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The effects of managerial gender and education on firm performance

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Abstract

The role of women has been increasingly affirmed as gender equality has become the norm, particularly when it comes to how firms should be managed. In addition, education instills knowledge that could change managerial perspectives, thus affecting the ways they manage firms. This study uses a dataset covering 617 non-financial firms listed on the Vietnamese stock market from 2010 to 2021 to examine the impact of managerial gender and education on firm performance, measured in accounting- and market-based values. The System Generalized Method of Moments was employed to address endogeneity and other defects normally associated with panel data. The results reveal that having female chief executive officers

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(CEOs) positively affects firms. Additionally, a CEO's educational background positively affects both accounting- and market-based measures. The study provides new evidence of the positive effects of female CEOs and highly educated CEOs on firm performance compared with some extant studies in Vietnam. Based on the research findings, relevant suggestions are proposed regarding the welcoming features of CEOs in managing firms in Vietnam.

Keywords: Managerial gender, Managerial education, Firm performance

1. Introduction

Chief executive officers (CEOs) play a critical role in corporate management, providing directions, monitoring, and coordinating actions to cope with changes and challenges arising from the environment. As a result, CEOs are expected to have the skills and knowledge to understand the business environment. Leaders with advanced degrees are able to improve firm performance more effectively (Hambrik and Mason, 1984).

With the rising trend of global gender equality, CEOs are no longer confined to men, and women participating in corporate management are no longer unusual. The presence of female CEOs can have direct and indirect impacts on firm performance. According to Adams and Ferreira (2009), female CEOs have a more important role in improving a firm's supervision than male counterparts. Nonetheless, female CEOs are only presented in fewer than 10% of the S&P 500 firms (Catalyst, 2023).

In Vietnam, gender discrimination, as well as prejudices about women's abilities, knowledge, and roles, have existed for a long time. However, the current setting has changed as the legal power of men and women is prescribed to be equal. More and more women have been participating in fields previously the privilege of men, such as politics and economics. According to the Asian Development Bank (2023), the number of Vietnamese businesses owned by women has increased rapidly to more than 20% of small- and medium-sized enterprises, and more than half of Vietnamese firms have women in the ownership structure.

Even with remarkable changes, there are limitations to females' engagement in a firm. In a survey about the role of women in business development conducted by Navigos and the World Economic Forum, firms do not have an equal recruitment policy for men and women. Positions requiring advanced skills and knowledge are frequently prioritized for men. Women are commonly chosen for positions as facilitators rather than decision-makers. Furthermore, women still have to experience performance evaluation bias.

In addition to gender, the educational level can affect CEOs' performance in several ways. Education enhances the understanding and knowledge of a CEO and allows him/her to be more open and adapt to the changing environment. Using the upper echelons theory, Hambrick and Mason (1984) argued that senior managers' education level can affect decision-making, thus affecting firm performance. However, there is inconsistent evidence as to the role of education of CEOs toward firm performance.

Because of the increasingly important role of women and education, this study enriches the empirical evidence on the role of the two factors in Vietnam. Given the complex development in the role of females, it is surprising to find that there are limited studies on the impact of female CEOs on businesses in Vietnam, especially studies that utilize large samples or updated datasets over long horizons. To address the gaps mentioned in the current paper, we examine whether the level of education of CEOs and female CEOs is conducive to firm performance by using a sample covering 617 non-financial listed firms in Vietnam from 2010 to 2021. In addition to the accounting-based performance measures such as return on assets (ROA) and return on equity (ROE), we also consider market-based evaluation of the role of CEOs' education and gender. This would allow a more comprehensive examination of how the external stakeholders perceive a firm with varied characteristics of CEOs.

The rest of this study is structured as follows. Section 2 continues with a literature review, providing background on the potential effects of managerial gender and education on firm performance and establishing testable hypotheses based on the relevant literature. Section 3 outlines the research methods, including empirical models, variable construction, and data sources. Section 4 presents and discusses the empirical results, and section 5 concludes with relevant implications for various stakeholders.

