Do Female CEOs and Chairwomen Constrain Bank Risk-Taking? Evidence from the Financial Crisis[☆]

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Abstract

This paper examines whether female Chief Executive Officers (CEO) and Chairwomen constrain bank risk-taking. Using a large panel of U.S. commercial banks, we document that banks with female CEOs hold higher levels of equity capital. Furthermore, while neither CEO nor Chair gender is related to bank failure in general, we find strong evidence that smaller banks with female CEOs or Chairwomen were less likely to fail during the financial crisis. Overall, our findings are consistent with the view that gender-based differences in risk tolerance may affect corporate decisions.

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1. Introduction

> "Maleness has become a synonym for insufficient attentiveness to risk."
> (Christopher Caldwell in *Time*, 2009, Vol. 174, No. 7, p. 13)

Women and men often act and behave differently. Gender-based behavioral differences have been widely documented in the cognitive psychology and behavioral economics literature, and are perceived to be related to information processing, diligence, conservatism, overconfidence, and risk tolerance (see e.g., Levin et al., 1988; Feingold, 1994; Powell and Ansic, 1997; Byrnes, Miller and Schafer, 1999; Costa, Terracciano and McCrae, 2001; Eckel and Grossman 2002; Nettle 2007; Schmitt, Realo, Voracek and Allik, 2008; Croson and Gneezy, 2009). In this paper, we presume that the gender-based behavioral differences between women and men are reflected in the decisions that top executives and directors make, and therefore may influence the firm's business strategies and governance and monitoring practices.[1] More specifically, given that women are generally more conservative, less overconfident, and less inclined to take extreme risks, we postulate that female executives and directors may better perceive potential biases in strategy formulation and risk assessments, and ultimately, constrain excessive risk-taking by their firms.

The purpose of this paper is to investigate whether female Chief Executive Officers (CEOs) and Chairwomen constrain risk-taking in commercial banks. In particular, we exploit a large panel of U.S. commercial banks to empirically examine the association between the gender of the bank's top executives and its capital ratios and default risk during the recent financial

[1] Considerable empirical evidence suggests that the characteristics of individual executives may affect corporate decisions and performance (see e.g., Bertrand and Schoar, 2003; Malmendier and Tate, 2005; Malmendier, Tate and Yan, 2011; Arena and Braga-Alves, 2013; Graham, Harvey and Puri, 2013).

crisis. Since the financial crisis has been often attributed to excessive risk-taking by banks, and was characterized by numerous bank failures and bailouts, we consider this period of severe financial turmoil to provide a convenient setting to examine the potential effects of female executives and directors on risk-taking in the banking industry. If the documented gender-based differences in conservatism and risk aversion influence the bank's business strategies, product compositions, and loan pricing decisions, we should observe that the banks with female CEOs and Chairwomen are associated with higher capital ratios and lower default risk amidst the financial crisis. While we expect banks with female CEOs and Chairwomen to make more conservative decisions and to hold higher levels of equity capital also outside the crisis periods, such actions are less likely to have negative consequences because risky investments are less prone to go bad in good times. Therefore, to the extent that bank conservatism reduces the likelihood of bank failure, the effect is more likely observed in the crisis period and, consequently, our analysis focuses on the years surrounding the recent financial crisis.

The implications of gender-based behavioral differences for financial decisions-making have received increasing attention in the literature over the last ten years. In general, the prior literature suggests that women are more conservative and risk averse than men, and exhibit less risky behavior in financial decisions. Levin et al. (1988), Johnson and Powell (1994), Powell and Ansic (1997), Eckell and Grossman (2002), Gysler, Brown Kruse and Schubert (2002), and Fehr-Duda, de Gennaro and Schubert (2006) conduct experiments to examine gender differences in financial decisions, and report that women try to avoid losses and are more cautious and less overconfident in taking risks.[2] Gender differences in conservatism, risk tolerance, and

[2] Croson and Gneezy (2009) provide a comprehensive review of gender differences in economic experiments.

overconfidence have also been documented to affect real financial decisions in a natural environment. Jianakoplos and Bernasek (1998), Sunden and Surette (1998), Barber and Odean (2001), Dwyer, Gilkeson and List (2002), Agnew, Balduzzi and Sunden (2003), and Watson and McNaughton (2007) analyze household investment portfolios and retirement accounts. In brief, the results of these empirical studies indicate that women hold less risky portfolios, follow more conservative investment styles, and trade less frequently than men.

Furthermore, previous studies indicate that the behavioral differences between women and men may affect financial decisions also in a professional setting. Atkinson, Baird and Frye (2003) and Niessen-Ruenzi and Ruenzi (2011) examine whether the gender of mutual fund managers influences the performance and risk characteristics of the funds. Using a sample of U.S. fixed-income funds, Atkinson et al. (2003) do not find any significant differences between female and male fund managers in investment behavior and fund performance. Niessen-Ruenzi and Ruenzi (2011), in contrast, document that female equity fund managers are more risk averse, follow less extreme investment strategies, and trade less than male fund managers. Bellucci, Borisov and Zazzaro (2010) and Beck, Behr and Guttler (2013) investigate the implications of gender differences in banking context. Bellucci et al. (2010) find that female loan officers are more risk averse than male officers and constrain credit availability to new borrowers. Beck at al. (2013) compare loan decisions made by female and male loan officers, and report that the loans handled by female officers have significantly lower default rates.

Krishnan and Parsons (2008), Barua, Davidson, Rama and Thiruvadi (2010), Elsaid and Ursel (2011), Faccio, Marchica and Mura (2012), and Huang and Kisgen (2013) focus on effects

of female executives and senior managers on corporate decisions and outcomes.[3] The findings reported in Krishnan and Parsons (2008) and Barua et al. (2010) indicate that firms with female executives and top managers make more cautious and conservative decisions with respect to financial reporting practices. Huang and Kisgen (2013) document that firms with female CEOs and CFOs are less likely to make acquisitions and less likely to issue debt than male-led firms. Most related to our study, Elsaid and Ursel (2011) and Faccio et al. (2012) examine the influence of female CEOs on firm risk-taking. Elsaid and Ursel (2011) document that firm-level risk-taking decreases after appointments of female CEOs, while Faccio et al. (2012) report that firms run by female CEOs make less risky financing and investment decisions.

Given the central role of banks in the financial crisis, it is not surprising that several studies have recently focused on the relationships between bank performance, governance mechanisms, and risk-taking at the onset and during the crisis. Beltratti and Stulz (2012) examine bank stock returns in the midst of the market turmoil. They document that larger banks with shareholder-friendly boards, lower capital ratios, and lower amounts of deposits had the lowest stock returns over the period from July 2008 to December 2009. Dietrich and Wanzenried (2011) investigate the profitability of Swiss commercial banks around the crisis. Their findings indicate that bank profitability in the midst of the crisis is negatively associated with bank size and the amount of loan loss provisions and is positively related to the level of income diversification, growth rate of lending activities, and state ownership. Altunbas, Manganelli and Marques-Ibanez (2011) and

[3] Several studies have recently examined the relationship between firm performance and gender diversity on the board of directors. The empirical evidence on the effects of female directors is mixed. While Carter, Simkins and Simpson (2003), Erhardt, Werbel and Shrader (2003), and Campbell and Minguez-Vera (2008), Anderson, Reeb, Upadhyay and Zhao (2011) document that gender diversity may have positive effects on profitability and market valuation, the results of Rose (2007) and Adams and Ferreira (2009), Ahern and Dittmar (2012) indicate that effect of female directors on firm performance is insignificant, or even negative.

Cole and White (2012) focus on the relationship between bank characteristics and realized bank distress during the crisis. Using a large panel of U.S. and European banks, Altunbas et al. (2011) find that smaller banks with higher capital ratios, larger deposit base, and more income diversification were less distressed during the crisis. In a similar vein, Cole and White (2012) document that banks with higher capital ratios, better asset quality and liquidity, higher earnings, and lower amounts of real estate loans were less likely to fail in 2009.

