Economics and Business Letters
13(3), 158-171, 2024

Do female CEOs handle crises better? Evidence from the COVID-19 pandemic

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Received: 23 January 2024
Revised: 19 April 2024
Accepted: 29 April 2024

Abstract
We examine whether firm performance in response to the shock of the COVID pandemic differed depending upon whether the CEO was female or male. We find that though female CEOs do not consistently demonstrate better management across all periods, following the shock, firms run by female CEOs were more profitable, more highly valued and more risk averse than firms run by male CEOs.

Keywords: COVID-19, female CEOs, firm performance
JEL Classification Codes: G12, G14, G41

1. Introduction

A large literature on executive gender stresses behavioral differences in male and female executives that can impact firm performance. For female executives, these characteristics have been shown to include greater aversion to risk (Faccio et al., 2016; Khan and Vieito, 2013), more democratic leadership styles (Bartunek et al., 2000; Eagly and Johnson, 1990), greater empathy (Batson et al., 1996; Toussaint and Webb, 2005), and better ethics (Farooq et al., 2022; Ho et al., 2021). On the basis of such behavioral differences, firms with female CEOs and/or a high proportion of females in senior management have been shown to have lower leverage, to have less volatile earnings, to have a higher chance of survival (Faccio et al., 2016; Vo et al., 2019), to be more profitable (Khan and Vietito, 2013; Lui et al., 2014), to have better earnings quality (Krishnan and Parsons, 2008), and to be more valuable (Francoeur et al., 2008; Martin

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Citation: Thornton, J. and Vasilakis. K. (2024) Do female CEOs handle crises better? Evidence from the COVID-19 pandemic, *Economics and Business Letters*, 13(3), 158-171. DOI: 10.17811/ebl.13.3.2024.158-171.

et al., 2009).[1]

A small strand of the gender and firm management literature suggests that the behavioral differences between male and female executives become more pronounced during crises and make female executives more effective in dealing with crises. For example, female executive may have a greater desire to help others and have a greater capacity to balance risk, which could make them more effective in times of uncertainty (Ryan et al., 2016; Shropshire et al., 2021). Additionally, crisis leadership requires executives to be creative, to improvise and to be intuitive, which are traits that or more typically exhibited by women executives (Byron and Khazanchi, 2012; Pearson and Sommer, 2011). If these judgements are correct, then firms with female CEOs might be expected to experience less severe negative shocks during a crisis period—including, for example, because they choose less risky strategies in economic downturns (Shropshire et al., 2021), or because they ensure that firms have larger buffers of capital (Palvia et al., 2015) and cash (Zeng and Wang, 2015). In this paper, we provide evidence that female CEOs can be better managers in a crisis than their male counterparts, which might be attributable to behavioral differences such as these. Specifically, we examine whether having a female CEO impacts firm profitability, value and risk-taking in a crisis situation where the crisis is driven by an exogenous event. In our case, the exogenous event is the outbreak of the COVID-19 pandemic.[2] Although there have been a number of studies on the impact of the pandemic on aspects of firm performance (e.g., Bose, 2022; Hu and Zhang, 2021), the only study of which we are aware that takes CEO gender into account is Shin and Park (2023), who report that the cumulative abnormal returns of Korean firms after the first COVID-19 case were less negative for firms with female CEOs. However, there are several studies beyond the context of the firm that suggest that firms with female CEOs might have performed differently than firms with male CEOs. For example, Garikipati and Kambhampati (2021) report that countries with female leaders recorded systematically fewer COVID-19 deaths than nations governed by men; Bruce et al. (2022) find that cities in Brazil with a woman as mayor had lower rates of death and hospitalizations from COVID-19; and Sergent and Stajkovic (2019) report that US states with female leaders had lower fatality rates, and that female leaders expressed more awareness of fears that followers might be feeling, concern for wellbeing, and confidence in their plans.

