

Board of Directors' Networks, Gender, and Firm Performance in a Male-Dominated Industry: Evidence from U.S. Banking

Ann L. Owen

Hamilton College

Judit Temesvary*

Federal Reserve Board

Andrew Wei

Cornell University

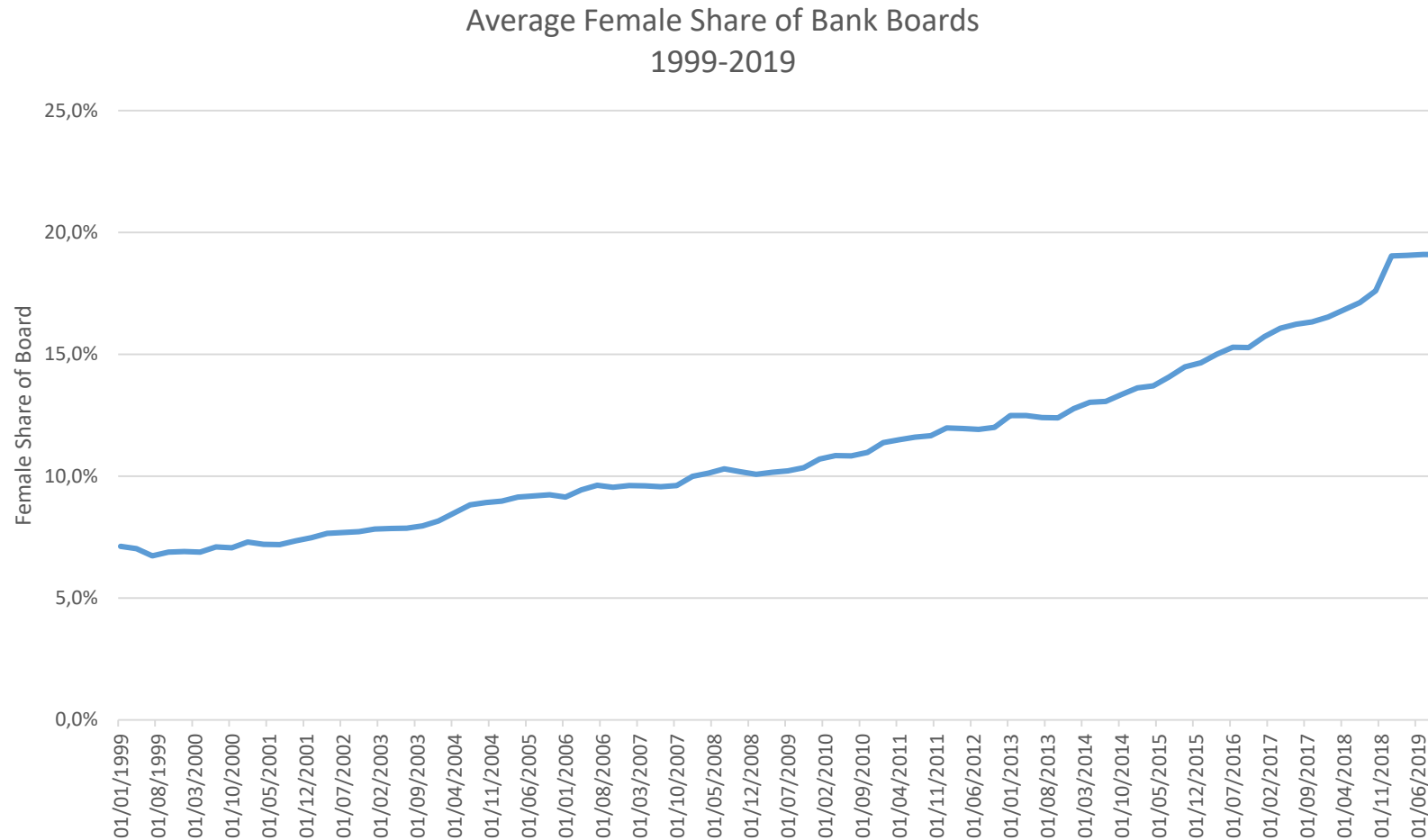
Presented by Ann Owen

March 7, 2024

5th Conference on Diversity, Equity and Inclusion in Economics, Finance, and Central Banking

*The views expressed in this paper are solely those of the authors and shall not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System.

