Economic Research Paper: 2014-4

FEMALE BANK EXECUTIVES: IMPACT ON PERFORMANCE AND RISK TAKING

Cindy Truong* and Yan Wendy Wu*

MARCH 2014

- Wilfrid Laurier University

Corresponding Author: wwu@wlu.ca

Female Bank Executives: Impact on Performance and Risk Taking

Cindy Truong
Department of Economics
School of Business and Economics
Wilfrid Laurier University
75 University Avenue West
Waterloo, ON, Canada, N2L 3C5
E-mail: cin.truong@gmail.com

and

Yan Wendy Wu*[1]
Department of Economics
School of Business and Economics
Wilfrid Laurier University
75 University Avenue West
Waterloo, ON, Canada, N2L 3C5
Phone: (519) 884-0710, ext. 2925
Fax: (519) 888-1015
E-mail: wwu@wlu.ca

* Corresponding author

Female Bank Executives: Impact on Performance and Risk Taking

Abstract

This paper studies the impact of female executives on the performance and risk taking of US banks. With a sample of US banks from 2002 to 2010, we find that the inclusion of female executives increases bank performance after addressing endogeneity and reverse causality issues. We also provide evidence that female executives decrease the risk taking of banks. These results suggest that there is added value to having female executives on the executive team. We also find that a more balanced gender ratio results in a greater impact on bank performance and risk taking. This supports the argument to increase gender diversity in executive level positions for females.

Keywords: Gender, Bank Executive, Diversity
JEL Classification: G21, G28, J16, J48

1. INTRODUCTION

There has been significant concern regarding the lack of females in the corporate world. Specifically, women have been struggling to circumvent the 'glass ceiling'. This issue is exacerbated when looking at females in top executive roles. In 2010, The Economist reports that among the Fortune 500 companies, women make up roughly a mere 15% of the most senior managerial positions and only 3% of the CEOs are women. Female employees in male dominated companies felt discouraged and many companies have to reinvent themselves as female friendly employers to get rid of the barriers to advancement (Catalyst, 2003). Moreover, to address this lack of gender diversity in the workplace, Norway passed a law in 2003 that required all publicly listed firms to have 40% of their board seats reserved for women by 2008. France and Spain have both followed suit, implementing their own mandatory quota laws in 2007 and 2012. In the United States, the US Securities and Exchange Commission passed a rule in 2009 making it mandatory for companies to report whether or not diversity played a role in the consideration and nomination of the board of directors. Companies are also asked to assess the efficacy of these policies. In Europe, a more contentious issue is the implementation of mandatory female quotas in the boardroom. This policy has been an on-going debate even before its inception. Arguments against the policy suggest that forcing women into these positions results in the wrong person for the wrong job. This notion has been refuted and countered by the belief that gender diversity improves firm performance. As a result, there is interest in the impact of females on firm performance and whether or not gender diversity is value added to firms.

In particular, there is an interest in examining the effects of female executives in the financial industry. A stated cause of the recent financial crisis is the breakdown in corporate governance and excessive risk taking of banks, which causes enormous financial losses as seen during the 2008 recession. To control for the excessive risk taking, there is a heightened need for banks to hire the right executives to make these high-level decisions. Several studies (Nancy and Bernasek, 1998; Niederle and Vesterlund, 2007; Croson and Gneezy, 2009) find that women are more risk averse in comparison to men in general, which may be seen as a desirable management style for

bank executives. This paper investigates the impact of female executives on the performance and risk taking of banks.

There has been much ambiguity between the relationship of gender and firm value. Several studies have suggested that the addition of females on boards have no significant impact on overall firm performance (Farrell and Hersch, 2005; Shrader et al., 1997). Farrell and Hersh (2005) find that the announcement of adding a female board member results in insignificant and abnormal returns. Consequently, the study suggests that gender diversity is not a value enhancing strategy for firms. Similarly, Shrader et al. (1997) investigate the impact of women in top management on firm performance and point out that there is no significant relationship. Alternatively, Adams and Ferreira (2009) and Ahern and Dittmar (2012) show that the percentage of female directors on the board has a negative impact on the firm value. They conclude that the negative impact is driven by the lack of high-level work experience of females and not gender itself. Different from these findings, Smith et al. (2006) and Carter et al. (2010) show a positive relationship between gender diversity and firm performance.

Studies on the relationship between the gender effect and risk taking for financial managers have also produced contrasting results. Atkinson et al. (2003) find that the risk of the portfolios managed by male and female fund managers did not differ and are almost identical in all cases. While Beck et al. (2012) show that loans screened and monitored by female loan officers are less problematic in comparison to loans handled by male loan officers. This suggests that females reduce the level of risk of banks. In support of this, Barber and Odean (2001) study the trading patterns of female and male investors and find that the overconfidence of males leads them to trade more than women, sometimes even when the net gains from the trade are negative. Sunden and Surette (1998) also show in their study that females in comparison to men are less likely to invest in risky assets such as stocks when deciding where to allocate their assets in a defined contribution plan. This suggests that females are more risk averse than men. In contrast, Berger et al. (2012) show that an increase in female board representation increases the risk taking of banks in Germany. The inclusion of a tenure variable lead the authors to suggest that this increase in risk taking may be associated with the fact that these female executives lack experience in comparison to their male colleagues. Likewise, Adams and

Funk (2012) conduct a survey on directors regarding their core values and risk attitudes and conclude that female directors are actually more risk loving than male directors.