Fortin, Goldberg and Roth (2010), in turn, analyze bank risk-taking at the onset of the financial crisis, and report that banks with powerful CEOs who have high base salaries were associated with lower risk-taking before the outbreak of the crisis. The association between CEO stock ownership and compensation incentives and bank performance is examined in Fahlenbrach and Stulz (2011). Their results suggest that the worst-performing banks had larger CEO ownership, and that the performance of banks amidst the crisis is unrelated to managerial option compensation and cash bonuses. Finally, Erkens, Hung and Matos (2012), Peni and Vahamaa (2012), and Aebi, Sabato and Schmid (2012) investigate the effects of corporate governance mechanisms on bank performance during the crisis. Erkens et al. (2012) document that banks with more independent boards and larger institutional ownership had lower stock returns, while Peni and Vahamaa (2012) find that banks with strong corporate governance practices had lower stock market valuations amidst the crisis. The results of Erkens et al. (2012) and Peni and Vahamaa (2012) also indicate that banks with strong corporate governance attributes were associated with higher risk-taking and lower capital ratios at the onset of the financial crisis. Aebi et al. (2012) document that governance mechanisms related to risk management had positive effects on bank stock returns amidst the crisis. In this paper, we aim to extend the above

literature by examining the association between female CEOs, Chairwomen, and bank risk-taking during the financial crisis.

The empirical findings reported in this paper demonstrate that the behavioral differences between women and men may have important implications for corporate decisions and outcomes. Specifically, using a large panel of U.S. commercial banks from 2007 to 2010, we find considerable evidence to suggest that female executives and directors may constrain risk-taking in the banking industry. Our results indicate that banks with female CEOs are more conservative and hold higher levels of equity capital. Furthermore, we document a negative association between female CEOs and Chairwomen and bank failures during the crisis. Although neither CEO nor Chair gender is related to bank failure in general, we find strong evidence that smaller banks with female CEOs and board Chairs were less likely to fail during the financial crisis. We utilize instrumental variable regressions and propensity score matching to address endogeneity concerns, and conduct a number of additional tests to ascertain the robustness of our results. These tests give further evidence that banks with female CEOs and board Chairs are associated with less risk-taking. Overall, the empirical findings are consistent with our research hypothesis, and provide support for the view that female executives and directors may inherently promote more conservative business strategies and less risky investment decisions.

The rest of this paper proceeds in the following manner. Section 2 describes the data on U.S. commercial banks and presents the methodology used in the analysis. Section 3 reports our empirical findings on the effects of female CEOs and Chairwomen on bank risk-taking. Finally, Section 4 summarizes the results and provides concluding remarks.

2. Data and methodology

2.1. Data

The data used in the empirical analysis consist of U.S. commercial banks. We collect data on the gender of bank Chief Executive Officers and Chairpersons of the Board of Directors, as well as data on balance sheets and income statements of individual banks. After excluding banks with unavailable gender data or insufficient financial data, we obtain a sample of 6,729 commercial banks and an unbalanced panel of 22,978 bank-year observations for the fiscal years 2007–2010. This sample includes a substantial proportion of U.S. banks and contains private as well as publicly traded commercial banks. Our sample period covers the fiscal years around the financial crisis and is characterized by numerous bank failures and bailouts.

The data on the gender of bank CEOs and board Chairs are collected from SNL Financial. At a given point in time, SNL Financial provides the names of the current CEOs and board Chairs for commercial banks. However, they do not provide historical data on executive and director names from which panel data-sets could be constructed, and therefore, we have utilized historical snapshots of SNL Financial data as recorded in the end of June of each individual year. For each bank and for each fiscal year, we manually determine the gender of the bank's CEO and Chairperson of the board based on their names. In the case of unisex names, it was required that at least 80 percent of the name holders were of a particular gender in order to include the CEO or board Chair in the sample.[4] Unclear cases, such as names of foreign origin, were excluded from

[4] The unclear names were coded to females and males based on http://www.genderchecker.com and http://www.nameplayground.com. The latter website provides percentages for the popularity of a given name in the

the sample. The financial data for the banks are obtained from the statements of income and condition (i.e. bank call reports). These statements are statutory for U.S. commercial banks and are collected by the Federal Deposit Insurance Corporation (FDIC). These data are publicly available on a quarterly basis from the Federal Financial Institutions Examination Council (FFIEC).

2.2. The empirical setup

Our empirical approach is two-fold. First, we examine the association between female CEOs, Chairwomen, and bank capital levels. The amount of equity capital is a central element in bank supervision and regulation as it is the predominant factor in reducing insolvency risk. Consistent with this view, Berger and Bouwman (2013) document that capital helps banks survive during financial crises and is particularly important for smaller banks at all times. Hence, we postulate that if the gender-based differences in conservatism and risk aversion affect firm-level decisions, banks with female CEOs and Chairwomen should hold higher level of equity capital, holding risk and other attributes constant. We examine the association between capital ratios and the gender of the bank's top executives by estimating alternative versions of the following panel regression specification:

$$\begin{aligned} Capital_{j,t} = {} & \alpha + \beta_1 Female_{j,t} + \beta_{2-13}(Bank\text{-}specific\ controls)_{j,t} \\ & + \beta_{14-15}(State\text{-}specific\ controls)_{j,t} + \beta_{16-18}(Year\ dummies)_{j,t} + \varepsilon_{j,t} \end{aligned} \quad (1)$$

U.S. in both genders. For instance, 39.7 percent of individuals named Pat are males and 60.3 percent are females, and consequently, CEOs and board Chairs named Pat were excluded from the sample.

where the dependent variable $Capital_{j,t}$ is one of two alternative capital measures for bank j at time t. Our first measure of bank capital is the *Tier-1 capital*, which is measured as Tier-1 capital scaled by total assets less disallowed intangibles. The second capital measure is *Capital ratio*, measured as the ratio of the bank's total equity capital to total assets.

Second, we exploit bank failures as an *ex post* measure of excessive risk-taking. To empirically examine the association between female CEOs, Chairwomen, and bank failures, we estimate several alternative logistic panel regression specifications of the following form:

$$\begin{aligned} Failure_{j,t} = {} & \alpha + \beta_1 Female_{j,t} + \beta_2 Capital_{j,t} + \beta_{3\text{–}14}(Bank\text{-}specific\ controls)_{j,t} \\ & + \beta_{15\text{–}16}(State\text{-}specific\ controls)_{j,t} + \beta_{17\text{–}19}(Year\ dummies)_{j,t} + \varepsilon_{j,t} \end{aligned} \tag{2}$$

where the dependent variable $Failure_{j,t}$ is defined as a binary variable which equals one at time t for banks that fail within one year.[5] We identify bank failures based on the FDIC list of bank failures and assistance actions.

The test variable of interest in Equations (1) and (2) is *Female*, which is defined as one of the following alternative female dummies: (i) *Female CEO* is a dummy variable which equals one for banks that have a female CEO, (ii) *Female Chair* equals one if the bank's Chairperson of the Board of Directors is a female, and (iii) *Female CEO or Chair* is assigned to one if either the CEO or the board Chair of the bank is a female. We estimate alternative regression specifications in which the three different female executive variables are used one at a time, as well as specifications in which *Female CEO* and *Female Chair* are used simultaneously.

We include several bank-specific as well as state-specific control variables in our regressions. In particular, we control for size, growth, and organizational/ownership

[5] Given this definition, we use bank failures from January 2008 to December 2011 in our empirical analysis.

characteristics of the bank. Furthermore, we attempt to control for the financial condition and riskiness of the bank's loan portfolio by including proxies for delinquency, liquidity, profitability, insured deposits, and core deposits in the regressions. The following twelve bank-specific control variables are used in the regressions: *Size* is measured as the logarithm of total assets, *Large bank* is a dummy variable for banks with above median total assets, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio which is measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits* is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income at time *t* divided by total assets at time *t*–1, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter S* is assigned to one for closely held banks that are organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, and *Dual* is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual. In the regressions with *Failure* as the dependent variable, we also include *Capital ratio* as an additional bank-specific control variable.

We control for state-specific macroeconomic effects and local market conditions by including the state unemployment rate *Unemployment* and the state per-capita income *PCI* as additional control variables in the regressions. Finally, we control for potential time fixed-effects with fiscal year dummy variables.[6] Throughout the regressions, we use robust standard errors which are adjusted for clustering by bank.

[6] We are unable to estimate regression specifications with bank fixed-effects because our female dummy variables remain unchanged over time for most banks, thereby leading to almost perfect collinearity with bank fixed-effects.

The control variables used in the regressions are selected based on the prior literature. Bank size is perhaps the most important control variable because different-sized banks may have very different business strategies, product compositions, and governance structures. Larger banks have been suggested to hold less equity capital and to be engaged in more risky operations (Jokipii and Milne, 2011; Bhagat, Bolton and Lu, 2013). Moreover, bank size may surrogate for numerous omitted variables in empirical analysis. The growth rate of loans proxies for bank growth. Foos, Norden and Weber (2010) and Schaeck and Cihak (2013) show that the growth rate of the bank is an important determinant of riskiness. *Core deposits*, *Insured deposits*, *Liquidity*, and *Delinquent loans* measure the stability of the bank's funding structure and the quality of the loan portfolio. These variables reflect funding and lending risks and are known to be correlated with bank performance amidst the financial crisis (Dietrich and Wanzenried, 2011; Altunbas et al., 2011; Beltratti and Stulz, 2012; Cole and White, 2012).