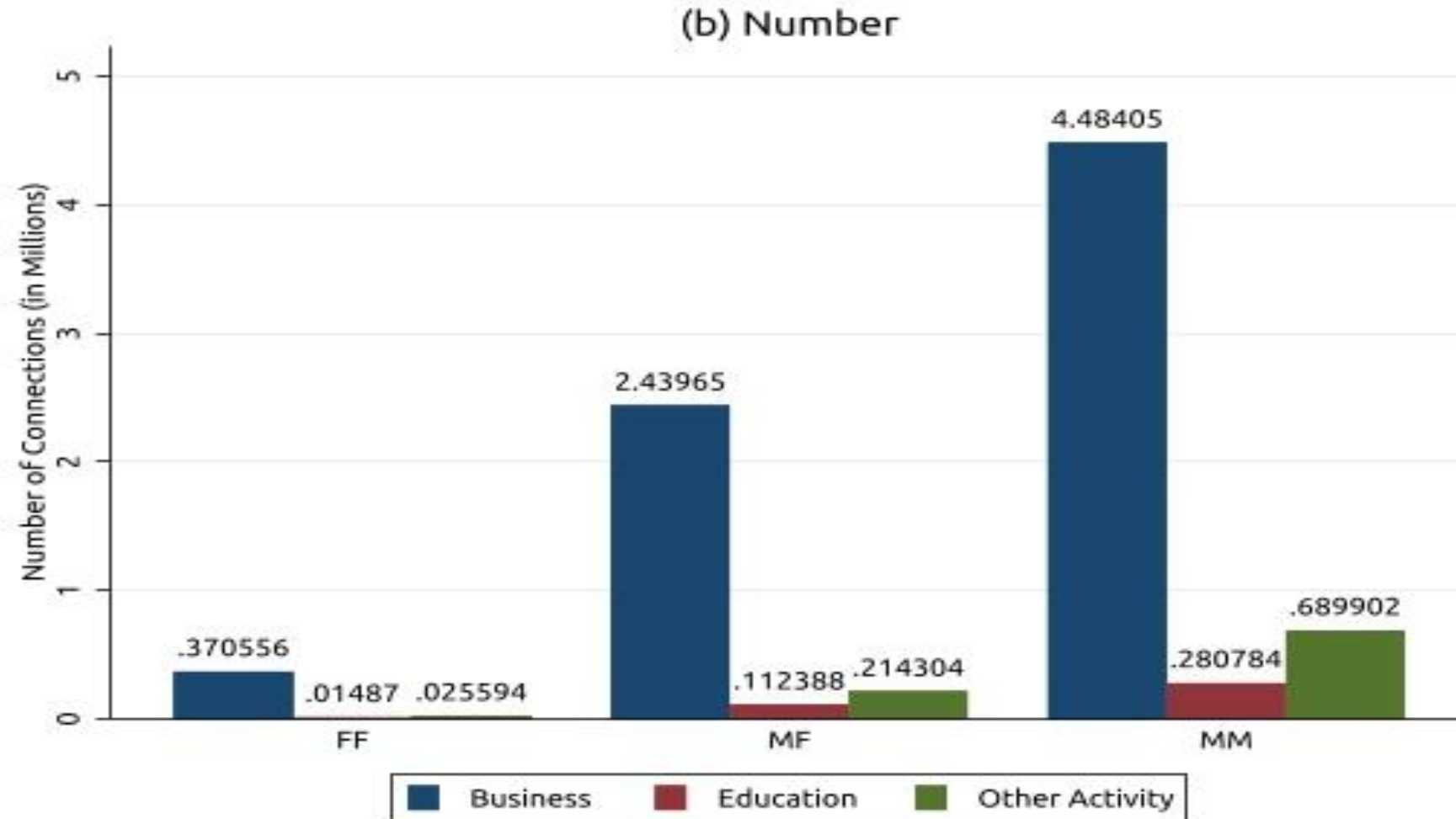
Women are underrepresented on bank boards.



