GENDER EFFECTS ON FIRM CAPITAL STRUCTURE

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by
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ABSTRACT

The literature of sociobiology and culture recognize that, statistically, females often make different choices than males across a wide range of issues. Scholars of business, economics, and finance find that females react differently than males to diverse financial and business situations. Moreover, extant research indicates that females on boards of directors exert a positive impact on monitoring, value, and performance. This dissertation extends the gender literature by empirically testing the hypothesis that female board representation limits the use of debt in firms' capital structures because of females' greater risk aversion, lower overconfidence, and less competitive nature compared with males. The empirical results indicate that influential female representation, such as a female chair of the board, has a causal negative and significant impact on the leverage of the company.

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And I need to thank them in Hebrew now . . .

ברצוני להודות מקרב לב לאימי כוכבה, לאבי יוסף, לאחיי שי ועומרי ולאחותי מורן על אהבה, אמונה ותמיכה שחוצה אוקיינוסים.

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CHAPTER 1

INTRODUCTION

Female board representation is becoming increasingly important as regulations (Adams, Gray, & Nowland, 2011) and market forces (Carter, Franco, & Gine, 2014) encourage increasing gender diversity in corporate management. For example, by 2020 companies listed on stock exchanges in the European Union (EU) will be required to have no less than 40% female nonexecutive directors. Companies not meeting the requirement will face penalties. In 2015, on average, only 21.2% of board members of the largest publicly listed companies in the EU are women[1]. More females on the board increase the likelihood of a female CEO (Matsa and Miller, 2011).[2] Ahern and Dittmar (2012) use a natural experiment of increasing female board representation to 40% by regulation in Norway. They find that changes in board diversity have an impact on the company's outcomes.[3] Even before the 2007-2008 financial crisis ended, a question was raised about what might have happened if "Lehman Brothers" had been "Lehman Sisters," or at least "Lehman Brothers and Sisters" (Adams & Ragunatha, 2013; Kristof, 2009; Morris, 2009; Prügl, 2012). The literature on economic, financial, and business includes much research that supports the idea that females react differently than males to diverse financial and

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[1] European Commission, 2015. http://ec.europa.eu/justice/gender-equality/files/womenonboards/factsheet_women_on_boards_web_2015-10_en.pdf

[2] The data set used in this study also supports increased female board participation over time (see Figures 4, 5, and 6).

[3] Eckbo, Nygaard, & Thorburn (2016) claim that Ahern and Dittmar's (2012) results are just an outcome of their instrument.

business situations, such as risk-taking, competition, and conflict (see Croson & Gneezy, 2009, for a literature review). If females possess different innate[4] behavioral approaches to business (for example, higher risk aversion), then increasing the number of females on boards of directors potentially influences companies' activities and overall economic environment.

Leverage and capital structure are among the key components in determining a company's risk and value. Leverage constitutes an important source of corporate value creation because the proportion of debt in a company's capital structure creates tax shields, prevents dilution of current shareholders' voting power, and increases return on equity (ROE). Conversely, more debt increases the risk of default or financial distress when firms face business and industry challenges.

The additional risk and value associated with higher leverage impacts, first, and most directly, equity providers of capital because of their residual claim on cash and assets. However, risk and value also affect executives and board members through their compensation packages and tenure with the firm.

This study examines the marginal impact of gender on firms' leverage decisions. Due to the different behavioral and cognitive characteristics of females relative to males, the research hypotheses ask (1) does greater representation of females on the board of

[4] The substantial literature that identifies gender differences includes theoretical, empirical, and experimental research in and across different fields, industries, and countries. It leads to the conclusion that gender differences are innate. But the differences can be intensified in different cultural and institutional settings. This paper deals with the U.S. market, so it is beyond its scope to explain if the differences are innate or cultural.

directors influence the amount of debt that firms use in their capital structures, and (2) do companies with a female chairperson of the board (COB) have less leverage than do firms with a male COB. Although substantial evidence suggests female executives may influence firms' capital structure decisions differently than male executives, an alternative argument suggests that female directors receive their positions to give an impression of corporate inclusion or diversity. This study posits that more female board representation results in less leverage relative to male board representation.

These hypotheses are tested with a sample of 6,353 U.S. companies from 1999 to 2014, resulting in 52,668 firm-year observations. The empirical results based on Tobit panel data regressions and propensity score matching (PSM) indicate that boards with more than one female member and/or a female chair tend to employ less debt in their capital structures. To control for endogeneity concerns, the analyses are repeated using instrumental variables two-stage Tobit (IV-2Tobit) and confirm the primary findings. The instrumental variables used are the total score of the Best and Worst States for Women (BWSW) and the Economic Freedom of North America 2016 Index by state (EFS).

The remainder of this dissertation is organized as follows. The next chapter explains the motivation for this study and reviews the literature on gender differences. This is followed by hypotheses regarding gender and leverage in Chapter 3. Chapter 4 presents the empirical strategy and the data; Chapter 5 explains the analyses; and Chapter 6 provides the empirical results. The final chapter includes conclusions and directions for future research.

CHAPTER 2

LITERATURE REVIEW

Females are different than males. Biology is only one aspect of this difference: Women have the ability to bear and nurse infants. Previous research establishes that differences include males' greater average height, weight, and strength than females, while the average woman has greater finger dexterity, a longer life expectancy, and a faster metabolism than the average man (Hofstede, 1980, 262; House, Hanges, Javidan, Dorfman, & Gupta 2004, 348).

Based on a meta-analysis of research regarding gender differences in personality, Feingold (1994) finds that males are more assertive and have higher self-esteem than females. Conversely, females are more extroverted, have higher anxiety levels, have greater levels of trust, and are especially tender-minded. These differences are robust across ages, time periods, educational levels, and nations. Hofstede (1998) reports that masculinity is associated with assertiveness, toughness, and a focus on material success, while women are more modest, tender, and concerned with the quality of life. House et al. (2004) claim that males are more assertive than women. Literature also documents that females (including female managers) are more altruistic, and companies with more females on the board give more to charity (Williams, 2003).

Prior literature finds that females in managerial positions influence firm performance and value (Carter, Simkins, & Simpson, 2003; Erhardt, Werbel, & Shrader, 2003). For example, using a sample of 300 Fortune 1000 firms, Farrell and Hersch (2005) find a positive correlation between females on corporate boards and return on assets. In a

sample of Fortune 500 companies, Catalyst (2004) finds that the companies with the highest representation of females on their top management teams exhibit significantly higher returns on equity and total return to shareholders than do companies with the lowest representation of females.

Examining M&A data for S&P 1500 companies, Levi, Li, and Zhang (2014) find that females' lower overconfidence decreases the overestimates of merger gains. As a result, firms with female directors are less likely to make acquisitions, and if they do, they pay lower bid premiums. They conclude that females appear to be less motivated by empire building, suggesting that females destroy less shareholder value than their male counterparts during M&A transactions. Adams and Ferreira (2009) use a sample of S&P 1500 companies between 1996 and 2003 to examine the effect of having more females on board. They find that increasing the number of female directors significantly improves the board's monitoring and corporate governance. Females attend more board meetings and sit on the monitoring committee more often than do males. These results impact companies' performance. Companies with weak corporate governance will improve their performances by increasing gender diversity on the board. However, the performance of companies with strong corporate governance will be negatively affected by increasing gender diversity.

Croson and Gneezy (2009) review the experimental literature on gender differences in economics and finance and conclude that males and females exhibit robust and significant differences in risk preference. They also claim that females' risk aversion increases in ambiguous environments like financial markets. Recently, other research suggests that

female directors influence firms' dividend policies and payments (McGuinness, Lam, & Vieito, 2015; Pucheta-Martínez & Bel-Oms, 2016). For example, Byoun, Chang, and Kim (2016) find that diverse boards that include female directors pay higher dividends, and this effect is particularly strong in firms with high levels of free cash flow. The authors suggest that females reduce the principal-agent problems related to free cash flow. Prior research thus provides compelling evidence that gender inclusiveness on boards of directors potentially influences firms' leverage decisions.

CHAPTER 3

HYPOTHESES

Financial and economic literatures indicate that gender affects firm decision-making, performance, and macroeconomic outcomes, suggesting that female representation on the board potentially influences the leverage decision.

Risk Aversion

The meta-analysis conducted by Byrnes, Miller, and Schafer (1999) finds that females are more risk averse than males. Based on 150 papers, the authors classified 14 tasks and report that males took higher risks in 12 tasks, including gambling. Nguyen and Noussair (2014) use face-reading software to investigate the impact of various emotions on risk aversion. The experiment shows that stronger emotions (fear, anger, happiness, and surprise) are associated with more risk-averse decision-making. Another interesting result is that women remain more risk averse than men, even after controlling for emotional state.

The general economic and financial literature on gender differences claims that females possess higher levels of risk aversion than males. Dwyer, Gilkeson, and List (2002) document, based on the results of 2,000 investors in mutual fund, that females take fewer risks than males when building their portfolios. After controlling for financial investment knowledge, the research shows a smaller difference in risk aversion between males and females, but it remains significant in most situations. Croson and Gneezy (2009) explain that the major differences between females' and males' risk aversion is emotions. Their explanation of this result is based on differences in emotional reactions

to risky situations, as seen in psychological literature reporting that females experience negative emotions like fear and nervousness in anticipation of negative outcomes more intensely than do males. They further claim that emotional reactions to risk are better predictors of the human response to risky choices than are cognitive approaches. Eriksson and Simpson (2010) extend the work of Croson and Gneezy (2009) and find that females' stronger emotional reactions to outcomes may explain gender differences in risk preference. The results of a lottery-based experiment show that females were less likely to join the lottery. The decisions to enter the lottery were impacted (not impacted) by emotional reactions to losing (winning) the lottery. When controlling for negative emotional reactions to losing, the analyses indicate substantially smaller differences in the decision to enter the lottery. Charnessa and Gneezy (2012) review 15 previous experimental papers using the same investment game and claim strong evidence for higher financial risk aversion of females. Carter et al. (2014) reach the same conclusion by examining the compensation package of executives by gender. In a sample of 20,000 salaries paid between 1996 and 2010, they find a gap in total compensation between females and males, with females receiving pay packages with lower total compensation and incentives compensation. However, the gap in the total compensation declines over time, while the gap in incentive pay remains unchanged over time; it did not decrease even when more females were on the board. The authors claim that this provides strong evidence that females exhibit greater levels of risk aversion than males, even as CEOs.

Sexton and Bowman-Upton (1990) find greater risk aversion among female entrepreneurs, with female entrepreneurs scoring significantly lower on risk-taking, in

general, and monetary risk, in particular. They conclude that female entrepreneurs are less willing to pursue opportunities with uncertain outcomes even with the incentive of substantial financial gain.

Dohmen et al. (2011) study risk attitudes using survey and experimental data and find that females are less willing to take risks than are males. These results are robust when controlling for income and wealth. According to Heaney's (2005) research on executive compensation, the increase in the level of an executive's risk aversion will eventually reduce the preferred leverage of the company. Thus this study posits that more female board representation and more female executive representation results in less leverage relative to male representation.

Overconfidence and Competition

Differences in overconfidence between males and females constitute a second dimension between genders that potentially affects firm leverage. Psychologists often find men possess more overconfidence than women. Barber and Odean (2001) study common stock trading in 35,000 accounts held by female and males and find that with high confidence levels in males lead to 150% more trading relative to females and negatively impacts returns. Through trading, males reduce their net returns by 0.94 percentage points per year compared with females. Huang and Kisgen (2013) study executive (mainly CFO) gender and find that males are more overconfident than females. This leads male executives to undertake more acquisitions, issue more debt, and use higher leverage. All of these differences negatively impact the returns of companies with male executives compared with those with female executives.

Males and females also perceive and react to competition differently from one another. Evolutionary biology and sociobiology show that males tend to be more competitive than females in many species. Campbell (2013) reviews the psychological literature on gender differences; overall, the literature suggests that males are more competitive than females. Boys spend most of their time at competitive games, while girls play games with no winner and no clear end point. This difference increases in adulthood when males view themselves as more competitive than females.

In an experiment, Niederle and Vesterlund (2007) examine female and male choices between competitive and noncompetitive compensation schemes in a nondiscriminatory environment. They find that males and females with similar performance levels differ substantially: Females avoid competition and males seek competition. The authors conclude that the gender gap in tournament entries is primarily the result of males being substantially more overconfident than females and males having a greater preference for working in a competitive environment than females. In an experiment involving competitive games, Gneezy, Niederle, and Rustichini (2003) find that when females and males compete against one another, females underperform males, even if they perform similarly in noncompetitive environments. They conclude that females either dislike competition or females feel less competent than their male competitors, thereby weakening their performance in mixed tournaments.