Public, *Subchapter S*, and *MBHC* dummies control for the organizational and ownership structure of the bank. Previous studies have documented that these variables may affect firm-level decisions and governance structures (see e.g., Depken, Hollans and Swidler, 2010; Holod, 2012; Berger and Bouwman, 2013; Cole and Mehran, 2013). Given that local macroeconomic developments are strongly correlated with bank performance and bank failures (Laeven and Levine, 2009; Aubuchon and Wheelock, 2010; Altunbas et al., 2011; Schaeck and Cihak, 2013), we include *Unemployment* and *PCI* to control for local economic conditions. Finally, we include *Capital ratio* as a control variable in the bank failure regressions because banks with more equity capital are less likely to fail (see e.g., Kolari, Glennon, Shin and Caputo, 2002; Cole and White, 2012; Berger and Bouwman, 2013).

2.3. Descriptive statistics

Table 1 reports the descriptive statistics for the variables used in the empirical analysis. We report the descriptives for the three different female variables, for the three alternative measures of bank risk-taking, and for the bank- and state-specific control variables. As can be noted from Table 1, female CEOs and board Chairs are relatively uncommon in the U.S. commercial banks. Only about 5.4 percent of the banks (1248 firm-year observations) included in our sample have a female CEO, and about 5.7 percent of the banks (1319 firm-year observations) have a female as the Chairperson of the Board of Directors. Nevertheless, it should be noted that these low percentages of female CEOs and board Chairs in commercial banks are consistent with the previously documented substantial underrepresentation of women among top executives and directors in non-financial firms (see e.g., Krishnan and Park, 2005; Adams and Ferreira, 2009; Jurkus, Park and Woodard, 2011; Faccio et al., 2012; Huang and Kisgen, 2013). Regarding our capital measures, it can be noted from Table 1 that U.S. commercial banks are, on average, well-capitalized with a mean (median) Tier-1 capital ratio of about 10.1 (9.2) percent. Correspondingly, the mean (median) equity to total assets ratio is 10.6 (9.7) percent. However, the financial strength of the banks varies considerably with Tier-1 capital ratios ranging from a minimum of zero to a maximum of 96.8 percent. Our four-year sample contains 270 observations of banks failing within the next year, representing approximately 1.2 percent of the bank-year observations.[7]

(insert Table 1 about here)

[7] The gender and financial data cover years 2007-2010 and we use bank failures during years 2008-2011 in our tests.

Table 1 further shows that the banks included in the sample are very heterogeneous in terms of size, loan growth, profitability, and the proportion of delinquent loans. Given that our sample includes large publicly traded "systemically important financial institutions" as well as very small private commercial banks, it is not surprising to observe that bank size exhibits considerable variation with the logarithm of total assets ranging from 6.91 ($8.10 million) to 21.28 ($1.91 trillion). The mean (median) return on assets for the banks in our sample is only 0.6 (0.8) percent, reflecting the severe impact of the financial crisis on bank profitability. The proportion of delinquent loans to total loans varies from zero to 32.7 percent, with a mean (median) of 1.6 (0.8) percent. In about 35 percent of our sample banks, the same individual holds the CEO and board chair positions (CEO-Chair duality). Finally, it can be noted from Table 1 that approximately 21 percent of the banks are publicly traded, about 35 percent are subchapter-S banks, and that almost 20 percent of the banks are affiliated with a multibank holding company.

(insert Table 2 about here)

Pairwise correlations among the variables used in the regressions are reported in Table 2. Consistent with our research hypothesis, the three female dummy variables are positively correlated with *Tier-1 capital* and *Capital ratio* and negatively correlated with *Bank failure*, suggesting that banks with female CEOs and Chairs are associated with lower levels of risk-taking. Nevertheless, the negative correlations between the female dummies and *Bank failure* are rather weak. The female variables are also negatively correlated with *Size*, *Dual*, and *Public*, indicating that female CEOs and Chairs are more common in smaller, private banks, and moreover, that female CEOs are less likely to simultaneously hold the position of the board

Chair of the same bank. It can be also noted from the table that the female dummies are positively correlated with *Liquidity* and *Insured deposits*, both of which can be interpreted as measures of conservativeness of the bank. Not surprisingly, the three female representation variables are strongly positively correlated with each other, while the two capital ratio measures are very highly correlated with each other and strongly negatively correlated with *Bank failure*.

Table 2 further shows that the risk-taking measures are strongly correlated with *Size*, *Delinquent loans*, and *ROA*. In particular, the correlations suggest that larger banks and banks with larger amounts of delinquent loans have lower capital ratios and, as expected, that less profitable banks with more non-performing loans are more likely to fail. Regarding our control variables, it can be noted from Table 2 that *Size* exhibits a strong positive correlation with *Public* and a negative correlation with *Liquidity*, *Core deposits*, *Insured deposits*, and *Subchapter S*, while *Loan growth* is highly negatively correlated with *Delinquent loans*, *Core deposits*, and *Insured deposits*. Finally, Table 2 indicates that state-level macroeconomic developments affect bank performance, as *Unemployment* is strongly negatively correlated with *ROA* and positively correlated with *Delinquent loans*.

3. Results

3.1. Female CEOs, Chairwomen, and bank equity capital

We begin our empirical analysis by conducting simple univariate tests for differences in the levels of equity capital between banks with female and male CEOs and board Chairs. The mean values for *Tier-1 capital* and *Capital ratio* as well as the results of *t*-tests for the null hypothesis that there is no difference in the means between female and male-led banks are

reported in Table 3. The *t*-tests are conducted for the complete sample of 22,978 bank-year observations and also separately for the four individual years.

(insert Table 3 about here)

Several interesting features emerge from Table 3. First, consistent with the correlations reported in Table 2, the univariate tests suggest that the gender of the CEO and board Chair may affect the bank's capital structure. As can be seen from the table, banks with female CEOs have, on average, 0.6 percentage points higher Tier-1 capital and equity capital ratios than banks with male CEOs. The observed differences in capital ratios are statistically significant at the 1 percent level. The capital ratios of banks with female CEOs seem to be consistently higher throughout the sample period, and the difference in capital ratios between female and male-led banks is largest, being 0.9 percentage points, in the aftermath of the crisis in 2010. The comparisons between banks with female and male Chairpersons of the Board further demonstrate that female-led banks are associated with more conservative capital ratios. Specifically, Table 3 shows that banks with female Chairs have about 0.5 (0.4) percentage points higher Tier-1 capital ratios (capital ratios) and that the differences in capital ratios are statistically highly significant. Overall, the statistics reported in Table 3 provide considerable evidence to suggest that banks with female CEOs and/or Chairwomen are more conservative in terms of capital structure and hold higher levels of equity capital. This finding supports our research hypothesis.

(insert Table 4 about here)

Next, we examine the effect of female CEOs and Chairwomen on capital ratios in a multivariate setting. In particular, we estimate alternative versions of Equation (1) with *Tier-1 capital* and *Capital ratio* as the dependent variables. The estimation results of these panel regressions are presented in Table 4. In Models 1-4, we use *Tier-1 capital* as the dependent variable, while in Models 5-8 the dependent variable is *Capital ratio*. All regressions include the same set of bank- and state-specific control variables as well as year fixed-effects. The adjusted R^2s of Models 1-4 are around 15 percent and the *F*-statistics are significant at the 1 percent level.

The test variables of interest in our regression specifications are the three female dummies: *Female CEO*, *Female Chair*, and *Female CEO or Chair*. As can be seen from Table 4, the coefficient estimates for *Female CEO* and *Female CEO or Chair* are positive and statistically highly significant in Models 1, 3, and 4, indicating that banks with female executives have higher capital ratios. The magnitudes of the estimated coefficients suggest that capital ratios are approximately 0.4 percentage units higher for banks with female CEOs and for banks in which either the CEO or board Chair is female. Albeit being statistically insignificant at conventional levels, the coefficients for *Female Chair* in Models 2 and 3 also appear positive. It can be further noted from Table 4 that the estimated coefficients for the control variables are statistically highly significant, except for *Loan growth* and *PCI*. Among other things, our estimates indicate that the amount of equity capital in U.S. commercial banks is positively associated with profitability and liquidity, and negatively associated with bank size, the amount of core and insured deposits, and the proportion of non-performing loans.