Source: Boardex and Authors' calculations

Motivation

Male networks dominate the bank boardroom.



Source: Owen, Temesvary and Wei (2023)

Research Questions and Main Findings

Questions

- How do within-board networks affect bank performance?
- Is there a differential effect of connections for men and women?

Main Findings

- More broadly connected female board members improve bank performance, with connections to men having the largest effect.
- We find some evidence that exclusively male networks reduce performance.
- The impact is greatest when women's share on boards is above the median.
- Connections of women on important board committees are also associated with improved bank performance.

Why Does the Connectedness of Women Improve Bank Performance?

- Context is important: there are very few women on bank boards.
- Women who are connected to other board members in a male-dominated setting may be better integrated into the work of the board, improving the functioning of the board overall.

Related Literature

Social Networks and Firm Performance

- Within-firm connections can decrease firm performance if they encourage cronyism or reduce incentives of the board to perform its monitoring role. (Fracassi & Tate, 2012; Khanna et al, 2015)
- Connections have a positive effect if they facilitate information sharing (Zhao, 2022; Ke et al, 2018)
- Studies of existing board networks primarily study male networks. (Owen, Temesvary & Wei, 2023)

Gender diversity and team performance

- Gender diversity improves firm performance when women are integrated into the work of the board. (Owen and Temesvary, 2018; Fan et al., 2019; Green and Homroy, 2018)
- Gender diversity can have a negative effect on team performance in a male-dominated context. (Marsden, 1987; McPherson et al. 2001; Joshi and Roh, 2009)

Data Measuring Connections in Two Ways Using Boardex

1. Two directors are connected if they were at the same institution or organization at the same time prior to being on the same bank board.
2. “Weighted” measure that captures the length of director connections.

Data Measuring Connections in Two Ways Using Boardex

Table 1: Connection Types by Gender

Connection Type	Number	Percent of Total, Male Directors	Percent of Total, Female Directors
Armed Forces	37344	.66	.06
Charities	90160	1.33	1.24
Clubs	149550	2.47	1.1
Government	63390	.91	.95
Medical	21070	.31	.29
Partnership	81222	1.27	.85
Private Bank	1801116	25.53	28.13
Private Non-Bank	416898	6.18	5.63
Professional Association	402158	6.45	3.68
Quoted Bank	1710794	24.24	27.54
Quoted Non-Bank	1701633	24.54	25.53
Sporting	1230	.02	.01
Universities	403446	6.08	5

Data: Constructing Bank Level Indices of Connectedness

- Individual board member-level connection indices: Four Types of Connections:
Female-Female (FF); Female-Male (FM); Male-Female (MF); Male-Male (MM)
 - ***Female Connections = FF + FM.***
 - ***Male Connections = MF + MM.***
- Board-level connection indices: Average # of connections of board members.
- ***Female Connection Index*** = Average # of connections of female board members
- ***Female-Female Connection Index*** = Average # of connections of female board members to other female board members
- ***Female-Male Connection Index*** = Average # of connections of female board members to male board members

Data: A few key summary statistics

- 554 U.S. banks.
- Quarterly data, 1999-2019.
- 11,097 unique individuals (board members).
- Average woman is connected to 1.9 men and 0.1 women.

Data: Bank performance measures

- Data source: Call Reports and FRY-9C, Consolidated Statements for Holding Companies.
- Performance measures:
 - ***Return on Equity (ROE)***
 - ***Return on Assets (ROA)***
 - ***Net Interest Margin (NIM)***
 - ***Earnings management*** from Fan et al. (2019): The absolute value of the residual of a regression predicting loan loss reserves based on past loan losses and current delinquencies, deflated by book value of total loans.

Methodology: IV Panel & DID Estimations

- Identification challenge: Board composition is endogenous in an estimation of bank performance.
- We run IV estimations with the cumulative deaths of connected directors as an instrument for board connections. (Fracassi and Tate, 2012)
- We estimate DID models that compare bank performance before and after deaths of connected and unconnected directors.

