

Board Gender Diversity and Bank Performance

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This research examines the relationship between board gender diversity and firm performance and risk of financial institutions in the US between 2007 and 2015. The study also examines the effect of the Dodd-Frank Act of 2010 on improving the diversity and inclusion efforts of this industry. The study shows that board diversity as measured by the percent of women on the board of directors is associated with better corporate performance. While gender diversity appears to improve performance, it does not affect bank risk, which reinforces the notion that diverse banks are not assuming greater financial risk to generate higher returns.

INTRODUCTION

In March of 2017, to commemorate the International Women's Day, State Street Global Advisors—one of the largest index-fund firms—paid to have a statue of the Fearless Girl installed in front of the famous Charging Bull statue in Bowling Green Park, around the corner from Wall Street. The statue attracted global attention as the company issued an action call to recruit more women to serve on corporate boards. The company's President and CEO, Ron O'Hanley, noted that "a key contributor to effective independent board leadership is diversity of thought, which requires directors with different skills, backgrounds and expertise." (2017). The company said that despite the documented positive effect of women in leadership positions on performance, a quarter of Russell 3000 companies have no women on their boards, while 58% of the companies in the index have less than 15% women board members (Lublin and Krouse, 2017). State Street decided to take concrete steps to affect a change by using its proxy voting power against companies that neglect to make bona fide strides at adding women board members. As a first step, State Street's notified the heads of those more than 700 Russell 3000, FTSE 350, and S&P/ASX 300 companies without women on their boards about its intention to address gender diversity in companies in which they invest.

State Street's action, while principled, also makes good business sense. The case for women in management contends that businesses that achieve gender diversity and manage it well, on average, attain better financial results than other companies (Catalyst, 2013; MSCI, 2016). Data from various industries and sectors showed that having at least 30% of women in leadership positions produces significant

performance benefits (Noland, et al., 2016; MSCI, 2016). Recognizing a strong link between performance results and board gender diversity, several European countries implemented quotas or voluntary codes for female representation on company boards. For example, the UK took an aggressive stance by advocating that FTSE 100 boards should aim for a minimum of 25% female representation. Other European countries have established suggested targets for their boards (a “quota rosa”) of 40% for all public companies (Vinnicombe, et al., 2010; Vinnicombe, et al., 2015).¹ As a result, the biggest continental European banks boast 25% female representation, up from 10% in 2007 (*International Business Times*, 2013). In a related issue, in March 2017 Schroders (the Europe’s second largest listed asset management firm) became the first FTSE 100 company to publish detailed pay reports in an effort to eradicate gender pay imbalances. Schroders found that an average pay for its female employees was 33% lower than salaries of male employees (Marriage, 2017), but the company is making voluntary steps to comply with the new UK rules that will require businesses with more than 250 employees to disclose these pay statistics.

The US lags behind their European counterparts in both boardroom gender diversity and pay equity. In the US, women make up less than 3% of chief executives, and the proportion of female directors has historically been between 10% and 15% (Kogut, et al., 2013). In fact, according to Glassdoor (2016), banking and finance have one of the highest pay disparities of all domestic industries. Recently, *American Banker* reported that the four largest banks in the US (Bank of America, Wells Fargo, Citigroup, and JPMorgan Chase) as well as American Express and Mastercard, rejected shareholders’ proposals to report on their gender pay gap, calling these efforts “costly and time consuming” (“*US banks are behind the global curve on gender pay equity*,” June 27, 2017).

The global financial crisis of 2007-2009 and the Great Recession that ensued, resulted in dramatic declines in bank profits and largely changed the banking industry’s landscape. Much academic and practitioner research has been done to examine the role of corporate governance and board composition at banks during the Great Recession (OECD, 2009; BCBS, 2010; Mehran, et al., 2011; Credit Suisse, 2014; Berger, et al., 2016). According to CERAM Business School, firms with a high ratio of women in top management in the CAC40 (the French equivalent of the Dow Jones Industrial Average) showed better resistance to the 2008 financial crisis (Forbes, 2011). The “Lehman Sisters” theory emerged in 2015 when IMF director Christine Lagarde said that female leadership is probably more risk-averse and suggested that the financial crisis could have been averted if more women served in senior management. However, other studies dispute the “Lehman Sisters” theory, finding instead that solely increasing female staff in banks is unlikely to change the way risk is managed (MSCI, 2016; Sheehy, 2017).

This study examines the influence of gender diversity of corporate boards of US banks on their performance (return and risk) between 2007 and 2015, which includes the pre- and post-crisis periods. Board diversity is defined as the proportion of women among the highest-ranking CEOs in firms and on board of directors. The study also attempts to determine the impact of diversity requirements of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act)—the main piece of legislation passed in response to the Great Recession—on diversity in the banking industry. In addition to addressing accountability and transparency of financial institutions, Dodd-Frank Act authorized certain federal agencies to assess the diversity policies and practices of financial entities they regulate. These policies were meant to improve the inclusion efforts of financial entities.

This study contributes to the existing literature in several ways. It adds to the research that examines the relationship between board diversity and firm performance. The financial crisis has reaffirmed the importance of good corporate governance to improve performance and to reduce excessive risk-taking practices by financial institutions (Caprio and Levine, 2012; Berger, et al., 2016). Using a comprehensive executive compensation dataset from Capital IQ, the study confirms findings that board diversity of banking institutions is associated with better corporate performance. We use various accounting- and market-based performance measures to examine this impact. While gender diversity improves bank performance of our sample banks, it does not adversely affect their risk, which is particularly important in the post-crisis financial climate. Finally, to our knowledge, we are the first to examine the connection between the Dodd-Frank Act of 2010 and its effect on improving the diversity and inclusion efforts of

financial institutions. We estimate various panel data models and difference-in-difference regressions to evaluate the effect of the Dodd-Frank Act on gender diversity of boards.