2. Literature review

2.1 CEOs' gender and firm performance

Upper echelons theory and leadership styles can help predict the influence of managers' gender on firm performance. According to Hambrick and Mason (1984), top management's traits may play a role in predicting firm performance. There are variations in how things are handled because managers view circumstances through a personal lens formed as a result of differences in experiences, values, personalities, and other aspects. According to Chesterman *et al.* (2004), female CEOs tend to commit longer-term and are dedicated to organizations. Furthermore, due to gender differences, almost all female CEOs are considered more risk-averse than men. Consequently, female leaders tend to take fewer risks or reduce unnecessary risks while setting up a project in particular and running a firm in general (Schubert, 2006).

Larson and Freeman (1997) discovered that men and women have different leadership philosophies, which impact corporate performance. Women outperform men in leadership and management roles due to their sensitivity, understanding, and gentleness. Women are soft and flexible, often choosing the path of persuasion and cooperation. By contrast, men appear strong, assertive, controllable, and competitive and tend to resort to their power in managing their subordinates. As a result, women in leadership positions exhibit better interoperability, encourage employees' participation, and promote the capacity of their superiors and subordinates. Female CEOs favor a leadership approach that strives to inspire all team members through knowledge sharing, connections, and communications (Larson and Freeman, 1997).

Huang and Kisgen (2013) demonstrated that firms led by female CEOs make more cautious financial decisions. Specifically, firms with female CEOs are less likely to take on acquisitions and issuing securities. Using data from US commercial banks, Palvia *et al.* (2015) demonstrated that banks with female CEOs typically have greater capital levels and are less likely to fail during a financial crisis.

Women on board can enhance corporate governance mechanisms (Carter *et al.*, 2003; Campbell and Mínguez-Vera, 2008; Terjesen *et al.*, 2009; Abdelzaher and Abdelzaher, 2019). Female CEOs help confine the issues of asymmetric information and agency conflicts (Chen *et al.*, 2018). Ying and He (2020) and Frye and Pham (2018) suggested that female CEOs tend to have stronger expertise and knowledge, and can make more accurate judgments in corporate financial decisions. Additionally, female CEOs create a friendlier working environment and pay more equitable wages (Tate and Yang, 2015). Tsou and Yang (2019) found that highly educated female workers can also improve firm performance in China. Recently, Suherman *et al.* (2023) have found that female CEOs tend to perform better in Indonesia from 2010 to 2020. Using a sample of 138 non-financial firms from 2011 to 2018, Mukherjee and Sen (2022) documented that female CEOs tend to improve firm performance in India. Chatterjee and Nag (2023) found that just the presence of a woman director on the board does not guarantee enhanced firm performance for a sample of 364 firms from 2017 to 2021. It takes a significant proportion of the boards and the active roles of the female directors to enhance firm performance. In the context of Vietnam, Pham (2021) also suggested that female CEOs might demonstrate behaviors of high ethics and the right level of confidence, which leads to higher firm performance, especially in the decline stage of firms. Nguyen and Tran (2019) also showed that the presence of more female executives on the board and a female chairman improves the firm's profitability.

There are, however, views that firms led by women tend to perform worse (Inmyxai and Takahashi, 2010; Amran, 2011; Hsu *et al.*, 2013; Bennouri *et al.*, 2018; Allison *et al.*, 2023). According to Fairlie and Robb (2009), women's roles in family companies are sometimes constrained since female founders or executives frequently have low human capital. Singhathep and Pholphirul (2015) stated that female CEOs have a detrimental effect on an organization's financial performance. Finally, although it has been demonstrated that female CEOs positively impact corporate value, the larger the power gap in a company with a co-CEO, the less impact female CEOs have (Hong and Kim, 2022). Recently, Allison *et al.* (2023) used data from the World Bank Enterprise Survey that covered 130,000 firms in over 100 developing countries from 2008 to 2017 and showed that female top managers underperform their male counterparts. Nonetheless, the researchers acknowledge that the inferiority of female-led firms is recorded for small- and medium-sized firms and varies widely across the globe. Meanwhile, Rahman and Chen (2023) showed that CEO gender did not exert a significant effect on the performance of listed firms in China from 2010 to 2020.

