

Do Women Stay Out of Trouble? Evidence from Corporate Litigation

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Comments welcome

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Abstract

We use a unique hand-collected dataset on corporate lawsuits to examine the effect of female representation in top management on corporate litigation. We find that firms with higher representation of women in the top management team face fewer lawsuits overall, particularly lawsuits related to product liability, environment, medical liability, labor and contracts. These results continue to hold under several alternative specifications and accounting for endogeneity using a novel instrument. The results are driven by the presence of multiple women in top management positions and are likely due to gender diversity in top management rather than an artifact of tokenism. Among firms with higher litigation risk, greater representation of female executives positively impacts the value of cash holdings. Overall, our results uncover an important and previously unidentified benefit of gender diversity in top management.

Keywords: Women executives, Gender diversity, Corporate litigation

JEL Codes: G39, K41, Z10

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1. Introduction

Being sued is an unpleasant reality for firms. Lawsuits can lead to significant monetary and reputational damages for defendant firms, and can diminish their relationships with customers, suppliers, investors, and other stakeholders. Some lawsuits can linger in courts for years and even drive firms to bankruptcy. Defendant firms lose significant wealth upon lawsuit filing (see, e.g., Bhagat and Romano (2002)). Firms spend billions of dollars in legal fees to avoid and defend lawsuits.¹ For instance, in 2004 Merck recalled Vioxx, an anti-inflammatory drug, from the market due to concerns that it might increase the risk of heart attack and stroke. Shortly thereafter, many patients who took Vioxx sued Merck. In response, the company set aside millions of dollars in reserves to pay for the potential legal costs.

Given the financial and reputational impacts of litigation, it is surprising that little research has been done to identify the determinants of various types of corporate lawsuits. The existing literature mostly focuses on securities class action lawsuits (e.g., Gande and Lewis (2009), and Kim and Skinner (2012)), which are a small subset of all corporate lawsuits. In fact, every year companies get sued for many other reasons by dissatisfied customers, employees, competitors, suppliers, and the government. For instance, in the highly publicized McDonald's hot coffee case, a product liability suit, the jury awarded plaintiff Stella Liebeck nearly \$3 million in punitive damages for the burns she suffered after spilling hot coffee on her lap. In the 2010 BP Deepwater Horizon oil spill, the largest accidental oil spill in history, BP has spent an

¹ An estimate by John B. Henry in the Metropolitan Corporate Counsel (February 2008, p. 28) suggests that the annual direct litigation cost of Fortune 500 companies was a whopping \$210 billion in 2006, i.e., about one-third of their after-tax profits that year.

estimated \$54 billion in clean-up costs, fines and compensation as of July 2015 (see Gilbert and Kent (2015)). Apple *Inc.* is involved in numerous multinational lawsuits over technology patent infringements, part of the ‘patent wars’ among the world’s largest smartphone manufacturers such as Apple, Google, Samsung, Microsoft, Sony and Nokia. Other prominent examples include the 1994 litigation involving major breast implant manufacturers that was settled for \$3.4 billion, and the Tobacco Master Settlement Agreement, in which tobacco companies agreed to pay \$206 billion over a period of 25 years.

Some lawsuits are almost a part of routine business. Others arise from human values, hubris and behavioral biases. Highlighting the importance of human behavior in litigation, Hutton, Jiang and Kumar (2015) find that firms with differing political values face different types of lawsuits: Republican-leaning firms are more likely to be subjects of civil rights, labor, and environmental lawsuits, while Democratic-leaning firms are more likely to be subjects of securities and intellectual property lawsuits. Using a similar measure of corporate culture, Di Giuli and Kostovetsky (2014) find that behavioral factors lead to differences in how responsible firms appear to stakeholders. In addition, Banerjee et al. (2014) find that executive overconfidence increases the likelihood of securities class action lawsuits.

In this paper, we examine a behavioral determinant of corporate lawsuits by examining its relation with the proportion of women in top management. To do so, we hand-collect a novel dataset on different types of corporate lawsuits. The issue of how gender diversity affects a firm’s litigation risk perhaps has never been more relevant given that women number an all-time high of 14.2% of the top five officers at S&P 500 companies in 2014 (see Egan (2015)). For several reasons, we expect firms with a greater proportion of women in top management to face fewer lawsuits. First, a large literature finds that women tend to be less risk-tolerant than men

(see, e.g., Hudgens and Fatkin (1985), Johnson and Powell (1994), Sundén and Surette (1998) and Bernasek and Shwiff (2001)), and that women executives choose safer corporate policies (see, e.g., Faccio, Marchica and Mura (2015) and Francis *et al.* (2015)). Therefore, women executives likely avoid risky corporate activities that might lead to lawsuits.

Second, prior studies find that women exhibit less overconfidence in decision-making (see, e.g., Estes and Hosseini (1988)) and less hubris about their abilities (e.g., Furnham, Hosoe and Tang (2002)). In a corporate setting, Huang and Kisgen (2013) find that female executives display lower overconfidence by making fewer acquisitions and debt issuances. Less overconfidence compared to male executives implies that, even with the same level of risk-aversion, firms with more female executives are likely to face fewer lawsuits because they overestimate the risk of lawsuits.

Third, related to lower risk-tolerance and lower overconfidence is women's greater tendency to comply with rules. In fact, historically, females have lower arrest rates than males in most places. This is true among most racial and ethnic groups, and for virtually all crime categories.² In the context of financial decisions, women tend to be more trustworthy and more compliant with rules and regulations (see, e.g., Baldry (1987); Barnett, Bass and Brown (1994); Bernardi and Arnold (1997); Fallan (1999); Beu, Buckley and Harvey (2003)). Compared to their male counterparts, female executives are less likely to manipulate corporate financial and other disclosures and more likely to adopt a conservative financial reporting strategy (see, e.g., Heminway (2007), Peni and Vähämaa (2010)).

Overall, we expect top executives' risk-tolerance, overconfidence, and propensity to be compliant to be important predictors of corporate litigation. Therefore, we hypothesize that firms

² Gender and crime – 'Differences between male and female offending patterns - Categories, women, arrests, and males' - JRank Articles (<http://law.jrank.org/pages/1250/Gender-Crime-Differences-between-male-female-offending-patterns.html#ixzz3U1pYSWhe>).

with greater representation of women in top management should face fewer lawsuits. Consistent with our hypothesis, we find that firms with greater proportions of women in the top management team face fewer lawsuits, especially lawsuits related to product liability, environment, medical liability, labor and contracts. This finding is robust to the inclusion of a number of firm-specific and executive-specific control variables, industry and year fixed effects, and alternative specifications.

Our baseline results reveal a negative relation between the proportion of women in top management and the number of lawsuits a firm faces. However, female representation in the top management team is likely endogenous, which makes it difficult to interpret the results as a causal relation. Endogeneity might affect the relation between the presence of female executives in the top management team and corporate litigation in at least two ways. First, women, being more risk-averse than men, might self-select to firms that face lower litigation risk. Also, boards could discriminate based on gender because of reservations they might have in women's ability to handle litigation. This self-selection produces a negative correlation between the presence of female top executives and lawsuits. Alternatively, boards of firms subject to higher litigation risk might decide to hire more female executives to reduce the risk of litigation. This endogeneity likely induces a positive relation between the presence of female executives and corporate lawsuits.

To identify the effect of female executives in top management on lawsuits, we employ an instrumental variables approach. We employ two instruments that are correlated with the presence of women in the top management team but are unlikely to be directly correlated with corporate litigation. The first instrument exploits a shock in the supply of female labor force across the U.S. states following World War II. The second instrument takes advantage of

variation in women's empowerment across the states. The results from the instrumental variables approach are consistent with the results from the baseline models, suggesting a negative causal effect of female representation in top management on corporate lawsuits. Finally, we examine a financial implication of the effect of gender diversity on lawsuits, and find that higher female representation in top management leads to a higher value of cash holdings by firms that are more susceptible to lawsuits.