Methodology: IV Panel Estimations

- Second stage estimation:

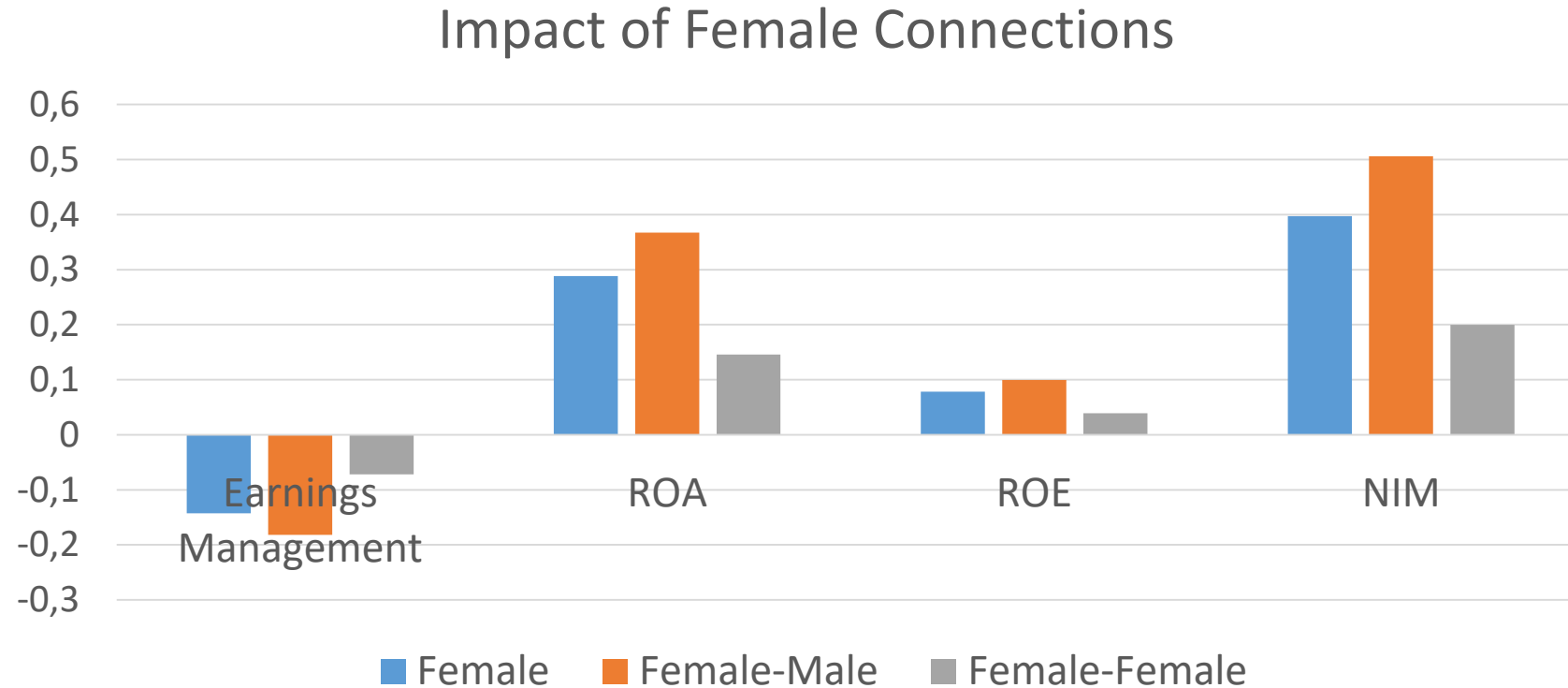
$$Y_{i,t} = \alpha_0 + \alpha_1 X_{i,t-1} + \alpha_2 Z_{i,t-1} + \alpha_3 S_{i,t-1} + \alpha_4 T_t + \alpha_5 B_i + \varepsilon_{i,t}$$

- $X_{i,t-1}$ is the one-quarter lagged value of a connection measure.
- $Z_{i,t-1}$ is a vector of the average characteristics of men and the average characteristics of women (age, grad school, bank board experience, and current bank employment).
- $S_{i,t-1}$ is a vector of balance sheet and board characteristics (Tier1 capital ratio, loan to deposit ratio, natural log of board size, and percent female).