Our study compliments the current literature by providing additional empirical evidence on how gender diversity influences firm performance and risk taking in financial industry. Furthermore, existing literature predominantly looks at the impact of board diversity on firm performance. We add to existing literature by studying females in top executive positions as opposed to female directors on boards. Moreover, the sample chosen in this study focuses exclusively on the financial firms. Therefore, this study sheds light on the policy debate of whether advancement of women into top executive roles should be part of the reforms in financial industries following the financial crises.

We investigate the impact of female executives on the performance and risk taking of banks using 2002 to 2010 bank information from the Compustat and ExecuComp databases. We use the return on asset and Tobin's Q as bank performance measure, and use z score and nonperformance asset ratio as bank risk measurements. We conduct basic ordinary list square (OLS) analyses followed by bank fixed effects panel approach, as well as an instrumental variable specification to address endogneity and missing variable problem. It is difficult to find valid instrumental variables in the context of corporate governance. Adams and Ferreira (2009) and Smith et al. (2006) both assign different instrumental variables for their study. Complimenting the current literature, we use the number of female college graduates as an instrumental variable for our gender variables.

The results of this study show that a greater fraction of females on the executive team increases bank performance. Moreover, the results suggest that female executives also decrease bank risk taking. These results are statistically significant in the instrumental variable model. Furthermore, we find that the mere presence of female executives does not have as great of an impact on bank performance and risk taking as having a balanced portion of female executives on the executive team.

The structure of the paper is as follows: The methodology and data are outlined in sections 2 and 3. Empirical results and findings are analyzed in section 4. Section 5 concludes the paper.

2. EMPIRICAL METHODOLOGY

2.1 HYPOTHESIS

The existing literature shows an ambiguous relationship between female directors and firm performance. Several studies suggest that the addition of females on boards have no significant impact on overall firm performance. Farrell and Hersh (2005) find that the announcement of adding a female board member results in insignificant abnormal returns. Consequently, the study suggests that gender diversity is not a value enhancing strategy for firms. Similarly, Shrader et al. (1997) investigate the impact of women in top management on firm performance and find that there is no significant relationship. Alternatively, Ahern and Dittmar (2010) find that the mandatory female quota has a significantly negative impact on firm value. They conclude that the negative impact is driven by the lack of high-level work experience of females and not gender itself. Likewise, Adams and Ferreira (2009) also find a negative relationship of gender diversity on firm performance for S&P1500 companies. In contrast, Smith et al. (2006) and Carter et al. (2010) find a positive relationship between gender diversity and firm performance.

Female executives could increase firm value by increasing diversity in the executive team. However, they could lead to lower firm performance if female executives have less experience than their male counterparts. The direction of the relationship is an empirical matter. Therefore, the following hypothesis is formulated:

H_1. An increase in the number of female executives will increase bank performance.

There is very limited literature that focuses on gender differences in the financial industry. Berger et al. (2012) find that an increase in female board representation increased the risk taking of banks in Germany. Alternatively, Beck et al. (2012) find that loans screened and monitored by female loan officers resulted in less delinquency and ultimately, suggest that females reduce the level of risk of banks. When analyzing investment decisions, Nancy and Bernasek (1998) find that women are significantly more risk averse than men when making financial decisions. Atkinson et al. (2003), on the other hand, find that the risk of portfolios managed by male and female fund managers are almost identical. From these mixed findings, the following hypothesis is developed:

H_2. An increase in the number of female executives will decrease bank risk taking.

2.2 MODEL SPECIFICATION

To test the hypothesis H_1, the following regression is estimated,

$$Y_{it} = \alpha_0 + \alpha_1 Female_{it} + \sum_j \beta_j X_{itj} \quad (1)$$

where *i* indexes banks and *t* indexes time. Dependent variable Y_{it} is the bank performance measure. $Female_{it}$ are measured with either the fraction of female executives or female executive dummy. The third term, X_{itj}, is *j* bank variable to control for bank specific characteristics.

To test the hypothesis H_2, the following regressions are estimated,

$$Z_{it} = \theta_0 + \theta_1 Female_{it} + \sum_k \omega_k X_{itk} \quad (2)$$

where *i* indexes banks and *t* indexes time. Dependent variable Z_{it} measures bank risk taking. Similar to regression (1), $Female_{it}$ are measured with either the fraction of female executives or female executive dummy. The third term, X_{itk}, is *k* bank variables to control for bank specific characteristics. Models (1) and (2) are also estimated with the addition of bank fixed effect to control for time constant, unobserved bank characteristics that may affect bank performance.