Our research contributes to at least two strands of the literature. First, a large literature documents the consequences of corporate litigation. Prior studies find that upon the filing of lawsuits, defendant firms face significant stock price declines (see, e.g., Bizjak and Coles (1995), Bhagat, Bizjak, and Coles (1998), Bhattacharya, Galpin, and Haslem (2007), and Gande and Lewis (2009)), higher costs of capital (see, e.g., Feroz, Park and Pastena (1991), Dechow, Sloan and Sweeney (1996), Karpoff, Lee and Martin (2008b), and Murphy, Shrieves and Tibbs (2009)), and higher managerial and director turnover (see, e.g., Niehaus and Roth (1999), and Karpoff, Lee and Martin (2008a)). However, scant research examines the underlying causes of corporate litigation. We aim to fill this gap by examining the effect of gender diversity in top management on the number of lawsuits faced by a firm.

Second, this study contributes to the growing literature on executive gender diversity and corporate policies and performance. At the individual level, higher risk-aversion of women in making personal financial decisions is well-known. A burgeoning literature in financial economics suggests that gender differences among corporate executives also have important effects. For instance, female executives tend to adopt more conservative firm policies (Huang and Kisgen (2013)) and their firms have higher survival rates (see, Faccio, Marchica and Mura (2015)). Female executives are also known to adopt more conservative accounting policies (see,

e.g., Barua et al. (2010) and Francis et al. (2015)). And public accounting firms with more female executives exhibit higher moral standards (Bernardi and Arnold (1997)). We advance this line of research by examining the link between gender diversity and various types of corporate lawsuits, which have important financial and reputational implications.

The rest of the paper proceeds as follows. In Section 2, we provide a description of the sample, data and methodology employed in the analysis. Section 3 presents and discusses the results of the empirical tests on the relation between the proportion of female executives in top management and corporate litigation. Section 4 examines the relation between the proportion of female executives and the value of cash among firms with high litigation risk. Section 5 concludes the paper.

2. Sample, Data and Methodology

2.1 Sample selection and data description

The primary source of our lawsuits data is the LexisNexis legal database, which includes cases filed in both federal and state courts. We hand-collect the data on lawsuits in which our sample firms were defendants. Our sample period consists of the years 1996 to 2010, and comprises public companies in the S&P 1500 in the year 2005. We limit our sample to this group to keep the substantial task of hand-collecting the lawsuits data manageable. The breadth of the types of lawsuits we collect is one of the most comprehensive in the litigation literature. They include (1) labor or pension, (2) intellectual property, (3) contracts, (4) securities, (5) environmental, (6) product liability, (7) medical liability, and (8) other lawsuits. Malm and Mobbs (2014) describe these litigation categories in detail.

We follow the prior literature and exclude financial firms ($6000 \leq \text{SIC} \leq 6999$), utilities ($4900 \leq \text{SIC} \leq 4999$), and government entities ($\text{SIC} \geq 9000$) from the sample because they are highly

regulated. Stock price and financial data for the sample come from CRSP and Compustat databases. Data on top executives comes from Execucomp.

Table 1, Panel A shows the annual number of lawsuits filed against our sample firms by lawsuit type from 1996 to 2010. From LexisNexis searches, we identify 28,709 filings with an average of about 1,914 lawsuits per year. The number of lawsuits increases from 929 in 1996 to 3,358 in 2010, a 3.6-fold increase over our 15-year sample period. The distribution of lawsuits by type is as follows: labor or pension (37%), intellectual property (12%), contracts (10%), product liability (9%), medical liability (7%), securities (3%), environmental (3%), and other (19%).

Panel B of Table 1 shows the percentage of each type of lawsuit by year. Labor or pension suits increase from about 30% of all lawsuits in 1996 to about 40% in 2010. Other large changes occur in intellectual property (contracts) [product liability] suits, which go from 9.4% (13.3%) [14%] to 12.8% (10.3%) [6%] of all lawsuits over this time period.

2.2 Research design and variable definitions

We describe the empirical proxies employed in the analysis in this subsection. We then proceed to motivate the control variables and empirical models.

2.2.1 Dependent variable

Our main dependent variable is corporate litigation, defined as the number of legal cases for which a firm is mentioned as a defendant within a year. We follow the LexisNexis classification of all lawsuits into the following categories: product liability, environmental, medical liability, labor or pension, intellectual property, securities, contracts, and other. *Total Lawsuits* is the sum of all types of lawsuits.

2.2.2 The Main Explanatory Variable

The main explanatory variable of interest is the proportion of female executives in the top management team (*Female Executives*), and is defined as the number of top female executives scaled by the total number of executives in top management team in a year. The top management team consists of the five highest paid executives listed in a firm's proxy statement, as reported by Execucomp.

2.2.3 Control Variables

To control for other potential determinants of corporate litigation, we follow prior studies and include a number of control variables in our regressions (see, e.g., Hutton, Jiang and Kumar (2015), Malm and Mobbs (2014)). These variables include firms' financial characteristics, corporate governance mechanisms, and executive characteristics. In addition, we include year and industry fixed effects using Fama and French (1997) 48 industry classification. Firm size (*Size*) is measured as the natural logarithm of total assets. *Market-to-Book* is computed as total assets less book equity, less deferred tax, plus the liquidation value of preferred stock, plus the product of the year-end common share price and the year-end number of shares outstanding, scaled by total assets. *Profitability* is calculated as the ratio of net income to total assets. *Stock Return* is the holding period stock return during the year. *Return Volatility* is calculated as the standard deviation of daily stock returns over the year. *Leverage* is computed as the ratio of total book debt to total assets. We measure female directorship (*Female Directors*) as the percentage of female directors on the board, excluding the CEO. *Board Independence* is measured as the number of independent directors divided by the number of all directors. *Delta Managers (Vega Managers)* is the average Delta (Vega) of all managers in the top management team. Both Delta and Vega are calculated using Core and Guay's (2002) methodology.

3. Empirical Results

Section 3.1 presents summary statistics, and section 3.2 examines the relation between female executives and the frequency with which a company gets sued. The next two subsections examine two further facets of this relation. Section 3.3 examines whether the relation we find is a symptom of tokenism or an effect of gender diversity. Section 3.4 investigates whether the relation is driven by the CEO, CFO or other executives. Section 3.5 conducts a number of robustness checks. Finally, in Section 3.6, we use an instrumental variables approach to investigate the relation between female executives and corporate litigation.

3.1 Summary statistics

Table 2 presents descriptive statistics for our lawsuit-related variables (Panel A) and the main explanatory variables used in the analyses (Panel B). The variables are defined in Appendix 1. The median size (log of total assets) of the firms in the sample is 7.34 with a mean of 7.49. The average *Market-to-Book* ratio is 2.14 with a median of 1.68. The averages of *Profitability* and *Stock Return* are 6% and 8%, respectively. *Leverage* has a mean of 13% with a median of 10%. The average firm has about 9% non-CEO female directors (*Female Directors*). The average proportion of independent directors on the board (*Board Independence*) is about 70%. The average *Delta* and *Vega* of the compensation of the top 5 managers are 0.52 and 0.07, respectively.

Panel C of Table 2 provides a preliminary exploration of our data. The panel shows the mean number of lawsuits against a firm by the number of top women executives. About 20.5% (4.3%) [1.3%] of the firm-years have 1 (2) [≥ 3] women among their top five executives, while about 74% have none. The mean number of all lawsuits shows a monotonic decline across firm-

years as the number of women in top management positions increases. While there is also a decline for individual categories of lawsuits, the pattern here is not consistent or monotonic, perhaps due to smaller numbers, and consequently greater volatility, in the number of lawsuits of each category faced by a firm.

Panel D shows the distribution of job titles of the 4,064 female executive-years in the 3,195 firm-years in our sample that have at least one woman among their top five executives. We classify each executive into one title. For an individual with multiple titles, we give priority to titles with clear functional areas (e.g., CFO or VP-Marketing) and to higher job titles (e.g., President and Divisional Manager is classified as President). Of the 12,278 firm-years in our sample, 240 (or 1.95%) have a woman CEO and 904 (or 7.36%) have a woman CFO. The titles of chairman, vice chairman, president or chief operating officer are held by women in an additional 971 executive-years.