The rest of the paper is organized as follows. The next section provides a review of the relevant literature on the topic of gender diversity on corporate boards' performance, and examines ongoing regulations and initiatives abroad and in the US. The following sections describe the data and methodology, and presents empirical results. The study concludes with the summary and contribution for practice.

LITERATURE

Corporate governance literature argues that board diversity is positively related to firm performance. Earlier studies, for example Bantel and Jackson (1989) and Murray (1989), argue for a "business case perspective" in the principal-agent model to propose a link between top management heterogeneity and performance due to the need for creativity and innovation in solving complex business problems. More recently, board diversity is examined in Campbell and Mínguez-Vera (2007); Terjesen, Sealy, and Singh (2009); Nielsen and Huse (2010); Adams and Mehran (2012); Liang, et al. (2013); Pathan and Faff (2013); and Garcia-Meca, Garcia-Sanchez, and Martinex-Fererro (2015). Researchers assert that a more heterogeneous board offers benefits from diverse members' skills and experiences, which can improve access to resources and expand networking opportunities, especially in the case of national/geographic diversity with an expanded need for global experience (Davies, et al., 2014; Ferreira, 2010; Oxelheim and Randoy, 2003). Specifically, in terms of gender diversity, studies find that corporations with more female board directors outperform companies with less female board members based on the returns to shareholders (Catalyst, 2007; Cook and Glass, 2011; and Barta, et al., 2012). In addition to diversity of thought, more gender diverse boards may improve the image of the firm and thus have a positive effect on the firm's shareholder value (Singh and Vinnicombe, 2004). An international study by Liu, Wei, and Xie (2014) confirms the positive effect of women on firm performance internationally, but earlier studies indicate that the board should be balanced and include at least three women to create a "critical mass" where women's views are perceived as more legitimate (Kanter, 1977).

Some other studies find inconclusive evidence of an impact of women serving on boards and firm performance (Farrell and Hersch, 2005; Liang, et al., 2013; Terjesen and Singh, 2008; Terjesen, et al., 2009). This is especially true when the benefits of heterogeneous teams are rebuffed by the firms, and lead to more conflicts and less group cohesion (Baranchuk and Dybvig, 2009). Some studies assert that gender diversity can be regarded as endogenous to the firm characteristics, i.e., good performing firms may hire women to serve on the board of directors and then observe no or negative impact on performance (Dobbin and Jung, 2014). This may be because they failed to harmonize different backgrounds and mitigate potential conflicts among board members, as noted above, or perhaps these women were hired during the company's natural lifecycle of maturity and decline. However, Smith, et al. (2006) finds that the positive relationship is due to board diversity affecting firm performance, and not the other way around. Thus, our first task in this study is to examine the influence of board gender diversity on the performance of banks.

The issue of corporate governance and risk taking in banks has become a topic of interest to researchers, practitioners, and policymakers, particularly following the recent financial crisis (Berger, et al., 2016; John, et al., 2016; among others). Banks have unique features that distinguish them from nonfinancial companies, and which influence corporate governance mechanisms. These features include the conflict of interest between shareholders and depositors (the banks' ultimate liability), potential moral hazard incentives due to deposit insurance, and the fact that banks are highly leveraged institutions (Becht, et al., 2012; Caprio and Levine, 2002; John, et al., 2016; Laeven, 2013; Levine, 2004; Macey and O'Hara, 2003). A detailed survey of this literature suggests that these features render bank governance more complex than that of non-financial firms, and have an impact on their performance and risk taking (John, et al., 2016). Our study builds on and expands the existing literature pertaining to the influence of board gender diversity on risk taking (Arguden, 2012; Sheedy, 2017). Previous studies for non-financial

institutions assert that women are more risk-averse than men and that their presence is associated with lower risk taking. Specifically, Mateos de Cabo, et al. (2012) finds a higher proportion of women on the board at lower-risk, larger, and growth-oriented banks. Adams and Ferreira (2004) argue that such a relationship may not necessarily be due to differences in gender risk aversion, but rather to a preference towards risk in less diverse (more homogenous) environments. However, a study of German banks reports that a higher proportion of female executives lead to riskier activities (Berger, et al., 2012). Anecdotal evidence suggests that a lack of diversity can lead to “group think,” which might have been a contributing factor in the 2008 financial crisis, according to Meagan Butler, the supervision head of the Financial Conduct Authority (FCA) in UK (2017). While the FCA did not go as far as to introduce gender quotas, the UK regulator tried to exert pressure on firms through discussions about compensation and the appointment of boards and senior executives. Thus, our second task will be to examine the effect of board gender diversity on the risk taking at US banks.

Based on the belief that greater diversity promotes stronger, more effective and more innovative business, the Dodd-Frank Wall Street Reform and Consumer Protection Act ("the Act") called for the establishment of an Office of Minority and Women Inclusion (OWMI) in federal agencies subject to the Act.² The Act requires each OMWI within their respective agencies to develop standards and procedures to ensure, to the maximum extent possible, the inclusion of women and minorities in all business and activities of the agency. Thus, our third task in this paper will be to examine the effect of the Dodd-Frank Act of 2010 on gender diversity and inclusion efforts of US banks.