A concern is the reverse causality issue of bank performance and female executives. Executive females may affect bank performance, but similarly, bank performance may also dictate the number of executive females hired. Consequently, instrumental variable methods are used to address this issue. It is hypothesized that the number of female graduates by state could be a suitable instrument for the fraction of female executives and the executive female dummy. The idea behind the basis of this instrument is that the number of female graduates by state affects the number of potential female executives in a company. Jurkus et al. (2008) suggest that firms typically hire females for top management positions when there is a greater pool of potential candidates in the market. Consequently, it is expected that the larger the number of female graduates, the greater is the fraction of female executives and the presence of females on executive teams. Moreover, it is also expected that the number of female graduates by state does not affect bank performance or bank risk.

3. DATA

The sample consists of bank financial and executive data for the period 2002 to 2010. Following the bank selection criteria of Fahlenbrach and Stulz (2011), a sample of 72 bank holding companies and investment banks is chosen. 23 out of the 95 banks in Fahlenbrach and Stulz (2011) sample are eliminated due to bankruptcy or merger and acquisition. We choose firms in ExecuComp with SIC (standard industry classification) codes between 6000 and 6300, excluding codes 6282 for investment advice and 6211 for brokerage houses.

Annual bank financials are collected from the Compustat database. Executive information including gender and age is collected from the ExecuComp database. Moreover, additional data including state population from the historical US Census and the number of female graduates by state from the College Completion database from the Chronicle of Higher Education website is collected. The final sample includes data from 72 banks during the period 2002 to 2010 yielding approximately 655 observations. However due to missing and incomplete data, the actual number of observations will vary between certain variables.

For the hypothesis H_1, the main dependent variable measuring firm performance is ROA. ROA is calculated as the percentage of net income to total assets. This choice of dependent variable is commonly used in similar studies by Farrell and Hersh (2005) and Adam and Ferreira (2009). A second measure of performance used to check robustness is Tobin's Q. Tobin's Q is a market-based measure of performance and is the ratio of market value to total assets.

The explanatory variables of interest include the fraction of females on the executive team or a female dummy variable. The fraction of females on the executive team is calculated by taking the ratio of females to males on the executive team. The female dummy variable measures whether or not the executive team has a female. The fraction of females on the executive team provides a more detailed analysis in comparison to the female dummy variable because it is able to capture marginal effects of female executives whereas the dummy variable loses this impact. The comparison between these two variables could shed light on whether the mere presence of a female

and a more gender balanced executive team have similar impacts on bank performance and risk taking.

The control variables for hypothesis H_1 include bank size measured as total assets, capital asset ratio and book to market ratio. All three variables have been cited extensively in the literature as affecting firm performance. The size of the bank, measured as total assets is often used as a control variable in the analysis of financial performance (Campbell and Vera, 2008; Carter et al., 2010; Fama and French, 1992). The size of a company dictates its market power. It is expected that the larger the company, the greater the market power it has and the better it's performance (Bain, 1951). Capital asset ratio is a measure of leverage calculated as the ratio of equity to total assets. Leverage has been cited by numerous studies as an important control variable in financial performance (Campbell and Vera, 2008; Li and Tallman, 1996). Another control variable used for the performance hypothesis is the book to market ratio. The book to market ratio is calculated as the ratio of book earnings per share to market value per share. This variable is a growth measure where a lower book to market ratio is an indication of a high growth firm, greater investment opportunities and better firm performance (Coles et al., 2006).

For the hypothesis H_2, the main dependent variable measuring risk is a calculated z-score. It is commonly used in the financial literature as a measure of bank risk (Laeven and Levine, 2009). The z-score is calculated as return on assets, plus capital asset ratio divided by the standard deviation of asset returns. It indicates the number of standard deviations that a bank's ROA has to fall to become insolvent. Lower z-scores correspond to riskier banks since it is closer to becoming insolvent. Two additional risk measures used in robustness tests are the log of the z-score and the ratio of nonperforming assets to total assets. Higher nonperformance asset ratio indicates higher risk taking.

The control variables for hypothesis H_2 are average age of the executive team, state population, log of total assets, book to market ratio and capital asset ratio. The study by Berger et al. (2012) suggest that the greater the average age of an executive team, the lower is the level of risk taken by banks. The authors suggest that experience may lead executives to make less risky decisions in comparison to their younger counterparts. State population controls for the market size (Berger et al., 2012; Dick, 2007). Total assets

control for bank size because larger banks are able to absorb more risk in comparison to smaller banks. As previously mentioned, the book to market ratio is an indication of firm growth. The level of firm growth affects risk where high-growth firms have lower debt ratios. Lower debt ratios, in turn, correspond to less risk. Capital asset ratio is a measure of leverage. Bank leverage affects risk levels since higher levels of debt financing results in greater risk of bankruptcy.

Table 1 provides the descriptive statistics and correlation matrix of all variables used in the paper. Panel A of Table 1 shows the descriptive statistics. The statistics show a wide range in the profitability levels of banks. The mean ROA is .57 percentage points with a minimum value of -29.10 percentage points and a maximum value of 3.70 percentage points. There is much variability in the risk levels of US banks. The mean z-score observed is 20.95 standard deviations, with a minimum value of -2.40 standard deviations and a maximum value of 159 standard deviations. The mean fraction of female executives is 7 females for every 100 males. Moreover, the mean of the female dummy variable is .343. This shows that less than half of the companies listed have female executives. The alternative measures used for robustness tests also show much variation in the statistics.