Benchmark Results: Full Sample

VARIABLES	Earnings Management (1)	ROA (2)	ROE (3)	Net Interest Margin (4)
<i>Panel A: Impact of Female Connections</i>				
Female Connections _{t-1}	-0.000278*** (0.000101)	0.0507*** (0.00934)	0.306** (0.153)	0.0291** (0.0130)
Observations	10,175	10,912	10,912	10,912
First-Stage F-Stat	13.221	12.649	12.649	12.649
<i>Panel B: Impact of FM Connections</i>				
Female-Male Connections _{t-1}	-0.00037*** (0.000136)	0.0675*** (0.0126)	0.407** (0.206)	0.0387** (0.0175)
Observations	10,175	10,912	10,912	10,912
First-Stage F-Stat	13.732	12.943	12.943	12.649
<i>Panel C: Impact of FF Connections</i>				
Female-Female Connections _{t-1}	-0.00112*** (0.000412)	0.205*** (0.0391)	1.234** (0.607)	0.117** (0.0504)
Observations	10,175	10,912	10,912	10,912
First-Stage F-Stat	10.873	11.061	11.061	11.061
Bank FE	X	X	X	X
Year-Quarter FE	X	X	X	X

Results: Full Sample – Standardized Effects



- A one standard deviation (sd) increase in female connections decreases earnings management by 0.14 sd and increases ROA by 0.29, ROE by 0.08, and NIM by 0.40 sd.
- Banks gain the most when a female board member is connected to a man.

Selected Difference-in-Differenced (DID) Results

Dependent Variable	(1)	(2)	(3)	(4)
Window (in years)	Return on Assets [-2, +2]		Return on Equity [-2, +2]	
After	-0.0260 (0.0158)	-0.0195 (0.0158)	-0.556** (0.255)	-0.475* (0.255)
Connected to Man	-0.123*** (0.00567)	-0.108*** (0.00630)	-1.242*** (0.0645)	-1.013*** (0.1000)
Connected to Both Man & Woman	-0.268*** (0.00371)	-0.217*** (0.0112)	-3.033*** (0.0600)	-2.280*** (0.187)
After * Connected to Man	0.0598** (0.0241)	0.0510** (0.0221)	0.859*** (0.274)	0.733*** (0.276)
After * Connected to Both Man & Woman	-0.0733*** (0.0158)	-0.0872*** (0.0152)	-0.655** (0.255)	-0.860*** (0.236)
Tier 1 Capital		-0.0507*** (0.0124)		-0.781*** (0.236)
Ln(Assets)		-0.115*** (0.0354)		-1.663*** (0.535)
Leverage Ratio		0.0854*** (0.0213)		1.322*** (0.407)
Constant	0.182*** (0.00363)	1.483*** (0.478)	1.686*** (0.0593)	19.24** (7.743)
Bank FE	X	X	X	X
Observations	4,062	4,062	3,977	3,977
R-squared	0.334	0.348	0.342	0.361

Selected DID Results

- Connected directors whose death we ultimately record in our data are at banks with worse performance.
- After the death of a male director who was only connected to men, the bank has improved performance.
- After the death of a male director who was connected to both men and women, the bank has worse performance.
- These findings corroborate the conclusions from our IV estimations:
 - The gender of network connections matters
 - Male-Female connections are valuable
- Men who are connected to women “bridge” directors of different genders

Summary and Conclusion

- Better connected female directors are associated with higher profitability and better governance in the banking industry.
 - Additional connections of women to male directors are particularly valuable.
- DID estimations suggest exclusively male networks reduce performance.
- The results are consistent with the interpretation that connections help female board members gain influence.
- Results highlight the importance of considering the gender of networks when examining their impact.