Based on existing literature, females behave differently than males in three factors (risk aversion, overconfidence, and competition) that potentially influence firms' capital structure. These three factors arguably work in the same direction of reducing leverage.

The literature also indicates that having more females on the board of directors or as chairperson affects companies' outcomes and decisions. My research hypotheses are defined on this basis.

Hypothesis A: Greater female representation on boards of directors results in less leverage in the company's capital structures.

Hypothesis B: Companies with a female COB have less leverage in their capital structure than do companies with a male COB.

Conversely, females who succeed in becoming board members may be different from the general population of females due to self-selection (Adams & Funk, 2012) or adaptive behaviors on the job (Croson & Gneezy, 2009). Adams and Ragunathan (2013) provide empirical support for the claim that female managers possess the same risk aversion as male managers. Using a sample of commercial banks and bank holding companies during the 2007-2008 financial crisis, they claim that female board representation did not reduce banks' risky activities and assets. However, they find female board members improve performance, reduce absenteeism of male directors at meetings, and increase the probability of repaying the Troubled Asset Relief Program (TARP). They conclude by claiming, "Our results highlight that we do not yet have a complete understanding of how and why gender diversity matters for corporate outcomes" (Adams & Ragunathan, 2013). Atkinson, Baird, and Frye (2003) report that after controlling for wealth and knowledge, gender makes no difference in the performance or risk of mutual fund management. Based on the experimental literature, Croson and Gneezy (2009) conclude that males are more competitive and higher risk-

takers than females. The differences are smaller for the same "categories," meaning that males and females who choose to participate in the same environment are more likely to have the same level of competiveness and risk-taking.

CHAPTER 4

DATA AND METHOD

This dissertation focuses on U.S. companies due to data availability and the importance of the U.S. economy in global commerce. The data on board members come from BoardEx, which provides detailed data on board structure including the gender, position, education, demographic, and personal information of board members, and COBs from 1999 to 2014. Compustat provides the data on firms' financial statements and market data, including company size, industry leverage, and other financial ratios.

In their seminal work on capital structure, Rajan and Zingales (1995) claim "A more appropriate definition of financial leverage is provided by the ratio of debt (both short term and long term) to total assets" (1,429). In addition, they offer a way to incorporate the market value of equity in total assets, which they name "Quasi market value of assets." The Quasi market method subtracts the book value of equity from total assets and adds the market value of equity. The analysis uses four different measures for leverage constructed following Rajan and Zingales (1995) and is based on the data extracted from Compustat. These measures are

I. LTD_BVTA = Long-term debt/BV total asset

II. Book_LEV = BV of debt (short- and long-term)/BV total asset

III. LTD_MVA = Long-term debt/Total asset (QuasiMVA)

IV. LEV_MVA = BV of debt (short- and long-term)/Total asset (QuasiMVA)

Appendix A includes the exact lines and definitions from Compustat for these four construct leverage variables.

Table 1 displays summary statistics based on the gender of the chairperson. Only 856 firm-year observations have a female chairperson relative to 51,812 firm-year observations for male chairperson, indicating that that only 1.6% of firm-year observations are for female-led firms. Out of the 856 firm-year observations with a female chairperson, 446 observations contain a female CEO (52.1%).

Table 1

Summary Statistics

Note. This table presents the mean, standard deviation and the sample size based on firm - year observation by the chairperson gender. See Appendix A for the four definitions of leverage. num_female_dir is the absolute value of the number of female on board, and female_ratio is the number of female directors to the total number of directors.

Variable	No.	Mean	SD	0.25	0.75
Male chairperson					
Book_LEV	50,343	0.27	1.87	0.02	0.34
LTD_BVTA	50,375	0.19	0.99	0	0.28
LEV_MVA	49,822	0.16	0.18	0.01	0.24
LTD_MVA	49,854	0.13	0.16	0.00	0.20
num_female_dir	51,812	0.78	0.94	0	1
female_ratio	51,812	0.08	0.1	0	0.14
Female chairperson					
Book_LEV	848	0.26	1.12	0.00	0.3
LTD_BVTA	848	0.14	0.21	0.00	0.22
LEV_MVA	841	0.14	0.18	0.00	0.22
LTD_MVA	841	0.10	0.15	0.00	0.16
num_female_dir	856	1.91	1.07	1	2
female_ratio	856	0.24	0.12	0.14	0.3

Table 1 shows that in all four categories of leverage, the male subsample exhibits higher leverage than the companies with a female COB. Companies with a female COB have 1.13 more female directors on the board. That means that after excluding the female COBs, we still have 0.13 more female directors (an increase 16.6% of female directors who are not a COB).

Figure 1 describes the density of companies based on Book_LEV and shows a high density of companies with zero leverage, indicating the use of Tobit regressions in multivariate analysis. I find similar results with the other three constructs of leverage. (Appendix B provides histograms for the other three constructs.)

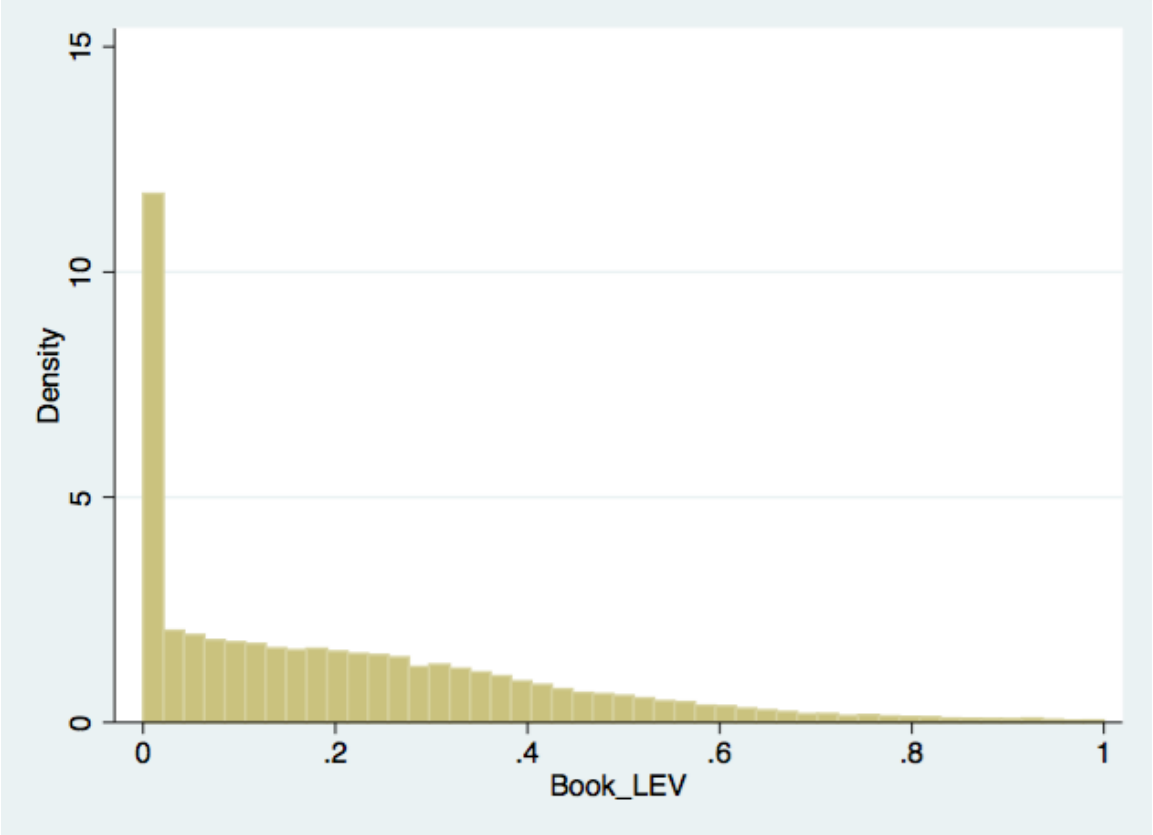

Figure 1. Density of companies by Book_LEV

Based on the FF49 (Fama-French's classification of 49 industries), only 37 industries (out of 49 industries) have a firm with a female COB (see Appendix D). Figure 3 shows the distribution of female directors on the boards based on firm-year observations: Nearly

50% of the boards in the sample have no female directors. Boards with three or more female directors are approximately 5.5% of the sample.

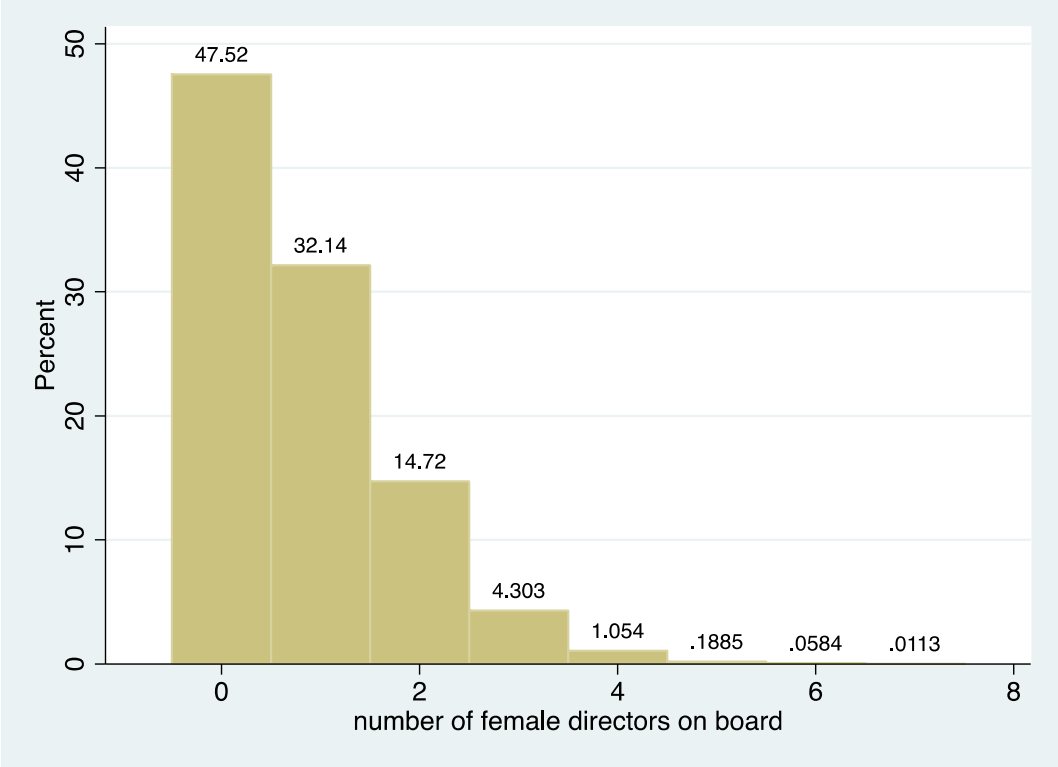

Figure 2. Distribution of female directors on the board

As time passes, more females serve on boards of directors. Figures 3, 4, and 5 are based on the data set used in this research and show the female-to-male ratio for boards with different characteristics. All three figures display the increasing participation of females on boards over time. For example, Figure 4 shows that in the year 2000, the ratio of female COBs to male COBs was just 0.50%, and this ratio increased to 2.42% by the year 2014.