3.2 Female executives and corporate litigation

This section examines the relation between the proportion of females among a firm's top executives and corporate lawsuits in a regression framework. Our main dependent variable of interest, total number of lawsuits, is count data. Therefore, we consider regression models that are suitable for count data. We first consider the Poisson model but our main dependent variable exhibits greater variability than the Poisson distribution would predict, so it fails the equi-dispersion test. Therefore, we employ the negative binomial model, which can be considered a generalization of the Poisson model and allows for over-dispersion in the dependent variable.³

Table 3 reports the results from the negative binomial regression model. Panel A presents the results of *Total Lawsuits* as the dependent variable. *Female Executives* is the main

³ Our results remain qualitatively similar with a Poisson model, as discussed in the robustness section.

explanatory variable of interest. The regression model controls for other potential determinants of corporate litigation in the finance literature (see, e.g., Hutton, Jiang and Kumar (2015), and Malm and Mobbs (2014)) such as firm size, market-to-book ratio, profitability, stock return, return volatility, leverage, female directors, independent directors, and average Delta and Vega of the compensation of the top management team. Control variables are defined in Section 3.2. In addition, industry effects can be important given the considerable variation across industries in the incidence of women top executives and the number of lawsuits against firms (see Appendix 2). So we include Fama and French (1997) 48 industry fixed effects. All models also include year fixed effects.

Model 1 of Panel A reports the results from a parsimonious regression where the only independent variables are *Female Executives*, year and industry fixed effects.⁴ The coefficient on the Female Executives variable is negative and statistically significant at the 10% level. The results reveal that a higher fraction of female executives in top management predicts fewer lawsuits. Model 2 controls for several firm characteristics such as firm size, market-to-book ratio, profitability, stock returns, return volatility and leverage, which have been found to predict lawsuits against a firm. The coefficient on *Female Executives* remains negative and now becomes statistically significant at the 5% level. Finally, column 3 adds governance and compensation variables such as the fraction of non-CEO female directors, board independence, managers' average Delta and Vega. Even with the full set of control variables, *Female Executives* obtains a negative coefficient which is statistically significant at the 1% level. The coefficient estimate of -0.783 from the negative binomial model on *Female Executives* means that for each one-unit increase in *Female Executives*, the expected log count of the number of

⁴ We cannot use firm fixed effects because there is not enough variation over time in the proportion of women among the top 5 executives within a firm.

lawsuits decreases by 0.783. In other words, a one standard deviation increase in the proportion of female executives in the top management team (i.e., 0.11) leads to an average decrease of 1.09 (i.e., $e^{0.11*0.783}$) lawsuits. This effect is economically significant given that the mean annual number of lawsuits faced by a firm is 2.37.

Control variables take expected signs. Larger firms and firms with higher valuations (i.e., higher market-to-book ratios) face more lawsuits, consistent with a ‘deep pocket’ effect. Less profitable firms face more lawsuits perhaps because these firms are more likely to fail to honor contracts with various stakeholders. Interestingly, average executive Delta is positively related but Vega is negatively related to the number of lawsuits. We suspect that rather than indicating a causal effect of Delta and Vega on lawsuits, the result indicates that, in equilibrium, firms which face higher litigation risk incentivize their executives to reduce firm risks (with lower Vega) and increase returns (with higher Delta).

Columns 1 to 8 of Panel B report results from regressions of each type of lawsuit in our sample: product liability, environmental, medical liability, labor or pension, contracts, intellectual property, securities, and other litigation, respectively. We find that the fraction of female executives negatively and significantly predicts lawsuits related to product liability, environmental, medical liability, labor or pension, and contracts. This relation is negative but statistically insignificant for intellectual property and other lawsuits. A notable exception is securities lawsuits, which show a positive relation to the proportion of female executives.⁵

3.3 Tokenism or diversity?

In this section, we examine whether the observed negative relation between female

⁵ This relation becomes negative, though insignificant, when we use the instrumental variables approach in Section 3.4 below.

executives and corporate litigation is driven by only one woman or multiple women in the top management team. Apart from being independently interesting, this analysis helps shed light on a subtle but important endogeneity issue: if the negative relation is primarily driven by firms with only one female executive, it might be an indication of tokenism, and the observed negative relation might be an artifact of a firm's need to "exhibit" gender diversity and also avoid lawsuits. For example, firms for which maintaining a good reputation with various stakeholders is critical are likely to avoid lawsuits. Moreover, these firms are also more likely to include a female executive in the top management team to appear diversity-friendly. This endogeneity can generate a negative relation between female executives and the number of lawsuits, rather than a causal relation. On the other hand, if the result is driven by a critical mass of women in top management positions, it is less likely to be an artifact of such tokenism and more likely to be a causal effect of diversity.

A firm may need more than one woman in the top management team because only one woman may not have real power to affect corporate decisions and might be an indication of tokenism. In model 1 of Table 4, we re-estimate our baseline regression (model 3 in Panel A of Table 3) by replacing our main explanatory variable with indicator variables for 1) only one female executive (*#Female Execs. = 1*), and 2) more than one female executives (*#Female Execs. > 1*) in the top management team during the year. We find a negative but statistically insignificant relation between the number of lawsuits and *#Female Execs. = 1*. However, we find an economically larger, negative and statistically significant relation between the number of lawsuits and the presence of multiple female managers (*#Female Execs. > 1*). This result suggests that the negative relation between the number of lawsuits against a firm and the presence of female executives is unlikely to be merely an artifact of tokenism, but an effect of

gender diversity.

3.4 Female CEO, CFO or other executives?

A pertinent question is whether the observed relationship between corporate litigation and women executives is driven by the female CEO or female CFO or the rest of the top management team. While interesting, this question is hard to answer given that, as Panel D of Table 2 shows, only about 1.95% (7.36%) of the firm-years in our sample have a woman CEO (CFO). Thus, the results are unlikely to be reliable given the small sample sizes of firms with female CEOs and CFOs. Nevertheless, we examine this issue in column 2 of Table 4. *Female CEO (CFO)* is a dummy variable that equals one when the firm has a female CEO (CFO). We define CFO as the executive holding the top financial position among the group of top five executives.⁶ *Other Female Executives* is the number of female executives in top management who do not hold the CEO or CFO positions, scaled by total number of top executives. As shown in column 2, the indicator variable *Female CEO* is not significant in predicting the number of lawsuits. The *Female CFO* indicator is negative but statistically insignificant (t-statistic = -1.07). Finally, *Other Female Executives* is negatively associated with corporate litigation and is statistically significant at the 1% level.

3.5 Robustness checks

We conduct various tests, reported in Table 5, to check the robustness of our main results. First, we employ the number of female executives, instead of their fraction, in the top management team as the main explanatory variable and obtain similar results, as shown in row 1

⁶ These titles include Chief Financial Officer, (Senior) Vice President-Finance, Treasurer or Controller.

of Table 5. Second, the results are also similar when we use a dummy variable for the presence of at least one female executive on the top management team as our main explanatory variable, as shown in row 2 of Table 5. Third, a potential concern is that our results may be driven by a few industries that have large concentrations of women executives and face few lawsuits. Even though our regressions control for industry fixed effects, we further mitigate this concern by excluding from our sample the five industries with the highest concentration of women in the top management team. As shown in row 3 of Table 5, our main result is essentially unchanged.

We next redo our tests using alternative regression methodologies to ensure that our results are not driven by specific estimation techniques. For instance, we use the Poisson regression instead of the Negative Binomial regression and find similar results in row 4. Next, we estimate a Tobit regression which explicitly accounts for the censored nature of the data, i.e., the fact that the number of lawsuits against a firm is censored at zero. We also estimate the zero-inflated Poisson regression that accounts for the mass of zero in the distribution of lawsuits. In rows 5 and 6, our baseline results continue to hold under either of these alternative specifications.⁷ Finally, to deal with the issue that there are many firms with no females in the management team, we estimate the regression in the subsample of firm-years with non-zero female executives, and find qualitatively similar results in row 7. All of these tests support our hypothesis that the presence of more women in top management predicts fewer lawsuits against a firm.