Panel B of Table 1 provides the Pearson correlation matrix of all variables. The correlation between the two performance measures ROA and Tobin's Q is 0.59. This correlation suggests that although there is considerable common variation in the two measurements, each captures some unique information. The correlation among the three risk taking measures, z-score, log z-score, and nonperformance asset ratio have correlations of 0.78, -0.52, and -0.27 respectively. Since higher z-score and log z-score indicate lower risk, while higher nonperformance asset ratio corresponds to higher risk, the correlations between them are negative. The magnitudes of the correlations, again, reflect that each of the risk measure captures some unique information.

Table 2 compares the means of various bank characteristics between banks with and without female executives. The statistics show that banks with female executives have a higher ROA and Tobin's Q, suggesting that consistent with hypothesis H_1, females increase bank performance. Alternatively, the mean z-score, log of z-score for banks with females is lower than the mean z-score of banks without female executives.

The difference in z-score between banks with and without females is statistically significant at the 5% level. The nonperforming asset ratio is also greater for banks with female executives, though not significant. These indicate that on average, banks with female executives exhibit greater risk taking behaviour. These univariable comparisons contradict the prediction of hypothesis H_2. Although univariable analyses contain some useful information, they do not accurately reflect the true effect of gender variables. A more rigorous investigation of the relationship is provided by multivariable regressions in the next section.

4. EMPIRICAL RESULTS

4.1 EXECUTIVE GENDER AND BANK PERFORMANCE

The results of tests performed to investigate hypothesis H_1 are presented in Table 3. Columns 1 and 2 present estimation results of the basic ordinary least squares regression. The coefficient of the fraction of female executives is positive, but statistically insignificant as shown in column 1. Similarly, the executive female dummy variable is insignificant as shown in column 2. No robust conclusions can be drawn from this ordinary least squares regression.

The initial intent of including variables to control for executive qualifications including tenure, experience and education is not possible since this data is not available. Furthermore, some unobservable and time-constant bank characteristics such as corporate culture may also have an impact on bank performance. A panel data model is run in order to address endogeneity and omitted variable bias issues. Results of the bank fixed effect model are outlined in columns 3 and 4. Interestingly, once the bank fixed effect is applied, the relationship between the fraction of female executives and ROA is now significantly positive at the 1% level. As shown in column 3, an increase in the fraction of female executives by one will increase the ROA by 2.79 percentage points. Column 4 shows that the coefficient for the female executive dummy is still positively insignificant. This difference suggests that just the presence of a female executive does not have as strong of an effect as a gender balanced executive team.

The female executive variable could be correlated to the unobservable firm characteristics and render the regression the problem of endogeneity. We use an

instrumental variable (IV) model to address this problem, where the number of female graduates in a specific state is used as the instrument for female variables. The number of female graduates by state affects the number of female executives in a company. Jurkus et al. (2008) suggest that firms typically hire females for top management positions when there is a greater pool of potential candidates in the market. Moreover, it is also expected that the number of female graduates by state does not affect bank performance or bank risk. Results of the IV model are presented in columns 5 and 6, which are consistent with the findings of the bank fixed effect model. The coefficients for female variables are positively significant. Specifically, as column 5 shows, an increase in the fraction of female executives by one will increase the ROA by 65.46 percentage points, significant at the 1% level. In column 6, if there is a female executive, the ROA of the bank will increase by 16.45 percentage points, significant at the 10% level. The F statistics report the significance level of the instrument variable. The instrument variables in both model (5) and (6) show significant explanatory power at the 1% level.

Collectively, the results in Table 3 are consistent with hypothesis H_1 and suggest that a greater fraction of female executives increases bank performance. Similarly, having at least one female on the executive team also increases bank performance. Female executives may increase performance as a result of greater diversity. Greater diversity results in a broad range of perspectives, greater strategic alternatives and an increase in quality of brainstorming ideas (Kim et al., 2009). Moreover, diversity also facilitates creativity and enhances group decision-making and outcomes (Kim et al., 2009). For these reasons, it is rationalized that female executives add value to banks as a result of the benefits from diversity.

4.2 EXECUTIVE GENDER AND RISK

Results of tests performed to investigate the impact of female executives on the risk taking of banks are presented in Table 4. Columns 1 and 2 report basic OLS regression results. Both the fraction of female executives and the executive female dummy variable have insignificantly negative coefficients, which do not support hypothesis H_2.

The OLS regression might have omitted unobservable time constant bank characteristics. Bank fixed effect models are used to address the omitted variable problem. The regression results are reported in columns 3 and 4. Once the bank fixed effect is applied, the results become positively significant. These results support hypothesis H_2 by showing that female executives decrease bank risk taking. An increase in the fraction of female executives by one will increase the z-score by 7.76, significant at the 5% level. Column 4 shows that if there is a female executive on the team, then the z-score will increase by 1.40, significant at the 5% level.