Models 5-8 in Table 4 are alternative versions of Equation (1) with *Capital ratio* as the dependent variable. The R^2s of these models are around 12 percent and the *F*-statistics are statistically significant at the 1 percent level. The coefficient estimates for the three female

dummies in Models 5-8 are all positive, and thereby indicate that female-led banks hold higher levels of equity capital. Again, the estimated coefficients are statistically significant for *Female CEO* and *Female CEO or Chair* in Models 5, 7, and 8, and statistically insignificant for *Female Chair* in Models 6 and 7. Consistent with Models 1-4, the coefficients for the control variables suggest that larger banks with lower amounts of core and insured deposits and more delinquent loans are more likely to have lower capital ratios.

Overall, the univariate tests as well as the panel regressions presented in Tables 3 and 4 indicate that banks with female CEOs and/or Chairwomen are associated with higher levels of equity capital. These findings provide support for our hypothesis that female executives and directors constrain bank risk-taking. If interpreted more generally, our results suggest that gender-based differences in conservatism and risk tolerance may have important implications for corporate decisions and outcomes.

3.2. Instrumental variable regressions

Our research hypothesis implies that female CEOs and Chairwomen affect the level of bank risk-taking. We acknowledge that empirical tests of this hypothesis may suffer from endogeneity problems and reverse causality. Although we have attempted to control for various bank-specific characteristics as well as state-level macroeconomic developments, it is possible that we have omitted correlated variables or some unobservable bank characteristics that simultaneously affect both the level of risk-taking and the appointment of female executives and directors. Furthermore, our findings may be influenced by a self-selection bias if the gender-

based differences in risk tolerance induce women to self-select into managerial positions in less risky banks.

In order to mitigate endogeneity concerns, we utilize two-stage instrumental variable regressions to ascertain whether bank risk-taking is affected by the gender of the bank's CEO and board Chair.[8] In the first-stage regressions, we model the three female indicator variables using the percentage of female-led banks in a given state as an instrument. Specifically, we use the number of other banks in the state with a female CEO divided by the total number of other banks in the state as an instrument for *Female CEO*, and correspondingly, the number of other banks in the state with a female board Chair divided by the number of other banks in the state as an instrument for *Female Chair*. [9] We conjecture that it is more likely to observe an individual bank with a female CEO and/or Chairwoman in a state in which female executives are generally more typical. This state-level instrumental variable is uncorrelated with our capital ratio measures and arguably has no conceptual relation to risk-taking of individual banks. In the second-stage, *Tier-1 capital* and *Capital ratio* are then regressed on the fitted values of the female variables from the first-stage regressions and all the control variables used in Equation (1).

[8] In our robustness checks, we further address endogeneity concerns by utilizing propensity score matching technique to identify male-led banks that are statistically indistinguishable from female-led banks in terms of size, growth, liquidity, deposit base and other observable bank characteristics.

[9] It should be noted that it is very difficult to find suitable instruments. In addition to the percentage of female-led banks in a given state, we also tried to use several other state-level variables, such as the supply of educated women and the level of female participation in the labor force as instruments, but unfortunately, these variables appeared uncorrelated with our female dummies.

(insert Table 5 about here)

The estimation results of the two-stage instrumental variable regressions are presented in Table 5. Columns 1, 4, and 7 report the estimates of the first-stage regressions with *Female CEO*, *Female Chair*, and *Female CEO or Chair* as the dependent variables, while the alternative second-stage estimates that utilize the fitted values of the female dummies are reported in Columns 2–3, 5–6, and 8–9. Several interesting features can be observed from Table 5. First, the estimated coefficients for the instrumental variables are positive and statistically highly significant in the first-stage regressions, suggesting that our instruments are strongly correlated with the different female indicator variables. The first-stage regressions also indicate that the likelihood of having a female CEO and/or Chairwomen is negatively associated with bank size and CEO-Chair duality and positively associated with the amount of insured deposits, profitability, and liquidity.

The estimates of the second-stage regressions with the instrumented female variables are very similar to the results presented in Table 4. Specifically, consistent with Table 4, the estimated coefficients for the instrumented *Female CEO* and the instrumented *Female CEO or Chair* are positive and statistically significant, and thereby indicate that female-led banks hold higher levels of equity capital. Overall, the instrumental variable regressions provide strong evidence to suggest that the gender of the bank's CEO and/or board Chair affects the level of risk-taking in commercial banks. Nonetheless, it is important to recognize that any causal interpretations of our empirical findings should be made with caution.

3.3. Female CEOs, Chairwomen, and bank failures during the financial crisis

As the next step of the analysis, we examine the association between bank failures and the gender of the bank's CEO and board Chair. For this purpose, we first conduct univariate tests for differences in failure rates between banks with female and male CEOs and/or Chairs during the financial crisis. We define *Bank failure* as a binary variable which equals one at time *t* for banks that fail within one year.[10] Table 6 reports the mean failure rates for female and male-led banks and results of two-tailed *t*-tests for the null that there is no difference in the means. Given that female CEOs and Chairs are more common in smaller banks and, moreover, that smaller banks are generally more likely to fail, we conduct the *t*-tests separately for the complete sample of 22,978 bank-year observations and for subsamples of small and large banks.[11] In general, it can be noted from Table 6 that the mean failure rates of banks with female CEO and Chairs are lower than the failure rates of male-led banks, but the differences in failure rates are not statistically significant at conventional levels in the full sample. However, in the subsample of small banks, the differences in failure rates appear statistically significant. As can be seen from Table 6, small banks with female CEOs and/or Chairwomen have about 0.5 percentage units lower default rate than corresponding banks with male CEOs and/or Chair. This finding provides further support for our research hypothesis that female CEOs and Chairwomen constrain bank risk-taking.

[10] We use the FDIC list of bank failures and assistance actions to identify banks that failed during the financial crisis.

[11] The subsample of large banks consists of banks with above median total assets and the subsample of small banks contains banks with below median total assets. We use the median of total assets for all U.S. commercial banks as the cut-off point, while the small and large bank subsamples include only banks for which we have data on CEO and Chair gender. Consequently, the number of observations in the small and large bank subsamples is not identical.

(insert Table 6 about here)

To examine the association between bank failures and the gender of the bank's CEO and board Chair in a multivariate setting, we estimate alternative logistic specifications of Equation (2) with *Bank failure* as the dependent variable. In these regressions, we use the three different female variables individually as well as interacted with bank size indicator variables. All model specifications include bank- and state-specific control variables as well as year fixed-effects. Table 7 presents the estimation results for the effects of female CEOs and Chairwomen on the likelihood of bank failure within one year. As can be seen from the table, the regressions have relatively good explanatory power for explaining bank failures; the pseudo R^2s are around 59 percent and the chi-square statistics are statistically highly significant. Not surprisingly, the coefficient estimates for our control variables (not tabulated for brevity) indicate that the factors commonly used to explain bank failures are important determinants of bank failures also during the financial crisis. Specifically, the estimates demonstrate that the likelihood of bank failure during the financial crisis is strongly negatively associated with *Capital ratio* and *Core deposits*, while being positively associated with *Size*, *Delinquent loans*, and *Unemployment*. These findings are broadly consistent with Aubuchon and Wheelock (2010) and Cole and White (2012).

(insert Table 7 about here)

Regarding the variables of interest, the regression results reported in Table 7 provide mixed evidence on the effects of female CEOs and Chairs on bank failures during the financial

crisis. The estimates of Models 1–4 indicate that the presence of female CEOs and Chairs, in general, does not affect the bank's propensity to fail. In Models 5–8, however, the coefficient estimates for *Female CEO*, *Female Chair*, and *Female CEO or Chair* interacted with the small bank indicator are consistently negative and statistically highly significant. These estimates demonstrate that the likelihood of failure is significantly lower in small female-led banks, and therefore, consistent with our research hypothesis, suggest that female CEOs and Chairs may constrain bank risk-taking, at least in smaller banks. In larger banks, the propensity to fail appears unaffected by the gender of the bank's CEO and/or Chairperson of the board. Overall, although the predicted negative association between female CEOs and Chairwomen is non-existent in larger banks, our bank failure regressions provide strong evidence that smaller banks with female CEOs and/or Chairwomen were less likely to fail during the financial crisis.[12]

3.4. Robustness checks

Our empirical findings hold in a number of robustness checks. First, given that our sample is heavily unbalanced towards male-led banks and female-led banks comprise only about 5 percent of the observations, we build matched-firm samples in which each bank with a female CEO or board Chair is matched with a similar male-led bank. For this purpose, we utilize propensity score matching technique to identify male-led banks that are essentially identical to female-led banks in terms of size, growth, liquidity, deposit base and other observable bank

[12] It can be argued that CEOs and board Chairs may have a stronger influence on corporate decisions-making in smaller, private firms. Moreover, as noted by Holod (2012), the CEOs of smaller, private banks are more likely to hold large ownership stakes, and may therefore have very different incentives than the CEOs of large publicly traded banks.

characteristics. Specifically, we use all the control variables used in Equation (1) to estimate propensity scores for the banks included in our sample and then use these scores to build a matched-sample of male-led banks that are statistically indistinguishable from the female-led banks. If the only observable difference between banks is CEO or board Chair gender, we should not observe any differences in bank risk measures, unless risk-taking is affected by the gender of the bank's CEO and board Chair.