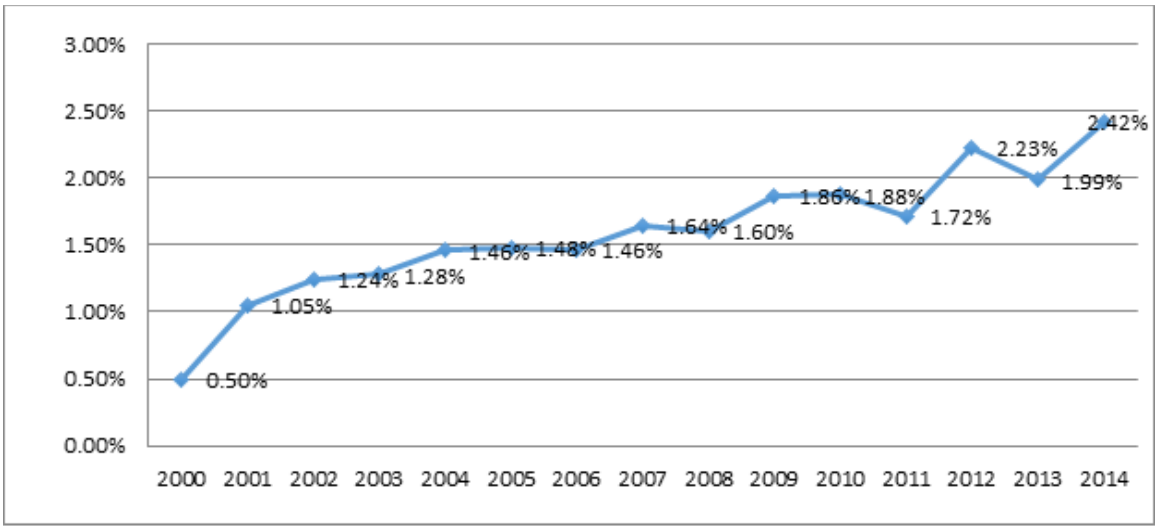

Figure 3. Female-to-Male COB ratio

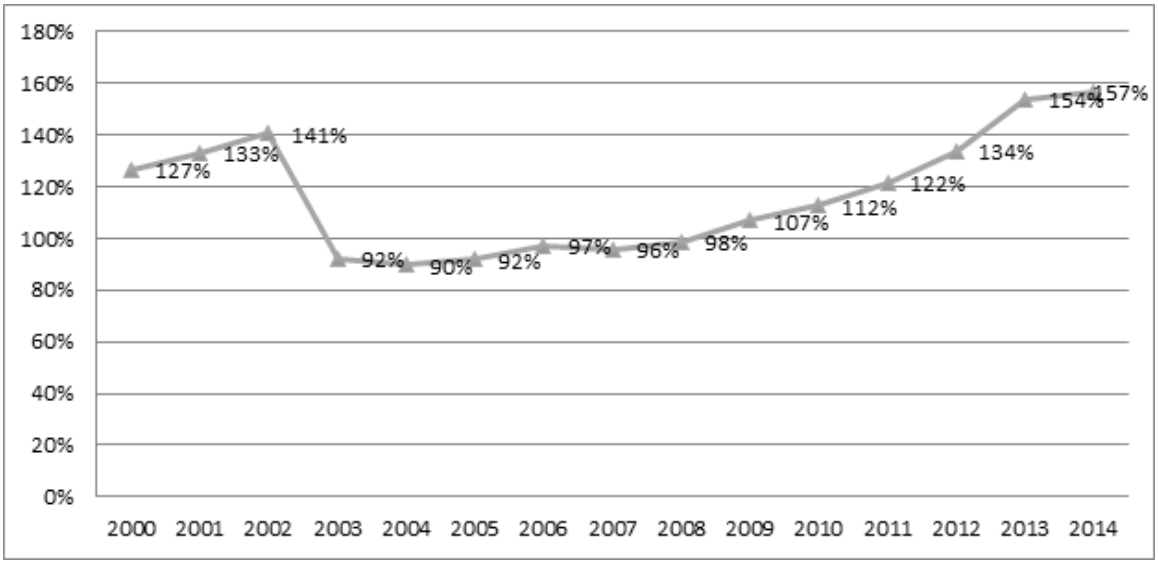

Figure 4. Ratio of boards with and without female director

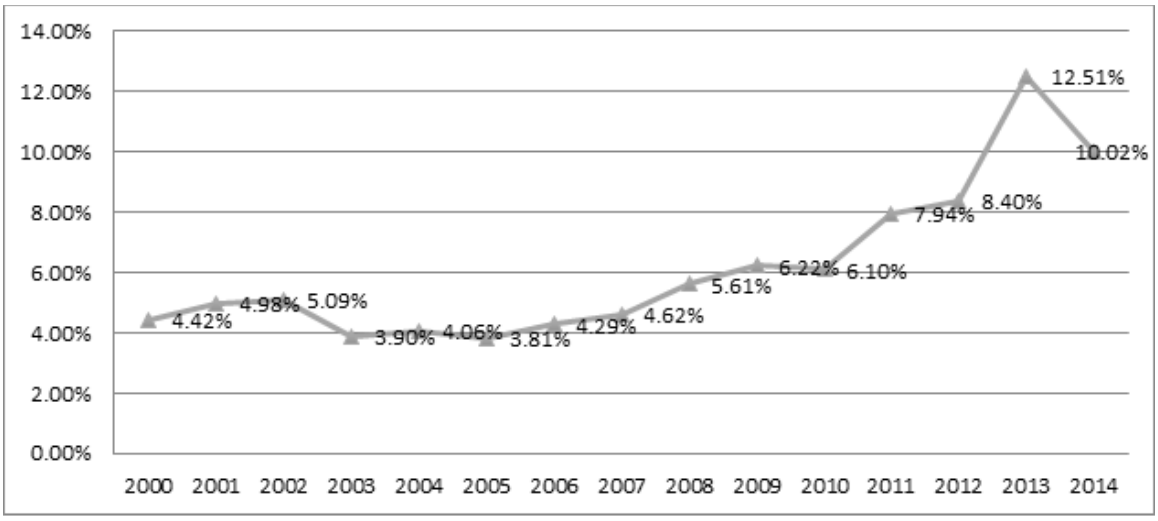

Figure 5. Ratio of boards with three or more female directors

CHAPTER 5

ANALYSES

The empirical study tests whether females on boards have different preferences for capital structure than do males on boards. Tests are based on a correlation analyses, such as panel data regressions. The second part of the empirical study tests whether differences in capital structure are based on a causal effect of females.

Correlation and casualty analyses are conducted to test the hypotheses. The correlation analysis includes panel data regressions that test if the presence of females on boards reduce leverage, relative to males in the same positions. I conduct a Tobit panel data regression based on the high density of companies with zero leverage, as displayed in Figure 2. The correlation analysis also used propensity score matching (PSM) to compare the leverage of companies based on similar female versus male COB. I use this method because only 1.6% of firm/year observations have a female chair. The matching is based on individual, company, and industry characteristics.

The causality analysis includes IV regression using two different instrumental variables. The first instrumental variable used is the attitude of the company's headquarters state toward females via culture and institutions and its impact on females on the company's board. The instrumental variable is based on the method presented by Huang and Kisgen (2013), who use data from Sugarman and Straus (1988). In this study, the instrumental variable is based on the 2016 data available from the Best and Worst States for Women (Bernardo, 2016). The variable used in this study is the total score of the Best and Worst States for Women (BWSW). Higher scores reflect a more positive

attitude toward women. Scores range from zero to one hundred, with the highest score in Minnesota (83.17) and the lowest score in Louisiana (39.60) (see Appendix C for the full list).[5]

The second instrumental variable used as a robustness check is the Economic Freedom of North America 2016 Index by state (EFS) from the Fraser Institute's annual report (The Frasier Institute, 2016). This index captures the ability of individuals to act in the economic sphere free of undue restrictions. Scores range from zero to ten, and a higher score means more economic freedom. The index is at a state-year level.

The following regressions will be used:

$$Y = \alpha + \beta i Xi + \beta G\, XG + \varepsilon,$$

where:

Y = *Leverage*

Xi = *Control variables*

XG = *Dummy for gender/Gender COB (female =1)*

α = Intersect

ε = *errors*

[5] The Best and Worst States for Women score is based on data collected from the U.S. Census Bureau, the U.S. Bureau of Labor Statistics, the Centers for Disease Control and Prevention, the National Center for Educational Statistics, the Federal Bureau of Investigation, Violence Policy Center, the Missouri Economic Research and Information Center, the Social Science Research Council, U.S. News & World Report, and WalletHub research.

To obtain the marginal effect on leverage of having females on the board, I control for other variables that potentially influence the leverage decision. These variables can be divided into three categories: external, company, and individual.

External variables include a year fixed effect that will be used to capture the specific business cycle of each year. Also, the industry in which a company operates has a major impact on leverage. Industries with more stable cash flow traditionally will have higher leverage than industries with less stable cash flow, because stability increases the likelihood of paying back the loan.

The second category of control variables includes company information. For example, company size is used because it can be assumed that larger companies generally will find it easier to be approved for a loan. The last category of control variables is personal characteristics of board members, like experience. Proxies for experience include age, education, and the number of years in the position.

CHAPTER 6

RESULTS

Results of Correlation Analyses

The first empirical test is a panel data regression for the correlation between females on the board and leverage. This test is not conducted for female COBs at this stage, due to the small sample. The panel data regression is conducted by using a Tobit model because of the high density of zero leverage in the sample, as can be seen in Figure 2 and Appendix B.

The dependent variables include the four definitions of leverage already defined. To capture the presence of females on the board, three dummy variables are constructed:

- female_dir = 1 if at least one board member is female, and 0 if no females are on the board
- female_2dir = 1 if two or more females are on the board, and 0 if no females or one female is on the board
- female_3dir = 1 if three or more females are on the board, and 0 if two or fewer females are on the board.

The control variables in the panel data regression include board characteristics, firm characteristics, and fixed effects. The board characteristics include board size, the independent director ratio, and the averages for the current board members for five additional characteristics (age, education, network size, time on the board, and the

number of quoted current boards). The firm characteristics include size (market capitalization) and ROA. Year and industry (FF49) fixed effects are included.[6]

The sample in Table 2 does not include companies with a book value of 100% leverage or more. Table 2 presents the Tobit panel data regressions for the total sample.

Table 2 shows two different results. On one hand, moving from no females on the board to females on the board has no significant effect, except for the LEV_MVA subsample, which is positive and significant at the 10% level (see columns 1, 4, 7, and 10). On the other hand, moving to two or more female directors is generally significant and decreases leverage (see columns 2, 3, 5, 6, 8, 9, 11, and 12).

The insignificant/positive correlation between females on the board and leverage might be because most boards with a female member have only one female director (see Figure 2), which could be either window dressing to satisfy the increasing pressure for gender diversity on boards or one female board member might have no direct impact on leverage in a heavily male-dominated board. The negative effects of a few female board members could be an outcome of a real impact that females have on decision-making.[7]

[6] Ahern & Dittmar (2012) use the following three main control variables in their study of females on boards: board size, firm size, and industry fixed effects. Rajan & Zingales (1995) and Titman & Wessels (1988) show that profitability and size correlate with leverage. Anderson, Reeb, Upadhyay, & Zhao (2011) show that other "board heterogeneity" factors that impact company outcomes are based on personal characteristics like age, education, board experience, and professionalism.

[7] The next subsection will provide casualty analyses for Hypothesis A.

Table 2

Capital Structure Decision by Females on the Board: Tobit Panel Data

Note. This table reports results of tobit panel data regression that includes the total sample. The dependents variables are the four definitions of leverage. See Appendix A for the four definitions of leverage. female_dir is a dummy variable that equals one if a board has one female or more, and zero otherwise. female_2dir is a dummy variable that equals one if a board has two females or mores, and zero otherwise. female_3dir is a dummy variable that equals one if a board has three females or more, and zero otherwise. The control variables include: board size, independent director ratio, size of the company (market capitalization), ROA, and averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables. The Year and industry (FF49) fixed effects are also included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	BOOK_LEV			LTD_BVTA			LEV_MVA			LTD_MVA		
female_dir	0.002			0.001			0.002*			0.001		
	(0.002)			(0.002)			(0.001)			-0.001		
female_2dir		-0.005**			-0.004*			-0.004***			-0.003**	
		(0.002)			(0.002)			(0.001)			(0.001)	
female_3dir			-0.007**			-0.007**			-0.003			-0.002
			(0.003)			(0.003)			(0.002)			(0.002)
Constant	0.204***	0.204***	0.203***	0.086	0.086	0.085	0.251***	0.251***	0.251***	0.162***	0.161***	0.161***
	(0.062)	(0.062)	(0.062)	(0.060)	(0.060)	(0.060)	(0.0411)	(0.0411)	(0.0411)	(0.0360)	(0.0360)	(0.0360)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	49,346	49,346	49,346	49,521	49,521	49,521	49,597	49,597	49,597	49,629	49,629	49,629
Companies	6,327	6,327	6,327	6,342	6,342	6,342	6,324	6,324	6,324	6,325	6,325	6,325
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

The next two empirical tests presented provide additional support for this claim.

The second statistical test uses a propensity score matched sample to account for the fraction of boards with female and COB representation. The PSM process is based on a probit regression with the matching based on the nearest-neighbor method. The control variables in the probit regression include five chairperson characteristics (networking, time as chair, no. of boards, age, and education), two main firm characteristics (size [market capitalization] and net income), and board characteristics (i.e., board size) together with year dummies and industry dummies. For each female-COB firm, a matching control firm that has male-chair on board is identified. Therefore, the treatment and control groups are nearly identical in almost every dimension other than COB gender. Table 3 shows the difference between the female chair sample and the matching male sample.