DATA AND METHODOLOGY

To address the questions of the effect of board gender diversity on bank performance and risk taking as well as to examine the implications of Dodd-Frank Act of 2010 on gender diversity at US banks, we use a sample that consists of banks in the US between 2007 and 2015. We draw our data from Capital IQ and its executive compensation database, specifically screening for the variable of board job functions, including Chairman, Vice Chairman, and various other key board and supervisory positions.³ The screening procedure searches through biographies of the executives to identify gender-specific key terms, such as “she”, “her”, and “Mrs/Ms”). We supplement our data with information from annual reports, banks' web sites, news releases, and other relevant sources. Because not all firms are required or choose to report information on their corporate governance, our dataset includes approximately one-tenth of all banks in the US. However, banks with registered shares are required by the SEC to publish their corporate governance data and 90% of our sample are publicly traded banking institutions.

To estimate our models, we rely on financial variables that are traditionally found to affect firm performance and risk. Financial data were obtained from regulatory Call Reports, SNL Financial, and Capital IQ. The Call Report, also known as the Consolidated Report of Condition and Income, is a required report filed by banks with their respective regulatory agencies each quarter for the agencies' use in monitoring the condition, performance, and risk profile of individual institutions and the industry as a whole. We group our variables by board characteristics and financial variables of firm performance and risk. For bank performance measures, we include accounting-based performance metrics of return on assets (*ROA*), return on equity (*ROE*), and market-based performance measures of price to book value (*P/BV*) and price to tangible book value (*P/TBV*). We measure bank risk by obtaining bank market betas as a measure of systematic risk and calculated standard deviation of accounting-based ROA (*STDEV_ROA*) and ROE (*STDEV_ROE*).

We obtain the total size of the board (*BoardSize*) and measure the board gender diversity by the percentage of women on the board (*PrcWomen*). Several studies examine board sizes in banks and compare them to nonfinancial firms. They find that banks typically have larger boards than those of nonfinancial firms most likely due to banks' complexity and regulations (Adams and Mehran, 2003; Booth, et al., 2002). These studies show that bank board size is positively associated with bank performance (Adams and Mehran, 2012) and this relationship held true at US banks during the financial crisis (Aebi, Sabato, and Schmid, 2012). The benefits are due to improved monitoring and advising of

larger boards. However, there are also costs associated with large boards (for example those caused by coordination problems, slower decision making, etc.), and there is possibly a limit beyond which the costs dominate the benefits (de Andres and Vallelado, 2008). Board size may also have an effect on bank riskiness. Empirical results of studies that examine this relationship vary by sample time period and international scope, but recent studies show that there is a negative association between the probability of default and board size among US banks (Berger, et al., 2016). However, beyond a certain number of board members (above 14), operational risk may actually increase due to coordination problems (Wang and Hsu, 2013).

In general, the banking industry is highly regulated, and regulators impose restrictions on bank entry and merger decisions, bank capital, bank investments and loans, and mandatory standards for bank governance (John, et al., 2016). Our analysis captures several important bank-level control variables. We use total assets, *TA*, as a measure of bank size (in logarithm). Bank's profitability measures may be associated with the size of the institutions, which can be a driving force behind their activities due to economies of scale and scope, but can also be associated with a greater risk taking (Demsetz and Strahan, 1997). We include loans to assets ratio (*Loans*), which measures the extent to which a bank is involved in traditional banking activities, and it may also be a measure of risk because a higher percentage of loans to total assets can lead to a greater exposure to credit risk and a higher volatility of earnings. The regulatory capital ratio or leverage ratio (*Capital*) represents the bank's core measure of capital strength, which serves as a cushion against unexpected losses. Banks with higher capital buffer are able to sustain possible losses more easily and avoid bank failure. This is because it is difficult and costly to raise adequate regulatory capital during economic downturns or the recent crisis when the value of bank assets (especially their securities portfolio) deteriorated significantly. Given the high leverage of banks and the importance of debt claims and depositors in the capital structure, capital regulations are important in promoting safety and soundness of the banking system.

We also include information on whether the bank is publicly traded (*Listed*) because public banks are required to publish governance data. We also anticipate that stronger market discipline may lead to better performance and higher public visibility, which can lead to higher reputational impact and potentially deter risky activities. While public banks' access to additional capital at lower costs serves as a source of financial strength (Berger, et al., 2016), it also allows them to invest in riskier projects in search of higher returns for their shareholders (Barry, et al., 2011).

Some studies use the variable of tenure (the length of time on board) to relate it to the business experience of a director (Setiyono and Tarazi, 2014). The Capital IQ executive database does not include this variable, but we were able to obtain the age (*Age*) of each director and use it as a proxy, albeit not perfect, for the tenure variable. Longer tenure may relate to more experienced directors, but it may also relate to higher salary (*Compensation*, in logarithm), which has been shown to be associated with lower risk-taking, as older directors have higher amounts of their wealth vested with the company (May, 1995). Furthermore, there is a debate surrounding potential director tenure limits due to a possible compromise to independence and quality of service. However, at this time there is a lack of consensus on the optimal recommendation pertaining to tenure and its potential effect on gender quotas (Terjensen and Sealy, 2016).

The proposed model highlights the impact of board diversity on bank performance and risk.

$$Return_{i,t} \text{ or } Risk_{i,t} = \beta_1 PrcWomen_{i,t} + \beta_2 BoardSize_{i,t} + \beta_3 \log(BankSize)_{i,t} + \beta_4 Loans_{i,t} + \beta_5 Capital_{i,t} + \beta_6 Listed_{i,t} + \beta_7 \log(Compensation)_{i,t} + \beta_8 Age_{i,t} + \varepsilon_{i,t} \quad (1)$$

To mitigate the problem of endogeneity, we use the one-year lag, (*t-1*), of each of the bank control variables, including bank size, loans to assets and capital ratios.