Despite diverse views, literature tends to show appreciation towards the role of female CEOs. Female CEOs are generally more ethical, less arrogant, and more cautious in financial management than male CEOs. Therefore, the following hypothesis is proposed:

H1: Firms led by female CEOs tend to perform better.

2.2 CEOs' education and firm performance

The educational level can affect CEOs' performance in three different ways. Firstly, the level of education increases the understanding and knowledge of the CEO, enabling him/her to have a deeper understanding of the firm's operations and a thorough awareness of complex issues. Secondly, the educational level allows the CEO to free up his/her mind, expand knowledge, and enhance reasoning ability. Finally, the networks built in the academic environment, especially those in postgraduate studies, can be helpful for a CEO's future career.

Orens and Reheul (2013) argued that a CEO's education is reflected in the firm's strategic choices. Wiersema and Bantel (1992) and Barker and Mueller (2002) argued that top managers with higher education are more likely to make significant changes in corporate management and adopt more effective innovative strategies. According to Hambrick and Mason (1984) and Jalbert *et al.* (2002), leaders with advanced degrees, knowledge, and expertise often have more positive performance. Bertrand and Schoar (2003) suggested that companies where the CEO holds a Master's degree in management tend to have higher profitability. Interestingly, highly educated CEOs are more willing to adopt innovations (Bantel and Jackson, 1989). Barker and Mueller (2002) asserted that highly educated CEOs are less risk-averse, more receptive to original ideas, more likely to consider new possibilities of change for improvement, and make investments. Besides, numerous studies have found a positive relationship between managers' competence and firm performance, and that competence can be described as a function of educational level (Cheng *et al.*, 2010; Joh and Jung, 2016). More recently, Ali *et al.* (2022) found that managerial education helps enhance firm performance in the emerging economy of Pakistan. Interestingly, Urquhart and Zhang (2022) documented that CEOs with PhD degrees outperform their peers. Specifically, they increase firm performance by 3.03%, and if the CEOs obtain PhD from a highly ranked university by 4.65%.

On the other hand, some studies do not find a significant relationship between CEO's education level and firm performance (Palia, 2001; Bhagat *et al.*, 2010). Bhagat *et al.* (2010) mentioned that education is one of the important qualities to meet the requirements of the CEO position, but it is not a good measure to represent the CEO's capacity. Graduating from a highly-ranked university with multiple degrees does not necessarily mean that a CEO can significantly improve firm performance (Morresi, 2017). Using a sample of 248 listed firms in Vietnam, CEO education does not affect the performance of firms in Vietnam (Cao *et al.*, 2016). Interestingly, Nguyen and Nguyen (2024) have found that CEO's education does not affect the performance of real estate firms in Vietnam. Surprisingly, CFOs with postgraduate studies are recording lower profitability.

To sum up, there are still debates about whether a CEO's educational level affects a firm's achievements. However, numerous extant studies show a positive relationship between a CEO's education and firm performance. Therefore, the following hypothesis is proposed:

H2: A CEO's educational level is positively related to firm performance.

3. Research methods

3.1 Research model

In line with previous studies (Ying and He, 2020; Bhagat *et al.*, 2010), this study proposes the following model to examine hypotheses H1 and H2:

$$Perf_{i,t} = \beta_0 + \beta_1 Perf_{i,t-1} + \beta_2 CEOChar_{i,t} + \beta_3 CFOA_{i,t} + \beta_4 Size_{i,t} + \beta_5 Liquidity_{i,t} + \beta_6 Cash_{i,t} + \alpha_i + Industrydum_i + Yeardum_t + \varepsilon_{i,t}, \quad (1)$$

where i and t represent the firm and year, respectively; *Perf* is the dependent variable, proxied by ROA and PTB. ROA is not an adequate measure of firm performance since it is an accounting-based measure, thus potentially being subject to earnings management. Therefore, in this study, PTB, the ratio of price to book value of equity, is also used. This is to capture the evaluation of market players towards firm performance.