3.6 Endogeneity and instrumental variables approach

Our baseline results suggest a robust negative relation between female representation in top management and corporate lawsuits. However, interpreting this result as a causal effect of

⁷ The zero-inflated Poisson regression uses size and industry fixed effects in the “inflate” equation (i.e., the equation that predicts zeros).

female executives on litigation is difficult because women executives are not randomly assigned to firms. Arguably the negative relation could be driven by the possibility that women self-select into firms which are less susceptible to litigation, or boards of firms with high litigation risk might be reluctant to hire women in top management positions. Moreover, omitted variables might drive both litigation events and the presence of women in the top management team simultaneously. In our main empirical model, we control for many potential determinants of litigation, and year and industry fixed effects to deal with the issue of omitted variable bias. In this section, we employ instrumental variable techniques to further mitigate such endogeneity concerns.

First, we exploit a historical event that led to a plausibly exogenous shock in female labor supply across the states in the US. Acemoglu, Autor and Lyle (2004) find that the Second World War (WWII) drew many women to the workforce permanently due to a decline in the domestic supply of male labor induced by the war. Around 16 million men in the U.S. were mobilized to serve in the armed forces. Our identification strategy exploits the fact that mobilization rates varied substantially across the U.S. states, partly due to idiosyncratic differences in the behavior of local draft boards, from less than 42 percent in Georgia, the Dakotas, and the Carolinas, to more than 52 percent in Washington, Pennsylvania, New Hampshire, Oregon, and Massachusetts. Because the negative supply shock of male workers had to be compensated with female workers, this variation in the mobilization of men also led to a variation in female labor supply across the states. Even though a significant number of women left the workforce after the war (see, e.g., Goldin (1990)), part of the effect remained permanently (see, e.g., Clark and Summers (1982)). Equally important, the war also changed many men's perception of working women over subsequent generations because WWII created

more men with mothers who worked. Fernandez, Fogli, and Olivetti (2004) conclude that “although the effect of World War II faded for the older cohorts, its influence on the labor supply for the later cohort persisted” (pp 1278). The war thus created an echo effect that influenced not only the generation that was directly affected by the war but also the next generation.

Motivated by these findings, we employ the proportion of eligible males drafted to the war in a state as an instrument for the fraction of female executives in the top management team of a firm headquartered in the state, and estimate two-stage instrumental variable models. This proportion should positively predict the supply of female workforce in the state. Also, this geography of managerial labor supply is important because, as Yonker (2014) finds, even top executives of public firms are likely to come from the same state. We expect this variable to be positively correlated with the proportion of women in the top management team in a state because it led to 1) an increased supply of female workforce subsequent to the war due to a ripple effect, and the possibility that some of the women eventually reached the top management team, and 2) greater transformation of the society in states with high mobilization rates, leading to positive perceptions about women’s abilities as leaders.

Our results corroborate these priors. Column 1 of Panel A in Table 6 shows the first stage OLS regression in which the fraction of registered men between the ages of 18 and 44 who were drafted or enlisted for WWII in a state⁸ (*WWII Mobilization*) positively predicts the percentage of female executives in top management in the firm headquartered in the state. As expected, the coefficient on *WWII Mobilization* in a state is positive and statistically significant at the 1% level in predicting the share of female executives in a firm headquartered in the state. The economic impact of the difference in mobilization on the difference in female representation

⁸ We obtain data on *WWII Mobilization* from Professor David Autor's website: <http://economics.mit.edu/faculty/dautor/data/autacemly06>.

in management is substantial. The difference in mobilization between the states with highest and lowest mobilization rates is about 10%. This translates into a difference in the fraction of women in the top management team of about 2.2% ($0.222 \times 10\%$). Clearly this number is significant considering that the average fraction of women in the top management team is about 5%. Thus, our instrumental variable is not weak and passes the relevance criterion. On the contrary, there is no reason why *WWII Mobilization* should directly affect a firm's litigation risk. So this instrument plausibly satisfies the exclusion criterion.

The results on the other control variables indicate that female executives are more likely to be employed at firms that are smaller, have higher percentages of female directors, and have lower pay performance sensitivity (delta) for its top executives. Column 2 of Table 6 reports the results of the second-stage negative binomial regression with Total Lawsuits as the dependent variable and the predicted value of *Female Executives* from the first-stage regression (*Instrumented Female Executives*) as the main explanatory variable. It shows that, consistent with the results from the OLS model, *Instrumented Female Executives* negatively and significantly predicts the number of corporate lawsuits.

To ensure that the results are not sensitive to the choice of an instrument, we also use another instrument. In particular, we follow Huang and Kisgen (2013) and we use the state-level gender equality index (*State Gender Equality*) developed by Sugarman and Straus (1988). We use this index as an instrument for the fraction of top executives that are female in a firm located in the state. The gender equality index calibrates a state's level of gender equality based on economic, political, and legal spheres of life for each of the 50 U.S. states. Higher values of the index indicate greater gender equality. We expect greater gender equality to increase women's expected return on investment in education and career-building, and thus to lead to a greater

supply of qualified women capable of corporate leadership. This, in turn, can increase female representation in the top management team for firms located in a state. Hence, this instrument satisfies the relevance criterion. More importantly, this instrument also plausibly satisfies the exclusion restriction because there is no reason to believe that state level historical gender equality directly affects a firm's litigation risk.⁹

Column 3 of Panel A in Table 6 shows the results of the first-stage regression. As expected, the state gender equality index positively and significantly predicts the proportion of female executives. In the second-stage negative binomial regression in column 4, the predicted value of *Female Executives* continues to predict the number of total lawsuits negatively and significantly.

In columns 5 and 6 of Panel A, we report the results of the IV analysis using both our instruments together. The F-test in the first stage regression in column 5 shows that our instruments are jointly significant at the 1% level in predicting the presence of women in the state. However, since the two instruments are highly positively correlated (Pearson correlation = 0.52), *WWII Mobilization* loses statistical significance. In the second stage regression reported in column 6, *Instrumented Female Executives* continues to negatively and significantly predict the number of corporate lawsuits. Since our second stage is a non-linear model, there is no way to formally test for exclusion despite having two instruments. However, we obtain a statistically insignificant linear Hansen J statistic, which points to their validity.

Since both our instruments are measured at the state level, a potential concern is that there could be variation across states in the ease of suing companies, which may be correlated with the proportion of female executives, our instruments, and the number of lawsuits a firm

⁹ State gender equality might affect employment/labor related lawsuits but we have many other types of lawsuits which are unlikely to be directly affected by this variable.

located in the state faces. We deal with this issue with a robustness check in which we re-estimate our IV regressions after controlling for a state-level measure of the ease of bringing lawsuits against companies. This measure is the overall ranking of state liability systems assigned by the Institute for Legal Reform of the U.S. Chamber of Commerce.¹⁰ States are ranked from 1 to 50, where 50 indicates the easiest state to sue a company. In panel B of Table 6, the first-stage regression shows that the fraction of female executives positively predicts the ease of suing a firm in a state. Nevertheless, our two instruments continue to be jointly significant in predicting *Female Executives*. In the second-stage, the *Instrumented Female Executives* variable continues to be significant in predicting the number of lawsuits a firm faces. The coefficient of the ease of litigation variable is statistically insignificant in the second-stage. This analysis suggests that our results are unlikely to be driven by variation across states in the ease of suing a firm.

Another concern is whether the states that drafted higher percentages of people during WWII are more progressive ('blue') and their politics led them to have more female executives now. We do not find empirical support for this possibility. In untabulated regressions, we add as an explanatory variable to our first-stage regression the percentage of votes that the Democratic candidate, Franklin D. Roosevelt, received in the 1940 presidential election, and find that it has the wrong sign and is statistically insignificant in predicting the *Female Executives* variable (coefficient estimate = -0.03, $t = -1.03$). The coefficient estimate of the *WWII Mobilization* variable remains statistically significant in the first-stage. The second stage regression continues

¹⁰ ILR asks general counsels of companies with revenues of at least \$100 million to grade each state on 10 key areas of legal fairness in the court system. The survey was conducted annually from 2002 to 2008, and bi-annually after that. We use the 2002 ranking because that is the earliest ranking and occurs within our sample period. The ranking does not change substantially from year to year. See 'The Best States to Sue a Company' - 24/7 Wall St., September 13, 2012 (<http://247wallst.com/special-report/2012/09/13/the-best-states-to-sue-a-company/#ixzz3i9FFzMBC>).

to yield a negative and highly significant coefficient on the instrumented *Female Executives* variable (coefficient estimate = -17.92, $z = -3.22$).

