EDUCATIONAL QUALIFICATIONS OF BOARD MEMBERS IN RISK MANAGEMENT OF COMMERCIAL BANKS IN VIETNAM

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ABSTRACT

This study examines the impact of board members' education on risk management of 31 Vietnamese commercial banks in the period 2008-2020. Research results show that the higher the level of education of the board members, the less likely it is that the bank will fail. The early completion of 3 pillars of BASEL II has a positive impact on the risk management ability of the bank. In addition, the larger the bank's scale does not mean that it will stand firm against risks during its operation, especially during a crisis.

Keyword: Bank Risk, Academic Level, Administrative Council, Basel ….

1. Introduction

The role of the bank management team is considered one of the main causes of the 2007-2009 global financial crisis (Beltratti and Stulz 2012), (Peni and Vähämaa 2012). A growing body of research demonstrates that the governance mechanism of an organization through the activities of the Board of Directors (BOD) plays a very important role in effectively monitoring the risks in the operations of banks to enhance the stability of the banking system of a country (Srivastav and Hagendorff 2016). Diversity in the board of directors will increase corporate governance and is reflected in many aspects such as skills, experience as well as demographic characteristics of individuals on the board (Zhou, Kara, and Molyneux 2019). These aspects can positively impact board performance through better decision making by providing diverse perspectives (Van der Walt et al. 2006) and by enhancing the independence of thought of board members to perform their advisory and monitoring functions (Adams and Ferreira 2007).
Previous studies have considered board diversity as one of the key issues among board characteristics influencing financial firm decisions and investments (Oxelheim (2003); Veltrop et al. (2015). In addition, educational background appears to be a fundamental and important "asset" of a new CEO in the appointment decision for a bank or other financial firm (King, Srivastav, and Williams (2016).

In the study of (Levine 2004) it is argued that the complex governance system in banks is due to the unclear nature of bank regulation, and some factors such as the quality of supervision, the level of regulation, the banking environment and the nature of bank assets Adams and Mehran (2003), Macey and O'Hara (2016). Bai and Elyasiani (2013) argue that traditional governance standards of non-financial institutions are no longer reliable when applied in the banking system, while capital sources have different stability requirements. This motivates the research team to evaluate the impact of the educational level of the board of directors and the impact of gender diversity on bank risk management activities especially during the crisis period. In Vietnam, to create a breakthrough in improving the quality of human resources in the banking sector, the State Bank issued Decision No. 1537/QD-NHNN (dated July 17, 2019) on approving the plan to implement the strategy for developing human resources in the banking sector until 2025, with a vision to 2030 of the State Bank. According to this orientation, the State Bank and credit institutions need to develop specialized training and development programs for specialized and expert planning staff to ensure that staff are trained and developed in depth in accordance with job requirements; at the same time, develop a reasonable use and treatment policy to create conditions for staff to demonstrate their capacity, stick with

the sector, regularly evaluate and review the planning to supplement truly capable staff, and remove from the planning unqualified staff who do not make outstanding contributions to the work of the company.

2. LITERATURE REVIEW

2.1 Theoretical Basis

During the global financial crisis of 2007–2008, a significant number of financial firms either failed or survived only because of government intervention (Elsharkawy, Paterson, and Sherif (2018) , Erkens et al. (2012) . Although some firms were more affected than others, the failure required political intervention from governments in affected economies around the world (Taylor 2009). This prompted the Basel Committee (Basel Committee 2010) with its responsibility for banking supervision to emphasize the importance of understanding how banks should be managed on the board and promoting corporate governance in banks (García-Meca, García-Sánchez, and Martínez-Ferrero 2015). To this end, a strong governance system will increase the effectiveness of supervision and ensure a trustworthy financial system with a good reputation, supporting the economic development of the whole country (Basel Committee, 2010). Therefore, the board of directors must perform various functions such as providing information to subordinates, engaging managers in monitoring and controlling, linking the organization to the external environment, and monitoring compliance with laws and regulations (García-Meca, García-Sánchez, and Martínez-Ferrero 2015).