Appendix: Summary Statistics

VARIABLES	N	Mean	SD	P10	P25	P50	P75	P90
<i>Male Characteristics</i>								
Age	69,229	57.40	8.100	46	52.50	58.67	63	66.50
Grad School	58,507	0.410	0.340	0	0	0.400	0.667	1
Bank Board Experience	69,367	9.492	5.350	2.750	5.650	9.231	12.75	16.18
Current Bank Employment	69,399	1.596	0.476	1	1.100	1.667	2	2
<i>Female Characteristics</i>								
Age	28,908	57.91	8.254	47	53	58	63	68
Grad School	18,891	0.485	0.452	0	0	0.500	1	1
Bank Board Experience	29,141	8.051	5.941	1.375	3.500	6.917	11.50	16.25
Current Bank Employment	29,221	1.627	0.546	1	1	2	2	2
<i>Bank Characteristics</i>								
Tier1 Capital Ratio	22,559	12.43	6.330	9.410	10.43	11.79	13.48	15.88
Loan to Deposits Ratio	22,558	1.091	0.263	0.820	0.954	1.088	1.224	1.358
Ln(Board Size)	70,972	1.683	0.863	0	1.099	1.946	2.303	2.639
Percent Female	70,312	0.0858	0.140	0	0	0	0.143	0.250
<i>Connection Measures</i>								
Female Connections	29,909	1.967	2.652	0	0	1	3	6
FM Connections	29,909	1.861	2.537	0	0	1	3	6
FF Connections	29,909	0.106	0.331	0	0	0	0	0.500
Male Connections	69,737	1.375	2.056	0	0	0.600	1.857	4
MF Connections	69,737	0.155	0.378	0	0	0	0.0667	0.625
MM Connections	69,737	1.220	1.849	0	0	0.500	1.625	3.562
<i>Bank Performance Measures</i>								
Earnings Management	19,959	0.00246	0.00516	0.000313	0.000733	0.00138	0.00222	0.00437
Return on Assets	22,559	0.166	0.466	0.00398	0.149	0.237	0.305	0.377
Return on Equity	22,559	1.250	10.39	0.0402	1.404	2.221	2.934	3.703
Net Interest Margin	22,558	0.933	0.194	0.743	0.829	0.917	1.016	1.143
Stock Price Growth	37,755	0.239	26.35	-32.73	-10.06	0.813	10.42	29.95