Panel C shows the results from the instrumental variable analysis applied separately to different types of lawsuits. For brevity, we only report the results of regressions that use *WWII Mobilization* as the instrument. The results are similar when we use *State Gender Equality* as the instrument. The results show that instrumented *Female Executives* negatively predicts seven of the eight types of litigation risk measures and is statistically significant for five of them. The relation is positive but statistically insignificant for intellectual property litigation. Interestingly, the significantly positive coefficient on *Female Executives* in predicting securities lawsuits found in the OLS regression now disappears, and becomes negative but statistically insignificant.¹¹

4. Female Executives, Litigation Risk and the Value of Cash

In this section, we examine a direct economic implication of female representation in the top management team in the presence of litigation risk. Actions that potentially lead to lawsuits likely have higher risk as well as higher expected return. Because of this trade-off, the impact of lawsuits and the moderating effect of gender diversity on overall firm value seems ambiguous. Besides, firm value is affected by many other firm policies. So we focus on the effect of gender diversity on a specific kind of asset, viz. cash, whose value is influenced substantially by the risk of lawsuits. Analyzing the value of cash is important because firms' cash holdings have been increasing over time (Bates, Kahle and Stulz (2009)), partly because cash holdings have become

¹¹ While we do not delve much into this issue, we suspect that the positive relation obtained in the baseline model could be driven by the possibility that firms with high risk of securities lawsuits are more likely to hire female executives, who tend to be more conservative, to mitigate such lawsuits. Consistent with this selection story, the positive relation disappears under the instrumental variables approach which reduces the selection bias. Our untabulated finding that female CFOs drive the positive relation in the OLS regression seems to support this argument.

increasingly important as a strategic resource for innovation and competitiveness (see Schroth and Szalay (2010), and Lyandres and Palazzo (2012)).

In the presence of high litigation risk, cash held by firms likely becomes less valuable to shareholders because a part of it is expected to go to plaintiffs, instead of being distributed as dividends or invested in positive NPV projects. Our finding that female executives reduce the instances of such lawsuits implies that the attrition in the value of cash because of high litigation risk should be lower among firms with larger proportions of women executives.

To test this conjecture, we construct two measures of a firm's litigation risk. First, we create a simple industry-level measure of such risk by calculating the average number of lawsuits that firms in each Fama-French 48 industry face during our sample period. We then define a firm as a high litigation risk firm, if it is in an industry whose average number of lawsuits exceed the median value for all industries. This is a firm's litigation risk based on its industry affiliation and is time-invariant because, presumably, the risk of litigation, compared to actual lawsuits, does not change much over time. We call this variable *HighLitRisk 1*.

Second, we construct a measure of a firm's litigation risk by estimating the predicted number of lawsuits it is likely to face based on its observable characteristics. Specifically, using a negative binomial model, we regress the actual number of lawsuits on firm size, market to book ratio, profitability, stock return, and industry and year fixed effects. Using the coefficient estimates obtained from the model, we calculate the predicted number of lawsuits a firm faces. For each firm, we then arrive at another time-invariant measure of its litigation risk by averaging the number of predicted lawsuits it obtains over the years. Finally, we identify a firm as having high litigation risk if the average number of predicted lawsuits is above the median value for all firms in the sample. We call it *HighLitRisk 2*.

We adopt a framework similar to Faulkender and Wang (2006) to estimate the market value of a firm's cash holding as follows:

$$r_{i,t} - R_{i,t}^B = \beta_0 + \beta_1 \times \frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}} \times HighLitRisk_i \times Female Executives_{i,t} + \beta_2 \times \frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}} \times Female Executives_{i,t} + \beta_3 \times HighLitRisk_i \times Female Executives_{i,t} + \beta_4 \times \frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}} \times HighLitRisk_i + \beta_5 \times \frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}} + \gamma'X + \varepsilon_{i,t}$$

where $r_{i,t} - R_{i,t}^B$ is the firm i 's stock return in year t adjusted for Fama and French (1997) 48 industry benchmark return. The coefficient β_5 captures the market valuation of a one dollar increase in a firm's cash holdings. $HighLitRisk_i$ is a time-invariant litigation risk indicator, which equals one if firm i faces above-median litigation risk defined in two different ways earlier (*HighLitRisk 1* and *HighLitRisk 2*). The coefficient of our main interest is β_1 on the three-way interaction, which, after controlling for all the main effects and two-way interactions, captures the incremental value of cash explained by the presence of female executives among high litigation risk firms. Given our finding that female executives decrease the instances of actual lawsuits a firm faces, and thus likely reduce the expected cash outflow to the plaintiffs, we expect β_1 to assume a positive value to indicate that women executives mitigate the attrition in the value of cash caused by expected payoffs to plaintiffs.

Table 7 shows the results of this analysis. Column 1 presents the results when litigation risk is defined by *HighLitRisk 1*. As expected, the coefficient on the triple interaction is positive and statistically significant at the 5% level. In column 2, where litigation risk is defined by *HighLitRisk 2*, the coefficient on the triple interaction is again positive and significant at 10% level. These estimates are economically meaningful too. The coefficient estimates of 1.4 and 1.2 suggest that among high litigation risk firms, a firm with a mean fraction of female executives (i.e., 0.056) enjoys 7 to 8 cents higher market value per dollar of cash holdings (e.g., $0.056 \times 1.4 = 0.078$) compared to a firm without female executives.

Of particular interest is the double interaction of $\frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}} \times HighLitRisk_i$, which assumes negative value in both specifications and is statistically significant in the second. This result suggests that, in general, the value of cash is lower among firms with high litigation risk. Other control variables take expected signs and significance, and are generally consistent with the prior literature. For instance, the average value of a dollar revolves around a dollar as indicated by the coefficient estimate of about one on $\frac{\Delta Cash_{i,t}}{MktCap_{i,t-1}}$.

5. Conclusion

This paper sheds light on a benefit of having female executives in top management. We use a unique hand-collected dataset on corporate litigation, and find that a higher female representation in top management reduces disputes related to the violations of product liability, environmental, medical liability, labor and contracts laws. To deal with endogeneity, we use the variation in the supply of female labor across the U.S. states induced by World War II, and a historical state-level gender equality index as instrumental variables, and continue to find a negative relation between the proportion of female executives in top management and the number of lawsuits a firm faces. Finally, we find a benefit of higher female representation in firms which face higher litigation risk. In particular, among firms which are more susceptible to lawsuits, firms with greater representation of women in the top management enjoy a higher market valuation of their cash holdings. Our research thus sheds light on a previously unidentified but important benefit of gender diversity in the management team.

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Appendix 1: Variable definitions

Total Lawsuits	The number of legal cases that name a firm as a defendant in a year. From LexisNexis searches
Labor or pension lawsuits	The number of labor or pension-related lawsuits that name a firm as a defendant in a year. From LexisNexis searches
<i>Other types of lawsuits (e.g., Product Liability):</i> Defined similarly.	
Female Executives	Number of female executives in the top management team divided by number of top executives in a firm in a given year. From Execucomp
#Female Execs. = 1	An indicator variable which equals 1, if the top management team has exactly one female executive, and zero otherwise. From Execucomp
#Female Execs. > 1	An indicator variable which equals 1 if the top management team has more than one female executive, and zero otherwise. From Execucomp
Female CEO	An indicator variable which equals 1 if the firm has a female CEO, and zero otherwise. From Execucomp
Female CFO	An indicator variable which equals 1 if the firm has a female CFO, and zero otherwise. From Execucomp
Other Female Executives	Number of non-CEO and non-CFO female executives divided by the number of all executives in the top management team. From Execucomp
Size	Log of total assets. From Compustat
Market-to-Book	Book total assets minus book equity plus market equity minus deferred taxes and investment tax credit, all divided by book assets. From Compustat
Profitability	Net income divided by book total assets. From Compustat
Stock Return	A firm's stock return for the year. From CRSP
Return Volatility	Variance of daily excess stock return for the year. From CRSP
Leverage	Long-term debt plus short-term debt, divided by the market value of total assets. From Compustat
Female Directors	Number of non-CEO female directors divided by the number of all directors. From IRRC
Board Independence	Number of independent directors divided by the number of all directors. From IRRC
Delta Managers	Average Delta of top 5 managers' compensation, where Delta measures the sensitivity of their wealth to the firm's stock price. Obtained from Professor Lalitha Naveen's website.
Vega Managers	Average Vega of all managers' compensation, where Vega measures the sensitivity of their wealth to the firm's stock price volatility. Obtained from Professor Lalitha Naveen's website.