Table 3

Mean: Differences in Capital Structure by COB Gender: Propensity Score Matching One Neighbor

Note. Unmatched includes the total sample, and Matched includes a subsample based on propensity score matching one neighbor. The one neighbor approach results in 759 female COB companies matched with 759 male COB companies. The matching was constructed by using board size; size of the company (market capitalization); net income; and COB age, education, network size, time on the board, and the number of quoted current boards. Year and industry (FF49) fixed effects are included. The variables matched are the four definitions of leverage, absolute number of females on the board (num_female_dir), and the ratio of the females on the board to the board size (female_ratio). See Appendix A for the four definitions of leverage. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Variable	Sample	Female	Male	Difference	SE
Book_LEV	Unmatched	0.198	0.239	-0.041	0.043
	Matched	0.198	0.250	-0.052***	0.018
LTD_BVTA	Unmatched	0.148	0.181	-0.033***	0.014
	Matched	0.148	0.164	-0.016*	0.010
LEV_MVA	Unmatched	0.139	0.158	-0.018***	0.006
	Matched	0.139	0.164	-0.024***	0.009
LTD_MVA	Unmatched	0.105	0.126	-0.021***	0.005
	Matched	0.105	0.118	-0.013**	0.008
num_female_dir	Unmatched	1.894	0.775	1.119***	0.033
	Matched	1.894	0.782	1.111***	0.051
female_ratio	Unmatched	0.235	0.082	0.152***	0.003
	Matched	0.235	0.087	0.147***	0.005

Table 3 provides the initial support for Hypothesis B, which argues that companies with a female chair will have lower leverage than companies with a male chair. In all four definitions of leverage, the matched and unmatched samples show that the presence of female on the board leads to a negative association to leverage relative to male counterparts. In the matching method, the results for all four definitions of leverage are significant. The results are also economically significant. For example, the difference in

the matched Book_LEV is 5.2%, reflecting a reduction in average leverage from 25% for male COB to 19.8% female COB. This means that, on average, the leverage was reduced by 20.8%. The matched sample also supports the interesting result from the summarized statistics that boards with a female chair have more female board members. As can be seen in Table 3, boards with a female COB have 1.894 females on the board, compared with 0.782 females on boards with a male COB. This outcome is mirrored in the female ratio PSM.

Table 4 contains the results of PSM based on two near neighbors. This is a robustness check because the sample includes only1.6% female COBs.

Table 4

Mean Differences in Capital Structure by COB Gender: Propensity Score Matching Two Neighbor

Note. Unmatched includes the total sample, and the Matched includes a subsample based on propensity score matching two neighbors. The two neighbor approach results in 759 female COB companies matched with 1,518 male COB companies. The matching was constructed by using board size; size of the company (market capitalization); net income; and COB age, education, network size, time on the board, and the number of quoted current boards. Year and industry (FF49) fixed effects are also included. The variables matched are the four definitions of leverage, the absolute number of females on the board (num_female_dir), and the ratio of the females on the board to the board size (female_ratio). See Appendix A for the four definitions of leverage. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Variable	Sample	Female	Male	Difference	SE
Book_LEV	Unmatched	0.198	0.239	-0.041	0.043
	Matched	0.198	0.232	-0.034***	0.013
LTD_BVTA	Unmatched	0.148	0.181	-0.033***	0.014
	Matched	0.148	0.163	-0.015*	0.009
LEV_MVA	Unmatched	0.139	0.158	-0.018***	0.006
	Matched	0.139	0.160	-0.020***	0.007
LTD_MVA	Unmatched	0.105	0.126	-0.021***	0.005
	Matched	0.105	0.121	-0.015***	0.006
num_female_dir	Unmatched	1.894	0.775	1.119***	0.033
	Matched	1.894	0.783	1.111***	0.045
female_ratio	Unmatched	0.235	0.082	0.152***	0.003
	Matched	0.235	0.086	0.148***	0.005

The results in Table 4 are in the same direction as Table 3, reinforcing the result that companies with a female COB have less leverage than do companies with a male COB. Appendix D shows similar results for samples based on three, four, and five neighbors in the PSM.

As results of the panel data regression in Table 2, and the results of the PSM in Tables 3 and 4, I ran a Tobit panel data on the PSM sample of one neighbor (sample of

Table 3). Table 5 presents the outcome. The control variables are the same as those in Table 2. The results show a negative impact of female COB on the company leverage. These results are very strong and significant in all four regressions.

Table 5

Capital Structure Decision by Female COB (PSM subsample n=1)*: Tobit Panel Data*

Note.This table reports results of tobit panel data regression that is based on the subsample created in the PSM using the one neighbor approach. The dependent variables are the four definitions of leverage. See Appendix A for the four definitions of leverage. The independent variable is Female COB, a dummy variable that equals one if a board has a female COB, and zero if the COB is a male. The control variables include board size; independent director ratio; size of the company (market capitalization); ROA; and averages for the current board members for age, education, network size, time on the board, and number of quoted current boards. See Appendix H for the coefficients of the control variables. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

	(1)	(2)	(3)	(4)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Female COB	-0.067***	-0.074***	-0.039***	-0.045***
	(0.021)	(0.020)	(0.013)	(0.012)
Constant	0.38**	0.159	0.335***	0.158*
	(0.156)	(0.148)	(0.092)	(0.090)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Control	YES	YES	YES	YES
Observations	1,485	1,485	1,484	1,484
Companies	839	839	838	838
p-value (chi2)	0.000	0.000	0.000	0.000

The results are economically significant. For example, the coefficient for female COBs is -6.7% in the Book_LEV regression. This reflects a reduction of 26.8% when moving from a male COB to a female COB.[8] As a robust test, in Table 6, I run the same

[8] 6.7%/ 25% = 26.8%

regression presented in Table 5 with the PSM sample of two neighbors (sample of Table 4). Table 6 presents the results of the four regressions.

Table 6

Capital Structure Decision by Female COB (PSM subsample n=2)*: Tobit Panel Data*

Note. This table reports results of tobit panel data regression that is based on the subsample created in the PSM using the two neighbor approach. The dependent variables are the four definitions of leverage. See Appendix A for the four definitions of leverage. The independent variable is Female COB, a dummy variable that equals one if a board has a female COB, and zero if the COB is a male. The control variables include board size; independent director ratio; size of the company (market capitalization); ROA; and averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Variables	(1) BOOK_LEV	(2) LTD_BVTA	(3) LEV_MVA	(4) LTD_MVA
Female COB	-0.052***	-0.058***	-0.028**	-0.037***
	(0.018)	(0.017)	(0.011)	(0.011)
Constant	0.245**	0.059	0.244***	0.087
	(0.118)	(0.112)	(0.073)	(0.070)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Control	YES	YES	YES	YES
Observations	2,221	2,221	2,220	2,220
Companies	1,365	1,365	1,364	1,364
p-value (chi2)	0.000	0.000	0.000	0.000

The results in Table 6 show that companies with a female COB have less leverage in their capital structure than do companies with a male COB (see the coefficient for female COBs in Tables 5 and 6) in all four definitions of leverage. Appendix F shows similar results for samples based on three, four, and five neighbors in the PSM.

Based on the five sets of PSM results and the five sets of Tobit panel regressions, I conclude that companies with female COBs have less leverage than do companies with male COBs.

Results of Causality Analyses

The second set of empirical tests is for causality analysis, which assists in understanding whether the results are an outcome of gender, and not the different nature of the company (reverse causality), or some other omitted variable that impacts the female and the company at the same time. This study uses an instrumental variable approach for the causality analyses.

The IV approach is accompanied by a Tobit model due to the high density of zero leverage in the sample. All of the IV approach analyses using control variables are the same as those shown in Table 2.

The first instrumental variable is the Best and Worst States for Women (BWSW) to capture the HQ state attitude toward females (see p. 19 for details). In all the regressions in stage one that used BWSW as the instrumental variable, the coefficients were positive and significant. This means that a company's headquarters state with a more positive attitude toward females via culture and institutions positively reflects on having more females on boards and female COBs.

The second instrumental variable is the Economic Freedom of North America 2016 Index by state (EFS), which captures the ability of individuals to act in the economic sphere free of undue restrictions (see p. 20 for details). In all of the regressions in stage one that used EFS as the instrumental variable, the coefficients were negative and significant. This means that more economic freedom negatively reflects on having

females on boards and female COBs (Chapter 5 elaborates on this instrumental variable).[9] In Tables 7, 8, 9, 10, and 11, columns one to four display the second-stage IV approach for the BWSW instrument, and columns five to eight display the second-stage IV approach for the EFS instrument. In Tables 7 and 8, the instrumented female is the fitted value of the dummy of number of female on board indicator from the stage one regression. In Tables 9, 10, and 11, the instrumented female is the fitted value of the dummy of female COB indicator from the stage one regression. The results of the second-stage IV approach for the dummy variable for two or more females on the board are provided in Table 7, for the total data set sample.

[9] This result is consistent with the "old boys' network" (Davies-Netzle, 1998; Gamba Kleiner, 2001).

Table 7

Capital Structure Decision by Boards with Two or More Females: IV Tobit

Note. This table reports results of IV tobit regression that includes the total sample. Panel A contains the stage 1 of the tobit IV regression. In panel A, the dependent variable is Female_2dir, a dummy variable that equals one if a board has two or more females, and zero otherwise. The instrumental variable in columns 1-4 is the total score of the Best and Worst States for Women (BWSW) based on the HQ state. Scores range from zero to one hundred, and a higher score reflects a more positive attitude toward women. The instrumental variable in columns 5-8 is the Economic Freedom of North America 2016 Index by state (EFS) from the Fraser Institute's annual report based on the HQ state. Scores range from zero to ten, and a higher score means more economic freedom. Panel B contains the stage 2 of the tobit IV regression. In panel B, the dependent variables are the four definitions of leverage. See Appendix A for the exact definition of the leverages. The control variables in both stages include board size; independent director ratio; size of the company (market capitalization); ROA; and the averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables in panel B. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
BWSW	0.001***	0.001***	0.001***	0.001***				
	(0.000)	(0.000)	(0.000)	(0.000)				
EFS					-0.024***	-0.024***	-0.024***	-0.024***
					(0.002)	(0.002)	(0.002)	(0.002)
Constant	-0.499***	-0.502***	-0.499***	-0.502***	-0.247***	-0.247***	-0.247***	-0.247***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	49,612	49,644	49,597	49,629	49,612	49,644	49,597	49,629
p-value (F)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Panel B								
IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female_2dir	-2.348***	-1.975***	-1.177***	-1.215***	-1.369***	-1.247***	-0.524***	-0.647***
	(0.383)	(0.300)	(0.179)	(0.179)	(0.172)	(0.137)	(0.064)	(0.070)
Constant	-0.822***	-0.834***	-0.300***	-0.457***	-0.420***	-0.535***	-0.032	-0.224***
	(0.218)	(0.173)	(0.102)	(0.103)	(0.129)	(0.104)	(0.048)	(0.053)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	49,612	49,644	49,597	49,629	49,612	49,644	49,597	49,629
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 7 displays the results of the second stage, showing that for all four of the regressions in columns 1-4, the coefficient for the instrumented female_2dir by BWSW is negative and significant. Moreover, in the results of all four regressions in columns 5-8, the coefficient for the instrumented female_2dir by EFS is negative and significant.

The results of the second-stage IV approach for the dummy variable for three or more females on the board are provided in Table 8, for the total data set sample. The results provide additional support to Hypothesis A.

The results of the second-stage IV approach for analyzing cases with a female COB are shown in Table 9s and 10 for samples based on one and two neighbors in the PSM. Appendix G shows the results for samples based on three, four, and five neighbors in the PSM.

As can be seen in Table 9, columns 1-4, the results for all four regressions yield a coefficient for the instrumented female COB by BWSW that is negative and significant. These results are replicated in all the five samples based on one to five neighbors in the PSM (see Tables 9 and 10 and the three tables in Appendix G). For the results of all four regressions in columns 5-8, the coefficient for the instrumented female COB by EFS is also negative; in columns 5 and 8, the coefficient is significant. In the other four samples (neighbors two to five), all of the coefficients for the instrumented female COB by BWSW and by EFS are negative and significant.

Table 11 provides an additional robustness check for a female COB by testing the same variables in Tables 9 and10 on the total sample. Table 11 results are consistent with the negative significant coefficient for the instrumented female COB. The consistent negative and significant coefficient for the instrumented female COB across two different

instrument variables and six different samples provide a robust support for Hypothesis B that companies with a female COB will have less leverage in their capital structure than will companies with a male COB.