On the basis of the gender and management literature discussed above, and the recent research on the role of female leadership in dealing with the pandemic more generally, we test three hypotheses on the CEO gender–firm performance–crisis nexus. These are:

H1: Firms with female CEOs were more profitable than firms with male CEOs in response to the COVID shock.

[1] Of course, there are also studies showing that firms with female CEOs perform less well than firms with male CEOs (e.g., Adams and Ferreira, 2008) and that CEO gender has no statistically significant impact on performance (e.g., Campbell and Minguez-Vera, 2008)

[2] The crisis needs to reflect an exogenous event such that a firm is not in trouble because of poor decisions by a low-ability CEO.

H2: Firms with female CEOs were more valuable than firms with male CEOs in response to the COVID shock.

H3: Firms with female CEOs engaged in less risk-taking than firms with male CEOs in response to the COVID shock.

To anticipate our baseline results, we find that following the COVID shock, US firms with female CEOs performed somewhat better than firms with male CEOs. Specifically, firms with female CEOs were 8% more profitable and 0.4% more highly valued, and they reduced risk-taking activities relative to firms with male CEOs by between 1-1.5%. These results are robust to instrumental variable (IV) estimation and a specification that employs propensity score matching (PSM) methods. Our study contributes to the literature on CEO gender and firm performance by focusing on differences in firm outcomes in response to a crisis brought on by an exogenous shock.

3. Methodology and data

We begin by adopting an OLS estimation approach. The main treatment (intervention) is represented by the date that the WHO determined COVID-19 to be a pandemic, which was March 11, 2020. Our baseline model is as follows:

$$y_{i,t} = \alpha_0 + \beta_1 COVID_t + \beta_2 COVID_t * Female_i + \beta_3 Female_i + X_{i,t} + \gamma_i + \epsilon_{i,t} \qquad (1)$$

where y_{it} represents firm performance, measured either by the return on assets (ROA) to capture firm profitability, Tobin's Q to measure firm value, and the standard deviation of the return on assets (σROA), the standard deviation of the return on equity (σEQUITY), and firm leverage (LEV) to measure firm risk-taking. COVID represents the event/shock and is equal to one from Q2 2020 (which captures the March 2020, intervention) to Q4 2021 and zero otherwise. $Female$ is a dummy variable that equals one for the firms with female CEOs and zero for firms with male CEOs. α_0 represents firm performance in the control group prior to the treatment. β_1 captures any change in firm performance following the COVID outbreak. β_2 captures the effect of the shock of the pandemic on firms that have female CEOs. A positive (negative) and statistically coefficient for β_2 would indicate, ceteris paribus, that performance improves (deteriorates) more for firms with female CEOs. A positive and statistically significant for β_3 would indicate that female CEOs exhibit superior management of firms compared to male CEOs not only during the crisis but also in normal times. Finally, X is a vector of firm-specific characteristics, *i* indexes the firm, *t* indicates time, and γ captures industry fixed effects.

The variables in the vector X include: CEO age, (AGE), because as a CEO grows older, firm investment, growth, and profitability may decline (Belenzon et al., 2019); CEO network size (NTWK), because networks have been viewed as a means for executives to protect each other on their respective boards (El-Khatib et al., 2015); CEO tenure (TENURE), because tenure helps build decision-making autonomy (Combs et al., 2007); whether the same

person holds the CEO and Chair position simultaneously (DUAL), because duality increases CEO power by diminishing the role of the board of directors (Jiraporn et al., 2016); the independence of the executive board (BINDEP), because independent directors may better detect and counter CEO missteps (Fogel et al., 2021) and mitigate excessive CEO power (Jiraporn et al., 2016); and firm size (FSIZE) and the growth of firm sales (GSALES), which could benefit firms if they provide economies of scale (Hall and Weiss, 1967).