(insert Table 8 about here)

We re-estimate alternative versions of Equations (1) and (2) using the propensity score matched sample of banks. The estimation results of these regressions are presented in Table 8. In Panel A, *Tier-1 capital* and *Capital ratio* are used as the dependent variables, while Panel B reports the estimates of logistic regressions with *Bank failure* as the dependent variable. The estimates based on the matched-sample of banks are broadly consistent with our main analysis, and thereby provide further evidence to suggest that female CEOs and Chairs may constrain bank risk-taking. It can be noted from Panel A that the estimated coefficients for *Female CEO* and *Female CEO or Chair* are positive and statistically significant at the 5 percent level as in Table 4, and even the magnitudes of the coefficients are very similar to the corresponding coefficients reported in Table 4.

The matched-sample estimates of the *Bank failure* regressions are also very similar to the results presented in Table 7. The estimated coefficients for the female variables interacted with the small bank indicator are negative and statistically significant in each of the models, indicating that female CEOs and Chairwomen decrease the likelihood of bank failure in smaller

banks. Overall, the regression results based on the matched-banks approach suggest that smaller banks with female CEOs and Chairs are associated with lower levels of risk than male-led banks, even among a sample of banks that are otherwise statistically indistinguishable. This finding can be interpreted as evidence that the gender of the bank's CEO and board Chair affects the level of risk-taking in commercial banks. Nonetheless, as already noted in Section 3.2., we recognize that any causal interpretations of our findings should be made with caution.[13]

Second, we acknowledge that female CEOs and Chairs are more common in smaller banks and, moreover, that the bank failure regressions reported in Tables 7 and 8 indicate that the negative association between bank failures and female CEOs and Chairwomen is pertained only to small banks. Therefore, in order to further examine the dependence of our results on bank size, we re-estimate the regressions in small and large bank subsamples which consist of banks with below and above median total assets, respectively. These estimates (not tabulated) are qualitatively similar to the results reported in Tables 5 and 7. Nevertheless, the regressions with the capital ratio measures as the dependent variables suggest that the influence of female CEOs and Chairs on capital ratios is strongest in small banks, and weak or non-existent in the subsample of large banks. The bank failure regressions are consistent with our main analysis and demonstrate that small banks with female CEOs and/or Chairs were less likely to fail during the financial crisis. We also re-estimate the regressions using alternative classifications of small and large banks. When the bottom 30 and top 70 percent of total assets instead of the median are used as the cut-off points to define the small and large bank indicators, the coefficient estimates

[13] Although propensity score matching is often used as a tool for alleviating endogeneity concerns, it is important to note that the matching is based on the observable firm characteristics. Consequently, our empirical findings may still suffer from endogeneity biases caused by omitted variables or unobservable bank characteristics.

are very similar to our main analysis, and thereby further confirm that the results are strongest for smaller banks, and weak or non-existent for larger banks.

In our main analysis, we use *Tier-1 capital* and *Capital ratio* to assess the capital position of the bank. To further ascertain the robustness of our empirical findings, we estimate logit panel regressions with a binary variable *Well-capitalized bank* as the dependent variable. This risk-taking proxy equals one for banks that are well-capitalized under the Federal Deposit Insurance Corporation (FDIC) Improvement Act definition for prompt corrective action by bank regulators.[14] The results of these additional regressions (not tabulated) are consistent with the results reported in Table 5. In particular, the coefficient estimates for *Female Chair* and *Female CEO or Chair* are positive and statistically significant, indicating that female-led banks are more likely to be well-capitalized under the FDIC definition than male-led banks.

Fourth, in our main regressions, we use contemporaneous data on the dependent and independent variables. We examine the robustness of our results by regressing the risk-taking variables on one-year lagged female dummies and control variables. The lagging of the independent variables should also further mitigate endogeneity concerns. However, because data on the female variables are available only from 2007 onwards, these additional regressions are based on a three-year sample. The estimation results of the specifications with lagged independent variables (not tabulated) are qualitatively similar to the results reported in Tables 5 and 7, and thereby suggest that our findings are not sensitive to lagging of the variables. Most importantly, the estimates indicate that banks with female CEOs and/or Chairwomen are

[14] Under this definition, a bank is well-capitalized if the ratio of Tier-1 capital to total assets (Tier-1 leverage ratio) is at least 5 percent, the ratio of Tier-1 capital to risk-weighted assets (Tier-1 risk-based ratio) is at least 6 percent, and the ratio of the sum of Tier-1 and Tier-2 capital to risk-weighted assets (total risk-based ratio) is at least 10 percent.

statistically significantly associated with higher capital ratios and were less likely to fail during the financial crisis.

Fifth, we are aware that risk-taking may be affected by the bank's ownership structure (see e.g., Sullivan and Spong, 2007; Laeven and Lavine, 2009). Unfortunately, detailed information about the ownership structure of smaller, privately-held banks is unavailable. In our regressions, we have attempted to control for ownership by including dummies for Subschapter S and publicly traded banks.[15] As an additional test, we use FDIC bank call report data on minority-owned financial institutions to construct a subsample of banks without controlling female CEO or Chair ownership, and we then re-estimate the regressions using this subsample.[16] The estimates of these additional regressions (not tabulated) are very similar to the results presented in Tables 5 and 7. The estimated coefficients are positive and significant for *Female CEO* and *Female CEO or Chair* in the capital ratio regressions, while the coefficients for *Female CEO*, *Female Chair*, and *Female CEO or Chair* interacted with the small bank indicator are negative and statistically highly significant in the failure regressions. Hence, we argue that our empirical findings should not be driven by the inability to adequately control for bank ownership.

Finally, we examine the robustness of our results by excluding those banks from the sample in which the CEO or Chairperson of the board changed within one year. The regression results (not tabulated) based on the restricted sample without executive changes are consistent with our main findings. Overall, the estimates of these additional regressions provide further

[15] Holod (2012) argues that the CEOs of smaller, private banks are more likely to hold larger ownership stakes of those banks, while the CEOs of larger, publicly traded banks are more likely to be hired agents with relatively small ownership stakes.

[16] A minority owned financial institution is defined as a bank that is at least 51 percent owned by minorities, such as African Americans, Hispanic Americans, or women.

evidence that banks with female CEOs and board Chairs have significantly higher levels of equity capital and were less likely to fail during the financial crisis.

3.5. Limitations

There are several limitations that should be considered when interpreting our empirical findings. First, although we have utilized instrumental variable regressions and propensity score matching technique to address endogeneity concerns, it is important to recognize that any causal interpretations of the relationship between bank risk-taking and female CEOs and chairwomen should be made with caution. Unfortunately, we are unable to completely rule out endogeneity caused by omitted variable bias. As noted above in the robustness checks, we are unable to fully control for differences in ownership structure due to data unavailability. Another omitted variable that may affect risk-taking, at least in publicly traded banks, is executive compensation (see e.g., Fortin et al., 2010). Data on executive compensation is available only for large, publicly traded banks, and therefore we are unable to control for the effects of executive compensation on risk-taking. Nonetheless, it can also be argued that managerial compensation incentives are less important in more closely owned private banks that comprise the vast majority of our sample. Omitted variable bias could also be alleviated by using bank fixed-effects in the regressions. However, given that our female dummy variables remain unchanged over time for most banks, we are unable to use bank fixed-effects due to almost perfect collinearity.

Furthermore, it should be noted that our sample is limited to four fiscal years around the financial crisis. We argue that this period of severe financial turmoil provides an expedient setting to examine the effects of female CEOs and Chairwomen on bank risk-taking.

Nevertheless, it is possible that the relation between executive gender and risk-taking is different in different business cycles. Moreover, given the short sample period, we are unable to analyze the relationship between bank risk-taking and CEO and Chair gender through time. It would be interesting to examine, for instance, if the appointment of a female CEO actually leads to a decrease in the level of risk-taking. Finally, we acknowledge that our sample of U.S. commercial banks is severely unbalanced towards male-led banks and female-led banks comprise only about 5 percent of the observations. This low proportion of banks with female CEOs and Chairwomen may create a bias in our estimations, which we have tried to alleviate in our robustness checks through the use of propensity score matching.