RESULTS

Univariate Analysis

Table 1 provides descriptive statistics for the banks in our sample and their performance, risk, and diversity measures. In 2007, out of the total 7476 executives, 742 or 9.93% were women. In 2010, there were 686 women out of 6315 executives (10.87%), and there were 642 women out of 4955 in 2015 (12.96%). The decline in the total number of banks between 2007 and 2015 is reflective of the general consolidation trend within the banking industry, where smaller banks continue to disappear and the larger banks are assuming a greater industry share each year (Rose and Hudgins, 2012). In terms of performance measures, such as asset size, loans to assets, ROA, and ROE, Table 1 shows that banks in our sample perform in line with their peers of similar size.

Among notable board characteristics, the average number of female board members has remained largely unchanged (ranging from 9.3 to 9.5), the number of banks with no women on the board of directors decreased from 306 in 2007 to 159 in 2015, which corresponds to a decrease from almost 39% to 31% of all banks, or one percentage point per year. The total number of banks with three or more women on the board has increased from 59 in 2007 to 70 in 2015, which in the percentage terms roughly doubled from 7.4% to 13.5%.

TABLE 1
BANK DIVERSITY AND PERFORMANCE TRENDS

	2007	2010	2015
Total Number of Banks	791	692	517
Total Number of Executives	7,487	6,315	4,955
Average Board Size	9.29	9.13	9.53
Average # Women on Board	0.96	1.03	1.30
% of Women	9.92	10.87	12.96
# Banks without Women on Board	306	240	159
# Banks with 3+ Women on Board	59	58	79
Average Age of Executives	69.40	67.50	63.90
Average Director's Compensation (\$)	48,504	51,601	81,508
ROA (%)	0.71	0.66	0.84
ROE (%)	7.49	6.53	8.55
Total Assets (\$M)	16,573.60	24,985.15	29,688.75
Loans to Assets (LTA) (%)	72.22	66.00	68.77
Net Income (NI) (\$M)	89.08	82.99	248.69
NIM (%)	3.59	3.56	3.45
Beta	2.00	0.69	0.70
P/E ratio	15.84	23.06	16.60
P/BV	1.29	0.93	1.25
P/TBV	1.54	1.07	1.43
Tier 1 Capital Ratio (%)	13.42	14.49	14.34
Total Capital Ratio (%)	14.73	15.94	15.68

In order to identify factors that contribute to banks' performance and account for board characteristics, we compare companies with "No Diversity" and the "Diversity" banks based on *PrcWomen* (i.e., banks with no women on the board of directors versus those with women on boards). The results appear in Table 2.

TABLE 2
FINANCIAL INDICATORS BY GENDER DIVERSITY

Panel A: 2007	No Diversity (<i>PrcWomen</i> =0)	Diversity (<i>PrcWomen</i> >0)	Significant difference?
BoardSize	7.70	10.25	Yes***
Compensation(\$)	\$45,534	\$50,297	No
ROA (%)	0.66	0.73	No
ROE (%)	7.13	7.71	No
Total Assets (\$M)	\$1,950.53	\$25,335.61	Yes**
Loans to Assets (LTA)	0.74	0.71	Yes**
Net Income (\$M)	\$6.38	\$138.63	Yes**
NIM (%)	3.62	3.58	No
Beta	-0.35	3.48	No
P/E	15.85	15.87	No
P/BV	1.27	1.31	No
P/TBV	1.43	1.60	Yes***
Tier 1 Capital Ratio (%)	14.30	12.88	Yes**
Total Capital Ratio (%)	15.57	14.22	Yes**
Panel B: 2010	No Diversity	Diversity	Significant difference?
BoardSize	7.56	10.03	Yes***
Compensation(\$)	\$48,493	\$53,239	No
ROA (%)	0.41	0.51	Yes*
ROE (%)	4.65	5.20	Yes*
Total Assets (\$M)	\$1,161.18	\$38,453.11	Yes**
Loans to Assets (LTA)	0.67	0.65	No
Net Income (\$M)	\$7.84	\$122.09	Yes*
NIM (%)	3.62	3.66	No
Beta	0.53	0.68	No
P/E	23.95	21.67	No
P/BV	0.85	0.97	Yes***
P/TBV	0.92	1.15	Yes***
Tier 1 Capital Ratio (%)	16.95	14.53	Yes***
Total Capital Ratio (%)	18.22	16.00	Yes***
Panel C: 2015	No Diversity	Diversity	Significant difference?
BoardSize	7.56	10.39	Yes***
Compensation(\$)	\$64,445	\$88,882	Yes**
ROA (%)	0.76	0.87	No
ROE (%)	8.01	8.78	No
Total Assets (\$M)	\$2,404.88	\$41,435.98	Yes**
Loans to Assets (LTA)	0.69	0.68	No
Net Income (\$M)	\$16.79	\$354.14	Yes*
NIM (%)	3.53	3.42	No
Beta	0.58	0.74	Yes***
P/E	18.77	15.99	Yes*
P/BV	1.20	1.26	No
P/TBV	1.29	1.48	Yes***
Tier 1 Capital Ratio (%)	15.58	13.81	Yes***
Total Capital Ratio (%)	16.81	15.19	Yes***

The superscripts ***, **, and * signify 1%, 5%, and 10% statistical significance based on *p*-values.