In line with previous studies such as Ying and He (2020), control variables are other firm characteristics that could affect firm performance, including financial leverage (lev), cash flow from operating activities (cfoa), firm size (size), liquidity (liquid), and cash holdings (cash). CEO's gender (ceo_fem) and educational level (ceo_edu) are included to investigate the effect of a CEO's characteristics on firm performance. α_i is the individual effect, while $\varepsilon_{i,t}$ is the error term. *Industrydum* and *Yeardum* are binary variables added to control for the industry effect and year effect on firm performance.

Table 1 describes the measurement of the variables.

Table 1. Variable construction

Variable	Definition	Measurement	Supporting studies
Dependent variables			
ROA	Return on assets	Earnings before taxes and interest / Total assets	Nguyen and Nguyen (2024), Ying and He (2020), Cao *et al.* (2016)
PTB	Price-to-book ratio	Market price / Book value of a stock	Suherman *et al.* (2023)
Independent variables			
lev	Financial leverage	The ratio of total debt to total assets.	Nguyen and Nguyen (2024), Ying and He (2020), Bhagat *et al.* (2010)

Table 1. Variable construction *(continued)*

Variable	Definition	Measurement	Supporting studies
cfoa	Cash flow from operating activities	$\frac{\text{Cash flow from operating activities}}{\text{Total assets}}$	Ying and He (2020)
size	Firm size	The natural logarithm of total assets.	Nguyen and Nguyen (2024), Ying and He (2020), Bhagat *et al.* (2010)
liquid	Liquidity	The ratio of current assets to current liabilities.	Nguyen and Nguyen (2024); Ying and He (2020); Cao *et al.* (2016)
cash	Cash holdings	The ratio of cash holdings to total assets.	Ying and He (2020)
ceo_fem	Female CEO	ceo_fem = 1 if CEO is female, and 0 otherwise.	Ying and He (2020), Cao *et al.* (2016)
ceo_edu	CEO's educational level	ceo_edu = 1 if CEOs hold a university degree or lower, 2 if Master's degree, 3 if PhD degree or above.	Nguyen and Nguyen (2024), Ying and He (2020), Cao *et al.* (2016), Bhagat *et al.* (2010)

Source: Authors' compilation

3.2 Research sample

The research retrieves financial data from Eikon Refinitiv (Thomson Reuters). In addition, the study manually collects CEO characteristics from firms' annual reports. Firms in the financial sector, such as banks, financial institutions, credit unions, and insurance companies, have different characteristics (Basil and Khaled, 2011). Therefore, the study excludes firms in the financial sector from the sample. This final dataset is unbalanced panel data, covering 617 non-financial firms listed on the Vietnamese stock market from 2010 to 2021, totaling 6,210 firm-year observations. Only non-financial firms were selected since they have both operating and accounting characteristics compared to firms in other industries (Suherman *et al.*, 2023).

3.3 Estimation strategy

For panel datasets, the conventional estimators include pooled ordinary least squares (pooled OLS), fixed effects model, and random effects model. However, these models cannot tackle the endogeneity caused by the potential two-way relationship of the variables representing corporate decisions. For example, firm performance can be a determinant of leverage (Nguyen *et al.*, 2017), liquidity (Dang, 2020), cash holdings (Alnori *et al.*, 2022), size (Yadav *et al.*, 2022), cash flows (Jagadish and Sharmila, 2021). Finally, if the CEO's gender (Tsou and Yang, 2019; Suherman *et al.*, 2023) and education (Ali *et al.*, 2022; Urquhart and Zhang, 2022) can affect firm performance, it is natural to expect that firms might take advantage of this when they have issues in terms of low performance.