Instrumental variable specification is used again to address the endogeneity problem. IV results are shown in columns 5 and 6. Results of the instrumental variable regression show a greater impact on the z-score in comparison to the bank fixed effect model. There is still a significantly positive relationship between the female executive variables and z-score. Specifically, column 5 shows that an increase in the fraction of female executives by one will now increase the z-score by 141.99, significant at the 5% level. Similarly, column 6 reports that if there is a female executive on the team, the z-score will increase by 35.16, significant at the 5% level. The F-statistics for the instrument variable are significant at the 1% level for the fraction of female executive variable and significant at the 5% level for the female executive dummy.

Collectively, the regression results support hypothesis H_2 that a greater fraction of female executives leads to less risk-taking by banks. An increase in the number of female executives will result in less risk, as the z-score increases significantly.

4.3 ROBUSTNESS TESTS

For robustness tests, three alternative dependent variables are used as bank performance and risk measures. Tobin's Q, a market-based measure of performance, is used as an alternative measure of performance. It is calculated as the ratio of market value to total assets. Results of the dependent variable Tobin's Q are reported in Table 5. The ordinary least squares regression results in column 1 show that an increase by one in the fraction of female executives will increase Tobin's Q by .066, significant at the 5% level. Column 2 reports that if there is a female executive on the executive team, Tobin's

Q will increase by .017, significant at the 10% level. When bank fixed effect are applied, the coefficients stays positively significant.

When the instrumental variable specification is used, the change in Tobin's Q has increased in comparison to the OLS regression results. Specifically, column 5 shows that an increase in the fraction of females by one will increase Tobin's Q by 2.68, significant at the 1% level. If there is a female executive on the executive team, Tobin's Q will increase by .679, significant at the 5% level, as shown in column 6. F-statistics of both IV regressions are significant at 1% levels. These findings support the results reported when using the ROA as a performance measure.

Table 6 summarizes the results of the dependent variable risk measure, log of the z-score. The ordinary least squares regression results are outlined in columns 1 and 2 show that female executives will reduce the log of z-score. An increase in the fraction of females by one will decrease the log of z-score by 1.02, significant at the 5% level. Similarly, if there is a female executive on the executive team, the log of z-score will decrease by .22, significant at the 5% level. Results of the bank fixed effect model are outlined in columns 3 and 4. When the bank fixed effect is applied, the results become positive, but not statistically significant.

When the instrumental variable specification is used, the results become positively significant. Column 5 shows that an increase in the fraction of female executives by one will increase the log of z-score by 5.49, significant at the 5% level. Similarly, if there is a female executive on the executive team, the log of z-score will increase by 1.35, significant at the 10% level. The F-statistics for the IV regression is significant at 1% level for model (5) and significant at 5% level for model (6). These findings are similar to the results of the z-score risk measure, where female executives reduce bank risk taking.

Table 7 shows the results of the final alternative risk measure, the ratio of nonperforming assets to total assets. Columns 1 and 2 outline results of the OLS regression. An increase in the fraction of female executives increases the percentage ratio of nonperforming total assets to total assets. Similarly, if there is a female executive on the team, the percentage ratio of nonperforming total assets to total assets increases. These results, however, are not statistically significant.

When bank fixed effect is applied, the relationship between the ratio of nonperforming total assets to total assets and the number of female executives becomes negative. Results are shown in columns 3 and 4. As shown, the results with the bank fixed effect are statistically insignificant.

The instrumental variable specification results are outlined in columns 5 and 6. Similar to the bank fixed effect results, the relationship between the ratio of nonperforming assets to total assets and the female executive independent variables are negative. However, the fraction of female executives is now statistically significant at the 10% level. An increase in the fraction of female executives by one will result in a 27.40% decline in the ratio of nonperforming asset total to total assets. The female executive dummy variable is still statistically insignificant in the instrumental variable specification. This again shows that the mere presence of a female executive does not have as strong of an effect on risk taking as a more gender balanced executive team. The F-statistics for the IV regressions are significant at the 5% and 10% level respectively.

5. CONCLUSION

Increasing gender diversity is a central theme for corporate reform around the world. However, the impact of female executives has been understudied to support such reform. Current literature shows mixed results on how women executives would impact firm performance and risk taking. In this paper, we provide some new evidence on the impact of female executives in the banking industry. The result of the paper not only is relevant to the gender diversity reform initiative, it also sheds light on the corporate governance reform in the financial industry following the recent financial crises.

We find that female executives increase bank performance measured by both ROA and Tobin's Q after controlling for bank specific characteristics. These results are robust after addressing endogeneity and reverse causality issues with panel regression and instrumental variable approaches. We also provide evidence that female executives decrease the risk taking of banks by increased z-score and decreased nonperformance asset ratio. These relationships are statistically insignificant with panel approach, but become statistically significant when an instrument variable is used.

An additional contribution to the literature is the finding that the estimations of the fraction of female executives yield larger and more significant effects on both the performance and risk measures in comparison to the executive female dummy. The fraction of female executives on the executive team measures the marginal effects of female executives, whereas the female executive dummy measures that a female is present on the executive team. Consequently, this finding may suggest that just the presence of a female executive is not as effective as having a more diverse or balanced executive team, as measured using the fraction variable. This has significant policy implications where it supports the argument and movement towards having more balanced gender ratios in the executive team.

FUNDING

This work was supported by Social Science and Humanities Research Council of Canada [grant number 430-2012-0698].