Our sample comprises 410 US firms over the period Q1 2019 to Q4 2021. Data on firm CEO and executive board characteristics are from BoardEx. The stock prices used in the calculation of (σEQUITY) are from Thompson Eikon Datastream. Data to calculate ROA, Tobin's Q, leverage, firm size, and sales growth are from Compustat. We winsorize the variables at the top and bottom 5% of the distribution to reduce the impact of outliers. Summary statistics, definitions and data sources for all the variables are presented in Table 1, which indicates a wide variation in firm performance measures and firm characteristics. Table 2 breaks down the summary statistics according to whether the firm is led by a female or male CEO. On average, firms led by female CEOs appear to be more profitable and more valuable and exhibit more stable earnings. There is little difference in average firm size and sales growth, but female led firms tend to be substantially less leveraged, consistent with evidence in the literature that female CEOs tend to be more risk averse. Female CEOs are typically about 9 years younger than male CEOs and exhibit similar lengths of tenure (about 7.5 years on average) as their male counterparts.

3. Results

Table 3 reports estimates for Equation (1) with the estimates presented with and without the firm-specific control variables. They suggest that firms with female CEOs performed somewhat better on all the metrics used. The coefficient on ($COVID_t * Female$) is positive and statistically significant in the estimates for firm profitability and firm value and negative and statistically significant for each measure of firm risk. That is, following the exogenous shock of the pandemic, firms with female CEOs were more profitable, more highly valued and more risk-averse relative to firms with male CEOs, thereby supporting our hypotheses H1 to H3. Focusing on the estimates that include the firm-specific control variables, firms with female CEOs achieved an ROA that was about was 8% higher, a Tobin's Q that was 0.3% higher, and a reduction in risk-taking that was between 0.8-2.3% lower relative to firms with male CEOs. The lack of statistical significance of the coefficient on the $Female$ variable indicates that female CEOs only exhibited superior management of firms compared to male CEOs during the pandemic crisis and not in normal times. In other words, while female CEOs demonstrate a better performance during the crisis, they do not consistently demonstrate better management across all periods. This supports the view that female CEOs excel in crises situations.

Of the control variables, CEO tenure, CEO/Chair duality, board independence, and the growth of sales were associated positively with firm profitability and value and these same variables, plus a CEO's age and the size of CEO networks, were associated with a reduction in firm risk-taking, which are results that broadly align with the literature.

Table 1. Summary statistics, variable definitions, and data sources

Variable	Mean	St dev	Min	Max	Description	Source
ROA	0.052	0.040	-1.220	0.236	Ratio of earnings before interest and taxes (to book value of total assets)	Compustat
Tobin's Q	2.000	1.565	0.520	10.544	The market value of equity plus total liabilities divided by book value of total assets	Compustat
σROA	0.041	0.049	0.004	0.149	Standard deviation of the ratio of earnings before interest and taxes (to book value of total assets)	Compustat
σEQUITY	0.001	0.040	0.003	0.040	Standard deviation of daily equity returns in each quarter	Thompson Eikon Datastream
LEV	0.521	0.342	0.043	10.345	The ratio of total book value of liabilities to total assets in a given period	Compustat
FEMALE	0.083	0.345	0	1	Dummy variable equal to one if a firm has a female CEO and zero otherwise	BoardEx
AGE	55.676	9.343	30	72	The age of the CEO in a given period	BoardEx
NTWK	6.743	1.132	3.123	8.987	Network size of the CEO as indicated by the number of overlaps through employment, other activities, and education	BoardEx
TENURE	7.432	5.923	0	26	The number of years the CEO has served in position in a given period	BoardEx
DUAL	0.123	0.323	0	1	Dummy variable equal to one if the CEO also hold the position of chairman in a given period and zero otherwise	BoardEx
BINDEP	0.809	0.112	0.432	1.212	The percentage of independent non-executive directors on the board in a given period	BoardEx
GSALE	3.012	3.532	0.054	23.654	Quarterly growth of firm sales	Compustat
FSIZE	5.872	2.232	-1.403	15.011	Natural logarithm of the total assets of the firm in a given period	Compustat

Notes: The sample covers 410 US firms over the period Q2 2019 to Q4 2021.