The most notable and statistically significant differences between diverse and non-diverse banks in Table 2 appear to be the board size, total assets, and market-based price to book ratios. These suggest that women tend to be better represented on boards of larger banks. According to findings in Table 2, banks with diverse boards are on average significantly larger (about 20 times) based on assets size and earn significantly higher net income (about 15 times). In fact, a recent study conducted by PricewaterhouseCoopers reports that women made up 26% of the boards in the banking and capital markets industry (Olson, 2013); however, these results refer to companies within S&P 500, our sample consist of all banking firms. Furthermore, diverse banks tend to capture a higher price multiple compared to their non-diverse counterparts. Diverse banks also report lower capital ratios (Tier 1 and Total Capital Ratio). Capital is the ultimate line of defense against bank failure as it provides a cushion for a firm to absorb losses and remain solvent. The current regulatory capital standards indicate that for a bank to be well capitalized, its Tier 1 capital ratio has be greater than or equal to 5% and its total risk-based capital has to be greater than or equal to 10%. Obviously, both categories of banks in our sample are well capitalized, but larger banks have slightly lower capital ratios. This finding is consistent with the industry averages as higher-performing banks typically manage their liquidity more judiciously. Another interesting observation is that banks with more diverse boards appear to exhibit somewhat higher risk as measured by beta, but the average is still below the market beta of one, and is only statistically significant in the last year of observations in 2015.

Before we proceed with the multivariate analysis of the panel data, we examine averages and pairwise correlation matrix of all variables in our dataset.

**TABLE 3
CORRELATION ANALYSIS**

	Obs	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ROA (1)	3086	0.69	0.75	1.00																				
ROE (2)	3080	7.20	12.55	0.79	1.00																			
BoardSize (3)	3094	9.87	3.34	0.13	0.17	1.00																		
PrcWomen (4)	3094	11.68%	9.79%	-0.01	0.04	0.23	1.00																	
TA (5)	3094	\$ 35,928	\$ 221,637	0.00	0.1	0.18	0.16	1.00																
Loans (6)	3038	\$ 18,229	\$ 108,590	-0.05	0.21	0.20	0.18	0.95	1.00															
NI (7)	3094	\$ 204.89	\$ 2,042.03	0.03	0.05	0.17	0.14	0.75	0.63	1.00														
NIM (8)	3037	3.56	0.83	0.31	0.06	-0.11	-0.07	-0.20	-0.23	-0.05	1.00													
STDROA (9)	3094	0.61	0.77	-0.98	-0.78	-0.13	0.02	-0.01	0.05	-0.02	-0.04	1.00												
STDROE (10)	3094	7.68	22.38	-0.46	-0.33	-0.07	0.03	0.30	0.53	-0.11	-0.22	0.47	1.00											
Beta (11)	2837	0.73	0.50	-0.31	-0.24	0.21	0.13	0.29	0.38	0.08	-0.12	0.35	0.54	1.00										
Tier1_rat (12)	2902	14.23	5.30	0.13	0.04	-0.34	-0.11	-0.08	-0.09	-0.08	-0.11	-0.16	-0.21	-0.24	1.00									
Cap_rat (13)	2929	15.70	5.19	0.11	0.04	-0.31	-0.09	-0.03	-0.04	-0.04	-0.13	-0.13	-0.20	-0.20	0.99	1.00								
Compensation (14)	3094	\$ 70,063	\$ 92,250	-0.02	0.00	0.07	0.16	0.40	0.40	0.33	-0.22	0.03	0.09	0.37	0.09	0.14	1.00							
Age (15)	3094	67.09	4.32	0.19	0.15	-0.02	-0.06	0.03	0.04	0.03	0.03	-0.17	-0.09	-0.01	0.21	0.22	0.18	1.00						
Diversity (16)	3094	0.71	0.45	-0.01	0.02	0.42	0.65	0.08	0.08	0.06	0.02	0.03	0.02	0.19	-0.22	-0.22	0.08	-0.04	1.00					
Listing (17)	3094	0.91	0.28	0.01	0.10	-0.01	-0.05	0.02	0.01	0.04	0.31	0.01	-0.02	0.11	-0.02	-0.02	0.01	0.04	-0.03	1.00				
P (18)	2892	21.87	76.65	0.02	-0.06	0.12	-0.04	0.05	0.03	0.06	0.06	0.00	0.05	0.11	-0.08	-0.08	0.06	0.07	0.02	0.03	1.00			
PE (19)	1698	17.93	16.39	0.03	-0.10	-0.10	-0.11	-0.09	-0.10	-0.08	-0.24	-0.07	-0.04	-0.18	0.42	0.41	0.08	0.13	-0.15	0.00	-0.12	1.00		
PBV (20)	2951	1.15	0.52	-0.68	-0.37	-0.01	0.07	-0.02	-0.01	0.02	0.12	0.73	0.28	0.35	0.01	0.00	0.13	-0.07	0.06	0.11	0.08	-0.04	1.00	
PTBV (21)	2949	1.36	0.68	-0.93	-0.65	-0.05	0.06	0.00	0.06	0.02	0.16	0.95	0.37	0.34	-0.10	-0.10	0.07	-0.13	0.07	0.05	0.01	-0.08	0.87	1.00

Source: Capital IQ, Call Reports, and authors' calculations. These measures are based on 360 banks that appeared in all years between 2007 and 2015. All metrics are based on end-of-year figures from the banks' balance sheet and income statements, along with trading data over the last 9 years.

Table 3 shows that performance measures of *ROA* and *ROE* are positively correlated with *BoardSize* and bank size (total assets, *TA*). *ROA* is also correlated with capital ratios, and both performance measures are positively correlated with the executive's *Age*. The market performance measures (*PBV* and *PTBV*) are positively correlated with net interest margin (*NIM*), an important measure of bank performance, which measures the ratio of net interest income (interest income – interest expenses) to bank's assets. In terms of *PrcWomen*, the variable seems to be most strongly associated with *BoardSize*,

bank size, compensation, and stock price. As for risk, *PrcWomen* is positively correlated with market beta, but the correlation with *STDROA* and *STDROE* (both are based on bank's book values) is small and statistically insignificant. We investigate these results in more detail in a multivariate setting below.