The current research employs the System Generalized Method of Moments (System GMM). The goal is to determine the effects of independent variables of interest, gender, and educational level of CEOs on the two dependent variables, ROA and PTB. The Hansen and Arellano Bond tests are used to check the overidentification condition and autocorrelation of residuals in the difference model in the System GMM (Roodman, 2009). If the p-value of the two tests is above the significance level, i.e., 5%, the estimates could be considered reliable for statistical inferences. We rely on System GMM since the method can tackle the endogeneity issue caused by the potential two-way relationship between the dependent and independent variables, which might be quite common in corporate finance. Furthermore, System GMM can address other defects, including heteroskedasticity and autocorrelation, which are typical characteristics of panel data, using two-step estimators (Roodman, 2009). Finally, since firm performance might exhibit dynamism (Nguyen and Le, 2023), we employ a dynamic model to account for this. Specifically, we adopt a dynamic model by introducing one-period lagged values of the dependent variable, i.e., ROA (ROA_{t-1}) and PTB (PTB_{t-1}), as additional explanatory variables on the right-hand side. Dynamic models require System GMM to be the main estimator since this strategy is tailored to solve the endogeneity caused by including the lagged dependent variable as an explanatory variable. Meanwhile, the use of conventional estimators cannot address the endogeneity caused by the inclusion of the one-period lagged value of the dependent variable on the right-hand side of equation (1).

4. Results and discussion

4.1 Descriptive statistics

Table 2 displays the summary statistics of variables in the model. The ROA variable has an average value of 0.064 or about 6.4%. The PTB variable has an average value of 1.04, so generally, the market value of equity is approximately equal to the book value of equity. Lev is on average 0.218, so about a fifth of the total assets is financed by debt. CFOA is about 5.6% of the size of total assets, but the volatility is quite high as indicated by the standard deviation and the range. Liquid is rather high at 2.381, and cash is about 15% of the total assets.

Table 2. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROA	5,874	0.064	0.079	-0.492	0.839
PTB	5,874	1.043	1.157	0.060	22.781
lev	5,874	0.218	0.185	0.000	0.800
cfoa	5,874	0.056	0.138	-0.694	1.410
size	5,874	27.310	1.574	23.288	33.695
liquid	5,874	2.381	3.117	0.034	47.368
cash	5,874	0.149	0.157	0.000	0.962

Source: Authors' calculation

4.2 Correlation matrix

Table 3 presents pairwise correlation coefficients. The majority of the correlation coefficients are quite small. CEO's educational level, or CEO's education, has a negative correlation with ROA (-0.041) and a positive association with PTB (0.058). So, the link between education level and firm performance is quite mixed, based on correlation analysis. This suggests that the consideration of both accounting-based and market-based indicators is justifiable.

This correlation matrix, however, only serves as a reference because it only depicts the correlation between two variables in the absence of any other control variables. Multiple regression is still required to investigate the relationship between the explanatory and dependent variables. We also perform the variance inflation factor (VIF) test to see if severe multicollinearity exists between variables. The results are that all coefficients are less than 2, implying that multicollinearity should not be a concern (Kennedy, 1992).

Table 3. Correlation matrix

	roa	ptb	lev	cfoa	size	liquid	cash
roa	1.000						
ptb	0.264	1.000					
lev	-0.323	-0.036	1.000				
cfoa	0.360	0.066	-0.201	1.000			
size	-0.039	0.252	0.371	-0.057	1.000		
liquid	0.178	0.028	-0.359	0.035	-0.193	1.000	
cash	0.398	0.154	-0.397	0.212	-0.129	0.339	1.000

Source: Authors' calculation

4.3 Empirical results and discussion

System GMM utilizes lagged values of variables in the model as instruments for endogenous variables; as a result, it is more convenient and less challenging to conduct GMM estimation when it comes to instrumental variable selection compared to instrumental variable regression. To ascertain the validity of the estimation results, two tests of autocorrelation of order two of residuals in the differenced models and overidentification are performed. The satisfaction of these conditions implies that the results are valid for statistical inferences (Roodman, 2009). In Table 4, the p-values of the two tests are higher than 5%, suggesting the validity and reliability of the estimates, and the lagged variable is statistically significant, which supports the use of dynamic models.