Table 2. Summary statistics for female and male CEOs

Variable	Mean	Standard deviation	Minimum	Maximum
Panel A. Female CEOs				
ROA	0.082	0.023	-1.220	0.236
Tobin's Q	2.234	1.423	0.540	10.532
σROA	0.093	0.047	0.004	0.145
σEQUITY	0.002	0.035	0.007	0.036
LEV	0.434	0.340	0.049	10.123
AGE	45.342	9.123	34.00	65.000
NTWK	6.987	1.132	3.123	8.834
TENURE	7.323	5.932	0.000	24.000
DUAL	0.111	0.344	0.000	1.000
BINDEP	0.757	0.121	0.465	1.210
GSALE	2.989	3.532	0.065	23.543
FSIZE	5.987	2.432	-1.423	15.011
Panel B. Male CEOs				
ROA	0.034	0.056	-1.224	0.232
Tobin's Q	1.764	1.654	0.520	10.544
σROA	0.043	0.047	0.007	0.149
σEQUITY	0.001	0.030	0.003	0.040
LEV	0.603	0.340	0.043	10.323
AGE	54.232	9.123	30.000	72.000
NTWK	6.743	1.132	3.178	8.987
TENURE	7.521	5.932	0.000	26.000
DUAL	0.137	0.344	0.000	1.000
BINDEP	0.812	0.121	0.432	1.212
GSALE	3.021	3.532	0.054	23.654
FSIZE	5.932	2.010	-1.423	15.011

Notes: Variable definitions and data sources are provided in Table 1.

Table 3. OLS estimates for the effect of COVID and female CEOs on firm performance—intervention date Q1 2020.

	ROA		Tobin's Q		σROA		σEQUITY		LEV	
COVID	-0.821***	-0.909***	-0.299***	-0.224***	0.723***	0.823***	0.512***	0.635**	0.731***	0.356**
	(0.007)	(0.001)	(0.000)	(0.016)	(0.014)	(0.034)	(0.000)	(0.040)	(0.000)	(0.007)
COVID*FEMALE	0.003***	0.823***	0.043***	0.032***	-0.033***	-0.083***	-0.089***	-0.143***	-0.050***	-0.230***
	(0.000)	(0.010)	(0.000)	(0.002)	(0.000)	(0.004)	(0.000)	(0.001)	(0.001)	(0.000)
FEMALE	0.024	0.001	0.002	0.002	-0.034	-0.245	-0.134	-0.022	-0.024	-0.045
	(0.013)	(0.001)	(0.004)	(0.002)	(0.031)	(0.234)	(0.182)	(0.063)	(0.043)	(0.043)
AGE		0.332		0.234		-0.342***		-0.565***		-0.246***
		(0.223)		(0.189)		(0.030)		(0.062)		(0.006)
NTWK		0.143		0.323		0.413		-0.659***		-0.880***
		(0.644)		(0.983)		(0.409)		(0.021)		(0.024)
TENURE		0.838***		0.867***		-0.843**		-0.798**		-0.732**
		(0.070)		(0.054)		(0.333)		(0.132)		(0.032)
DUAL		0.293**		0.256**		-0.532***		-0.565***		-0.509***
		(0.131)		(0.125)		(0.045)		(0.211)		(0.001)
BINDEP		0.887***		0.843***		0.398		0.134		0.254
		(0.094)		(0.054)		(0.442)		(0.558)		(0.632)
GSALES		2.835***		3.434***		-0.398***		-0.978***		-0.490***
		(0.054)		(0.034)		(0.089)		(0.003)		(0.001)
FSIZE		0.001		0.000		-0.000		-0.001		-0.001
		(0.002)		(0.001)		(0.002)		(0.004)		(0.120)
Intercept	0.423***	0.165***	0.634***	0.143***	-0.612	-1.234	-0.692	0.545	0.798	-0.452
	(0.006)	(0.007)	(0.001)	(0.009)	(0.432)	(0.890)	(0.354)	(0.434)	(0.712)	(0.325)
R^2	0.371	0.656	0.453	0.499	0.232	0.432	0.342	0.697	0.190	0.675
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	4920	4920	4920	4920	2460	2460	2460	2460	4920	4920

COVID represents the treatment and is equal to one from Q1 2020 to Q4 2021 and zero otherwise and. FEMALE equals zero for the control gro up (firms with male CEOs) and one for the treatment group (firms with female CEOs)
See Table 1 for the definition of the variables.
Robust standard errors in parenthesis. *** and **indicate statistical significance at the 1, and 5% levels, respectively.