Many theories from economics such as resource dependence, human behavior, and social psychology provide insights into the relationship between corporate performance and board functions (Carter et al. 2010). For example, the agency theory of Jensen and Meckling 1976 is considered a branch of financial economics that is mainly based on the potential conflict between management and owners. This conflict emphasizes the need for a strong governance mechanism to monitor and control the activities of the company (Wagana and Nzulwa 2017). Meanwhile (Carter, Simkins, and Simpson 2003) also implies that having members with different skills and experiences in a well-balanced diverse board can help achieve better monitoring of the activities of managers. Moreover, a proper balance of boards (including representatives from different backgrounds) prevents individuals and groups with common special interests from dominating the decision-making and implementation process. In contrast, (Carter et al. 2010) argued that although agency theory supports the importance of board diversity in enhancing and improving board independence, it does not support a strong relationship between board diversity and firm financial performance compared to other theories such as resource dependence theory. Corporations are not separate entities but exist in a connected environment and respond to opportunities and threats around them. Resource dependence theory (Salancik and Pfeffer 1978) suggests that organizations should benefit from available resources from information and expertise in the environment and receive support from important groups or organizations in the external context. Lawal 2012 also stated that creating a legitimate company in the environment from building communication channels is important for the company.
Hillman and Harris 2002 consider the board of directors as an important part of organizational resources for each firm through the use of their external networks and personal relationships to attract important necessary resources, helping the firm compete. In addition, a diversified board of directors can help firms collect different information and have wider exposure to the environment from suppliers, customers, policymakers, as well as social groups and competitors. Furthermore, it reduces the transaction costs that firms may incur in accessing such information. Therefore, according to resource dependence theory, firms with diverse board members are expected to have superior performance.

Related to the human capital theory, it is stated that a person's experience, skills, and education shape his or her personality, influence his or her decision-making process, and can be used to generate benefits for an organization (Becker 1964). The existence of different genders on the board of directors leads to unique human capital, which is expected to influence the performance of the company (Nielsen and Huse 2010). However, Terjesen, Sealy, and Singh 2009 argue that, although women on the board of directors have the same level of education as men, they are less likely to gain experience faster due to tokenism to perform symbolic actions to show the image of equality in companies and can exist on the board of directors and hinder the contribution of women. According to human capital theory and contingency theory (Fiedler 1964), the impact of board diversity on the firm is either positive or negative depending on the type of firm and the time context. Social psychological theory indicates that gender and educational differences provide a diverse pool of skills, information, and opinions, which on the one hand adds value to critical thinking and decision making, but can also lead to more time-consuming conflicts, which negatively

affects performance (Campbell and Mínguez-Vera 2008). While (Westphal and Milton 2000) believe that divergent thinking can be encouraged due to the presence of diverse groups on the board. Therefore, social psychological theory views board diversity as having both positive and negative effects on firm performance. Indeed, the relationship between CEO education, board diversity, and firm performance has attracted the attention of scholars to investigate the nature of the association between these variables and how this affects policymakers when making decisions regarding hiring a new CEO or replacing a new board.

2.2 CEO's educational background

One of the important tasks of corporate boards is to select a superior chief executive officer (CEO). In this regard, CEO ability is considered a combination of characteristics such as previous work experience, career history, and educational background. Unobservable characteristics such as leadership ability, gaining the trust of board members and shareholders, and team-building skills are also considered. However, measuring the non-quantifiable characteristics and skills of CEOs empirically is a major challenge (Falato, Li, and Milbourn 2015). An objective and measurable characteristic such as educational background is expected to play an important role in CEO recruitment, especially since the stock market responds positively to companies that appoint CEOs with better educational backgrounds (Bhagat, Bolton, and Subramanian 2010). In addition to educational attainment being an important factor in CEO recruitment, those with advanced degrees are also expected to be compensated more than their less-advanced counterparts (Graham et al. 2012). Similarly, (Falato et al. 2015) document substantial evidence of CEO educational pay, reporting a positive effect of CEOs with higher levels of education on firm performance. Furthermore, Miller et al. 2015 argue that CEO skills depend on the nature of the education, which varies with the quality and level of the educational institution that awards the award.