Multivariate Analysis

In this section, we run regressions of performance measures (*ROA*, *ROE*, *PBV*, and *PTBV*) and risk measures (*STDROA*, *STDROE*, and *beta*) on the diversity measures and bank control variables. Studies on board structure and performance often suffer from endogeneity problem that comes from the nature of the investigated variable (Setiyono and Tarazi, 2014). Such endogeneity can occur, for example, because board structure may be affected by the firm's previous good or bad performance (Carter, et al., 2010) or inherent biases for or against female managers (Cook and Glass, 2011). On the one hand, Dobbins and Jung (2014) show that institutional investors in male dominated industries may change their investment in a firm in response to greater gender board diversity. Alternatively, investors may view that newly appointed female leaders potentially possess superior skills in terms of advanced degrees, managerial and public relations skills, thus helping firms gain competitive advantage in a greater variety of products and market areas (Bilimoria and Wheeler, 2000; Cook and Glass, 2011; Garcia-Meca, et al., 2015). To avoid the possible endogeneity problem, we use lags (*t-1*) of all control variables as their instruments. The results for performance measure regressions appear in Table 4 and risk measures results appear in Table 5.

TABLE 4
THE EFFECT OF GENDER DIVERSITY ON BANK PERFORMANCE

Variable	ROA	ROE	PBV	PTBV
PrcWomen	0.6158*** (0.2162)	7.2103** (2.8812)	0.2719** (0.1079)	0.2882** (0.1316)
Board Size	0.0052 (0.0090)	0.1358 (0.1301)	0.0050 (0.0035)	0.0179*** (0.0044)
Bank Size (TA)	0.0314* (0.0118)	0.0733 (0.2242)	0.0262** (0.0104)	0.0946*** (0.0137)
Loans	-0.3971** (0.1909)	-7.3356** (2.2463)	-0.0463 (0.0905)	-0.1372 (0.1129)
Capital Ratio	0.0272*** (0.0048)	0.2899*** (0.0831)	-0.0006 (0.0019)	-0.0089** (0.0028)
Listing	0.2537*** (0.0848)	4.9015** (1.9669)	0.1339*** (0.0262)	0.1405*** (0.0297)
Compensation	-0.0051 (0.0296)	0.1035 (0.3713)	0.1105*** (0.0161)	0.1113*** (0.0187)
Age	-0.0003 (0.0049)	-0.0618 (0.0634)	0.0039 (0.0029)	0.0119*** (0.0037)
No. obs	2678	2677	2618	2618
R ²	0.112	0.073	0.113	0.193

In order to avoid endogeneity problems for the numerical variables, we used their lags *t-1* as instruments. Heteroskedasticity-consistent asymptotic standard errors appear in parentheses. ***, **, and * signify 1%, 5%, and 10% significance. All models include control dummy variables for Year.

Regression results in Table 4 show that board diversity (*PrcWomen*) has a positive impact on all performance measures (*ROA*, *ROE*, *PBV*, and *PTBV*) used in the model. These results suggest that inclusion of women on bank corporate boards has a positive effect on performance. These are consistent with evidence found in Campbell and Mínguez-Vera (2007), Liu, et al.

(2014), Strøm, et al. (2014), and García-Meca, et al. (2015) who show that more diverse boards are associated with better corporate performance. We do not find loan exposure, compensation, or age to have any consistent or strong influence on a bank's performance across different model specifications. Bank assets have a positive effect on performance across most specification as well as the listing status. The overall results with respect to the performance variables are therefore largely in line with prior research.

TABLE 5
THE EFFECT OF GENDER DIVERSITY ON BANK RISK

Variable	STDROA	STDROE	Beta
PrcWomen	-0.3755*** (0.1346)	-7.5885*** (1.8759)	-0.2192*** (0.7768)
Board Size	-0.0234*** (0.0056)	-0.3505*** (0.0748)	-0.0058** (0.0027)
Bank Size (TA)	0.0661*** (0.0112)	0.5561*** (0.1799)	0.1678*** (0.0079)
Loans	0.7229*** (0.1091)	5.2784*** (1.5936)	0.0666 (0.0673)
Capital Ratio	-0.0135*** (0.0027)	-0.3689*** (0.0525)	-0.0088*** (0.0016)
Listing	-0.3145*** (0.0584)	-6.3555*** (1.5498)	0.3829*** (0.0306)
Compensation	-0.0144 (0.0228)	-0.3143 (0.2915)	0.0303** (0.0133)
Age	-0.0044 (0.0034)	-0.1258** (0.0499)	-0.001 (0.0020)
No. obs	2686	2686	2500
R ²	0.0533	0.0788	0.3888

See notes to Table 4.

In terms of performance volatility in Table 5, our results suggest that a higher representation of women on boards is associated with lower risk taking of banks. The results are significant and consistent across all specifications. Among other interesting results are that total assets and loan exposure increase risk taking, but larger boards and higher capital ratios have highly significant and negative influence on risk. These findings suggest that larger boards alleviate bank complexity and result in positive net outcomes for banks. The finding on the coefficient of bank capital is intuitive as bank capital serves as a buffer against potential losses and reduces their probability of default (Berger et al., 2016). The coefficients on the compensation and age variables do not appear to have any influence in multivariate regressions.