WWII Mobilization	Number of men between the ages of 18 and 44 who served in the World War II divided by the number of registered men in each state in the U.S. Data obtained from Professor David Autor's website: http://economics.mit.edu/faculty/dautor/data/autacemly06 .
State Gender Equality	Gender Equality Index developed by Sugarman and Straus (1988) for each state in the U.S. A higher value indicates a greater equality of women with men in economic, political and legal spheres.
State Litigation Ease	The ease of bringing lawsuits against companies in a state, measured as the overall ranking of state liability systems assigned by the Institute for Legal Reform of the U.S. Chamber of Commerce. States are ranked from 1 to 50, where 50 indicates the easiest state to sue a company.
$\Delta\text{Cash}_{i,t}/\text{MktCap}_{i,t-1}$	Change in cash and marketable securities divided by lagged market capitalization. From Compustat
$\Delta\text{Earnings}_{i,t}/\text{MktCap}_{i,t-1}$	Change in earnings before extraordinary items, interest and taxes divided by lagged market capitalization. From Compustat
$\Delta\text{Net Assets}_{i,t}/\text{MktCap}_{i,t-1}$	Change in non-cash assets divided by lagged market capitalization. From Compustat
$\Delta\text{R\&D}_{i,t}/\text{MktCap}_{i,t-1}$	Change in R&D expenditure divided by lagged market capitalization. From Compustat
$\Delta\text{Interest}_{i,t}/\text{MktCap}_{i,t-1}$	Change in total interest and related expense divided by lagged market capitalization. From Compustat
$\Delta\text{Dividends}_{i,t}/\text{MktCap}_{i,t-1}$	Change in common dividends divided by lagged market capitalization. From Compustat
$\text{Cash}_{i,t-1}/\text{MktCap}_{i,t-1}$	Lagged cash and marketable securities divided by lagged market capitalization. From Compustat
HighLitRisk 1	An indicator variable which equals 1, if the firm is in an industry whose average number of lawsuits exceed the median value for all industries, and 0 otherwise.
HighLitRisk 2	An indicator variable which equals 1 if a firm's average predicted number of lawsuits exceed the median value of all firms, and 0 otherwise. We first regress a firm's actual number of lawsuits on firm size, market to book ratio, profitability, stock return, and industry and year fixed effects using a negative binomial model. We then use the estimated coefficients to calculate the predicted number of lawsuit each year, and take the time series average for each firm.

Appendix 2: Number of firm-years, percentage of firm-years with at least one female executive and the average number of lawsuits per firm-year by Fama-French 48 industry

Industry	Number of firm-years	% of firm-years with ≥ 1 female executive	Average number of lawsuits per firm-year
Agriculture	33	42%	5.03
Food Products	383	31%	1.89
Candy & Soda	24	25%	4.67
Beer & Liquor	80	35%	2.64
Tobacco Products	32	53%	1.34
Recreation	78	12%	1.33
Entertainment	95	45%	0.81
Printing and Publishing	120	44%	2.03
Consumer Goods	284	40%	1.64
Apparel	236	39%	1.36
Healthcare	245	35%	1.82
Medical Equipment	376	27%	3.39
Pharmaceutical Products	464	36%	4.13
Chemicals	415	16%	2.53
Rubber and Plastic Products	81	14%	0.27
Textiles	49	0%	0.98
Construction Materials	292	14%	1.18
Construction	261	20%	1.47
Steel Works, etc.	233	13%	1.15
Fabricated Products	11	100%	0.18
Machinery	643	21%	1.31
Electrical Equipment	219	15%	1.55
Automobiles and Trucks	214	7%	9.19
Aircraft	135	25%	7.88
Shipbuilding, Railroad Equipment	20	0%	2.90
Defense	90	43%	3.92
Precious Metals	15	0%	2.80
Metallic and Industrial Metal Mining	92	34%	0.95
Coal	29	17%	1.52
Petroleum and Natural Gas	608	13%	1.77
Communication	274	38%	4.03
Personal Services	169	39%	1.20
Business Services	1344	31%	2.15
Computers	455	24%	2.55
Electronic Equipment	1043	14%	1.48
Measuring and Control Equipment	321	16%	0.51
Business Supplies	254	20%	2.61

Shipping Containers	73	4%	4.71
Transportation	444	22%	2.62
Wholesale	601	23%	0.87
Retail	1058	43%	4.46
Restaurants, Hotels, Motels	309	40%	1.77

Table 1: Distribution of lawsuits by type and year

This table shows the number and percentage of lawsuits filed against S&P1500 companies excluding financial and utility firms during 1996-2010 by lawsuit type and year.

Panel A: Number of lawsuits by type and year

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Labor or pension	281	296	310	357	308	376	422	524	561	832	1140	1272	1218	1394	1350	10,641
Intellectual Property	87	119	123	84	112	101	128	181	181	249	334	376	417	420	430	3,342
Contracts	124	103	115	112	123	128	141	160	175	227	292	302	316	386	347	3,051
Securities	19	26	15	16	22	35	38	41	53	101	74	118	78	129	107	872
Environmental	17	19	17	21	22	37	48	45	38	74	75	98	95	98	77	781
Product Liability	130	165	136	154	92	121	170	165	151	216	228	241	260	244	201	2,674
Medical Liability	71	46	67	67	84	76	112	95	128	135	215	219	201	235	261	2,012
Others	200	185	194	250	203	229	316	315	323	406	476	474	498	682	585	5,336
Total	929	959	977	1,061	966	1,103	1,375	1,526	1,610	2,240	2,834	3,100	3,083	3,588	3,358	28,709

Panel B: Percentage of lawsuits by type and year

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Labor or pension	30.3	30.9	31.7	33.6	31.8	34.1	30.7	34.3	34.8	37.1	40.3	41	39.5	38.8	40.2
Intellectual Property	9.4	12.4	12.6	7.9	11.6	9.2	9.3	11.9	11.2	11.1	11.8	12.1	13.5	11.7	12.8
Contracts	13.3	10.7	11.8	10.6	12.7	11.6	10.3	10.5	10.9	10.1	10.3	9.7	10.2	10.8	10.3
Securities	2.0	2.7	1.5	1.5	2.3	3.2	2.8	2.7	3.3	4.5	2.6	3.8	2.5	3.6	3.2
Environmental	1.8	2.0	1.7	2.0	2.3	3.4	3.5	2.9	2.4	3.3	2.6	3.2	3.1	2.7	2.3
Product Liability	14.0	17.2	13.9	14.5	9.5	11.0	12.4	10.8	9.4	9.6	8.0	7.8	8.4	6.8	6.0
Medical Liability	7.6	4.8	6.9	6.3	8.7	6.9	8.1	6.2	8.0	6.0	7.6	7.1	6.5	6.5	7.8
Others	21.5	19.3	19.8	23.5	21	20.7	23	20.7	20	18.1	16.8	15.3	16.1	19	17.4

Table 2: Summary statistics

The table reports summary statistics of the lawsuit-related (main explanatory) variables for our full sample in Panel A (B). The sample consist of S&P 1500 firms that have data available on stock prices, accounting data, and lawsuit information over the sample period 1996-2010. The variables are defined in Appendix 1. Panel C shows the mean number of lawsuits against a firm by the number of women among its top executives. Panel D shows the distribution of job titles of the 4,064 female executive-years in 3,195 firm-years in our sample that have at least one woman among their top five executives. Each executive is classified into one title. For an individual with multiple titles, priority is given to titles with clear functional areas (e.g., CFO or VP-Marketing) and to higher job titles (e.g., President and Divisional Manager is classified as President).