Table 4. Two-stage least squares estimates of the effect of COVID and female CEOs on firm performance

	First stage	Second stage				
	FEMALE	ROA	Tobin's Q	σROA	σEQUITY	LEV
GENEQ	0.004***					
	(0.001)					
INSTFEM		2.712***	1.245***	-15.232***	-1.658***	-2.230***
		(0.001)	(0.000)	(4.123)	(0.000)	(0.001)
AGE	-0.234***	0.234	0.398	-0.089***	-0.343***	-0.543***
	(0.025)	(0.142)	(0.247)	(0.002)	(0.034)	(0.053)
NTWK	0.265	0.343	0.545	-0.323	0.453	0.253
	(0.143)	(0.734)	(0.873)	(0.000)	(0.543)	(0.334)
TENURE	0.192	0.279**	0.245**	-0.423***	-0.923***	-0.590***
	(0.264)	(0.108)	(0.023)	(0.000)	(0.431)	(0.101)
DUAL	-0.170***	0.868***	0.649***	-0.490***	-0.423***	-0.632***
	(0.014)	(0.094)	(0.094)	(0.020)	(0.064)	(0.042)
BINDEP	0.219**	0.273**	0.249**	0.221	0.323	-0.290
	(0.108)	(0.123)	(0.014)	(0.456)	(0.945)	(0.932)
GSALE	0.004**	0.008***	0.006***	-0.234***	-0.643***	-0.542***
	(0.001)	(0.000)	(0.000)	(0.040)	(0.034)	(0.042)
FSIZE	0.006***	0.000	0.000	-0.001	-0.000	-0.001
	(0.002)	(0.001)	(0.001)	(0.002)	(0.012)	(0.002)
Intercept	0.053***	0.845***	0.798***	-0.932***	0.732***	-0.890***
	(0,001)	(0.093)	(0.054)	(0.072)	(0.045)	(0.053)
R^2	0.898	0.342	0.313	0.432	0.778	0.732
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	4920	4920	4920	2460	2460	4920
F-statistic	19.46					

The first column reports the result from the first stage OLS regression in which the dependent variable is the female CEO dummy. The remaining columns report the results from the second stage regressions for firm performance in which INSTFEM is the fitted value of the female indicator from the first-stage regression. GENEQ is the state-level gender equality index used by Huang and Kisgen (2013).

Robust standard errors in parenthesis. *** and ** indicate statistical significance at the 1 and 5% levels, respectively

Table 5. Probit regression of the likelihood of a firm having a female CEO

Tobin's Q	2.450***
	(1.102)
ROA	0.265**
	(0.090)
TENURE	0.134
	(0.123)
AGE	-0.934***
	(0.053)
DUAL	-0.099**
	((0.021)
BINDEP	0.156**
	(0.023)
FSIZE	-0.024**
	(0.001)
GSALE	0.432***
	(0.003)
Pseudo R^2	0.342
Time fixed effects	Yes
Industry dummies	Yes
Obs.	4920

Notes: The dependent variable is a binary variable that equals one if a firm has a female CEO and zero otherwise.
See Table 1 for variable definitions.
Robust standard errors in parenthesis. ***, **, and * indicate statistical significance at the 1, 5 and 10% levels, respectively

Table 6. Matching estimates of the treatment effect of having a female CEO on firm performance following the COVID pandemic shock