Finally, we examine the effect of the Dodd-Frank Act of 2010 on the diversity and inclusion efforts of the US banks by separating the sample into the pre-2010 and post-2010 periods. Examples from international regulations suggest that the passage of diversity-related corporate governance regulations result in an increase of percentage of women on boards. For example, in Australia, women serving on board of directors increased from 9% in 2006 to 20% in 2015 (Catalyst, 2015). Banking is a regulated industry and as such, the regulation and governance complement each other. Becher and Frye (2011) show that regulators pressure firms to adopt effective monitoring structure. Section 342 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 the Dodd-Frank Wall Street Reform and Consumer Protection Act ("the Act") established an Office of Minority and Women Inclusion (OWMI) in

federal agencies subject to the Act, including FDIC, FRB, NCUA, OCC, etc. (see Endnote 2). While the rule applies to these regulatory agencies, they in turn apply it to “all contracts of an agency for services of any kind, including the services of financial institutions, investment banking firms, mortgage banking firms, asset management firms, brokers, dealers, financial services entities, underwriters, accountants, investment consultants, and providers of legal services.”(GPO, 2010). Each agency seeks diversity in the workforce, at all levels of the agency, in recruiting strategies, in sponsoring recruitment events, and other employment and mentoring activities. Research suggests that regulation increases the visibility of corporate governance through enhanced public scrutiny, positive incentives (through the price of and access to services), or penalties for poor governance decisions. Therefore, it can be argued that even when regulators do not specifically stipulate the levels of board diversity (which is the case of Dodd-Frank Act), their presence will still compel regulated firms to adopt effective governance structures (Becher and Frye, 2011). For our sample of banks, while the total board size remained largely unchanged, an average of about 9.8 executives, the number of women on board increased from 1.07 to 1.27. Table 6 reports that the percent of women on board increased from 10.3% prior to 2010 (Group=0) to 12.2% after 2010 (Group=1). The results are statistically significant and suggest that the Dodd-Frank Act had an effect on improving banks’ board diversity. We check the robustness of these results below.

TABLE 6
DIFFERENCES IN BOARD DIVERSITY CHARACTERISTICS PRE- AND POST- DODD-FRANK ACT

Group	Obs	BoardSize	Std. Err.	Std. Dev.	[95% Conf. Interval]		Women	Std. Err.	Std. Dev.	[95% Conf. Interval]		PrcWomen	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	1,080	9.845	0.104	3.417	9.641377	10.0493	1.072	0.030	0.990	1.013089	1.13135	0.103	0.003	0.091	.0979576	.108808
1	2,160	9.818	0.071	3.317	9.678096	9.95801	1.267	0.024	1.109	1.219862	1.31347	0.122	0.002	0.102	.1180848	.126682
t test		t= 0.2188					t=-4.8712					t=-5.184				
df		df=3238					df=3238					df=3238				
		<i>Pr(T > t)=0.8269</i>					<i>Pr(T > t)=0</i>					<i>Pr(T > t)=0</i>				
<i>Ho: diff =mean(0)-mean(1)=0</i>																
<i>Ha: diff≠0</i>																

The table presents diversity board characteristics prior to 2010 vs. post 2010 to examine possible differences due the implementation of the Dodd-Frank Act.

Additional Tests and Robustness Checks

In this section, we conduct an additional robustness check of the proceeding results on the impact of the Dodd-Frank Act of 2010 on board gender diversity of banks in our sample. We use panel data to estimate a difference-in-difference (DID) regression to evaluate the effect of the act on the percent of women on board of directors. We could just compare the treatment group (Diversity=1) before and after the passage of the act, but we might pickup other effects that changed at the time of its implementation. The technique allows us to difference out these confounding factors and to isolate the treatment effect. The DID estimator is defined as the difference in average outcome in the treatment group before and after treatment minus the difference in average outcome in the control group before and after treatment. The equation is written as:

$$Y_{it} = \beta_1 C_{i,t-1} + \beta_2 Treatment_i + \beta_3 Post_t + \beta_4 Treatment_i * Post_t + \alpha_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

Y_{it} is the dependent variable for *PrcWomen* as discussed above. $C_i, t-1$ is a set of lagged bank-level control variables (we use *BankSize*, *Loans*, and *Capital ratio*); $Treatment_i$ variable is a dummy for the board gender diversity, $Post_t$ is the dummy variable that refers to time periods after the implementation of the Dodd-Frank Act of 2010. Hence, β_4 is a key explanatory variable for the DID regressor, identifying a bank and period following the passage of the Act. α_i and δ_t are banks’ fixed- and time-effect controls, respectively. This approach allows us to capture differences across groups and the year effects. The

inclusion of time fixed effects produces a difference-in-differences estimate of *PrcWomen* after the passage of the act, controlling for pre-existing differences across banks.

TABLE 7
DODD-FRANK ACT AND BOARD DIVERSITY: DIFFERENCES IN DIFFERENCES

Variable	<i>PrcWomen</i>
Bank Size (TA)	5.830** (2.450)
Loans	-4.274*** (0.024)
Capital Ratio	-0.028 (0.024)
Treatment	10.909*** (0.337)
Post	1.121*** (0.3423)
Interaction (Treatment*Post)	2.097*** (0.2982)
No. obs	3005
No. of banks	344
R ²	0.6288

***, **, and * signify 1%, 5%, and 10% significance. The model includes fixed-effects robust estimates, with an Interaction term as a key explanatory variable for the difference in difference regressor. Time dummies and a constant are included in estimations, but not reported in the table.