Panel A: Lawsuit related variables

Variables	# Firm-years	Mean	StdDev	P5	P25	Median	P75	P95
All lawsuits	12,280	2.37	8.2	0	0	0	2	11
Product liability lawsuits	12,280	0.22	1.74	0	0	0	0	1
Environmental lawsuits	12,280	0.06	0.43	0	0	0	0	0
Medical liability lawsuits	12,280	0.13	0.6	0	0	0	0	1
Labor or pension lawsuits	12,280	0.88	3.56	0	0	0	0	4
Contracts lawsuits	12,280	0.25	0.98	0	0	0	0	1
Intellectual property lawsuits	12,280	0.28	1.2	0	0	0	0	2
Securities lawsuits	12,280	0.07	0.37	0	0	0	0	1
Other lawsuits	12,280	0.44	1.68	0	0	0	0	2

Panel B: Main explanatory variables

Variables	# Firm-years	Mean	StdDev	P5	P25	Median	P75	P95
Female Executives	12,278	0.06	0.11	0.00	0.00	0.00	0.13	0.27
Size	12,279	7.49	1.50	5.30	6.38	7.34	8.46	10.24
Market-to-Book	12,279	2.14	1.47	0.94	1.27	1.68	2.46	5.00
Profitability	12,278	0.06	0.10	-0.07	0.03	0.06	0.10	0.18
Stock Return	12,052	0.08	0.44	-0.68	-0.13	0.11	0.33	0.72
Return Volatility	12,277	0.0009	0.0009	0.0002	0.0003	0.0006	0.0011	0.0027
Leverage	12,055	0.13	0.13	0.00	0.02	0.10	0.20	0.39
Female Directors	9,995	0.09	0.09	0.00	0.00	0.10	0.14	0.25
Board Independence	9,995	0.70	0.16	0.40	0.60	0.73	0.83	0.90
Delta Managers	11,525	0.52	4.39	0.01	0.05	0.12	0.29	1.22
Vega Managers	11,810	0.07	0.12	0.00	0.01	0.03	0.07	0.25

Panel C: Mean number of lawsuits against a firm by the number of top women executives

	# of Female Executives			
	0	1	2	≥ 3
All lawsuits	2.44	2.28	2.09	1.21
Product liability lawsuits	0.26	0.12	0.13	0.02
Environmental lawsuits	0.07	0.05	0.03	0.01
Medical liability lawsuits	0.16	0.20	0.09	0.08
Labor or pension lawsuits	0.88	0.92	0.87	0.54
Contracts lawsuits	0.26	0.22	0.24	0.13
Intellectual property lawsuits	0.28	0.27	0.29	0.16
Securities lawsuits	0.06	0.10	0.07	0.05
Other lawsuits	0.46	0.40	0.37	0.22
# of firm-years	9083	2515	526	154

Panel D: Distribution of the titles of female executive-years

Title	# of female executive-years
Chief Executive Officer (CEO)	240
Chairman/Vice Chairman	66
President	291
Chief Operating Officer (COO)	614
Divisional CEO/Co-CEO	17
Chief Financial Officer (CFO)	904
(Senior or Exec) VP or [Vice President]	1,069
(Senior or Exec) VP - Marketing/Merchandizing	9
(Senior or Exec) VP - Human Resource	8
(Senior or Exec) VP - Accounting	4
(Senior or Exec) VP - Chief Admin Officer	24
(Senior or Exec) VP - Chief Clinical (Medical) Officer	7
(Senior or Exec) VP - Chief Information Officer	13
(Senior or Exec) VP - Chief Investment Officer	2
General Counsel/Legal	49
Other or missing title	747
Total	4,064

Table 3: Female executives and corporate lawsuits

The table presents estimates of the negative binomial regression of the number of lawsuits against a firm using three specifications. Regressions where Corporate Litigation is measured by Total Lawsuits in Panel A and for all lawsuits in Panel B, they are each type of lawsuit. All models include year and industry fixed effects, defined based on Fama-French 48 industry classification. The t-statistics, which are heteroskedasticity robust and clustered at the firm level, are in parentheses. Statistical significance at the 1%, 5%, and 10% levels, respectively, is indicated by ***, **, *.

Panel A: Female managers and all lawsuits

Dependent Variable:	Total Lawsuits		
	Model 1	Model 2	Model 3
Female Executives	-0.952* (-1.94)	-0.643** (-2.12)	-0.783*** (-2.66)
Size		0.729*** (23.73)	0.760*** (20.18)
Market-to-Book		0.044 (1.43)	0.056* (1.74)
Profitability		-0.701** (-2.15)	-0.597* (-1.70)
Stock Return		-0.030 (-0.56)	-0.060 (-1.03)
Return Volatility		-38.921 (-1.09)	-34.905 (-0.88)
Leverage		-0.211 (-0.62)	-0.308 (-0.92)
Female Directors			0.211 (0.50)
Board Independence			-0.250 (-1.02)
Delta Managers			0.004* (1.76)
Vega Managers			-0.629*** (-3.38)
Year/Industry Fixed Effects	Yes	Yes	Yes
N	12,201	11,973	9,485
Pseudo R ²	0.024	0.099	0.101

Panel B: Female Executives and different types of lawsuits

Dependent Variable:	Product Liability	Environ.	Medical Liability	Labor/pension
	Model 1	Model 2	Model 3	Model 4
Female Executives	-2.293*** (-3.28)	-2.137*** (-2.72)	-1.313** (-2.18)	-0.814** (-2.32)
Other Firm Controls	Yes	Yes	Yes	Yes
Year/ Industry Fixed Effects	Yes	Yes	Yes	Yes
N	9,485	9,485	9,485	9,485

Dependent Variable:	Contracts	Intel Prop	Securities	Other
	Model 5	Model 6	Model 7	Model 8
Female Executives	-1.032*** (-2.69)	-0.306 (-0.74)	1.246** (2.45)	-0.461 (-1.17)
Other Firm Controls	Yes	Yes	Yes	Yes
Year/ Industry Fixed Effects	Yes	Yes	Yes	Yes
N	9,485	9,485	9,485	9,485

Table 4: Female CEO, CFO or tokenism?

The table presents results from the regression estimates of the negative binomial regression of corporate litigation on female managers using two specifications. The dependent variable in all the specifications is *Total Lawsuits*. *#Female Execs. = 1* (*#Female Execs. > 1*) is an indicator variable which takes the value of one if the firm has only one (more than one) female executive(s) in its top management group, and zero otherwise. *Female CEO (CFO)* is a dummy variable that equals one when the firm has a female CEO (CFO). *Other Female Executives* is the number of female executives in top management who do not hold the CEO or CFO positions, scaled by total number of top executives. All models include year and industry fixed effects defined based on Fama-French 48 Industry classifications. t-statistics, which are heteroskedasticity robust and clustered at the firm level, are in parentheses. Statistical significance at the 1%, 5%, and 10% levels, respectively, is indicated by ***, **, *.

Dependent Variable:	Model 1 Total Lawsuits	Model 2 Total Lawsuits
#Female Execs. = 1	-0.109 (-1.46)	
#Female Execs. > 1	-0.310** (-2.52)	
Female CEO		0.012 (0.01)
Female CFO		-0.585 (-1.07)
Other Female Executives		-0.952*** (-2.69)
Other Firm Controls	Yes	Yes
Year/Ind. Fixed Effects	Yes	Yes
N	9,485	9,485
Pseudo R ²	0.101	0.101

Table 5: Female Executives and Corporate Litigation: Robustness Checks

The table presents results of robustness checks of our main results. The coefficients are on the *Female Executives* variable in different specifications. Statistical significance at the 1%, 5%, and 10% levels, respectively, is indicated by ***, **, *.