4. Conclusions

The purpose of this paper is to investigate the association between bank risk-taking and the gender of the bank's Chief Executive Officer and Chairperson of the board. In particular, using a large panel of U.S. commercial banks, we empirically examine whether banks with female CEOs and Chairwomen are associated with higher capital ratios and lower default risk during the recent financial crisis. Our analysis is motivated by the well-documented behavioral differences between women and men. Given that women are generally more conservative, less overconfident, and less inclined to take extreme risks, we postulate that female CEOs and Chairwomen may constrain risk-taking by their firms. Since the financial crisis has been often attributed to excessive risk-taking by banks, and was characterized by numerous bank failures and bailouts, we consider this period of severe financial turmoil to provide an expedient setting to examine the potential effects of female executives and directors on firm-level risk-taking in the banking industry.

The empirical findings reported in this paper demonstrate that bank risk-taking around the financial crisis is associated with the gender of the bank's CEO and Chairperson of the board. In particular, we document that banks with female CEOs are more conservative and hold higher levels of equity capital. Furthermore, we document a negative association between female CEOs and Chairwomen and bank default risk during the financial crisis. Although neither CEO nor Chair gender is related to bank failure in general, we find strong evidence suggesting that smaller banks with female CEOs and/or board Chairs were less likely to fail during the financial crisis. These findings hold in a number of robustness checks. Overall, our results indicate that female CEOs and board Chairs may constrain risk-taking in the banking industry, and thereby provide further support for the view that female executives and directors may inherently promote more conservative business strategies and less risky investment decisions.

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Table 1. Descriptive statistics.

Variable	N	Mean	St.dev.	Min	P25	P50	P75	Max
Female variables:								
Female CEO	22978	0.054	0.227	0	0	0	0	1
Female Chair	22978	0.057	0.233	0	0	0	0	1
Female CEO or Chair	22978	0.094	0.292	0	0	0	0	1
Dependent variables:								
Tier-1 capital ratio	22978	0.101	0.041	0.000	0.082	0.092	0.111	0.968
Capital ratio	22973	0.106	0.043	0.001	0.084	0.097	0.117	0.988
Bank failure	22978	0.012	0.108	0	0	0	0	1
Control variables:								
Size	22978	12.013	1.309	6.908	11.176	11.886	12.671	21.281
Loan growth	22976	0.055	0.203	-6.442	-0.027	0.036	0.108	9.449
Delinquent loans	22981	0.016	0.023	0	0.003	0.008	0.020	0.327
Return on assets	22978	0.006	0.017	-0.825	0.003	0.008	0.013	0.496
Core deposits	22978	0.826	0.116	0	0.766	0.841	0.906	1
Insured deposits	22978	0.809	0.139	0	0.745	0.838	0.908	1
Liquidity	22978	0.066	0.070	0	0.025	0.042	0.080	1
CEO duality	22976	0.353	0.478	0	0	0	1	1
Public	22978	0.212	0.409	0	0	0	0	1
Subchapter-S	22978	0.351	0.477	0	0	0	1	1
MBHC	22978	0.197	0.398	0	0	0	0	1
Unemployment	22978	7.090	2.421	2.700	5.000	7.100	8.700	14.000
Per capita income	22978	38.337	4.276	29.950	35.231	38.035	40.750	71.830

The table reports the descriptive statistics for the sample of U.S. commercial banks. *Female CEO* is a dummy variable which equals one for banks that have a female CEO, *Female Chair* equals one if the bank's Chairperson of the Board of Directors is a female, and *Female CEO or Chair* is assigned to one if either the CEO or the board Chair of the bank is a female. *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles, *Capital ratio* is the ratio of the bank's total equity capital to total assets, and *Bank failure* is a binary variable which equals one for banks that fail within one year. *Size* is the logarithm of total assets, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits* is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter-S* is assigned to one if a bank is organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, *CEO duality* is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual, *Unemployment* is the state unemployment rate, and *Per capita income* is the state per-capita income *PCI*.

Table 2. Correlations.

	FCEO	FChair	FCEO or FChair	Tier-1 capital	Capital ratio	Failure	Size	Loan growth	Delinq. loans	Liquid.	ROA	Core deposits	Ins. deposits	CEO duality	State unemp.	State income	Public	Sub-S
FChair	0.279																	
FCEO or FChair	0.745	0.767																
Tier-1 capital	0.035	0.027	0.037															
Capital ratio	0.033	0.022	0.031	0.928														
Failure	-0.006	-0.002	-0.004	-0.156	-0.150													
Size	-0.044	-0.061	-0.064	-0.227	-0.156	0.057												
Loan growth	-0.009	-0.017	-0.016	0.033	0.025	-0.062	0.051											
Delinq. loans	0.003	-0.013	-0.004	-0.192	-0.178	0.371	0.136	-0.190										
Liquidity	0.028	0.008	0.024	0.120	0.100	0.013	-0.181	-0.133	0.015									
ROA	0.006	0.024	0.011	0.188	0.182	-0.219	-0.020	-0.013	-0.423	-0.097								
Core deposits	0.014	0.012	0.013	-0.072	-0.068	-0.058	-0.133	-0.137	-0.057	0.107	0.023							
Ins. deposits	0.037	0.035	0.041	-0.025	-0.040	0.019	-0.371	-0.193	0.116	0.073	-0.086	0.320						
CEO duality	-0.044	-0.052	-0.134	0.041	0.034	-0.013	-0.005	-0.014	-0.027	0.042	0.044	0.011	0.014					
State unemp.	0.023	-0.002	0.014	-0.044	-0.041	0.078	0.137	-0.119	0.291	0.167	-0.261	0.033	0.228	-0.062				
State income	-0.005	-0.040	-0.027	-0.015	-0.003	-0.001	0.039	0.037	-0.014	0.033	-0.011	0.097	-0.090	0.008	-0.138			
Public	-0.005	-0.044	-0.027	-0.067	-0.012	0.041	0.446	0.032	0.094	-0.075	-0.124	-0.054	-0.197	-0.064	0.125	0.140		
Sub-S	-0.005	0.025	0.012	-0.030	-0.049	-0.034	-0.216	-0.058	-0.093	0.029	0.206	0.090	0.092	0.075	-0.139	-0.002	-0.364	
MBHC	0.002	-0.015	-0.003	-0.036	0.047	-0.013	0.135	-0.012	-0.023	-0.018	0.011	-0.007	-0.086	-0.024	-0.053	-0.010	0.167	-0.085

The table reports pairwise correlations for the variables used in the empirical analysis. *FCEO* is a dummy variable which equals one for banks that have a female CEO, *FChair* equals one if the bank's Chairperson of the Board of Directors is a female, and *FCEO or FChair* is assigned to one if either the CEO or the board Chair of the bank is a female. *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles, *Capital* ratio is the ratio of the bank's total equity capital to total assets, and *Failure* is a binary variable which equals one for banks that fail within one year. *Size* is the logarithm of total assets, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits* is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter-S* is assigned to one if a bank is organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, *CEO duality* is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual, *Unemployment* is the state unemployment rate, and *PCI* is the state per-capita income *PCI*.

Table 3. Capital ratios: Univariate tests.

Variable	Year	Male CEO	Female CEO	Difference	Male Chair	Female Chair	Difference	Male CEO and Chair	Female CEO or Chair	Difference
Tier-1 capital	All	0.101	0.107	0.006***	0.101	0.105	0.005***	0.101	0.106	0.005***
Equity capital		0.106	0.112	0.006***	0.106	0.110	0.004***	0.106	0.110	0.004***
		N=21,730	N=1,248		N=21,659	N=1,319		N=20,821	N=2,157	
Tier-1 capital	2007	0.104	0.111	0.007***	0.104	0.109	0.006**	0.104	0.109	0.006***
Equity capital		0.109	0.116	0.007**	0.109	0.114	0.005*	0.109	0.114	0.005**
		N=5,573	N=294		N=5,533	N=334		N=5,339	N=528	
Tier-1 capital	2008	0.099	0.103	0.004*	0.099	0.103	0.004*	0.099	0.102	0.004*
Equity capital		0.104	0.108	0.004	0.104	0.108	0.004	0.104	0.107	0.003
		N=5,455	N=322		N=5,447	N=330		N=5,226	N=551	
Tier-1 capital	2009	0.099	0.103	0.004*	0.099	0.103	0.004*	0.099	0.102	0.004*
Equity capital		0.104	0.108	0.004	0.104	0.108	0.004	0.104	0.107	0.003
		N=5,455	N=322		N=5,447	N=330		N=5,226	N=551	
Tier-1 capital	2010	0.099	0.108	0.009***	0.100	0.101	0.002	0.099	0.104	0.005***
Equity capital		0.104	0.114	0.009***	0.105	0.106	0.001	0.104	0.109	0.005***
		N=5,391	N=321		N=5,382	N=330		N=5,171	N=541	

The table reports the mean values for *Tier-1 capital* and *Capital ratio* and the results of two-tailed *t*-tests for the null hypothesis that there is no difference in the means between female and male-led banks. *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles and *Capital ratio* is the ratio of the bank's total equity capital to total assets. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 4. Capital ratio regressions.