The coefficients of the model in Equation (2) are estimated using panel data regressions for a balanced panel dataset for banks that reported in all years between 2007 and 2015. The results in Table 7 suggest that the act had a positive effect on the gender diversity of the banks' boards. These results are consistent with our earlier findings. Table 7 also confirms that larger firms exhibit greater board diversity, which is consistent with findings in Terjesen, et al. (2009). The argument is that larger companies are more visible and may be more scrutinized (or even pressured to act) on their decisions regarding board composition practices (Singh, et al., 2015).

CONCLUSIONS

Board composition and diversity have received much attention by researchers, practitioners, and regulators. Since critical strategic, governance, and risk management decisions are made in the boardroom, it is important that the board leadership consists of the most talented and competent, individuals. Increasing the diversity of the board adds to the talent pool from which the most capable board members can be drawn. This study examined the role of women on the board of directors of the US banking institutions between 2007 and 2015. Recognizing a strong link between performance results and board gender diversity, many European countries implemented quotas or voluntary codes for female representation on company boards. This resulted in a significant rise in female representation on financial companies' boards. In the US, however, while 53.7% of all financial services jobs are occupied by women, they account for 45.7% of first/mid-level positions, 28.6% of senior-level positions, and only 2.1% of CEO roles.

The study contributes to the research on the relationship between gender diversity of corporate boards, performance, and risk. Overall, our results show that board diversity as measured by the percent of women on the board of directors has a positive impact on all performance measures, including accounting-based ROA and ROE, as well as market-based price-to-book and price-to-tangible book values. These results are consistent with studies that show that more diverse boards are associated with better corporate performance. While gender diversity appears to improve bank performance, it does not affect company's risk, which reinforces the notion that diverse banks are not assuming greater financial risk to generate higher returns. These results are consistent with studies by Credit Suisse (2014) and MSCI (2016). The board of directors of banking organizations used in this study exhibit a greater gender diversity between pre- and post-implementation of the Dodd-Frank Act. The average total number of executives on the board of banks in our sample remained virtually unchanged, but the total number of women and the percent of women on the board increased. However, the increase was to 1.27 women or 12.2% of the board. This is still quite far from the national initiatives of pursuing the goal of increasing the number of women on boards to 20% by 2020 (2020 Women on Board, *American Banker*, 2013). While the financial services sector is working hard toward achieving gender diversity of their boards, the pace of growth has been, at best, modest.

An important practical implication of our results is that female presence has a positive effect on bank performance without any notable negative effects on risk. The conclusions support public policy initiatives aimed at increasing gender diversity and inclusion efforts at the US banks. Although the financial industry is making modest gains in female representation on their boards, we must ask whether the financial industry can afford the long wait predicted for the skills, experiences, and perspectives gender parity will bring to an increasingly competitive, regulatory and technology driven industry. Some domestic companies are following the examples of other countries by taking progressive steps to improve gender diversity on boards. According to McKinsey & Company, the reform can be brought from the "inside-out" by changing mindsets, expanding criteria for inclusion, and maintaining an active pipeline (Huber and O'Rourke, 2017). Changing the mindset includes an organization-wide commitment to diversity and inclusion of women in decision-making processes. According to the Center for Work-Life Policy, there exists an "invisibility bias" among male managers who simply do not see the lack of women around them (Harvard Business Review, 2013). By expanding criteria for inclusion, the boards will consider and give opportunities to women with potential and promise, not just their prior experience. MCSI (2016) finds that while female directors typically lagged their male counterparts in C-Suite experience, they outpaced men in achieving advanced educational degrees. Researchers have documented demand-side reasons, such as gender discrimination and stereotyping, as well as supply-side factors, such as gender differences in preferences and productivity that may have contributed to the historic absence of women in top management. These studies conclude that both factors play a role in female underrepresentation in top management positions (Matsa and Miller, 2011; Hurley and Choudhary, 2016). Regardless of whether this is a problem of demand or supply or these challenges are based on existing biases, there are strong moral arguments and economic reasons to promote and improve gender diversity of corporate boards and corporations.

ENDNOTES

1. In February 2002, Norway introduced a 40% gender quota for boards of publicly traded and state-owned enterprises. Norwegian companies that were not in compliance faced dissolution and de-listing from the Oslo Stock Exchange (Hoel, 2008; Terjesen and Sealy, 2016). Prior to the quota, Norway's share of female directors was around 10%, despite of various government initiatives, including women's networks, mentoring, training, databases, and law hearings. Despite initial opposition by many groups, all Norwegian listed companies achieved 40% female representation by mid-2008. Later, other European nations followed the suit with the Spain's 40% goal, France's 20%, Germany's 30%, etc. (for an excellent overview, please see Terjesen and Sealy, 2016).
2. These agencies include the Department of the Treasury, Federal Deposit Insurance Corporation, Federal Housing Finance Agency, each of the Federal Reserve Banks, Federal Reserve Board, National Credit Union Administration, Office of the Comptroller of the Currency, Securities and Exchange Commission, and the Bureau of Consumer Financial Protection.
3. A complete list include the following positions: Vice Chairman, Chairman Emeritus, Chairman of the Board, Co-Chairman of the Board, Member of the Board of Directors, Unit Chairman, Unit Vice Chairman, Unit Board Member, Unit Co-Chairman, Unit Chairman Emeritus, Vice Chairman Emeritus, Director, Emeritus, Member of Supervisory Board, Member of Advisory Board, Chairman of Supervisory Board, Member of Corporate Board, Vice Chairman of Supervisory Board, Chairman of Advisory Board, Chairman of Corporate Board, Co-Chairman of Advisory Board, Co-Chairman of Corporate Board, Co-Chairman of Supervisory Board, Vice Chairman of Advisory Board, Vice Chairman of Corporate Board, and Lead Director.

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