Table 8

Capital Structure Decision by Boards with Three or More Females: IV Tobit

Note. This table reports results of IV tobit regression that includes the total sample. Panel A contains the stage 1 of the tobit IV regression. In panel A, the dependent variable is Female_3dir, a dummy variable that equals one if a board has two or more females, and zero otherwise. The instrumental variable in columns 1-4 is the total score of the Best and Worst States for Women (BWSW) based on the HQ state. Scores range from zero to one hundred, and a higher score reflects a more positive attitude toward women. The instrumental variable in columns 5-8 is the Economic Freedom of North America 2016 Index by state (EFS) from the Fraser Institute's annual report based on the HQ state. Scores range from zero to ten, and a higher score means more economic freedom. Panel B contains the stage 2 of the tobit IV regression. In panel B, the dependent variables are the four definitions of leverage. See Appendix A for the exact definition of the leverages. The control variables in both stages include board size, independent director ratio, size of the company (market capitalization), ROA, and the averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables in panel B. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
BWSW	0.0007***	0.0007***	0.0007***	0.0007***				
	(0.000)	(0.000)	(0.000)	(0.000)				
EFS					-0.010***	-0.010***	-0.010***	-0.010***
					(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.227***	-0.226***	-0.227***	-0.227***	-0.108***	-0.108***	-0.107***	-0.107***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	49,612	49,644	49,597	49,629	49,612	49,644	49,597	49,629
p-value (F)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Panel B								
IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female_3dir	-4.292***	-3.692***	-2.145***	-2.264***	-3.172***	-2.918***	-1.211***	-1.511***
	(0.768)	(0.634)	(0.363)	(0.378)	(0.491)	(0.417)	(0.185)	(0.214)
Constant	-0.625***	-0.679***	-0.200*	-0.361***	-0.425***	-0.541***	-0.033	-0.227***
	(0.218)	(0.173)	(0.102)	(0.103)	(0.129)	(0.104)	(0.048)	(0.053)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	49,612	49,644	49,597	49,629	49,612	49,644	49,597	49,629
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 9

Capital Structure Decision by Boards with Female COB (PSM subsample n=1)*: IV Tobit*

Note. This table reports results of IV tobit regression that is based on the subsample created in the PSM using the one neighbor approach. Panel A contains the stage 1 of the tobit IV regression. In panel A, the dependent variable is Female COB, a dummy variable that equals one if a board has a female COB, and zero if the COB is a male. The instrumental variable in columns 1-4 is the total score of the Best and Worst States for Women (BWSW) based on the HQ state. Scores range from zero to one hundred, and a higher score reflects a more positive attitude toward women. The instrumental variable in columns 5-8 is the Economic Freedom of North America 2016 Index by state (EFS) from the Fraser Institute's annual report based on the HQ state. Scores range from zero to ten, and a higher score means more economic freedom. Panel B contains the stage 2 of the tobit IV regression. In panel B, the dependent variables are the four definitions of leverage. See Appendix A for the exact definition of the leverages. The control variables in both stages include board size; independent director ratio; size of the company (market capitalization); ROA; and the averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables in panel B. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***p < .01. **p < .05. *p < .1. PSM subsample, n = 1.

Panel A

Variables	(1) BOOK_LEV	(2) LTD_BVTA	(3) LEV_MVA	(4) LTD_MVA	(5) BOOK_LEV	(6) LTD_BVTA	(7) LEV_MVA	(8) LTD_MVA
BWSW	0.007***	0.007***	0.007***	0.007***				
	-0.001	-0.001	-0.001	-0.001				
EFS					-0.048**	-0.048**	-0.048**	-0.048**
					-0.019	-0.019	-0.019	-0.019
Constant	-0.117	-0.117	-0.117	-0.117	0.689**	0.689**	0.689**	0.689**
	-0.292	-0.292	-0.292	-0.292	-0.313	-0.313	-0.313	-0.313
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,485	1,485	1,484	1,484	1,485	1,485	1,484	1,484
p-value (F)	0	0	0	0	0	0	0	0

`

Panel B								
IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female COB	-0.271*	-0.395***	-0.222**	-0.300***	-0.468*	-0.379	-0.226	-0.291*
	-0.142	-0.146	-0.092	-0.097	-0.281	-0.249	-0.157	-0.164
Constant	0.414**	0.311*	0.423***	0.262**	0.475**	0.305	0.424***	0.259**
	-0.178	-0.184	-0.116	-0.123	-0.217	-0.192	-0.124	-0.129
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,485	1,485	1,484	1,484	1,485	1,485	1,484	1,484
p-value (chi2)	0	0	0	0	0	0	0	0
Wald test (*p*-value (chi2))	0.096	0.006	0.018	0	0.069	0.134	0.162	0.043

Table 10

Capital Structure Decision by Boards with Female COB (PSM subsample n=2)*: IV Tobit*

Note. This table reports results of IV tobit regression that is based on the subsample created in the PSM using the two neighbor approach. Panel A contains the stage 1 of the tobit IV regression. In panel A, the dependent variable is Female COB, a dummy variable that equals one if a board has a female COB, and zero if the COB is a male. The instrumental variable in columns 1-4 is the total score of the Best and Worst States for Women (BWSW) based on the HQ state. Scores range from zero to one hundred, and a higher score reflects a more positive attitude toward women. The instrumental variable in columns 5-8 is the Economic Freedom of North America 2016 Index by state (EFS) from the Fraser Institute's annual report based on the HQ state. Scores range from zero to ten, and a higher score means more economic freedom. Panel B contains the stage 2 of the tobit IV regression. In panel B, the dependent variables are the four definitions of leverage. See Appendix A for the exact definition of the leverages. The control variables in both stages include board size; independent director ratio; size of the company (market capitalization); ROA; and the averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables in panel B. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$..

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
BWSW	0.005***	0.005***	0.005***	0.005***				
	(0.001)	(0.001)	(0.001)	(0.001)				
EFS					-0.038***	-0.038***	-0.038***	-0.038***
					(0.14)	(0.14)	(0.14)	(0.14)
Constant	-0.129	-0.129	-0.129	-0.129	0.469**	0.469**	0.469**	0.469**
	(0.219)	(0.219)	(0.219)	(0.219)	(0.230)	(0.230)	(0.230)	(0.230)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2,221	2,221	2,220	2,220	2,221	2,221	2,220	2,220
p-value (F)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Panel B								
IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female COB	-0.380**	-0.529***	-0.263**	-0.364***	-0.702**	-0.658**	-0.346*	-0.409**
	(0.168)	(0.181)	(0.109)	(0.119)	(0.332)	(0.309)	(0.183)	(0.192)
Constant	0.356**	0.203	0.332***	0.167	0.417**	0.227	0.347***	0.176
	(0.145)	(0.157)	(0.094)	(0.104)	(0.195)	(0.181)	(0.108)	(0.114)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2,221	2,221	2,220	2,220	2,221	2,221	2,220	2,220
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.017	0.000	0.009	0.000	0.002	0.002	0.002	0.003

Table 11

Capital Structure Decision by Boards with Female COB: IV Tobit

Note. This table reports results of IV tobit regression that includes the total sample. Panel A contains the stage 1 of the tobit IV regression. In panel A, the dependent variable is Female COB, a dummy variable that equals one if a board has a female COB, and zero if the COB is a male. The instrumental variable in columns 1-4 is the total score of the Best and Worst States for Women (BWSW) based on the HQ state. Scores range from zero to one hundred, and a higher score reflects a more positive attitude toward women. The instrumental variable in columns 5-8 is the Economic Freedom of North America 2016 Index by state (EFS) from the Fraser Institute's annual report based on the HQ state. Scores range from zero to ten, and a higher score means more economic freedom. Panel B contains the stage 2 of the tobit IV regression. In panel B, the dependent variables are the four definitions of leverage. See Appendix A for the exact definition of the leverages. The control variables in both stages include board size; independent director ratio; the size of the company (market capitalization); ROA; and the averages for the current board members for age, education, network size, time on the board, and the number of quoted current boards. See Appendix H for the coefficients of the control variables in panel B. Year and industry (FF49) fixed effects are included. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
BWSW	0.0002***	0.0002***	0.0002***	0.0002***				
	(0.000)	(0.000)	(0.000)	(0.000)				
EFS					-0.001**	-0.001**	-0.001**	-0.001**
					(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.005	-0.005	-0.005	-0.005	0.021	0.021	0.021	0.021
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	41,527	39,136	41,512	39,122	41,527	39,136	41,512	39,122
p-value (F)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Panel B								
IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female COB	-13.20***	-11.36***	-6.609***	-6.977***	-20.53**	-18.93**	-7.84**	-9.81**
	(4.030)	(3.416)	(1.980)	(2.082)	(10.310)	(9.455)	(3.917)	(4.888)
Constant	0.280	0.099	0.252*	0.117	0.359	0.181	0.266	0.147
	(0.289)	(0.245)	(0.142)	(0.149)	(0.449)	(0.410)	(0.171)	(0.213)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	41,527	39,136	41,512	39,122	41,527	39,136	41,512	39,122
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CHAPTER 7

CONCLUSION

The literature on business, economics, and finance recognizes that females react differently than do males when making financial decisions. A manager's characteristics and style have an economic, significant effect on a company's financial and organizational practices (Betrand & Schoar, 2003). The leverage of a company is among the more important factors in corporate finance. Leverage/capital structure is an important issue for any company, because it creates value for shareholders, while simultaneously creating risk for them. However, leverage can create risk not only for shareholders but also for all stakeholders, particularly, most importantly for this study, directors who are impacted through their compensation packages.

This research examines all U.S. companies with information in BoardEx between 1999 and 2014, for 52,668 firm/year observations. Hypothesis A considers whether having more females on the board of directors will result in having less leverage in the company's capital structures. The results of the Tobit panel data regression and the casualty analyses through instrumental variable approach using two different instrument variables (BWSW and EFS) indicate that having two or more females on board have a negative impact on a company's leverage.

For Hypothesis B, which considers whether companies with a female COB will have less leverage in their capital structure than will companies with a male COB, the results of the PSM for female COBs compared with male COBs clearly show that companies

with a female COB tend to have lower leverage. The PSM test is robust in comparing the samples from one to five neighbors. Also, when conducting a Tobit panel data regression on the PSM samples (one to five neighbors), the results are significant and negative, meaning that the effect of females on a company's leverage is negative. In addition, when applying casualty analyses through instrumental variable approach using two different instrument variables (BWSW and EFS), the results are an outcome of the gender, and not due to the nature of the company. Female COB will have less leverage in their company's capital structure compared with male COB. These results all strongly support Hypothesis B.

Future research could test the results of this study by using a difference-in-differences regression to examine whether a change in the gender of COB from male (female) to female (male) reduces (leads to no change) the leverage of the company. Furthermore, additional instrumental variables could be used. For example, how many females are potentially available to sit on the board (pool) calculated using the Knyazeve, Knyazeve, and Masulis (2013) method for finding the available pool of directors but modified to find the available pool of female directors.

To further test the influence of females on boards, future work could test whether the negative impact of the female COB is replicated also at the committee chair level.

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APPENDICES

A. COMPUSTAT DEFINITIONS FOR THE FOUR LEVERAGE VARIABLES

1. Book_LEV = (dlc+dltt)/at
2. LTD_BVTA = dltt/at
3. LEV_MVA = (dlc+dltt)/QuasiMVA
4. LTD_MVA = dltt/ QuasiMVA

dlc -- Debt in Current Liabilities – Total

dltt -- Long-Term Debt – Total

at -- Assets – Total

mkvalt -- Market Value - Total - Fiscal

ceq -- Common/Ordinary Equity – Total

QuasiMVA = at-ceq +mkvalt

B. HISTOGRAMS FOR DENSITY OF LEVERAGE

This Appendix includes histograms for three out of the four definitions of leverage. Book_LEV is included in the main text. All four show a high frequency of companies with zero leverage.