However, the empirical evidence regarding CEO education is mixed. Meanwhile, Gottesman and Morey 2010 found no association between firm performance and CEO education. Furthermore, a wave of research suggests that a firm's superior performance reflects the firm's position and CEO's qualifications rather than its educational attainment (Beber and Fabbri 2012; Gottesman and Morey 2010). This is in contrast to some recent studies that demonstrate a positive association between CEO education and firm performance. Jalbert, Rao, and Jalbert 2002 show that CEOs without college degrees earn higher returns than those with college degrees. Similarly, Gottesman and Morey 2010 confirm that there is no relationship between CEO education and firm financial performance.
Barker and Mueller (2002) assert that younger CEOs with advanced science education, such as engineering, are more likely to invest more money in research and development, implying that educational background influences CEO investment decisions. However, they also report a nonsignificant relationship between advanced degrees such as MBAs or PhDs and firm performance. For CEOs with MBAs, they are less likely to engage in risky decisions, as risk-taking skills are thought to be more related to age than to a manager's educational level (King et al. 2016). In addition, CEOs with PhDs also have lower portfolio risk than others (Barker and Mueller (2002); Berger et al. 2014). In contrast, (Beber and Fabbri 2012) argue that firms with CEOs who have MBAs and less work experience tend to make more speculative decisions due to CEO overconfidence. (King et al. 2016), the support for education and its impact on CEO performance, imply that banks led by CEOs with higher MBA scores are more likely to achieve higher bank profitability than banks led by CEOs without MBAs. However, in a risk-taking context, CEOs with MBAs will make more innovative and risky decisions to ensure superior bank performance.

Based on two empirically proven suggestions, one side supports the view that education provides skills that enable CEOs to manage banks, make the right decisions in complex situations, and achieve better results. The remaining group argues that there is no significant evidence of the impact of CEO education or quality on bank financial performance. Indeed, mixed evidence has been found on the impact of CEO education on firm performance. However, the assessment of the education level of all board members has not been mentioned much in previous studies. Due to this conflict, a hypothesis is defined as follows:
H1: The higher the education level of all board members, the more positively affects the risk management ability of the bank.

2.3 Gender diversity on the board of directors

Gender on boards is a common debated issue. Researchers support the presence of female board members because women have a better understanding and grasp of consumer market trends and customer psychology to develop strategies that not only improve financial performance but also benefit social and community activities (Burke 2003; Stephenson 2004). Some studies have found that female board members bring more innovation and make higher-

quality decisions. Changing social attitudes toward women as well as legal regulations on gender equality have had a positive impact on increasing the number of women on corporate boards (Adams and Ferreira 2009; Kang et al. 2007).

Regarding the risk perspective, Hutchinson, Mack, and Plastow (2015) support that greater gender diversity reduces excessive corporate risk taking and improves financial performance. The higher the proportion of women in top management jobs, the better the financial performance of the company (Smith, Smith, and Verner 2006). This is similar to the conclusion of Liu 2014, who noted that boards with three or more female directors have a stronger impact on company performance than those with two or fewer female directors. In addition, they provide evidence to Chinese regulators that female directors have more legal control. Elsewhere, Campbell and Mínguez-Vera (2008) suggest that investors, while not penalizing Spanish companies for having female board members, also allay the notion that such gender diversity will help generate economic benefits.

In contrast, another study reported a negative association between firm performance and board gender diversity. Haslam et al. 2010 found that firms with a majority of female directors performed poorly, leading to a reduction in firm value. In another study, Adams and Ferreira 2009 found that firms with high levels of diversity among their boards were more likely to pay out incentives, have more board meetings, and experience negative business performance.

The above studies mainly refer to the relationship between gender diversity of the board of directors and the performance of banks but leave open their management ability during the economic crisis. Thus, the second hypothesis is raised:
H2: Gender diversity affects the risk management ability of banks

3. Data And Methodology

The data was collected from the annual reports and audited annual financial statements of 30 joint stock commercial banks in Vietnam and 1 state-owned commercial bank (Agribank) during the period 2008 to 2020. Information on the education level and gender of the board members was taken from the annual reports of each bank. Macro factors were taken from world bank.
To analyze the impact of board members' educational level on bank risk management, based on the models of Fang (2014), Nguyen and Vo (2015), King (2016) and Elsharkawy (2018), the author proposes two general research models below:

