.46)
1	0.0215	-0.0232	1	-0.1092***	-0.0316
	(0.26)	(-0.46)		(-2.98)	(-1.35)

Table 9. Board gender diversity and board attendance problem

This table presents results of two probit regression models, where the dependent variable is Att issue, a dummy that equals 1 if at least one of the firm's board directors attends less than 75% of board meetings during the year. Variables are defined in Appendix A. t-statistics (reported in parentheses) are computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and1% levels, respectively.

Variables	**(1)**
Female ind ratio	-0.462**
	(-2.250)
Female non-ind ratio	-0.342
	(-0.565)
Male ind ratio	-0.0804
	(-0.704)
dy/dx (Female ind ratio)	-0.0667**
	(-2.25)
Other Controls	Yes
Year Dummies	Yes
Intercept	Yes
Fixed Effects	Industry
Pseudo R^2	0.0921
Observations	17,711

Table 10. Board gender diversity and conditional conservatism

This table presents results of regression of earnings, operating accruals and operation cash flows on stock adjusted return, negative stock return indicator, Female ind ratio, Male ind ratio and their interaction terms. In Columns (1) and (2), the dependent variable is earnings. In Columns (3) and (4), the dependent variable is operating accruals. In Columns (5) and (6), the dependent variable is operating cash flows. Variables are defined in Appendix A. t-statistics (reported in parentheses) are computed based on firm-level clustered standard errors and adjusted for heteroskedasticity. *, **, and *** denote statistical significance at the10%, 5%, and 1% levels, respectively.

Variables	(1) Earn	(2) Earn	(3) Accr	(4) Accr	(5) Ocf	(6) Ocf
Ret	0.00156	0.0523***	-0.0293***	-0.0583***	0.0243***	0.0737***
	(0.469)	(4.559)	(-9.153)	(-5.049)	(5.920)	(5.051)
Bad	0.00452	0.0326**	0.00875*	-0.0108	-0.00521	0.0323*
	(0.970)	(2.282)	(1.927)	(-0.761)	(-0.897)	(1.805)
*Ret * Bad*	0.0970***	0.0513	-0.00456	0.0275	0.108***	0.0576
	(7.373)	(1.348)	(-0.356)	(0.733)	(6.587)	(1.206)
Female ind ratio	0.0626**		0.0770***		-0.0148	
	(2.240)		(2.783)		(-0.418)	
*Ret * Female ind ratio*	-0.141***		-0.298***		0.141***	
	(-3.827)		(-8.153)		(3.019)	
*Bad * Female ind ratio*	-0.0161		-0.106***		0.0894**	
	(-0.463)		(-3.105)		(2.042)	
Ret* Bad * Female ind ratio	**0.217****		**0.423*****		**-0.163**	
	(2.017)		**(4.002)**		**(-1.206)**	
Male ind ratio		0.0271*		-0.0116		0.0388*
		(1.743)		(-0.742)		(1.861)
Ret Male ind ratio*		-0.0907***		0.0226		-0.0708***
		(-4.941)		(1.223)		(-3.045)
*Bad * Male ind ratio*		-0.0439**		0.0229		-0.0481*
		(-1.981)		(1.040)		(-1.738)
Ret * Bad * Male ind Ratio		**0.0604**		**-0.0291**		**0.0741**
		(1.000)		**(-0.488)**		**(0.984)**
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.345	0.330	0.393	0.369	0.295	0.295
Observations	17,627	17,627	15,521	15,521	15,521	15,521