Table 1 Summary of statistics and correlations

Note: The return on assets equals net income divided by total assets. The z-score is measured as (capital asset ratio + return on assets)/(standard deviation of asset returns). The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market ratio is the book value per share/market price per share. Tobin's Q is the ratio of bank market value to asset total. The log of z-score is the natural logarithm of the z-score. The ratio of nonperforming assets equals nonperformance asset divided by total assets.

Panel A: Descriptive Statistics

Variable	Obs	Mean	Median	Std. Dev	Min	Max
Return on assets (%)	655	.57	1.00	1.99	-29.10	3.70
Z-score	655	20.95	15.67	22.65	-2.40	159
Fraction of females on executive team	645	.070	0	.108	0	.667
Female executive dummy	645	.343	0	.475	0	1
Capital asset ratio	655	.096	.092	.042	0	.544
Book to market ratio	648	.817	.568	1.54	.116	32.57
Total assets (millions)	655	149,109	13,825	384,369	136	3,221,972
Average age of executive team	611	54.47	54.33	4.31	42.50	70
State population (millions)	646	13.94	11.46	10.65	.551	37.25
Tobin's Q	654	.155	.155	.094	0	.584
Log Z-score	642	2.56	2.77	1.13	-4.68	5.07
Nonperforming assets ratio (%)	583	1.16	.492	1.66	.0004	10.47
Female graduates by state (thousands)	637	10,743	11,127	6,647	0	28,564

Panel B: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) ROA	1												
(2) Z-score	.241	1											
(3) Fraction of female executives	.026	-.058	1										
(4) Executive female dummy	.016	-.072	.910	1									
(5) Capital asset ratio	-.061	.502	-.049	-.041	1								
(6) Book to market ratio	-.383	-.130	-.022	-.014	.043	1							
(7) Total assets	.003	-.036	.074	.089	-.084	.041	1						
(8) Average age of executive team	.111	.131	-.126	-.138	.152	-.132	-.041	1					
(9) State population	.107	.137	.157	.134	-.055	-.066	.065	-.093	1				
(10) Tobin's Q	.595	.377	.076	.097	.329	-.458	-.174	.179	.096	1			
(11) Log Z-score	.560	.780	-.118	-.119	.3560	-.242	.067	.148	.230	.394	1		
(12) Nonperforming assets ratio	-.777	-.270	.014	.018	-.062	.441	-.041	-.154	-.091	-.542	-.515	1	
(13) Female graduates by state	-.002	.042	.146	.125	-.090	.073	.118	-.164	.893	-.107	.119	.039	1

Table 2 Mean comparisons of banks with and without female executives

Note: The return on assets is a percentage measure of net income divided by total assets. The z-score is measured as (capital asset ratio + return on assets)/(standard deviation of asset returns). The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market rati is the book value per share/market price per share. Tobin's Q is the ratio of bank market value t asset total. The log of z-score is the natural logarithm of the z-score. The ratio of nonperforming assets is the percentage measure of nonperformance asset divided by total assets. Asterisks indicate significance at 0.01(***), 0.05(**) and 0.10(*) levels. Values of t-statistics are in brackets.

	Mean for bank years with female executives (1)	Mean for bank years without female executives (2)	Difference (1) – (2)
Return on assets	.70	.48	.22 [1.31]
Z-score	18.00	22.60	-4.60*** [-2.45]
Capital asset ratio	.090	.100	-.010*** [-2.80]
Book to market ratio	.703	.886	-.183 [-1.42]
Total assets	195,223	128,530	66,693** [2.08]
Tobin's Q	.163	.150	.013* [1.69]
Log Z-score	2.37	2.66	-.291*** [-3.10]
Nonperforming assets ratio	1.25	1.14	-.110 [.723]

Table 3 Performance: The impact of female executives on bank ROA

Note The return on assets is a percentage measure of net income divided by total assets. The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market ratio is the book value per share/market price per share. Asterisks indicate significance at 0.01(***), 0.05(**) and 0.10(*) levels. Values of t-statistics are in brackets.

Independent variable	Dependent variable: Return on assets					
	OLS		Fixed Effect		IV & Fixed Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction of females on executive team	.334 [.49]		2.79*** [2.65]		65.46*** [3.00]	
Executive female dummy		.015 [.10]		.276 [1.20]		16.45* [2.60]
Capital asset ratio	-6.09*** [-3.34]	-6.18*** [-3.38]	-18.66*** [-7.12]	.187*** [.68]	-22.65** [-3.10]	-14.01** [-1.65]
Book to market ratio	-.328*** [-6.92]	-.329*** [-6.94]	-.160*** [-3.36]	-.163*** [-3.42]	-.060 [-0.44]	-.120 [-0.79]
Log(total assets)	.051 [1.23]	.050 [1.20]	.158 [0.85]	.128 [0.68]	1.52** [2.19]	1.84* [2.07]
Number of observations	638	638	638	638	620	620
F-statistics					9.71***	7.39***
p-value of F-statistics					0.002	0.007
R-squared	.104	.104	.321	.315	0.311	0.280

Table 4 Risk: The impact of female executives on z-score

Note: The z-score is measured as (capital asset ratio + return on assets)/(standard deviation of asset returns). The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market ratio is the book value per share/market price per share. Asterisks indicate significance at 0.01(***), 0.05(**) and 0.10(*) levels. Values of t-statistics are in brackets.