- Research model 1:

$$ADZ_{1,2\,it} = \alpha_0 + \alpha_1 UG\_EDUC_{it} + \alpha_2 MASTER\_EDUC_{it} + \alpha_3 PhD\_EDUC_{it} + \alpha_4 SIZE_{it} + \alpha_5 BASEL_{it} + \alpha_6 Gov\_Own_{it} + \alpha_7 CRISIS_t + \alpha_8 UR_t + \alpha_9 Infla_t + \varepsilon_{it} \quad \textbf{(1).}$$

- Research model 2:

$$ADZ_{1,2it} = \beta_0 + \beta_1 Male\_UG_{it} + \beta_2 Male\_MASTER_{it} + \beta_3 Male\_PhD_{it} + \beta_4 Female\_UG_{it} + \beta_5 Female\_MASTER_{it} + \beta_6 Female\_PhD_{it} + \beta_7 Gov\_Own_{it} + \beta_8 SIZE_{it} + \beta_9 BASEL_{it} + \beta_{10} CRISIS_t + \beta_{11} UR_t + \beta_{12} Infla_t + \varepsilon_{it} \quad \textbf{(2)}$$

In which: Z-Score is used to measure the risk of banks. The higher the Z_score, the more stable the business is. This parameter measures the risk of bankruptcy which is considered as the overall risk. To reduce the difference of Z-Score indices of the samples, this study used another variable, the adjusted Z-Score (ADZ), which represents the risk of bankruptcy Nguyen and Vo (2015). This approach is similar to the studies of Fang, Hasan, and Marton (2014) which aims to reduce the difference of Z-score of different observations.

UG_EDUCit , MASTER_EDUCit , PhD_EDUCit , respectively, are the number of bachelors, masters, and doctors in the board of directors of bank i in year t. $Male\_UG_{it}$, $male\_MASTER_{it}$, $Male\_PhD_{it}$, $Female\_UG_{it}$, $Female\_MASTER_{it}$, $Female\_PhD_{it}$ are the number of male bachelors, male masters, male doctors, female bachelors, female masters, and female doctors in the board of directors of bank i in year t, respectively. $SIZE_{it}$ is a variable measuring the size of bank i in year i based on the natural logarithm of total assets. $BASEL_{it}$ is the time bank i announced the completion of the 3 pillars of BASEL II in year t. Gov_Own is a dummy variable that takes the value of 1 if bank i has state capital and takes the value of 0 otherwise. $CRISIS_t$ is a dummy variable that takes the value of 1 if a financial crisis occurs in year t and takes the value of 0 otherwise. UR and Infla are the unemployment and inflation rates of Vietnam in year t, respectively

Table 1: variable description

Variable name	Symbol	Previous research	Formula	Expected
DEPENDENT VARIABLE				
Adjusted Z Score	adz	Nguyen and Vo (2015) Li, Tripe, and Malone (2017) Fang and Marton (2014)	$adz_1 = \ln \frac{ROA+(Equity/Asset)}{\sigma_{ROA}}$	
		Nguyen and Vo (2015) Lepetit and Strobel (2013)	$adz_2 = \ln \frac{ROA+CAR}{\sigma_{ROA}}$	
INDEPENDENT VARIABLE				
Number of bachelors	UG_EDUC	King (2016), Elsharkawy (2018)	Figures from annual bank reports	(+)
Number of masters	MASTER_EDUC	King (2016), Elsharkawy (2018)	Figures from annual bank reports	(+)
Number of PhDs	PhD EDUC	King (2016), Elsharkawy (2018)	Figures from annual bank reports	(+)
Number of male bachelors	Male_UG		Figures from annual bank reports	(+)
Number of male masters	Male_MASTER		Figures from annual bank reports	(+)
Number of male PhDs	Male_PhD		Figures from annual bank reports	(+)
Number of female bachelors	Female_UG		Figures from annual bank reports	(+)
Number of female masters	Female_MASTER		Figures from annual bank reports	(+)
Number of female PhDs	Female_PhD		Figures from annual bank reports	(+)
Bank size	Ln_size	Nguyen and Vo (2015) Elsharkawy (2018)	Figures from annual bank reports	(+/-)
BASEL completion time	BASEL	Nguyen and Vo (2015)	Figures from annual bank reports	(+)
State ownership	Gov_Own	Yu-Li, Shen, and Lin (2021) Iannotta and cộng sự (2013)	Takes the value of 1 if bank i has state capital and 0 otherwise.	(+)
Financial Crisis	CRISIS	Elsharkawy (2018)	Takes a value of 1 if a financial crisis occurred that year and takes a value of 0 otherwise.	(+)
Inflation	Infla	Baboucek and Jancar (2005) Uhde and Heimeshoff (2009)	Data taken directly from General Statistics Office of Vietnam.	(+)
Unemployment rate	UR	Bofondi and Ropele (2011) Louzis, Vouldis, and Metaxas (2012)	Data taken directly from General Statistics Office of Vietnam	(+)