	Matching methods Nearest neighbor matching	Three nearest neighbor matching	Radius matching			Local linear matching	Kernal matching
			r=0.01	r=0.03	r=0.05		
ROA	4.334***	1.974***	1.990***	1.882**	1.943***	1.914**	1.811**
	(0.312)	(0.312)	(0.092)	(0.690)	(0.612)	(0.632)	(0.642)
Tobin's Q	6.781***	2.434***	2.543***	1.854**	2.143***	2.245**	1.941**
	(0.774)	(0.243)	(0.123)	(0.554)	(0.422)	(0.532)	(0.423)
σ(ROA	-1.907***	-1.854***	-0.645**	-0.754*	-0.944**	-0.730**	-0.723**
	(0.062)	(0.020)	(0.290)	(0.399)	(0.123)	(0.345)	(0.434)
σEQUITY	-1.871***	-1.798***	-0.695**	-0.753*	-0.943**	-0.723**	-0.713**
	(0.022)	(0.042)	(0.232)	(0.344)	(0.125)	(0.356)	(0.450)
LEV	-2.222**	-1.721**	-1.212***	-1.189**	-1.045*	-1.512**	-1.172**
	(0.932)	(0.743)	(0.082)	(0.161)	(0.634)	(0.340)	(0.410)

Notes. A 0.06 fixed bandwidth and an Epanechnikov kernel are used for kernel and local linear regression matching. Bootstrapped standard errors are reported in parenthesis. ***, **, and * indicate statistical significance at the 1, 5, and 10%.

We subject the results to two robustness tests. The first test is a traditional panel data regression with firm fixed effects that includes the female CEO dummy variable ($Female$) and that tries to deal with potential endogeneity issues. These issues might arise, for example, because of possible gender discrimination by executive boards in making CEO appointments, or because female CEOs may have self-selected into certain types of firms, or because high risk-taking firms seek female CEOs in the belief that they will be more risk-averse than male CEOs (Martin et al., 2009). To instrument a firm having a female CEO we follow Huang and Kisgen (2013) and employ the state's gender status equality value for each firm based on the firm's headquarters location. The logic is that though this variable may be correlated with the decision to hire a female CEO, it is unlikely to affect firm performance other than through its direct effect on the gender of the CEO. We therefore estimate the following 2SLS model:

$$\text{First stage: } Female_i = \varphi + \tau_t + \gamma Gender\ Equality_i + \theta X_{it} + \epsilon_{i,t} \quad (2)$$

and

$$\text{Second stage: } y_{i,t} = \alpha + \tau_t + \beta Instrumented\ female_i + \theta X_{i,t} + \varepsilon_{i,t} \quad (3)$$

where $y_{i,t}$ is the measure of firm performance, $Female_i$ is the female CEO dummy variable, $Gender\ Equality_i$ is the state-level gender inequality index proposed by Huang and Kisgen (2013), $Instrumented\ female_i$ is the fitted value of the female from Equation (2), and X_{it} is the same vector of control variables employed in Equation (1).

The instrumental variable results are reported in Table 4. The first column reports the results from the first stage OLS regression with the female CEO dummy as the dependent variable. The F-statistic from the first stage regression is 19.46, which meets the rule of thumb threshold of 10 implied by Stock and Yogo (2015), thereby suggesting that we can rule out weak instrument issues. The remaining columns report the results for the second stage regressions with our instrumental variable and firm specific characteristics as independent variables. The coefficients on the instrumented variable are statistically significant in all the estimates and suggest that firms with female CEOs were more profitable, more highly valued, and more risk averse than firms with male CEOs.

The second robustness test makes use of PSM methods to ensure that a firm with a female CEO is matched with a firm with a male CEO with statistically the same firm-specific characteristics. We first estimate the propensity scores using a probit model. In this estimate, the dependent variable is the female CEO dummy, and the control variables include the firm characteristics employed in estimating Equation (1) plus firm value and profitability and we match the firms based on firm characteristics and by firm industry. The probit results are reported in Table 5 and indicate that the likelihood of employing a female CEO is greater in firms that are more highly valued and profitable, that have more independent boards, and that have experienced rapid sales growth, but is less likely in larger firms, as the CEO ages, and if the CEO is also the chairman. The estimated propensity scores are used to conduct matching to obtain the treatment effects of female CEO employment (compared to those of non-female CEO employment). The PSM results are reported in Table 6. The first two columns show the