Independent variable	Dependent variable: Z-score					
	OLS		Fixed Effect		IV & Fixed Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction of females on executive team	-7.72 [-.97]		7.76** [2.36]		141.99** [2.46]	
Executive female dummy		-2.31 [-1.33]		1.40** [2.10]		35.16** [2.08]
Capital asset ratio	234.77*** [11.29]	234.33*** [11.29]	139.52*** [16.96]	139.88*** [16.99]	135.21*** [7.84]	142.08*** [7.00]
Book to market ratio	-2.17*** [-4.16]	-2.18*** [-4.18]	-.155 [-1.12]	-.161 [-1.16]	-.033 [-.11]	-.152 [-.44]
Log(total assets)	-.205 [-.43]	-.177 [-.37]	2.83*** [4.51]	2.79*** [4.45]	5.74*** [3.20]	5.94*** [2.71]
Average age of executives on team	.468** [2.43]	.459** [-2.23]	.197*** [2.57]	.198*** [2.59]	.030 [.17]	-.013 [-.06]
State population (millions)	.267*** [3.44]	.268*** [3.46]	.189 [0.32]	.254 [0.44]	.064 [.05]	1.66 [1.04]
Number of observations	597	597	597	597	579	579
F-statistics					7.18***	4.83**
p-value of F-statistics					0.008	0.028
R-squared	.239	.240	.961	.961	.835	.768

Table 5 Performance: The impact of female executives on bank Tobin's Q

Note: Tobin's Q is the ratio of bank market value to asset total. The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market ratio is the book value per share/market price per share. Asterisks indicate significance at 0.01(***), 0.05(**) and 0.10(*) levels. Values of t-statistics are in brackets.

Independent variable	Dependent variable: Tobin's Q					
	OLS		Fixed Effect		IV & Fixed Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction of females on executive team	.066** [2.31]		.029** [2.30]		2.68*** [2.93]	
Executive female dummy		.017*** [2.64]		.005*** [2.73]		.679** [2.79]
Capital asset ratio	.711*** [9.19]	.713*** [9.23]	.071 [.75]	.074 [.79]	-.075 [-.25]	.291 [.82]
Book to market ratio	-.020*** [-10.06]	-.020*** [-10.07]	-.014*** [-8.51]	-.014*** [-8.53]	-.011* [-1.89]	-.013** [-2.09]
Log(total assets)	-.014*** [-8.12]	-.015*** [-8.31]	-.079*** [-11.69]	-.079*** [-11.69]	-.020 [-.69]	-.005 [-.14]
Number of observations	637	637	637	637	619	619
F-statistics					9.53***	7.14***
p-value of F-statistics					0.002	0.008
R-squared	.310	.312	.632	.632	0.602	0.601

Table 6 Risk: The impact of female executives on the log of z-score

Note: The log of z-score is the natural logarithm of the z-score, where the z-score is measured as (capital asset ratio + return on assets)/(standard deviation of asset returns). The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market ratio is the book value per share/market price per share. Asterisks indicate significance at 0.01(***), 0.05(**) and 0.10(*) levels. Values of t-statistics are in brackets.

Independent variable	Dependent variable: Log of Z-score					
	OLS		Fixed Effect		IV & Fixed Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction of females on executive team	-1.02** [-2.50]		.313 [1.27]		5.49** [1.97]	
Executive female dummy		-.222** [-2.52]		.009 [.18]		1.35* [1.73]
Capital asset ratio	9.01*** [8.36]	9.01*** [8.37]	7.06*** [10.78]	7.08*** [10.80]	6.73*** [7.30]	6.91*** [6.69]
Book to market ratio	-.158*** [-5.96]	-.158*** [-5.96]	-.020* [-1.93]	-.020* [-1.95]	-.014 [-.92]	-.018 [-1.09]
Log(total assets)	.052** [2.13]	.055** [2.23]	.082* [1.74]	.076 [1.62]	.193** [2.21]	.199* [1.96]
Average age of executives on team	.029*** [-.92]	.029*** [2.93]	.012** [2.13]	.013** [2.19]	.006 [.62]	.004 [.33]
State population (millions)	.022*** [5.66]	.022 [5.60]	-.100** [-2.26]	-.099** [-2.25]	-.102* [-1.68]	-.038 [-.49]
Number of observations	590	590	590	590	572	572
F-statistics					7.58***	5.15**
p-value of F-statistics					0.006	0.024
R-squared	.210	.210	.911	.911	.8323	.7830

Table 7 Risk: The impact of female executives on nonperforming asset ratio

Note: The ratio of nonperforming assets is the percentage measure of nonperformance asset divided by total assets. The fraction of female executives is the ratio of females to the total number of executives on the executive team. Capital asset ratio is defined as total equity/total assets. The book to market ratio is the book value per share/market price per share. Asterisks indicate significance at 0.01(***), 0.05(**) and 0.10(*) levels. Values of t-statistics are in brackets.