3.1 Research process

With panel data, there are three commonly used models include: Random effects evaluation model (REM), fixed effects evaluation model (FEM) and Pooled OLS model. After running regressions on all 3 models and conducting tests including Breusch - Pagan and Wooldridge, the author found that all three models had autocorrelation and heteroscedasticity. To overcome the above phenomenon, the author used the generalized least squares regression model (GLS). At this time, the author conducted F-test and Hausman-test to select the appropriate model between

FEM, REM and Pooled OLS. The results showed that the FEM model was the most suitable model. The author conducted other tests including: RAMSEY and VIF.

The test results showed that the model did not miss any important variables and did not have multicollinearity. To test the model's robustness (Robustness test), the author replaces Z_score with the ratio of bad debt to total customer loans (Baddebt ratio) and σ_ROE according to Fang (2014). At the same time, based on Houston (2010), two components of Z-score, CAR and σ_ROA, are used as separate dependent variables. The results of the two research models after changing the dependent variable both have signs and significance levels that are not significantly different from the Z_Score variable. Higher education level has a positive impact on CAR and a negative impact on Baddebt ratio, σ_ROA, σ_ROE, which are factors that increase risk for banks. (See the appendix).

Figure 1: Descriptive Statistics

Variable name	Observations	Mean	Standard Deviation	Min	Max
MEASURING BANK BANKRUPTCY RISK					
adz1	335	2.72759	0.8351292	0.3457535	4.294551
adz2	367	2.359006	0.9113271	-1.095046	4.003585
BANK FACTORS INTERNAL					
1) Educational level of board members					
UG_EDUC	314	3.203822	1.997567	0	9
MASTER_EDUC	314	3.035032	1.796886	0	9
PhD_EDUC	314	1.248408	0.9865294	0	5
Number of male masters	296	2.706081	1.753862	0	8
Number of male PhDs	296	2.5	1.568763	0	8
Number of female bachelors	296	1.067568	0.8765275	0	4
Number of female masters	296	0.3344595	0.6267714	0	3
Number of female PhDs	296	0.6216216	0.8143243	0	3
Number of male masters	296	0.2432432	0.6175031	0	3
Number of male PhDs	363	6.107438	1.975548	2	12
Number of female bachelors	363	1.258953	1.158274	0	5
2) Performance indicators					
Ln_size	381	32.1703	1.281272	28.51423	34.98866
Basel	403	0.0532717	0.2645025	0	2.090411
ROA	369	0.0111352	0.0210862	-0.0599	0.36
CAR	343	0.1404195	0.0683935	0.0486	0.555
ROE	369	0.1054058	0.0830982	-0.5633	0.3153
Bad debt ratio	326	0.0221903	0.017065	0.0001832	0.1776317
3) MACRO FACTORS					
Inflation	403	0.0722231	0.063854	0.0063	0.2312
UR	403	0.0156077	0.0041083	0.01	0.0227
Crisis	403	0.2307692	0.4218488	0	1

Figure 2: Pearson correlation matrix

The correlation coefficient between pairs of variables in both models has no coefficient greater than 0.8 Therefore, autocorrelation is unlikely to occur.