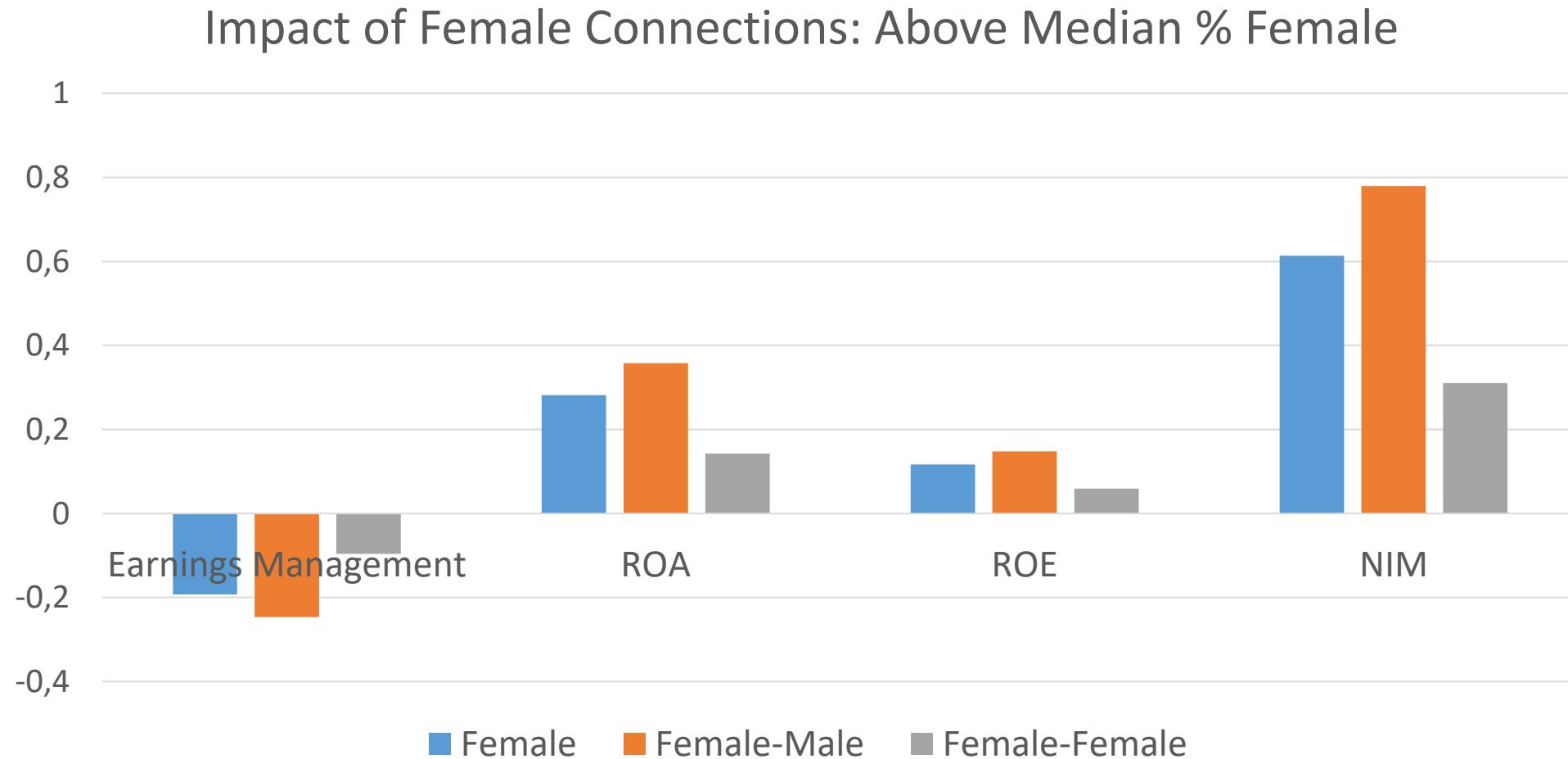
Appendix: First Stage Results

2 nd Stage Dependent Var.	Earnings Management	ROA	ROE	Net Interest Margin
1 st Stage Dependent Var.	Fem Conn	Fem Conn	Fem Conn	Fem Conn
VARIABLES	(1)	(2)	(3)	(4)
Female Deaths	-3.289*** (0.905)	-3.597*** (1.011)	-3.597*** (1.011)	-3.597*** (1.011)
Observations	10,175	10,912	10,912	10,912
F-Stat	13.221	12.649	12.649	12.649
FM Deaths	-2.473*** (0.667)	-2.705*** (0.752)	-2.705*** (0.752)	-2.705*** (0.752)
Observations	10,175	10,912	10,912	10,912
F-Stat	13.732	12.649	12.649	12.649
FF Deaths	-0.816*** (0.247)	-0.892*** (0.268)	-0.892*** (0.268)	-0.892*** (0.268)
Observations	10,175	10,912	10,912	10,912
F-Stat	10.873	11.061	11.061	11.061

Split Sample – Boards with Above-Median Female Share

VARIABLES	<u>Above Median % Female, Bank Level</u>			
	Earnings Management (1)	ROA (2)	ROE (3)	Net Interest Margin (4)
<i>Panel A: Impact of Female Connections</i>				
Female Connections _{t-1}	-0.000375*** (9.16e-05)	0.0495*** (0.00854)	0.456*** (0.110)	0.0449*** (0.00557)
Observations	5,620	6,010	6,010	6,010
First-Stage F-Stat	207.482	261.138	261.138	261.138
<i>Panel B: Impact of FM Connections</i>				
Female-Male Connections _{t-1}	-0.000501*** (0.000123)	0.0657*** (0.0114)	0.605*** (0.146)	0.0596*** (0.00751)
Observations	5,620	6,010	6,010	6,010
First-Stage F-Stat	175.563	218.633	218.633	218.633
<i>Panel C: Impact of FF Connections</i>				
Female-Female Connections _{t-1}	-0.00150*** (0.000367)	0.201*** (0.0349)	1.847*** (0.452)	0.182*** (0.0233)
Observations	5,620	6,010	6,010	6,010
First-Stage F-Stat	207.344	251.839	251.839	251.839

Split Sample – Standardized Effects



- Results are driven by the role of connections on boards with above-median shares of women
- No evidence of performance effects of connections for boards with below-median shares.