A positive and significant correlation exists between female CEO and ROA and PTB. This result lends credence to the hypothesis that female CEOs increase the efficiency of firms. Female executives can raise the firm value, not only when measured by accounting numbers (ROA) but also from investors' (PTB) perspectives. This estimate is consistent with previous

research, which suggests that female CEOs improve corporate performance compared to their male counterparts.

Table 4. CEO's gender and education on firm performance

Independent variable	CEO_FEM	CEO_FEM	CEO_EDU	CEO_EDU
	ROA	PTB	ROA	PTB
L.roa	0.414***		0.410***	
	[32.38]		[33.74]	
L.ptb		0.616***		0.535***
		[24.64]		[24.76]
lev	-0.103***	-0.014	-0.052***	-0.017
	[-11.21]	[-0.10]	[-5.53]	[-0.11]
cfoa	0.018***	-0.147	0.073***	-0.144
	[3.95]	[-0.68]	[7.00]	[-0.89]
size	0.006***	0.070***	0.003***	0.093***
	[8.18]	[3.92]	[4.69]	[5.40]
liquid	-0.001***	-0.002	-0.001***	-0.004
	[-7.30]	[-0.30]	[-3.38]	[-0.99]
cash	0.077***	0.466**	0.088***	0.612***
	[11.09]	[2.11]	[9.76]	[4.54]
ceo_fem	0.011***	0.338***		
	[3.19]	[3.69]		
ceo_edu			0.005***	0.220***
			[2.82]	[3.24]
_cons	-0.133***	-1.886***	-0.089***	-2.455***
	[-6.04]	[-3.38]	[-3.47]	[-4.32]
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
No of observations	5,182	5,182	5,182	5,182
AR2 test p-value	0.082	0.471	0.061	0.543
Hansen test p-value	0.101	0.182	0.338	0.607

Notes: t-statistics are in brackets. *** indicate statistical significance at 1%.

Source: Authors' calculation

Specifically, the aforementioned findings are in line with many earlier studies, such as Ullah *et al.* (2020), Carter *et al.* (2003), Terjesen *et al.* (2009, and Abdelzaher and Abdelzaher (2019). This could be due to the characteristics of women. Firstly, they are more cautious and do not want to take unnecessary risks (Huang and Kisgen, 2013; Palvia *et al.*, 2015). Secondly, they are a positive addition to the effectiveness of corporate governance mechanisms (Carter *et*

al., 2003; Terjesen *et al.*, 2009). Thirdly, they might have better expertise and more profound knowledge necessary to make appropriate financial decisions (Ying and He, 2020). Finally, female CEOs could be more friendly, thus effectively communicating and encouraging staff (Tate and Yang, 2015). The result is inconsistent with those that find no significant improvement in firm performance if the firms are led by women (Inmyxai and Takahashi, 2010; Bennouri *et al.*, 2018) or even worse when led by women (Allison *et al.*, 2023).

In Table 5, the coefficient of CEO education is statistically significant in both performance proxies (ROA and PTB) cases. The result shows that higher education attainment is positively related to firm performance, supporting the view that educational level can positively affect CEO performance in many ways. Firstly, the educational level increases a CEO's general and specific understanding and knowledge to build the right strategies (Orens and Reheul, 2013). The networks built in the academic environment can benefit a CEO's future career, and they are open to original ideas (Barker and Mueller, 2002). The result is inconsistent with those of Cao *et al.* (2016) and Nguyen and Nguyen (2024), who have found the insignificant effect of CEO gender on firm performance. However, the study of Cao *et al.* (2016) employed a dataset of a quite outdated period, while Nguyen and Nguyen (2024) only focused on firms in the real estate sector.

Furthermore, many studies support the positive role of female CEOs (Wiersema and Bantel, 1992; Barker and Mueller, 2002; Jalbert *et al.*, 2002; Bertrand and Schoar, 2003; Cheng *et al.*, 2010; Joh and Jung, 2016). More recent studies also documented the positive influence of highly educated CEOs on firms' achievements (Ali *et al.*, 2022; Urquhart and Zhang, 2022) in developing countries. The result is consistent with the findings in Vietnam, including Pham (2021) and Nguyen and Tran (2019).