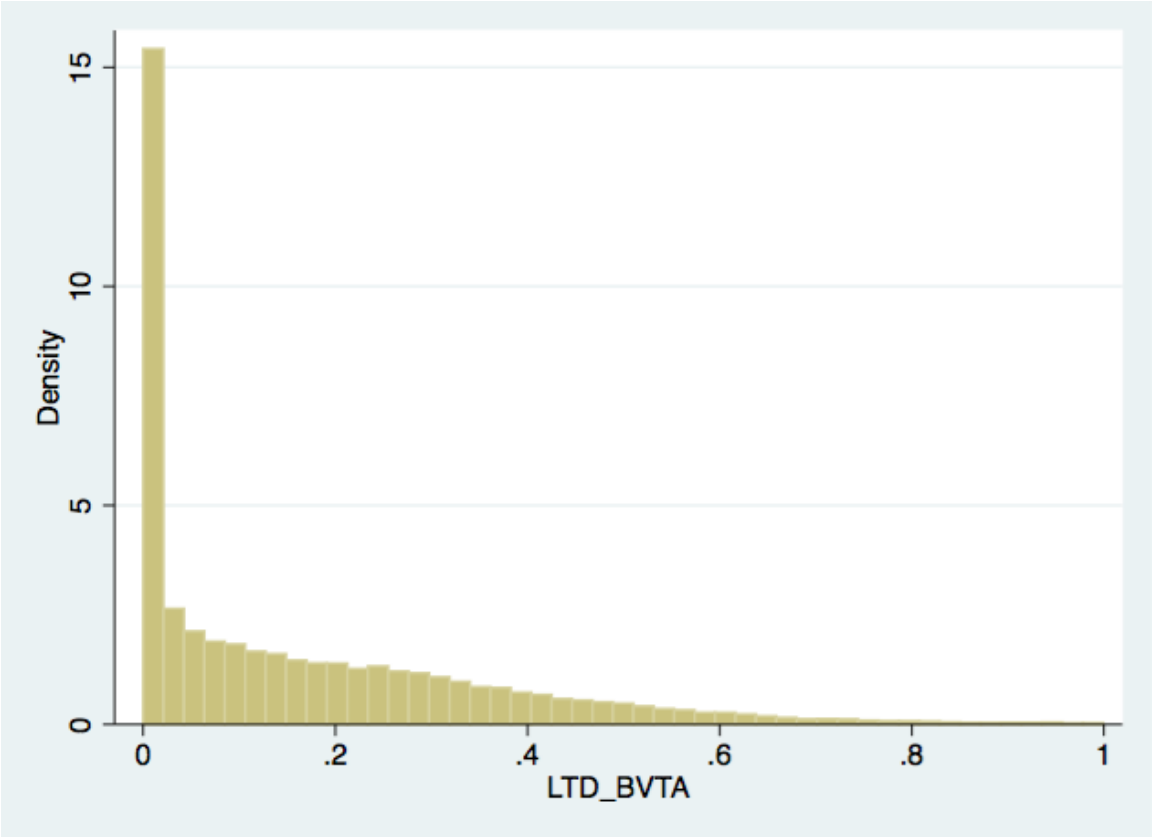

Figure B1. Density of companies by LTD_BVTA

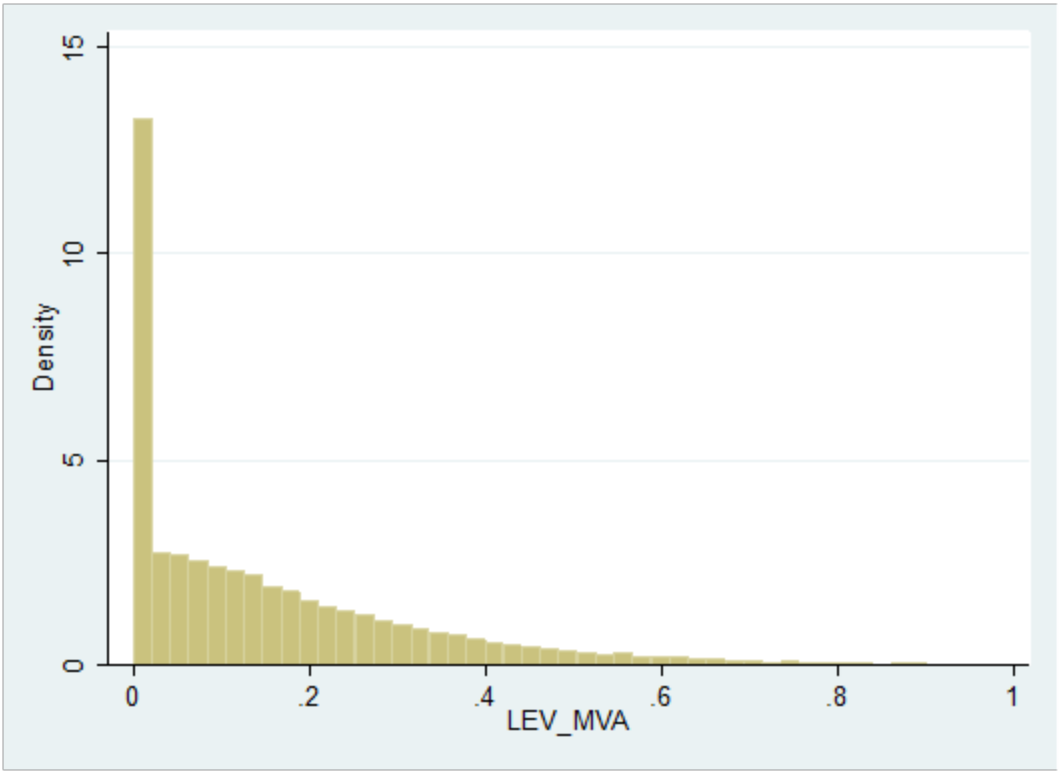

Figure B2. Density of companies by LEV_MVA

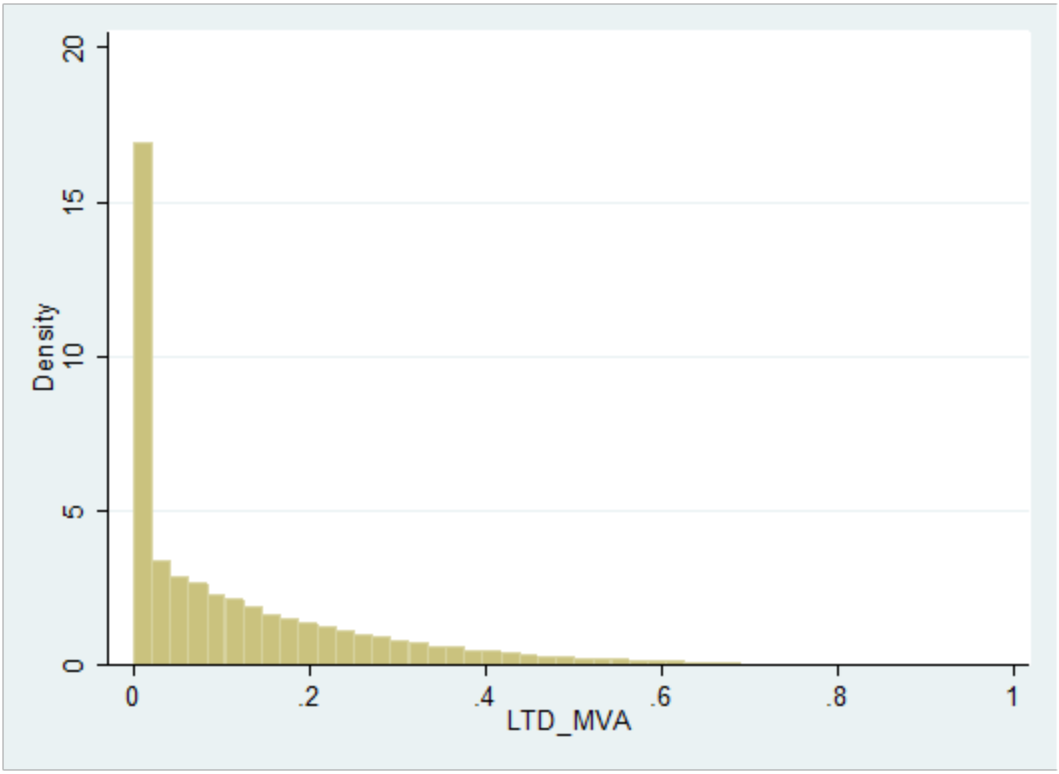

Figure B3. Density of companies by LTD_MVA

C. THE BEST AND WORST STATES FOR WOMEN IN 2016

Overall Rank	State	Total Score	Overall Rank	State	Total Score
1	Minnesota	83.17	27	Tennessee	59.91
2	Vermont	79.62	28	Florida	58.82
3	New Hampshire	77.97	29	Delaware	58.33
4	Maine	75.12	30	Idaho	57.81
5	Massachusetts	74.69	31	Indiana	56.84
6	North Dakota	74.6	32	Wyoming	56.61
7	Maryland	74.44	33	North Carolina	56.43
8	Wisconsin	72.31	34	Alaska	55.89
9	Nebraska	71.52	35	Kentucky	55.21
10	Hawaii	71.47	36	Arizona	55.12
11	Connecticut	71.08	37	District of Columbia	54.88
12	Washington	70.61	38	Michigan	53.83
13	Illinois	68.72	39	California	52.72
14	Virginia	68.06	40	Pennsylvania	51.83
15	Iowa	67.76	41	Georgia	51.01
16	New York	65.38	42	Texas	50.49
17	Kansas	63.95	43	Oklahoma	50.46
18	Montana	62.56	44	West Virginia	49.28
19	South Dakota	62.5	45	New Mexico	49.14
20	Oregon	62.05	46	Mississippi	47.43
21	Colorado	61.68	47	Arkansas	47.32
22	Ohio	61.26	48	Alabama	45.59
23	Missouri	61.02	49	Nevada	41.82
24	New Jersey	61	50	South Carolina	39.78
25	Utah	60.77	51	Louisiana	39.6
26	Rhode Island	60.64			

Note. Sample includes the states of the United States and the District of Columbia.

Source: Bernardo, 2016. https://wallethub.com/edu/best-and-worst-states-for-women/10728/

D. FAMA –FRANCH 49 INDUSTRIES CLASSIFICATION COB BY GENDER

Fama-French industry code (49 industries)	dummy variable for female chair of a board of director) 0	1	Total
Agriculture	126	0	126
Food Products	664	12	676
Candy & Soda	111	0	111
Beer & Liquor	143	0	143
Tobacco Products	56	4	60
Recreation	263	0	263
Entertainment	574	6	580
Printing and Publishi	286	13	299
Consumer Goods	582	22	604
Apparel	550	12	562
Healthcare	834	7	841
Medical Equipment	1,596	33	1,629
Pharmaceutical Produc	3,399	66	3,465
Chemicals	944	2	946
Rubber and Plastic Pr	238	1	239
Textiles	110	0	110
Construction Material	756	3	759
Construction	554	0	554
Steel Works Etc	500	6	506
Fabricated Products	58	0	58
Machinery	1,468	20	1,488
Electrical Equipment	703	13	716
Automobiles and Truck	606	1	607
Aircraft	258	2	260
Shipbuilding, Railroa	93	0	93
Defense	107	12	119
Precious Metals	120	0	120
Non-Metallic and Indu	204	0	204
Coal	121	0	121
Petroleum and Natural	1,914	18	1,932
Utilities	1,407	26	1,433
Communication	1,207	47	1,254
Personal Services	531	6	537
Business Services	2,337	44	2,381
Computer Hardware	951	16	967
Computer Software	3,658	73	3,731
Electronic Equipment	2,927	16	2,943
Measuring and Control	966	26	992
Business Supplies	445	2	447
Shipping Containers	107	0	107
Transportation	1,135	9	1,144
Wholesale	1,421	6	1,427
Retail	2,251	56	2,307
Restaraunts, Hotels,	719	24	743
Banking	6,115	147	6,262
Insurance	1,520	24	1,544
Real Estate	390	23	413
Trading	4,446	52	4,498
Almost Nothing	1,120	6	1,126
Total	51,591	856	52,447

E. PROPENSITY SCORE MATCHING

Table 12
Mean Differences in Capital Structure by COB Gender: Propensity Score Matching Three Neighbor

Variable	Sample	Female	Male	Difference	SE
Book_LEV	Unmatched	0.198	0.239	-0.041	0.043
	Matched	0.198	0.227	-0.029***	0.011
LTD_BVTA	Unmatched	0.148	0.181	-0.033***	0.014
	Matched	0.148	0.165	-0.017**	0.009
LEV_MVA	Unmatched	0.139	0.158	-0.018***	0.006
	Matched	0.139	0.161	-0.021***	0.007
LTD_MVA	Unmatched	0.105	0.126	-0.021***	0.005
	Matched	0.105	0.121	-0.016***	0.006

Note. PSM, n = 3. *** *p*-value < .01. ** *p*- value <.05. **p*- value <.1. The number of matching female is 759 observations.

Table 13
Mean Differences in Capital Structure by COB Gender: Propensity Score Matching Four Neighbor

Variable	Sample	Female	Male	Difference	SE
Book_LEV	Unmatched	0.198	0.239	-0.041	0.043
	Matched	0.198	0.222	-0.024**	0.011
LTD_BVTA	Unmatched	0.148	0.181	-0.033***	0.014
	Matched	0.148	0.166	-0.018**	0.008
LEV_MVA	Unmatched	0.139	0.158	-0.018***	0.006
	Matched	0.139	0.160	-0.020***	0.007
LTD_MVA	Unmatched	0.105	0.126	-0.021***	0.005
	Matched	0.105	0.120	-0.015***	0.006

Note. PSM, n = 4. *** *p*-value < .01. ** *p*- value <.05. **p*- value <.1. The number of matching is female 759 observations.