Weighted Conn.: Above-median % Female Effects Stronger

VARIABLES	Earnings Management	ROA	ROE	Net Interest Margin
<i>Panel A: Impact of Female Connections</i>				
Female Connections _{t-1}	-0.000249*** (6.27e-05)	0.0370*** (0.00720)	0.341*** (0.0871)	0.0336*** (0.00542)
Observations	5,620	6,010	6,010	6,010
First-Stage F-Stat	91.758	83.933	83.933	83.933
<i>Panel B: Impact of FM Connections</i>				
Female-Male Connections _{t-1}	-0.000327*** (8.45e-05)	0.0493*** (0.01000)	0.454*** (0.118)	0.0447*** (0.00795)
Observations	5,620	6,010	6,010	6,010
First-Stage F-Stat	67.636	59.353	59.353	59.353
<i>Panel C: Impact of FF Connections</i>				
Female-Female Connections _{t-1}	-0.00104*** (0.000268)	0.149*** (0.0304)	1.370*** (0.365)	0.135*** (0.0207)
Observations	5,620	6,010	6,010	6,010
First-Stage F-Stat	83.535	88.107	88.107	88.107

Connections of Male Directors Do Not Affect Performance

VARIABLES	Earnings Management (1)	ROA (2)	ROE (3)	Net Interest Margin (4)
<i>Panel A: Impact of Male Connections</i>				
Male Connections _{t-1}	0.000795 (0.00193)	-0.257 (0.473)	-3.176 (5.893)	-0.0734 (0.169)
Observations	10,230	10,971	10,971	10,971
First-Stage F-Stat	.229	.265	.265	.265
<i>Panel B: Impact of MF Connections</i>				
Male-Female Connections _{t-1}	0.0124 (0.0570)	-0.377 (1.052)	-6.671 (18.64)	-0.183 (0.864)
Observations	10,230	10,971	10,971	10,971
First-Stage F-Stat	.019	.057	.057	.057
<i>Panel C: Impact of MM Connections</i>				
Male-Male Connections _{t-1}	0.000149 (0.00145)	-0.139 (0.176)	-1.200 (1.682)	-0.0650 (0.100)
Observations	10,230	10,971	10,971	10,971
First-Stage F-Stat	.632	.632	.632	.632

Boards with Below-median Female Share Show No Connection Effects

VARIABLES	<u>Below Median % Female, Bank Level</u>			
	Earnings Management (5)	ROA (6)	ROE (7)	Net Interest Margin (8)
<i>Panel A: Impact of Female Connections</i>				
Female Connections _{t-1}	-0.000147 (0.000503)	0.0512 (0.0378)	-0.320 (0.532)	0.0421** (0.0170)
Observations	4,555	4,902	4,902	4,902
First-Stage F-Stat	23.676	22.98	22.98	22.98
<i>Panel B: Impact of FM Connections</i>				
Female-Male Connections _{t-1}	-0.000192 (0.000659)	0.0675 (0.0511)	-0.422 (0.705)	0.0555** (0.0243)
Observations	4,555	4,902	4,902	4,902
First-Stage F-Stat	15.777	15.125	15.125	15.125
<i>Panel C: Impact of FF Connections</i>				
Female-Female Connections _{t-1}	-0.000626 (0.00214)	0.212 (0.152)	-1.322 (2.191)	0.174*** (0.0601)
Observations	4,555	4,902	4,902	4,902
First-Stage F-Stat	47.536	50.918	50.918	50.918