In Table 5, the study puts both CEO characters into the model (1) and performs System GMM estimation. To ascertain the validity of the estimation results, two tests of autocorrelation of order two of residuals in the differenced models and overidentification are performed. In Table 5, the p-values of the two tests are higher than 5%, suggesting the validity and reliability of the estimates, and the lagged variable is statistically significant, which supports the use of dynamic models.

Generally, a positive and significant correlation exists between female CEO and ROA and PTB. This result consistently lends credence to the hypothesis that female CEOs increase the efficiency of the firms compared to their male counterparts. However, the CEO's education is only significantly related to PTB. When both variables are in the model, the effect of the CEO's gender tends to be stronger. Nevertheless, positive effects of both characteristics on firm performance can still be documented.

As for the control variables, cash flows are positively related to firm performance, implying that higher cash flows provide financial security and reduce systematic risk (Soni *et al.*, 2022). Size is also positively related to firm performance, confirming the effect of economies of scale (Bolarinwa *et al.*, 2021). Leverage is negatively linked to profitability

due to heightened interest paid (Booth *et al.*, 2001; Rajan and Zingales, 1995). Liquidity has an unfavorable effect on firm performance as excessive availability of funds can result in ineffective investments (Bhayani, 2010). Finally, cash holdings are positively associated with ROA and PTB, indicating that firms use this to benefit from higher financial flexibility.

Table 5. Both gender and education in model (1)

Independent variable	ROA	PTB
L.roa	0.414***	
	[45.38]	
L.ptb		0.547***
		[24.70]
lev	-0.090***	-0.139
	[-14.75]	[-0.85]
cfoa	0.026***	-0.247***
	[7.37]	[-2.78]
size	0.005***	0.087***
	[10.60]	[3.84]
liquid	-0.001***	-0.001
	[-9.00]	[-0.10]
cash	0.072***	0.324
	[14.03]	[1.36]
ceo_fem	0.008***	0.294***
	[3.39]	[2.88]
ceo_edu	0.000	0.170***
	[0.38]	[2.99]
_cons	-0.127***	-2.146***
	[-7.76]	[-2.97]
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
No. of observations	5,182	5,182
AR2 test p-value	0.080	0.680
Hansen test p-value	0.296	0.278

Notes: t-statistics are in brackets. *** indicate statistical significance at 1%.

Source: Authors' calculation

5. Conclusions

This study examines how the education and gender of CEOs affect firm performance, using a sample of non-financial listed firms in Vietnam from 2010 to 2021 and employing the System GMM estimator to address issues associated with dynamic models. The results show that

female CEOs tend to perform better in terms of both accounting-based and market-based performance measures, confirming the valuable characteristics of women in managing firms. Furthermore, a CEO's educational attainment has a positive effect on both accounting-based and market-based measures, highlighting the value of investing in the education of a firm's leader.

Based on the findings from this research and the general theme of the literature, there is strong evidence that the appointment of female CEOs increases accounting profit and the firms' market value. The status of women in society is becoming increasingly valued. When female CEOs positively impact businesses, it can change how modern society views the role of women in key executive management positions. We believe that female CEOs can successfully manage and run businesses, and the findings can help companies have more confidence in appointing women to CEO positions. This result is consistent with various empirical results in developing countries, providing a more sound basis for appointing female executives to important positions in the firm. Firms, in general, should consider better equality in terms of career paths and remuneration for employees of both genders in the same position.

Regarding the effect of CEOs' education, it tends to be beneficial for firms to have highly educated CEOs. Better education brings new perspectives and the ability to apply theories into practice, which effectively enhances firm performance. This result implies that firms should encourage and facilitate CEOs' training at higher levels.

This study has some limitations. First, due to limited resources, we could not control for more characteristics of CEOs to single out the effects of a CEO's gender and education on corporate performance. Second, it is also important to unveil the mechanism as to how the mentioned characteristics of CEOs can improve firm performance. These could be the avenue for future research.

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