Correlation matrix of model 1

	adz1	adz2	UG_EDUC	UG_EDUC	UG_EDUC	Ln_size	Gov_own	Infla	Crisis	Basel	UR
adz1	1										
adz2	0.9648	1									
UG_EDUC	0.0615	0.0418	1								
MASTER_EDUC	-0.0065	-0.0195	-0.575	1							
PhD EDUC	-0.0316	-0.0139	-0.3201	0.1281	1						
Ln_size	-0.2416	-0.263	-0.2402	0.5056	0.1923	1					
Gov_own	-0.0991	-0.1054	-0.315	0.4496	0.2886	0.6236	1				
Infla	-0.1449	-0.1275	0.1936	-0.2789	0.0868	-0.3176	0.0111	1			
Crisis	-0.1081	-0.0679	-0.0549	0.0262	-0.0454	0.136	0.0036	0.0533	1		
Basel	0.0048	0.063	-0.0577	0.0801	-0.0184	0.2343	0.0282	-0.1415	0.4368	1	
UR	-0.1443	-0.1376	-0.1246	0.1521	-0.0556	0.2166	0.0139	-0.4245	0.6644	0.3624	1

Correlation matrix of model 2

	adz1	adz2	Male_UG	Male_UG	Male_UG	Male_UG	Male_UG	Male_UG	Ln_size	Gov_own	Infla	Crisis	Basel	UR
adz1	1													
adz2	0.9667	1												
Male_UG	0.0419	0.0495	1											
Male_MASTER	0.0082	-0.0083	-0.4545	1										
Male_PhD	-0.0244	-0.0217	-0.0354	0.1391	1									
Female_UG	-0.0328	-0.0083	0.0475	-0.3752	-0.2315	1								
Female_MASTER	-0.0321	-0.0557	-0.2119	0.0962	0.0502	-0.2175	1							
Female_PhD	-0.0302	-0.0322	-0.2679	-0.0725	-0.1279	0.0046	-0.0424	1						
Ln_size	-0.2289	-0.2556	-0.1551	0.4505	0.1427	-0.2362	0.2844	0.0307	1					
Gov_own	-0.0983	-0.112	-0.2553	0.3697	0.1513	-0.1902	0.2735	0.1988	0.6346	1				
Infla	-0.1634	-0.1422	0.2386	-0.266	0.0107	-0.0132	-0.1423	0.1471	-0.312	0.0106	1			
Crisis	-0.1092	-0.0739	-0.0633	-0.0066	-0.0026	0.0645	0.0832	-0.0526	0.1548	0.0069	0.0513	1		
Basel	0.0094	0.0664	-0.0575	0.0865	0.0162	0.0186	0.0029	-0.0635	0.2336	0.0245	-0.1433	0.444	1	
UR	-0.1393	-0.1382	-0.1528	0.121	0.0201	0.0391	0.1145	-0.0885	0.2407	0.0193	-0.4255	0.6649	0.3669	1

4. Results and Discussion

In model 1 (see Figure 3), the impact between the educational level of the members of the board of directors has a positive impact at the 5% significance level on the adjusted Z-coefficient. This result is consistent with the studies of Barker and Mueller (2002), Bhagat et al. (2010), Berger et al. (2014), Falato et al. (2015), King et al. (2016). This could be the basis for increasing the feasibility of Decision No. 1537/QD-NHNN (dated July 17, 2019) on the approval and promulgation of the plan to implement the strategy for human resource development in the banking industry until 2025, with a vision to 2030 of the State Bank. Therefore, banks need to prioritize recruiting employees with a university degree or higher, especially senior leadership positions. Meanwhile, bank size has a negative impact on bank sustainability, especially during a crisis, similar to the study of De Jonghe 2010, Uhde and Heimeshoff 2009. Unemployment rate and inflation rate have positive results on bank risk. This is consistent with the study of Arpa et al. (2001), Baboucek and Jancar (2005), Bofondi and Ropele (2011), Louzis, Vouldis, and Metaxas (2012). State-owned banks have a lower probability of bankruptcy than other banks due to the support from the state when facing the risk of bankruptcy Yu-Li (2021). The results also found a positive relationship between the early completion of the 3 pillars of Basel II and the risk management capacity of each commercial bank.