Table 14

Mean Differences in Capital Structure by COB Gender: Propensity Score Matching Five Neighbor

Variable	Sample	Female	Male	Difference	SE
Book_LEV	Unmatched	0.198	0.239	-0.041	0.043
	Matched	0.198	0.224	-0.025**	0.011
LTD_BVTA	Unmatched	0.148	0.181	-0.033***	0.014
	Matched	0.148	0.174	-0.026***	0.008
LEV_MVA	Unmatched	0.139	0.158	-0.018***	0.006
	Matched	0.139	0.160	-0.020***	0.0007
LTD_MVA	Unmatched	0.105	0.126	-0.021***	0.005
	Matched	0.105	0.120	-0.014***	0.006

Note. PSM, n = 5. *** *p*-value < .01. ** *p*- value <.05. **p*- value <.1. The number of matching female is 759 observations.

F. TOBIT PANEL DATA USING PROPENSITY SCORE MATCHING SAMPLE

Table 15
Capital Structure Decision by Female COB (PSM subsample n=3)*:*
Tobit Panel Data

Variables	(1) BOOK_LEV	(2) LTD_BVTA	(3) LEV_MVA	(4) LTD_MVA
Female COB	-0.056***	-0.052**	-0.028**	-0.037***
	(0.018)	(0.017)	(0.011)	(0.011)
Constant	0.143	0.017	0.220***	0.091
	(0.112)	(0.101)	(0.066)	(0.065)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Control	YES	YES	YES	YES
Observations	2,928	2,928	2,927	2,927
Companies	1,821	1,821	1,820	1,820
p-value (chi2)	0.000	0.000	0.000	0.000

Note. Tobit panel data PSM sample, n = 3. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$. PSM, propensity score matching.

Table 16

Capital Structure Decision by Female COB (PSM subsample n=4)*:*

Tobit Panel Data

Variables	(1) BOOK_LEV	(2) LTD_BVTA	(3) LEV_MVA	(4) LTD_MVA
Female COB	-0.048***	-0.043***	-0.024**	-0.031***
	(0.017)	(0.015)	(0.010)	(0.010)
Constant	0.173*	0.040	0.219***	0.084
	(0.098)	(0.089)	(0.060)	(0.058)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Control	YES	YES	YES	YES
Observations	3,596	3,596	3,595	3,595
Companies	2,161	2,161	2,160	2,160
p-value (chi2)	0.000	0.000	0.000	0.000

Note. Tobit panel data PSM sample, n = 4. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$. PSM, propensity score matching.

Table 17

Capital Structure Decision by Female COB (PSM subsample n=2)*:*

Tobit Panel Data

Variables	(1) BOOK_LEV	(2) LTD_BVTA	(3) LEV_MVA	(4) LTD_MVA
Female COB	-0.042***	-0.042***	-0.021**	-0.029***
	(0.016)	(0.015)	(0.009)	(0.009)
Constant	0.134	0.019	0.182***	0.055
	(0.090)	(0.083)	(0.056)	(0.054)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Control	YES	YES	YES	YES
Observations	4,241	4,241	4,240	4,240
Companies	2,451	2,451	2,450	2,450
p-value (chi2)	0.000	0.000	0.000	0.000

Note. Tobit panel data PSM sample, n = 5. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$. PSM, propensity score matching.

G. SECOND-STAGE INSTRUMENTAL VARIABLE TOBIT APPROACH (PROPENSITY SCORE MATCHING SAMPLE)

Table 18

Capital Structure Decision by Boards with Female COB (PSM subsample n=3)*: IV Tobit*

IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female COB	-0.392**	-0.541***	-0.264**	-0.394***	-0.733**	-0.773**	-0.299*	-0.485**
	(0.173)	(0.181)	(0.108)	(0.121)	(0.321)	(0.319)	(0.164)	(0.199)
Constant	0.365***	0.235	0.343***	0.209**	0.455**	0.296	0.352***	0.233**
	(0.140)	(0.146)	(0.087)	(0.098)	(0.188)	(0.186)	(0.096)	(0.117)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2,928	2,928	2,927	2,927	2,928	2,928	2,927	2,927
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.024	0.000	0.013	0.000	0.002	0.000	0.053	0.000

Note. IV Tobit approach second-stage PSM sample, n = 3. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Table 19

Capital Structure Decision by Boards with Female COB (PSM subsample n=4)*: IV Tobit*

IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female COB	-0.484***	-0.633***	-0.323***	-0.453***	-0.857**	-0.960**	-0.359*	-0.608**
	(0.181)	(0.191)	(0.116)	(0.129)	(0.364)	(0.380)	(0.186)	(0.239)
Constant	0.401***	0.265**	0.338***	0.210**	0.484***	0.337*	0.346***	0.244**
	(0.127)	(0.135)	(0.081)	(0.091)	(0.176)	(0.184)	(0.090)	(0.116)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	3,596	3,596	3,595	3,595	3,596	3,596	3,595	3,595
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.004	0.000	0.002	0.000	0.000	0.000	0.028	0.000

Note. IV Tobit approach second-stage PSM sample, n = 4. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

Table 20

Capital Structure Decision by Boards with Female COB (PSM subsample n=2)*: IV Tobit*

IV (Stage 1)	HQ state attitudes regarding females (BWSW)				HQ state economic freedom (EFS)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA	BOOK_LEV	LTD_BVTA	LEV_MVA	LTD_MVA
Instrumented Female COB	-0.521***	-0.631***	-0.341***	-0.450***	-0.782**	-0.849**	-0.294*	-0.525**
	(0.192)	(0.198)	(0.122)	(0.132)	(0.350)	(0.356)	(0.179)	(0.220)
Constant	0.393***	0.266**	0.315***	0.186**	0.444***	0.307**	0.305***	0.199**
	(0.118)	(0.122)	(0.075)	(0.081)	(0.149)	(0.151)	(0.076)	(0.094)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES	YES	YES	YES
Observations	4,241	4,241	4,240	4,240	4,241	4,241	4,240	4,240
p-value (chi2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wald test (*p*-value (chi2))	0.003	0.000	0.002	0.000	0.003	0.000	0.096	0.000

Note. IV Tobit approach second-stage PSM sample, n = 5. Standard errors are in parentheses. ***$p < .01$. **$p < .05$. *$p < .1$.

H. CONTROL VARIABLE COEFFICIENTS

Cont. Table 2 control variables												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Avg. age	0.000657***	0.000614**	0.000635***	0.000423*	0.000395*	0.000410*	0.00108***	0.00103***	0.00106***	0.000807***	0.000776***	0.000791***
	(0.000244)	(0.000244)	(0.000244)	(0.000234)	(0.000235)	(0.000234)	(0.000190)	(0.000191)	(0.000190)	(0.000182)	(0.000182)	(0.000182)
Avg. education	-0.00807***	-0.00792***	-0.00804***	-0.00403**	-0.00396**	-0.00405**	-0.00631***	-0.00608***	-0.00618***	-0.00275*	-0.00261*	-0.00268*
	(0.00209)	(0.00209)	(0.00209)	(0.00201)	(0.00201)	(0.00201)	(0.00163)	(0.00163)	(0.00163)	(0.00156)	(0.00156)	(0.00156)
Avg. network size	3.22e-05***	3.27e-05***	3.24e-05***	2.57e-05***	2.60e-05***	2.57e-05***	3.99e-05***	4.06e-05***	4.03e-05***	3.30e-05***	3.35e-05***	3.33e-05***
	(3.89e-06)	(3.89e-06)	(3.88e-06)	(3.74e-06)	(3.74e-06)	(3.73e-06)	(3.06e-06)	(3.06e-06)	(3.06e-06)	(2.92e-06)	(2.92e-06)	(2.91e-06)
Avg. time on board	0.000342	0.000350	0.000346	0.000319	0.000323	0.000320	0.000677***	0.000685***	0.000682***	0.000614***	0.000619***	0.000617***
	(0.000285)	(0.000284)	(0.000284)	(0.000273)	(0.000273)	(0.000273)	(0.000224)	(0.000224)	(0.000224)	(0.000213)	(0.000213)	(0.000213)
Avg. number of current boards	0.00945***	0.00933***	0.00942***	0.00770***	0.00761***	0.00768***	0.0117***	0.0116***	0.0117***	0.00919***	0.00911***	0.00917***
	(0.00165)	(0.00165)	(0.00165)	(0.00159)	(0.00159)	(0.00159)	(0.00127)	(0.00127)	(0.00127)	(0.00123)	(0.00123)	(0.00123)
SIZE	-0.0177***	-0.0176***	-0.0177***	-0.00903***	-0.00899***	-0.00904***	-0.0396***	-0.0396***	-0.0396***	-0.0268***	-0.0267***	-0.0267***
	(0.000717)	(0.000717)	(0.000716)	(0.000685)	(0.000685)	(0.000685)	(0.000567)	(0.000567)	(0.000567)	(0.000541)	(0.000541)	(0.000540)
Board size	0.00443***	0.00466***	0.00455***	0.00368***	0.00380***	0.00373***	0.00619***	0.00649***	0.00638***	0.00528***	0.00547***	0.00539***
	(0.000407)	(0.000405)	(0.000402)	(0.000394)	(0.000392)	(0.000388)	(0.000316)	(0.000315)	(0.000313)	(0.000305)	(0.000304)	(0.000301)
ROA	-0.00842***	-0.00844***	-0.00844***	-0.00371***	-0.00373***	-0.00373***	-0.000453	-0.000451	-0.000448	0.000948	0.000945	0.000947
	(0.00106)	(0.00106)	(0.00106)	(0.000861)	(0.000861)	(0.000861)	(0.000657)	(0.000657)	(0.000657)	(0.000639)	(0.000639)	(0.000639)
Independent director ratio	-0.0157***	-0.0147***	-0.0153***	-0.00884	-0.00829	-0.00869	-0.00421	-0.00302	-0.00352	-0.00338	-0.00259	-0.00296
	(0.00568)	(0.00568)	(0.00568)	(0.00548)	(0.00548)	(0.00547)	(0.00439)	(0.00439)	(0.00439)	(0.00423)	(0.00423)	(0.00423)

Cont. Table 5 control variables				
	(1)	(2)	(3)	(4)
Avg. age	-0.00167	-0.000525	-0.000287	-0.000428
	(0.00229)	(0.00220)	(0.00137)	(0.00134)
Avg. Education	0.0178	0.0228	0.0101	0.0152
	(0.0184)	(0.0176)	(0.0111)	(0.0107)
Avg. network size	7.25e-05**	1.81e-05	0.000106***	3.65e-05*
	(3.35e-05)	(3.20e-05)	(2.06e-05)	(1.96e-05)
Avg. time on board	0.00319	0.00173	0.00126	0.00123
	(0.00260)	(0.00248)	(0.00158)	(0.00151)
Avg. number of current boards	0.0127	0.0188	-0.00507	0.00689
	(0.0163)	(0.0154)	(0.00958)	(0.00956)
SIZE	-0.00737	0.00337	-0.0260***	-0.00961**
	(0.00642)	(0.00610)	(0.00398)	(0.00377)
Board size	0.0138***	0.0135***	0.0148***	0.0126***
	(0.00457)	(0.00432)	(0.00272)	(0.00266)
ROA	-0.110***	-0.0408***	-0.0113	-0.00428
	(0.0155)	(0.0147)	(0.00907)	(0.00951)
Independent director ratio	-0.248***	-0.239***	-0.161***	-0.115***
	(0.0604)	(0.0572)	(0.0357)	(0.0354)

Cont. Table 6 control variables				
	(1)	(2)	(3)	(4)
Avg. age	0.000758	0.000682	0.00140	0.000679
	(0.00167)	(0.00160)	(0.00105)	(0.00101)
Avg. Education	0.00604	0.0149	-0.000307	0.00881
	(0.0140)	(0.0133)	(0.00881)	(0.00844)
Avg. network size	6.07e-05**	2.78e-05	8.38e-05***	4.00e-05***
	(2.51e-05)	(2.39e-05)	(1.59e-05)	(1.52e-05)
Avg. time on board	-0.000153	6.79e-05	-0.00147	-0.000640
	(0.00190)	(0.00182)	(0.00120)	(0.00115)
Avg. number of current boards	0.0100	0.0187	0.00451	0.0155**
	(0.0130)	(0.0123)	(0.00793)	(0.00779)
SIZE	0.00209	0.00955**	-0.0216***	-0.00930***
	(0.00487)	(0.00464)	(0.00313)	(0.00298)
Board size	0.0107***	0.00928***	0.0122***	0.00925***
	(0.00339)	(0.00322)	(0.00210)	(0.00204)
ROA	-0.150***	-0.0829***	-0.00898	-0.00197
	(0.0128)	(0.0121)	(0.00770)	(0.00801)
Independent director ratio	-0.203***	-0.184***	-0.113***	-0.0799***
	(0.0468)	(0.0446)	(0.0286)	(0.0284)