Variable	Model (1) Tier-1 capital	Model (2) Tier-1 capital	Model (3) Tier-1 capital	Model (4) Tier-1 capital	Model (5) Capital ratio	Model (6) Capital ratio	Model (7) Capital ratio	Model (8) Capital ratio
Constant	0.225***	0.224***	0.224***	0.224***	0.201***	0.200***	0.200***	0.200***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)
Female variables:								
Female CEO	0.004**		0.004*		0.005**		0.004**	
	(0.002)		(0.002)		(0.002)		(0.002)	
Female Chair		0.003	0.002			0.003	0.002	
		(0.002)	(0.002)			(0.002)	(0.002)	
Female CEO or Chair				0.004**				0.004**
				(0.002)				(0.002)
Control variables:								
Size	-0.007***	-0.007***	-0.007***	-0.007***	-0.005***	-0.005***	-0.005***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Large bank	-0.008***	-0.008***	-0.008***	-0.008***	-0.009***	-0.009***	-0.009***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Loan growth	0.004	0.004	0.004	0.004	0.002	0.002	0.002	0.002
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Core deposits	-0.039***	-0.039***	-0.039***	-0.039***	-0.037***	-0.037***	-0.037***	-0.037***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.014)	(0.014)	(0.014)	(0.014)
Insured deposits	-0.021***	-0.021***	-0.021***	-0.021***	-0.019***	-0.019***	-0.019***	-0.019***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Delinquent loans	-0.177***	-0.177***	-0.177***	-0.177***	-0.177***	-0.176***	-0.177***	-0.176***
	(0.041)	(0.041)	(0.041)	(0.041)	(0.045)	(0.045)	(0.045)	(0.045)
Return on assets	0.447***	0.447***	0.447***	0.447***	0.462***	0.463***	0.462***	0.462***
	(0.153)	(0.153)	(0.153)	(0.153)	(0.166)	(0.166)	(0.166)	(0.167)
Liquidity	0.056***	0.057***	0.056***	0.056***	0.053***	0.054***	0.054***	0.054***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)

Table 4. *Continued.*

Variable	Model (1) Tier-1 capital	Model (2) Tier-1 capital	Model (3) Tier-1 capital	Model (4) Tier-1 capital	Model (5) Capital ratio	Model (6) Capital ratio	Model (7) Capital ratio	Model (8) Capital ratio
Public	0.004**	0.004**	0.004**	0.004**	0.006***	0.006***	0.006***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Subchapter-S	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MBHC	-0.002**	-0.002**	-0.002**	-0.002**	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO duality	0.003***	0.003***	0.003***	0.004***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Unemployment	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PCI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	22,971	22,971	22,971	22,971	22,966	22,966	22,966	22,966
Adjusted R^2	14.60%	14.60%	14.60%	14.60%	11.50%	11.50%	11.50%	11.50%
F-stat.	49.87	49.87	47.36	50.22	40.01	39.76	37.94	40.03

The table reports the estimates of eight alternative versions of Equation (1). The dependent variable is *Tier-1 capital* in Models 1-4 and *Capital ratio* in Models 5-8. *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles and *Capital ratio* is the ratio of the bank's total equity capital to total assets. The female variables in the regressions are defined as follows: *Female CEO* is a dummy variable which equals one for banks that have a female CEO, *Female Chair* equals one if the bank's Chairperson of the Board of Directors is a female, and *Female CEO or Chair* is assigned to one if either the CEO or the board Chair of the bank is a female. The control variables are defined as follows: *Size* is the logarithm of total assets, *Large bank* is a dummy variable for banks with above median total assets, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits* is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter-S* is assigned to one if a bank is organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, *CEO duality* is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual, *Unemployment* is the state unemployment rate, and *Per capita income* is the state per-capita income *PCI*. Robust standard errors corrected for clustering at the bank level are reported in parentheses. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 5. Instrumental variables regressions.

	First stage (1)	Second stage (1)	Second stage (2)	First stage (2)	Second stage (3)	Second stage (4)	First stage (3)	Second stage (5)	Second stage (6)
Variable	Female CEO	Tier-1 capital	Capital ratio	Female Chair	Tier-1 capital	Capital ratio	Female CEO or Chair	Tier-1 capital	Capital ratio
Constant	0.062	0.196***	0.170***	0.175***	0.215***	0.192***	0.192***	0.191***	0.165***
	(0.054)	(0.030)	(0.032)	(0.054)	(0.022)	(0.024)	(0.069)	(0.026)	(0.027)
Female variables:									
Instrumented CEO		0.376**	0.404*						
		(0.191)	(0.211)						
Instrumented Chair					0.041	0.038			
					(0.049)	(0.052)			
Instrumented CEO or Chair								0.128**	0.138**
								(0.058)	(0.063)
Instrument	0.269**			0.349***			0.394***		
	(0.111)			(0.110)			(0.113)		
Control variables:									
Size	-0.007**	-0.004*	-0.002	-0.010***	-0.006***	-0.004***	-0.012***	-0.005***	-0.003**
	(0.003)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)
Large bank	0.001	-0.008***	-0.010***	0.007	-0.008***	-0.010***	0.005	-0.008***	-0.010***
	(0.007)	(0.003)	(0.003)	(0.007)	(0.001)	(0.001)	(0.009)	(0.002)	(0.002)
Loan growth	0.002	0.003	0.002	-0.012	0.004	0.003	-0.009	0.005	0.004
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.007)	(0.007)
Core deposits	0.009	-0.042***	-0.041**	0.009	-0.039***	-0.038***	0.010	-0.039***	-0.038**
	(0.020)	(0.015)	(0.017)	(0.021)	(0.012)	(0.014)	(0.026)	(0.013)	(0.015)
Insured deposits	0.048**	-0.039***	-0.037***	0.023	-0.022***	-0.019***	0.052**	-0.027***	-0.025***
	(0.019)	(0.013)	(0.014)	(0.018)	(0.006)	(0.006)	(0.024)	(0.007)	(0.007)
Delinquent loans	0.058	-0.200***	-0.202***	-0.033	-0.176***	-0.176***	0.012	-0.181***	-0.181***
	(0.105)	(0.055)	(0.059)	(0.101)	(0.041)	(0.045)	(0.129)	(0.043)	(0.047)
Return on assets	0.290	0.337**	0.345**	0.293	0.436***	0.452***	0.352*	0.401***	0.413***
	(0.186)	(0.156)	(0.166)	(0.198)	(0.152)	(0.167)	(0.209)	(0.147)	(0.159)

Table 5. *Continued.*

Variable	First stage: Female CEO	Model (1) Tier-1 capital	Model (2) Capital ratio	First stage: Female Chair	Model (3) Tier-1 capital	Model (4) Capital ratio	First stage: Female CEO or Chair	Model (5) Tier-1 capital	Model (6) Capital ratio
Liquidity	0.081**	0.026	0.021	0.011	0.056***	0.053***	0.092*	0.045***	0.041***
	(0.040)	(0.023)	(0.025)	(0.033)	(0.013)	(0.013)	(0.047)	(0.014)	(0.015)
Public	0.004	0.002	0.004	-0.005	0.004***	0.006***	-0.002	0.004**	0.006***
	(0.008)	(0.003)	(0.004)	(0.007)	(0.001)	(0.002)	(0.009)	(0.002)	(0.002)
Subchapter-S	-0.003	-0.008***	-0.008***	0.004	-0.009***	-0.010***	0.004	-0.010***	-0.010***
	(0.006)	(0.003)	(0.003)	(0.007)	(0.001)	(0.001)	(0.008)	(0.002)	(0.002)
MBHC	0.004	-0.004	0.004	-0.004	-0.002*	0.005***	0.002	-0.003*	0.005***
	(0.007)	(0.003)	(0.003)	(0.007)	(0.001)	(0.001)	(0.009)	(0.002)	(0.002)
CEO duality	-0.020***	0.011**	0.011**	-0.027***	0.004***	0.004**	-0.082***	0.014***	0.014***
	(0.005)	(0.004)	(0.005)	(0.005)	(0.002)	(0.002)	(0.006)	(0.005)	(0.005)
Unemployment	0.003*	0.000	0.000	0.001	0.001***	0.001***	0.002	0.001**	0.001
	(0.002)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
PCI	0.000	0.000	0.000	-0.001*	0.000	0.000	-0.001	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	22,971	22,971	22,966	22,971	22,971	22,966	22,971	22,971	22,966
Pseudo R^2	1.00%	-	-	1.10%	-	-	2.60%	-	-