Robustness Tests	N	Coefficient	z/t
Number (instead of fraction) of women executives	9,485	-0.115**	-2.37
Dummy variable for at least one female executive	9,485	-0.141**	-2.02
Excluding 5 industries with most presence of women	8,094	-0.630**	-2.00
Alternative Methodology: Poisson regression	9,485	-0.991**	-2.10
Alternative Methodology: Tobit regression	9,485	-6.76*	-1.73
Alternative Methodology: Zero-inflated Poisson	9,485	-1.065**	-2.31
Subsample with non-zero female executives	2,524	-1.044*	-1.73

Table 6: Female Executives and Corporate Litigation: Instrumental Variable Approach

Columns 1, 3 and 5 of Panel A report the results from the first-stage ordinary least squares regressions with *Female Executives* as the dependent variable. Columns 2 and 4 and 6 report the results for the second-stage negative binomial regression with *Total Lawsuits* as the dependent variable. *WWII Mobilization* is the fraction of registered men in a state between the ages of 18 and 44 who were drafted or enlisted for WWII. *State Gender Equality* is the state-level gender equality index proposed by Sugarman and Straus (1988). *Instrumented Female Executives* is the predicted value of the fraction of female executives from the first-stage regression. Panel B includes another control variable, *State Litigation Ease*, defined in Appendix 1. In Panel C, *Instrumented Female Executives* is from model 2 of Panel A. Shown in parentheses are t-statistics, which are heteroskedasticity robust and clustered at the firm-level. Statistical significance at the 1%, 5%, and 10% levels, respectively, is indicated by ***, **, *.

Panel A: Total Lawsuits

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
Dependent Variable:	<i>Female Execs.</i>	<i>Total Lit.</i>	<i>Female Execs.</i>	<i>Total Lit.</i>	<i>Female Execs.</i>	<i>Total Lit.</i>
<i>Instrumented Female Executives</i>		-20.072***		-13.179**		-16.223***
		(-3.55)		(-2.45)		(-3.31)
Female Directors	0.174***	3.622***	0.167***	2.273**	0.171***	2.929***
	(5.14)	(3.43)	(5.01)	(2.29)	(5.08)	(3.13)
Return Volatility	1.942	7.469	2.029	-6.386	1.940	1.120
	(0.87)	(0.19)	(0.91)	(-0.16)	(0.87)	(0.03)
Stock Return	-0.008***	-0.220***	-0.007**	-0.156**	0.008***	-0.188***
	(-2.75)	(-2.91)	(-2.51)	(-2.13)	(-2.67)	(-2.61)
Profitability	0.046***	0.227	0.046***	-0.059	0.047***	0.069
	(2.79)	(0.56)	(2.78)	(-0.14)	(2.85)	(0.17)
Size	-0.005**	0.651***	-0.005**	0.691***	-0.005**	0.672***
	(-2.14)	(14.29)	(-2.12)	(15.94)	(-2.07)	(16.02)
Market-to-Book	0.000	0.064**	0.000	0.062*	0.000	0.063**
	(0.18)	(2.04)	(0.08)	(1.95)	(0.05)	(1.99)
Leverage	-0.011	-0.474	-0.008	-0.427	-0.010	-0.425
	(-0.51)	(-1.41)	(-0.40)	(-1.26)	(-0.46)	(-1.26)
Delta Executives	-0.000***	-0.003	-0.000**	-0.000	-0.000**	-0.001
	(-2.66)	(-0.85)	(-2.38)	(-0.10)	(-2.56)	(-0.42)
Vega Executives	0.004	-0.456**	0.000	-0.555***	0.001	-0.494**
	(0.22)	(-2.27)	(0.02)	(-2.85)	(0.07)	(-2.49)
WWII Mobilization	0.240***				0.149	
	(2.81)				(1.50)	
State Gender Equality			0.001***		0.001*	
			(2.86)		(1.72)	
Year/Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	9372	9372	9440	9440	9372	9372
Adj. or Pseudo R ²	0.109	0.102	0.109	0.101	0.111	0.102

First Stage F-test	7.92***		8.18***		5.45***	
Linear Hansen's J/p-value						1.02 /0.312

Panel B: IV Approach Considering State-level Ease of Lawsuits

	Model 1	Model 2
	First Stage	Second Stage
Dependent Variable:	<i>Female Execs.</i>	<i>Total Lit.</i>
<i>Instrumented Female Executives</i>		-15.802***
		(-3.29)
State Litigation Ease	0.0005**	0.001
	(2.13)	(0.033)
WWII Mobilization	0.106	
	(1.07)	
State Gender Equality	0.001**	
	(2.09)	
Year/Industry Fixed Effects	Yes	Yes
N	9372	9372
Adj. or Pseudo R ²	0.120	0.102
First Stage F-test	5.58***	
Linear Hansen's J/p-value		2.41/0.12

Panel C: Different types of lawsuits

Dependent Variable:	Product Liability	Environ.	Medical Liability	Labor/pension
	Model 1	Model 2	Model 3	Model 4
<i>Instrumented Female Executives</i>	-38.717***	-46.111***	-29.200**	-24.262***
	(-3.26)	(-3.05)	(-2.42)	(-3.35)
Other Firm Controls	Yes	Yes	Yes	Yes
Year/ Industry Fixed Effects	Yes	Yes	Yes	Yes
N	9,372	9,372	9,372	9,372

Dependent Variable:	Contracts	Intel Prop	Securities	Other
	Model 5	Model 6	Model 7	Model 8
<i>Instrumented Female Executives</i>	-12.677	13.350	-11.713	-25.555***
	(-1.63)	(1.64)	(-1.25)	(-2.70)
Other Firm Controls	Yes	Yes	Yes	Yes
Year/ Industry Fixed Effects	Yes	Yes	Yes	Yes
N	9,372	9,372	9,372	9,372

Table 7: Female executives, high litigation risk and value of cash

The table reports the results of regression estimating the impact of female executives in value of cash in the presence of high litigation risk, following a framework similar to Faulkender and Wang (2006). The dependent variable, $r_{it} - R_{it}^B$, is benchmark-adjusted stock return for the year. In column 1, HighLitRisk_i is defined as an indicator variable. In column 2, HighLitRisk_i is defined as firms with above median predicted number of litigations. $\Delta Earnings_{i,t}$, $\Delta Net\ Assets_{i,t}$, $\Delta R\&D_{i,t}$, $\Delta Interest_{i,t}$, $\Delta Dividends_{i,t}$, and $\Delta Cash_{i,t}$, respectively, are dollar changes in operating income before depreciation, net assets (non-cash assets), R&D expenditure, interest paid, cash dividends and cash plus marketable securities. The scaling factor $MktCap_{i,t-1}$ is the lagged market value of equity. t-statistics, which are heteroskedasticity robust and clustered at the firm level, are in parentheses. Statistical significance at the 1%, 5%, and 10% levels, respectively, is indicated by ***, **, *.

	HighLitRisk 1	HighLitRisk 2
$\Delta Cash_{i,t}/MktCap_{i,t-1} * HighLitRisk_i * Female\ Executives_{i,t}$	1.410** (2.24)	1.235* (1.72)
$\Delta Cash_{i,t}/MktCap_{i,t-1} * Female\ Executives_{i,t}$	-0.995** (-2.10)	-0.580 (-1.43)
HighLitRisk _i * Female Executives _{i,t}	0.003 (0.05)	0.104** (2.00)
$\Delta Cash_{i,t}/MktCap_{i,t-1} * HighLitRisk_i$	-0.013 (-0.14)	-0.430*** (-4.89)
$\Delta Cash_{i,t}/MktCap_{i,t-1}$	0.906*** (12.75)	1.084*** (18.83)
Female Executives _{i,t}	-0.051 (-0.89)	-0.087** (-2.15)
HighLitRisk _i	0.110 (1.41)	0.068*** (11.25)
$\Delta Earnings_{i,t}/MktCap_{i,t-1}$	0.386*** (16.81)	0.381*** (16.68)
$\Delta Net\ Assets_{i,t}/MktCap_{i,t-1}$	0.219*** (14.96)	0.218*** (14.99)
$\Delta R\&D_{i,t}/MktCap_{i,t-1}$	1.064*** (4.17)	1.053*** (4.09)
$\Delta Interest_{i,t}/MktCap_{i,t-1}$	-4.119*** (-12.60)	-4.107*** (-12.66)
$\Delta Dividends_{i,t}/MktCap_{i,t-1}$	2.737*** (6.37)	2.668*** (6.22)
$Cash_{i,t-1}/MktCap_{i,t-1}$	0.132*** (5.24)	0.162*** (6.22)
Year/ Industry Fixed Effects	Yes/Yes	Yes/Yes
N	23521	23521
Adj. R ²	0.153	0.160