Cont. Table 7 control variables panel B								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. age	-0.00599***	-0.00572***	-0.00418***	-0.00396***	-0.00308***	-0.00356***	-0.00223***	-0.00228***
	(0.00156)	(0.00123)	(0.000729)	(0.000731)	(0.000913)	(0.000729)	(0.000343)	(0.000375)
Avg. Education	0.0190	0.0340***	0.0180***	0.0240***	-0.000979	0.0193***	0.00473*	0.0126***
	(0.0119)	(0.00937)	(0.00555)	(0.00558)	(0.00728)	(0.00582)	(0.00273)	(0.00299)
Avg. network size	0.000417***	0.000317***	0.000217***	0.000199***	0.000265***	0.000203***	0.000115***	0.000111***
	(6.17e-05)	(4.84e-05)	(2.89e-05)	(2.88e-05)	(2.91e-05)	(2.32e-05)	(1.09e-05)	(1.19e-05)
Avg. time on board	-0.000409	-0.000486	-0.000259	0.000166	-0.00174**	-0.00152**	-0.00114***	-0.000634*
	(0.00125)	(0.00101)	(0.000586)	(0.000598)	(0.000846)	(0.000681)	(0.000318)	(0.000350)
Avg. number of current boards	0.0244***	0.0241***	0.0190***	0.0178***	0.0293***	0.0277***	0.0223***	0.0206***
	(0.00871)	(0.00697)	(0.00408)	(0.00415)	(0.00613)	(0.00492)	(0.00230)	(0.00253)
SIZE	0.0414***	0.0445***	0.00809**	0.0171***	0.0251***	0.0323***	-0.00277**	0.00763***
	(0.00705)	(0.00559)	(0.00331)	(0.00333)	(0.00359)	(0.00288)	(0.00135)	(0.00148)
Board size	0.113***	0.0946***	0.0596***	0.0606***	0.0687***	0.0615***	0.0300***	0.0348***
	(0.0175)	(0.0137)	(0.00821)	(0.00818)	(0.00796)	(0.00634)	(0.00299)	(0.00326)
ROA	-0.232***	-0.0769***	-0.0113***	-0.00549*	-0.226***	-0.0724***	-0.00725***	-0.00192
	(0.00657)	(0.00526)	(0.00309)	(0.00317)	(0.00449)	(0.00361)	(0.00170)	(0.00193)
Independent director ratio	0.274***	0.303***	0.168***	0.200***	0.0870**	0.164***	0.0434***	0.0919***
	(0.0795)	(0.0623)	(0.0372)	(0.0371)	(0.0395)	(0.0314)	(0.0148)	(0.0162)

Cont. Table 8 control variables panel B								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. age	-0.00270**	-0.00308***	-0.00252***	-0.00233***	-0.00174*	-0.00241***	-0.00171***	-0.00168***
	(0.00134)	(0.00110)	(0.000634)	(0.000659)	(0.00102)	(0.000867)	(0.000385)	(0.000446)
Avg. Education	-0.0191*	0.00230	-0.00102	0.00457	-0.0217***	0.000569	-0.00316	0.00289
	(0.00995)	(0.00820)	(0.00472)	(0.00490)	(0.00793)	(0.00672)	(0.00300)	(0.00346)
Avg. network size	0.000371***	0.000284***	0.000193***	0.000179***	0.000288***	0.000227***	0.000124***	0.000123***
	(5.97e-05)	(4.93e-05)	(2.83e-05)	(2.94e-05)	(3.91e-05)	(3.32e-05)	(1.47e-05)	(1.71e-05)
Avg. time on board	-0.00670***	-0.00593***	-0.00341***	-0.00318***	-0.00589***	-0.00537***	-0.00273***	-0.00264***
	(0.00137)	(0.00113)	(0.000649)	(0.000674)	(0.00106)	(0.000900)	(0.000401)	(0.000464)
Avg. number of current boards	0.0123	0.0134	0.0130***	0.0112**	0.0186**	0.0178***	0.0182***	0.0154***
	(0.0103)	(0.00846)	(0.00486)	(0.00505)	(0.00795)	(0.00675)	(0.00300)	(0.00347)
Size	0.0103***	0.0183***	-0.00755***	0.000973	0.00819***	0.0168***	-0.00927***	-0.000426
	(0.00362)	(0.00299)	(0.00172)	(0.00179)	(0.00282)	(0.00240)	(0.00107)	(0.00123)
Board size	0.0863***	0.0737***	0.0461***	0.0476***	0.0655***	0.0592***	0.0287***	0.0336***
	(0.0145)	(0.0120)	(0.00685)	(0.00714)	(0.00931)	(0.00792)	(0.00351)	(0.00406)
ROA	-0.227***	-0.0731***	-0.00894***	-0.00316	-0.225***	-0.0714***	-0.00680***	-0.00138
	(0.00696)	(0.00575)	(0.00331)	(0.00348)	(0.00550)	(0.00468)	(0.00209)	(0.00246)
Independent director ratio	0.00924	0.0840**	0.0348	0.0645***	-0.0387	0.0512*	-0.00517	0.0326**
	(0.0470)	(0.0387)	(0.0222)	(0.0230)	(0.0341)	(0.0288)	(0.0128)	(0.0148)

Cont. Table 9 control variables panel B								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. age	-0.00329	-0.00262	-0.00302*	-0.00179	-0.00227	-0.00269	-0.00301*	-0.00183
	(0.00237)	(0.00246)	(0.00154)	(0.00164)	(0.00297)	(0.00265)	(0.00168)	(0.00177)
Avg. Education	0.0217	0.0244	0.0178	0.0185	0.0238	0.0240	0.0177	0.0182
	(0.0174)	(0.0180)	(0.0113)	(0.0120)	(0.0201)	(0.0179)	(0.0115)	(0.0120)
Avg. network size	3.20e-05	1.05e-05	4.91e-05**	1.67e-05	4.40e-05	9.58e-06	4.94e-05**	1.63e-05
	(3.25e-05)	(3.36e-05)	(2.12e-05)	(2.25e-05)	(3.99e-05)	(3.54e-05)	(2.27e-05)	(2.37e-05)
Avg. time on board	0.00523**	0.00557**	0.00397**	0.00449***	0.00613**	0.00553**	0.00400**	0.00447**
	(0.00249)	(0.00257)	(0.00162)	(0.00172)	(0.00304)	(0.00270)	(0.00173)	(0.00180)
Avg. number of current boards	0.0462***	0.0288*	0.0156	0.0167	0.0469***	0.0292*	0.0158	0.0171
	(0.0157)	(0.0162)	(0.0103)	(0.0109)	(0.0181)	(0.0160)	(0.0103)	(0.0108)
Size	0.00374	0.0108	-0.00634	-0.000940	0.00281	0.0108	-0.00637	-0.000934
	(0.00641)	(0.00664)	(0.00419)	(0.00445)	(0.00745)	(0.00662)	(0.00425)	(0.00443)
Board size	0.0140***	0.0153***	0.0108***	0.0119***	0.0145***	0.0153***	0.0108***	0.0119***
	(0.00474)	(0.00489)	(0.00310)	(0.00329)	(0.00549)	(0.00485)	(0.00313)	(0.00326)
ROA	-0.117***	-0.0624***	-0.0174	-0.00789	-0.120***	-0.0623***	-0.0175	-0.00772
	(0.0177)	(0.0185)	(0.0118)	(0.0127)	(0.0206)	(0.0185)	(0.0120)	(0.0127)
Independent director ratio	-0.208***	-0.195***	-0.101**	-0.0736	-0.234***	-0.191***	-0.101**	-0.0709
	(0.0654)	(0.0675)	(0.0429)	(0.0455)	(0.0815)	(0.0722)	(0.0468)	(0.0488)

Cont. Table 10 control variables panel B								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. age	-0.00146	-0.000983	-0.00125	-0.000555	-0.000281	-0.000502	-0.000949	-0.000389
	(0.00192)	(0.00208)	(0.00125)	(0.00137)	(0.00265)	(0.00248)	(0.00147)	(0.00155)
Avg. Education	0.0172	0.0254	0.0159	0.0201*	0.0222	0.0273	0.0172	0.0208*
	(0.0149)	(0.0161)	(0.00969)	(0.0106)	(0.0197)	(0.0183)	(0.0110)	(0.0115)
Avg. network size	4.84e-05*	3.01e-05	5.06e-05***	2.73e-05	6.54e-05*	3.70e-05	5.50e-05**	2.97e-05
	(2.79e-05)	(3.01e-05)	(1.82e-05)	(1.99e-05)	(3.85e-05)	(3.59e-05)	(2.14e-05)	(2.25e-05)
Avg. time on board	0.00304	0.00426*	0.00175	0.00293*	0.00490	0.00503*	0.00224	0.00321*
	(0.00221)	(0.00239)	(0.00144)	(0.00158)	(0.00322)	(0.00300)	(0.00178)	(0.00188)
Avg. number of current boards	0.0380***	0.0283*	0.0199**	0.0211**	0.0412**	0.0298*	0.0207**	0.0217**
	(0.0140)	(0.0151)	(0.00911)	(0.0100)	(0.0183)	(0.0171)	(0.0102)	(0.0107)
Size	0.00570	0.0107*	-0.00769**	-0.00317	0.00233	0.00936	-0.00856**	-0.00365
	(0.00564)	(0.00610)	(0.00367)	(0.00403)	(0.00778)	(0.00725)	(0.00432)	(0.00455)
Board size	0.00882**	0.00900**	0.00768***	0.00783***	0.00921*	0.00915*	0.00779***	0.00789***
	(0.00389)	(0.00420)	(0.00254)	(0.00278)	(0.00508)	(0.00473)	(0.00282)	(0.00297)
ROA	-0.143***	-0.0877***	-0.0134	-0.00581	-0.149***	-0.0901***	-0.0150	-0.00665
	(0.0164)	(0.0178)	(0.0109)	(0.0121)	(0.0218)	(0.0204)	(0.0123)	(0.0131)
Independent director ratio	-0.210***	-0.194***	-0.100***	-0.0783*	-0.253***	-0.211***	-0.111**	-0.0836*
	(0.0587)	(0.0634)	(0.0384)	(0.0421)	(0.0835)	(0.0778)	(0.0466)	(0.0491)

Cont. Table 11 control variables panel B								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Avg. age	-0.00295	-0.00329*	-0.00264**	-0.00246**	-0.00517	-0.00559	-0.00302*	-0.00332
	(0.00232)	(0.00196)	(0.00114)	(0.00120)	(0.00432)	(0.00396)	(0.00165)	(0.00205)
Avg. education	0.0144	0.0311*	0.0157	0.0223**	0.0383	0.0557	0.0197	0.0315
	(0.0213)	(0.0180)	(0.0105)	(0.0110)	(0.0422)	(0.0386)	(0.0161)	(0.0200)
Avg. network size	0.000176***	0.000116***	9.58e-05***	7.60e-05***	0.000245**	0.000188*	0.000108***	0.000103**
	(4.82e-05)	(4.08e-05)	(2.37e-05)	(2.49e-05)	(0.000107)	(9.82e-05)	(4.07e-05)	(5.08e-05)
Avg. time on board	-0.00112	-0.00114	-0.000616	-0.000234	0.000260	0.000288	-0.000385	0.000295
	(0.00226)	(0.00192)	(0.00111)	(0.00117)	(0.00378)	(0.00346)	(0.00144)	(0.00179)
Avg. number of current boards	0.0319**	0.0303**	0.0228***	0.0216***	0.0297	0.0280	0.0224**	0.0208*
	(0.0160)	(0.0135)	(0.00785)	(0.00825)	(0.0245)	(0.0223)	(0.00932)	(0.0116)
Size	-0.0228**	-0.0102	-0.0241***	-0.0165***	-0.0367*	-0.0246	-0.0264***	-0.0219**
	(0.00956)	(0.00810)	(0.00469)	(0.00494)	(0.0214)	(0.0197)	(0.00816)	(0.0102)
Board size	-0.00797	-0.00745	-0.00105	-0.00214	-0.0159	-0.0157	-0.00240	-0.00522
	(0.00579)	(0.00490)	(0.00284)	(0.00299)	(0.0126)	(0.0115)	(0.00479)	(0.00596)
ROA	-0.218***	-0.0656***	-0.00461	0.00143	-0.219***	-0.0664***	-0.00473	0.00120
	(0.0115)	(0.00976)	(0.00567)	(0.00598)	(0.0176)	(0.0161)	(0.00670)	(0.00834)
Independent director ratio	-0.172***	-0.0704	-0.0554**	-0.0298	-0.169*	-0.0672	-0.0549*	-0.0286
	(0.0568)	(0.0481)	(0.0279)	(0.0293)	(0.0866)	(0.0790)	(0.0330)	(0.0410)