Figure 3: Regression results of model 1

	adz1				adz2			
	OLS	Random Effect	Fix Effect	GLS	OLS	Random Effect	Fix Effect	GLS
UG_EDUC	0.0826**	0.0848***	0.0767	0.0827***	0.0807**	0.0807***	0.0785*	0.0884***
	-2.78	[2.78]	[1.63]	[3.08]	-2.76	[2.76]	[1.73]	[3.39]
MASTER_EDUC	0.0928**	0.0937***	0.0791*	0.0898***	0.0784*	0.0784**	0.0629	0.0702**
	-2.64	[2.62]	[1.84]	[2.87]	-2.27	[2.27]	[1.50]	[2.28]
PhD_EDUC	0.072	0.0726	0.0989	0.109**	0.101*	0.101**	0.128*	0.125***
	-1.46	[1.43]	[1.34]	[2.51]	-2.07	[2.07]	[1.79]	[2.94]
Ln_size	-0.388***	-0.404***	-0.978***	-0.373***	-0.457***	-0.457***	-1.047***	-0.460***
	(-6.90)	[-6.98]	[-9.35]	[-8.10]	(-8.35)	[-8.35]	[-10.90]	[-10.73]
Gov_own	0.476**	0.514***	.	0.414***	0.579***	0.579***	.	0.544***
	-2.74	[2.83]	.	[2.82]	-3.33	[3.33]	.	[3.59]
Infla	-7.502***	-7.678***	-12.88***	-7.491***	-7.991***	-7.991***	-13.82***	-7.804***
	(-6.64)	[-6.76]	[-9.88]	[-8.04]	(-7.32)	[-7.32]	[-11.10]	[-9.59]
Crisis	0.511**	0.528***	0.969***	0.401***	0.591***	0.591***	1.066***	0.495***
	-2.92	[3.01]	[5.44]	[2.79]	-3.4	[3.40]	[6.12]	[3.84]
UR	-89.79***	-90.62***	-112.2***	-77.44***	-96.54***	-96.54***	-121.6***	-84.68***
	[-4.95]	[-5.02]	[-6.50]	[-4.80]	(-5.45)	[-5.45]	[-7.30]	[-5.79]
Basel	0.29	0.286*	0.315*	0.277*	0.484**	0.484***	0.462***	0.465***
	-1.76	[1.74]	[1.87]	[1.92]	-2.91	[2.91]	[2.78]	[3.25]
Intercept	16.32***	16.83***	36.11***	15.63***	18.25***	18.25***	38.10***	18.19***
	-8.95	[8.95]	[10.38]	[10.63]	-10.29	[10.29]	[11.92]	[13.47]
Number of observations	280	280	280	280	301	301	301	301
R^2	23.50%	0.2691	0.349		27.21%	0.3148	0.386	
Mean VIF	2.05				2.06			
Breusch-Pagan	0.0024				0.0000			
Wooldridge test	0.0000				0.0000			
Ramsey RESET test	0.4333				0.2174			
Hausman test		0.0000				0.0000		
Wald test		0.0000				0.0000		
Wooldridge test		0.0000				0.0000		

Note: *** corresponds to 1% significance level, ** corresponds to 5% significance level, * corresponds to 10% significance level.

In model 2 (see Figure 4), the impact of the educational level of board members by gender is insignificant. The regression results show that the gender of each board member with a degree from bachelor to doctorate has an insignificant impact on the overall risk management ability of the bank. Therefore, the ability to effectively manage risks does not depend on the gender of each member. This is contrary to the evidence of Trang and Nhi (2020), when it was only proven that a certain number of female members in the board of directors can bring better profits to the business. From an academic perspective, when graduating with a bachelor's, master's, or doctoral degree, men and women have the same ability because they are trained in the same time frame and learn a not too different amount of knowledge. The remaining dependent variables have the same impact as in model 1