results from the one-nearest-neighbor matching and two-nearest-neighbor matching. The next three columns report the results from radius matching, and the final two columns report the results from the local linear matching and kernel matching, respectively. The estimated average treatment effect on the treated (ATTs) for the measures of firm performance and risk-taking are statistically significant and positive in the cases of firm profitability and value and negative for each measure of risk-taking. The results are a further indication that following the COVID shock firms with female CEOs were more profitable, more highly valued and more risk-averse than were firms with male CEOs.

4. Conclusions

We examined the relative performance of US firms with female and male CEOs following the exogenous shock of the COVID-19 pandemic. We found that following the shock firms with female CEOs were more profitable, more highly valued, and more risk-averse, with the results robust to alternative methodologies and robustness tests. The results suggest that though female CEOs do not consistently demonstrate better management across all periods, they are better than male CEOs at handling crises that are not of firms own making. Our results are consistent with recent literature suggesting that firms in which the CEO is a female tend to be more profitable and valuable, which might be related to their greater risk aversity and more democratic leadership styles, and with the literature arguing that female CEOs are more creative, more intuitive, and better able to improvise, which are characteristics that would appear to serve well in crisis situations.

Acknowledgements.
The paper reflects the views of the authors and not the organizations that they represent. We are grateful to an anonymous referee for comments that improved the paper.

References

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

Bartunek, J.M., Walsh, K and Lacey, C.A. (2000) Dynamics and dilemmas of women leading women, *Organization Science*, 11(6), 589-610.

Batson, C.D., Sympson, S.C., Hindman, J.L, Decruz, P., Todd, R.M., Weeks, J.L. and Burns, C.T. (1996) I've been there, too: effect on empathy of prior experience with a need, *Personality and Social Psychology Bulletin*, 22(5), 474-482.

Belenzon, S., Shamshur, A. and Zarutskie, R. (2019) CEO's age and the performance of closely held firms, *Strategic Management Journal*, 40(6), 917-944.

Bose, S., Shams, S., Ali, M.J. and Mihret, D. (2022) COVID-19 impact, sustainability performance and firm value: international evidence. *Accounting and Finance*, 62(1), 597-643.

Bruce, R., Cavgias, A., Meloni, L. and Remígio, M. (2022) Under pressure: women's leadership during the COVID-19 crisis, *Journal of Development Economics*, 154, 102761.

Byron, K. and Khazanchi, S. (2012) Rewards and creative performance: a meta-analytic test of theoretically derived hypotheses, *Psychological Bulletin*, 138, 809-830.

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

Combs, J.G., Ketchen Jr, D.J., Perryman, A.A. and Donahue, M.S. (2007) The moderating effect of CEO power on the board composition–firm performance relationship, *Journal of Managements Studies*, 44(8), 1299–1323.

Eagly, A.H. and Johnson, B.T. (1990) Gender and leadership style: a meta-analysis, *Psychological Bulletin*, 108(2), 233-256.

El-Khatib, R., Fogel, K. and Jandik, T. (2015) CEO network centrality and merger performance, *Journal of Financial Economics*, 116(2), 349–382.

Faccio, M., Marchica, M-T. and Mura, R. (2016) CEO gender, corporate risk-taking, and the efficiency of capital allocation, *Journal of Corporate Finance*, 39, 192-209.

Farooq, M.U., Su, K., Boubaker, S. and Gull, A.A. (2022) Does gender promote ethical and risk-averse behavior among CEOs? An illustration through related-party transactions, *Finance Research Letters*, 47(Part B), 102730.

Fogel, K., Ma, L. and Morck, R. (2021) Powerful independent directors, *Financial Management*, 50(4), 935-983.

Francoeur, C., Labelle, R. and Sinclair-Desgagné, B. (2008) Gender diversity in corporate governance and top management, *Journal of Business Ethics*, 81(1), 83-95.