The table reports the estimates of the two-stage instrumental variable regressions. In the first-stage regressions, we model the three female indicator variables using the percentage of female-led banks in a given state as an instrument In the second-stage regressions, *Tier-1 capital* and *Capital ratio* are regressed on the fitted values of the female variables from the first-stage regressions and all the control variables used in Equation (1). *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles and *Capital ratio* is the ratio of the bank's total equity capital to total assets. The female variables in the regressions are defined as follows: *Female CEO* is a dummy variable which equals one for banks that have a female CEO, *Female Chair* equals one if the bank's Chairperson of the Board of Directors is a female, and *Female CEO or Chair* is assigned to one if either the CEO or the board Chair of the bank is a female. The control variables are defined as follows: *Size* is the logarithm of total assets, *Large bank* is a dummy variable for banks with above median total assets, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits* is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter-S* is assigned to one if a bank is organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, *CEO*

duality is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual, *Unemployment* is the state unemployment rate, and *Per capita income* is the state per-capita income *PCI*. Robust standard errors corrected for clustering at the bank level are reported in parentheses. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 6. Bank failure: Univariate tests.

Variable	Bank size	Male CEO	Female CEO	Difference	Male Chair	Female Chair	Difference	Male CEO and Chair	Female CEO or Chair	Difference
Bank failure	All	0.012	0.009	-0.003	0.012	0.011	-0.001	0.012	0.010	-0.002
		N=21,730	N=1,248		N=21,659	N=1,319		N=20,821	N=2,157	
Bank failure	Small	0.007	0.001	-0.005*	0.007	0.001	-0.006*	0.007	0.002	-0.005**
		N=10,293	N=674		N=10,241	N=726		N=9,798	N=1,169	
Bank failure	Large	0.016	0.017	0.001	0.016	0.022	0.006	0.016	0.020	0.004
		N=11,437	N=574		N=11,418	N=593		N=11,023	N=988	

The table reports the mean failure rates for female and male-led banks and the results of two-tailed *t*-tests for the null hypothesis that there is no difference in the means between female and male-led banks. *Bank failure* is a binary variable which equals one for banks that fail within one year. The subsample of large banks consists of banks with above median total assets and the subsample of small banks contains banks with below median total assets. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 7. Bank failure regressions.

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)
Female variables:								
Female CEO	-0.315		-0.332					
	(0.376)		(0.377)					
Female Chair		0.023	0.086					
		(0.288)	(0.288)					
Female CEO or Chair				-0.167				
				(0.263)				
Female CEO x small bank					-2.015***		-2.009***	
					(0.672)		(0.682)	
Female CEO x large bank					-0.076		-0.144	
					(0.409)		(0.416)	
Female Chair x small bank						-1.364**	-1.354**	
						(0.669)	(0.673)	
Female Chair x large bank						0.259	0.287	
						(0.308)	(0.315)	
Female CEO or Chair x small bank								-1.675***
								(0.545)
Female CEO or Chair x large bank								0.095
								(0.287)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	22,966	22,966	22,966	22,966	22,966	22,966	22,966	22,966
Pseudo R^2	59.00%	58.98%	59.00%	58.99%	59.06%	59.04%	59.12%	59.10%
Chi-square stat.	664.17	663.51	665.96	661.39	665.30	662.61	664.42	662.45

The table reports the estimates of eight alternative versions of Equation (2). *Failure* is a binary variable which equals one for banks that fail within one year. The female variables in the regressions are defined as follows: *Female CEO* is a dummy variable which equals one for banks that have a female CEO, *Female Chair* equals one if the bank's Chairperson of the Board of Directors is a female, and *Female CEO or Chair* is assigned to one if either the CEO or the board Chair of the bank is a female. The following control variables are used in the regressions (not tabulated): *Size* is the logarithm of total assets, *Large bank* is a dummy variable for banks with above median total assets, *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits* is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter-S* is assigned to one if a bank is organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, *CEO duality* is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual, *Unemployment* is the state unemployment rate, and *Per capita income* is the state per-capita income *PCI*. The reported estimates are based on logistic panel regressions. Robust standard errors corrected for clustering at the bank level are reported in parentheses. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 8. Matched-sample regressions.

Panel A: Capital ratio regressions

Variable	Model (1) Tier-1 capital	Model (2) Tier-1 capital	Model (3) Tier-1 capital	Model (4) Capital ratio	Model (5) Capital ratio	Model (6) Capital ratio
Female variables:						
Female CEO	0.005**			0.005**		
	(0.002)			(0.002)		
Female Chair		0.002			0.001	
		(0.002)			(0.002)	
Female CEO or Chair			0.004**			0.004**
			(0.002)			(0.002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	2,472	2,612	4,271	2,472	2,612	4,271
Adjusted R^2	13.30%	14.60%	15.50%	10.60%	14.00%	12.70%
F-stat.	11.00	7.37	13.55	8.23	6.43	11.00

Panel B: Bank failure regressions

Variable	Model (1) Failure	Model (2) Failure	Model (3) Failure	Model (4) Failure	Model (5) Failure	Model (6) Failure
Female variables:						
Female CEO	0.549					
	(0.872)					
Female Chair		0.354				
		(0.707)				
Female CEO or Chair			-0.461			
			(0.586)			

Table 8. *Continued.*

Variable	Model (1) Failure	Model (2) Failure	Model (3) Failure	Model (4) Failure	Model (5) Failure	Model (6) Failure
Female CEO x small bank				-3.355*		
				(2.014)		
Female CEO x large bank				1.524		
				(1.247)		
Female Chair x small bank					-6.161***	
					(2.101)	
Female Chair x large bank					1.626	
					(1.211)	
Female CEO or Chair x small bank						-3.413***
						(1.332)
Female CEO or Chair x large bank						0.167
						(0.678)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	2,472	2,612	4,271	2,472	2,612	4,271
Pseudo R^2	78.85%	84.58%	72.55%	80.12%	86.33%	73.73%
Chi-square stat.	99.31	469.90	157.95	85.22	313.82	149.70

The table reports the estimates of eight alternative versions of Equations (1) and (2) using a propensity score matched sample of banks. In Panel A, the dependent variable *Tier-1 capital* in Models 1-3 and *Capital ratio* in Models 4-6. *Tier-1 capital* is measured as Tier-1 capital scaled by total assets less disallowed intangibles and *Capital ratio* is the ratio of the bank's total equity capital to total assets. In Panel B, the dependent variable is *Failure*, which is a binary variable which equals one for banks that fail within one year. The female variables in the regressions are defined as follows: *Female CEO* is a dummy variable which equals one for banks that have a female CEO, *Female Chair* equals one if the bank's Chairperson of the Board of Directors is a female, and *Female CEO or Chair* is assigned to one if either the CEO or the board Chair of the bank is a female. The following control variables are used in the regressions (not tabulated): *Size* is the logarithm of total assets, *Large bank* is a dummy variable for banks with above median total assets, *Loan growth* is the logarithm of loan growth, *Core deposit* is the core deposit ratio measured as all deposits less deposits in large time-deposit and large-brokered deposit accounts scaled by total deposits, *Insured deposits*

is the ratio of insured deposits to total deposits, *Delinquent loans* is the ratio of loans at least 90 days past due or in nonaccrual status to total loans, *ROA* denotes return on assets calculated as the net income, *Liquidity* is measured as the ratio of cash balances to total assets, *Public* is a dummy variable for publicly traded banks, *Subchapter-S* is assigned to one if a bank is organized under the subchapter-S, *MBHC* is a dummy variable for the banks that are affiliated with a multibank holding company, *CEO duality* is a dummy variable which equals one for banks in which the CEO and Chair positions are held by the same individual, *Unemployment* is the state unemployment rate, and *Per capita income* is the state per-capita income *PCI*. The specifications with *Tier-1 capital* and *Capital ratio* as the dependent variable are estimated as panel regressions, while the specifications *Failure* as the dependent variable are estimated as logistic panel regressions. Robust standard errors corrected for clustering at the bank level are reported in parentheses. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.