Figure 4: Regression results of model 2

	adz1 OLS	adz1 Random Effect	adz1 Fix Effect	adz1 GLS	adz2 OLS	adz2 Random Effect	adz2 Fix Effect	adz2 GLS
Male_UG	0.0890**	0.0890***	0.0741	0.0858***	0.104***	0.104***	0.0765	0.111***
	[2.58]	[2.58]	[1.34]	[3.02]	[3.07]	[3.07]	[1.43]	[3.70]
Male_MASTER	0.0708*	0.0708*	0.0357	0.0674*	0.0646	0.0646	0.0342	0.0696**
	[1.71]	[1.71]	[0.68]	[1.90]	[1.60]	[1.60]	[0.67]	[1.96]
Male_PhD	0.0104	0.0104	0.0852	0.0461	0.0361	0.0361	0.107	0.0623
	[0.19]	[0.19]	[1.10]	[0.96]	[0.67]	[0.67]	[1.42]	[1.33]
Female_UG	-0.108	-0.108	0.0943	-0.122*	-0.086	-0.086	0.0836	-0.0551
	[-1.28]	[-1.28]	[0.77]	[-1.82]	[-1.04]	[-1.04]	[0.71]	[-0.76]
Female_MASTER	0.0288	0.0288	0.113	0.0335	0.0219	0.0219	0.0673	0.0214
	[0.44]	[0.44]	[1.29]	[0.57]	[0.34]	[0.34]	[0.79]	[0.36]
Female_PhD	0.0896	0.0896	0.0662	0.103	0.0924	0.0924	0.0991	0.0931
	[1.04]	[1.04]	[0.49]	[1.33]	[1.08]	[1.08]	[0.75]	[1.19]
Ln_size	-0.389***	-0.389***	-0.974***	-0.383***	-0.466***	-0.466***	-1.039***	-0.488***
	[-6.48]	[-6.48]	[-8.53]	[-8.03]	[-8.00]	[-8.00]	[-9.87]	[-9.89]
Gov_own	0.513***	0.513***	.	0.451***	0.639***	0.639***	.	0.616***
	[2.87]	[2.87]	.	[2.96]	[3.58]	[3.58]	.	[3.84]
Infla	-7.965***	-7.965***	-12.96***	-7.604***	-8.484***	-8.484***	-13.86***	-8.411***
	[-6.73]	[-6.73]	[-9.40]	[-8.15]	[-7.39]	[-7.39]	[-10.53]	[-9.25]
Crisis	0.532***	0.532***	0.935***	0.381***	0.610***	0.610***	1.032***	0.561***
	[2.92]	[2.92]	[4.94]	[2.80]	[3.38]	[3.38]	[5.58]	[3.77]
UR	-86.05***	-86.05***	-106.6***	-66.11***	-93.19***	-93.19***	-116.4***	-81.81***
	[-4.64]	[-4.64]	[-5.95]	[-4.57]	[-5.15]	[-5.15]	[-6.73]	[-5.19]
Basel	0.269	0.269	0.308*	0.265*	0.460***	0.460***	0.448***	0.445***
	[1.63]	[1.63]	[1.78]	[1.84]	[2.76]	[2.76]	[2.61]	[3.06]
Intercept	16.53***	16.53***	36.07***	16.03***	18.68***	18.68***	37.95***	19.18***
	[8.51]	[8.51]	[9.53]	[10.57]	[9.90]	[9.90]	[10.89]	[12.16]
Number of observations	262	262	262	262	283	283	283	283
R^2	0.238	0.4425	0.336		0.278	0.5296	0.372	
Mean VIF	1.89				1.9			
Breusch-Pagan	0.0071				0.0001			
Wooldridge test	0.0000				0.0000			
Ramsey RESET test	0.1417				0.1323			
Hausman test		0.0000				0.0000		
Wald test		0.0000				0.0000		
Wooldridge test		0.0000				0.0000		

Note: *** corresponds to 1% significance level, ** corresponds to 5% significance level, * corresponds to 10% significance level

5. Conclusion

The study was conducted to assess the educational level of board members in risk management of Vietnamese commercial banks in the period 2008-2020. The research results show that in the process of bank operations, especially during the crisis period, the higher the education level of board members, the better their ability to overcome the crisis. The research results support postgraduate study for banking employees, especially senior

managers. The larger the bank size, the more likely it is that bankruptcy due to crisis (too-big-to-fail). In addition, macroeconomic factors such as inflation or unemployment rates also significantly affect the possibility of bank bankruptcy. In addition, the research also helps policy makers and commercial banks have more documents to plan to improve the qualifications of banking staff in the future to increase the stability of the commercial banking system in Vietnam**.**

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