Garikipati, S. and Kambhampati, U. (2021) Leading the fight against the pandemic: does gender really matter? *Feminist Economics*, 27(1-2), 401–418.

Hall. M. and Weiss, L. (1967) Firm size and profitability, *The Review of Economics and Statistics*, 49(3), 319 – 331.

Ho, S.S., Li, A.Y., Tam, K. and Zhang, F. (2015) CEO gender, ethical leadership, and accounting conservatism, *Journal of Business Ethics*, 127, 351-370.

Hu, S. and Zhang, Y. (2021) COVID-19 pandemic and firm performance: cross-country evidence, *International Review of Economics and Finance*, 74, 365-372.

Huang, J. and Kisgen, D.J. (2013), Gender and corporate finance: are male executives overconfident relative to female executives? *Journal of Financial Economics*, 108(3), 822-839.

Jiraporn, P., Jumreornvong, S., Jiraporn, N. and Singh, S. (2016) How do independent directors view powerful CEOs? Evidence from a quasi-natural experiment, *Finance Research Letters*, 16, 268-274.

Khan, W.A. and Vieito, J.P. (2013) CEO gender and firm performance, *Journal of Economics and Business*, 67, 55-66.

Krishnan, G.V. and Parsons, L.M. (2008) Getting to the bottom line: an exploration of gender and earning quality, *Journal of Business Ethics*, 78(1-2), 65-76.

Liu, Y., Wei, Z. and Xie, F. (2014) Do women directors improve firm performance in China? *Journal of Corporate Finance*, 28, 169-184.

Martin, A. D., Nishikawa, T. and Williams, M. A. (2009) CEO gender: effects on valuation and risk, *Quarterly Journal of Finance and Accounting*, 48(3), 23-40.

Palvia, A., Vähämaa, E. and Vähämaa, S. (2015) Are female CEOs and chairwomen more conservative and risk averse? Evidence from the banking industry during the financial crisis. *Journal of Business Ethics*, 131(3), 577-594.

Pearson, C.M. and Sommer, S.A. (2011) Infusing creativity into crisis management: an essential approach today, *Organizational Dynamics*, 40(1), 27-33.

Ryan, M.K., Haslam, S.A., Morgenroth, T., Rink, F., Stoker, J. and Peters, K. (2016) Getting on top of the glass cliff: reviewing a decade of evidence, explanations, and impact, *The Leadership Quarterly*, 27(3), 446-455.

Sergent, K. and Stajkovic, A.D., (2020) Women's leadership is associated with fewer deaths during the COVID-19 crisis, Quantitative and qualitative analyses of United States governors, *Journal of Applied Psychology*, 105(8), 771–783.

Shin, H. and Park, S. (2023) Are firms with women executives better at surviving a crisis? Evidence from South Korea during the COVID-19 pandemic, *Gender in Management*, 38(1), 133-151.

Shropshire, C., Peterson, S., Bartels, A.L., Amanatullah, E.T. and Lee, P.M. (2021) Are female CEOs really more risk averse? Examining economic downturn and other orientation, *Journal of Leadership and Organizational Studies*, 28(2), 185-206.

Stock, J. and Yogo, M. (2005) *Testing for weak instruments in IV regression*. In: Andrews, D. and Stock, J. (Eds.): Identification and Inference for Econometric Models: A Festschrift in Honor of Thomas Rothenberg Cambridge University Press, 80-108.

Toussaint, L. and Webb, J.R. (2005) Gender differences in the relationship between empathy and forgiveness, *The Journal of Social Psychology*, 145(6), 673-685.

Vo, L.V., Nguyen, H.T.H. and Le, H.T.T. (2019) Do female CEOs make a difference in firm operations? Evidence from Vietnam, *Accounting and Finance*, 61(S1), 1489-1516.

Zeng, S. and Wang, L. (2015) CEO gender and corporate cash holdings. Are female CEOs more conservative? *Asia-Pacific Journal of Accounting and Economics*, 22(4), 449-474.