Independent variable	Dependent variable: Nonperforming asset ratio					
	OLS		Fixed Effect		IV & Fixed Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Fraction of females on executive team	.848 [1.40]		-1.53 [-1.55]		-27.40* [-1.77]	
Executive female dummy		.159 [1.18]		-.226 [-1.11]		-.659 [-1.56]
Capital asset ratio	-6.45*** [-3.66]	-6.51*** [-3.69]	-5.92** [-2.00]	-6.20** [-2.10]	2.72 [.38]	.711 [.10]
Book to market ratio	.743*** [11.40]	.743*** [11.39]	.700*** [10.30]	.701*** [10.29]	.661*** [5.82]	.736*** [4.91]
Log(total assets)	-.085** [-2.11]	-.087** [-2.16]	.301 [1.27]	.321 [1.36]	-.333 [-.61]	-.202 [-.36]
Average age of executives on team	-.029** [-1.96]	-.029* [4.33]	-.052** [-2.31]	-.052** [-2.31]	-.066* [-1.84]	-.073* [-1.75]
State population (millions)	-.019*** [-3.23]	-.019*** [-3.18]	.611*** [3.62]	.598*** [3.52]	.730*** [2.71]	.378 [1.10]
Number of observations	531	531	531	531	531	531
F-statistics					4.54**	3.34*
P-value of F-statistics					0.034	0.068
R-squared	.253	.252	.463	.462	-	-

References

Adams, R.,B., and Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics, 94*(2), 291-309.

Adams, R. B., and Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, *58*(2), 219-235.

Ahern, Kenneth R, and Dittmar, A. K. (2012). The changing of the boards: The impact firm valuation of mandated female board representation. *The Quarterly Journal Economics, 127*(1), 137-197.

Atkinson, S. M., Samantha, B. B., and Frye, M. B. (2003). Do female mutual fund managers manage differently? *The Journal of Financial Research, 26*(1), 1-18.

Bain, J. S. (1951). *Relation of profit rate to industry concentration: American manufacturing, 1936-1940 . The Quarterly Journal of Economics*, 65(3), 293-32

Barber, B. M., and Odean, T. (2001). *Boys will be boys: Gender, overconfidence, and common stock investment . The Quarterly Journal of Economics*, 116(1), 261-29

Beck, T., Behr, P., and Guttler, A. (2012). Gender and banking: Are women better loan officers? *Review of Finance*, forthcoming

Berger, A. N., Kick, T., and Schaeck, K. (2012). Executive board composition and bank risk taking. Deutsche Bundesbank Discussion Paper.

Carter, D. A., DSouza, F., Simkins, B. J., and Simpson, W. G. (2010). The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance : An International Review, 18*(5), 396-414.

Campbell, K., and Mínguez-vera, A. (2008). Gender diversity in the boardroom and firm financial performance. *Journal of Business Ethics,83*(3), 435-451.

Catalyst, 2003. Leaders in a global economy: A study of executive women and men. Catalyst, New York.

Coles, J. L., Daniel, N. D., and Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics, 79*(2), 431-468.

Croson, R., and Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature, 47*(2), 448-474.

Dick, A. A. (2007). Market size, service quality, and competition in banking. *Journal of Money, Credit, and Banking, 39*(1), 49-81.

Fama, E. F., and French, K. R. (1992). The cross-section of expected stock returns. *Journal of Finance, 47*(2), 427-465.

Fahlenbrach, R., and Stulz, R. M. (2011). Bank CEO incentives and the credit crisis. *Journal of Financial Economics,* 99, 11-26

Farrell, K. A., and Hersch, P. L. (2005). Additions to corporate boards: The effect of gender. *Journal of Corporate Finance, 11*(1-2), 85-106.

Jurkus, A. F., Park, J. C., and Woodard, L. S. (2011). Women in top management and agency costs. *Journal of Business Research,* 64(2), 180-186

Kim, B., Burns, M. L., and Prescott, J. E. (2009). The strategic role of the board: The impact of board structure on top management team strategic action capability. *Corporate Governance : An International Review, 17*(6), 728-743.

Laeven, L., and Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics, 93*(2), 259-275.

Nancy, A. J., and Bernasek, A. (1998). Are women more risk averse? *Economic Inquiry, 36*(4), 620-630.

Niederle, M., and Vesterlund, L. (2007). Do women shy away from competition? do men compete too much? *Quarterly Journal of Economics, 122*(3), 1067-1101.

Shrader, C. B., Blackburn, V. B., and Iles, P. (1997). Women in management and firm financial performance: An exploratory study. *Journal of Managerial Issues, 9*(3), 355-372.

Smith, N., Smith, V., and Verner, M. (2006). Do women in top management affect firm performance? A panel study of 2,500 danish firms. *International Journal of Productivity and Performance Management, 55*(7), 569-593.

Sunden, A. E., and Surette, B. J. (1998). Gender differences in the allocation of assets in retirement savings plans. *The American Economic Review, 88*(2), 207-211.

Tallman, S., and Li, J. (1996). Effects of international diversity and product diversity on the performance of multinational firms. *Academy of Management Journal, 39*(1), 179-196.