

# GENDER DIVERSITY AND BANK PERFORMANCE IN DEVELOPING COUNTRIES: THE MODERATING EFFECT OF CULTURE

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## Abstract

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The purpose of this paper is to examine the relationship between women on the board of directors and bank performance under the moderating effect of national culture. The study is conducted on a sample of 134 listed commercial banks from 15 emerging countries belonging to the Middle East and North Africa (MENA) and Central Asia regions over a nine-year period (2012–2020). Results obtained show that the presence of women on the board is negatively and significantly correlated with financial performance. In an environment with high levels of individualism and of power distance, the presence of women on boards negatively impacts banks' performance. Our results corroborate the findings of Bhatia et al. (2023) and Talavera et al. (2018). When examining the interaction between cultural dimensions and board gender diversity, we find that gender diversity generally has a positive effect on bank performance. However, this positive relationship weakens in countries with higher levels of masculinity. In highly masculine cultures, the net effect may even become negative, highlighting the moderating role of cultural context. The presence of women on the board continues to exert a negative effect on financial performance in Islamic banks. Our results are robust to the use of an alternative measure of gender diversity and to endogeneity tests.

**Keywords:** Gender Diversity, Islamic Banks, Governance, Culture, Financial Performance

**Authors' individual contribution:** Conceptualization — H.S. and H.M.; Methodology — H.S.; Investigation — H.M.; Resources — O.B.; Writing — Original Draft — H.S.; Writing — Review & Editing — H.M. and O.B.

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## 1. INTRODUCTION

In the aftermath of the 2008 financial crisis, banking governance has garnered heightened attention. Inadequate governance practices in the banking sector increase the likelihood of institutional failures, leading to systemic risks and negative externalities (de Haan & Vlahu, 2016; Pathan & Faff, 2013; Srivastava, 2023). Recognizing the significance of effective governance for banks and the broader

economy, the Basel Committee on Banking Supervision (BCBS et al., 2014) issued the Guidelines on Governance Principles for Banks. These guidelines stress the importance of a well-functioning board of directors, emphasizing the need for diversity among directors to reflect the operational complexities of banks. Consequently, the concept of board diversity as a means to enhance governance practices in the financial sector has gained prominence in recent years, partly due to the repercussions of

the financial crisis. This has prompted regulatory interventions, such as the establishment of quotas for women on boards, as exemplified by Norway (Mateos de Cabo et al., 2009; Osmani & Doda, 2025).

Board diversity can be defined as the variety in the composition of its members, which can be categorized by aspects that are directly observable (such as gender, age, nationality, etc.) or by others that are not immediately discernible (education, previous experience, skills, etc.) (Galia & Zenou, 2013; Tenuta & Cambrea, 2023). This area has been the subject of several studies, focused mainly on non-financial companies (Arena et al., 2015; Liu et al., 2014; Bennouri et al., 2018; Ahmadi et al., 2018; Brahma et al., 2021) and, to a lesser extent, on financial institutions (Farag & Mallin, 2017; Osmani & Doda, 2025; Owen & Temesvary, 2018; Talavera et al., 2018). Despite these abundant studies, the results are mixed. The board characteristic variables (board size, independent directors, and education level diversity) do not always show the same sign regarding their impact on bank performance. In addition, concerning the gender diversity issue, the conclusions of empirical research do not yet define an optimal combination of female board representation (one woman, two women, etc.) (Awad et al., 2023). Furthermore, studies relating to emerging economies are fewer, and even more so when it comes to the banking sector.

This study aims to examine the impact of board gender diversity on the performance of banks in emerging economies, an area that has received limited analysis thus far. The banking sector holds significant importance, as it remains the primary source of financing in emerging countries (Awartani et al., 2016; Organization for Economic Co-operation and Development [OECD], 2009). Furthermore, Haque and Brown (2017) highlight the distinctiveness of financial markets in this region compared to others, given the reliance of companies on bank financing. Conversely, Ghosh (2016) notes that the Arab Spring has resulted in decreased profitability and increased banking risks in these countries. Consequently, studying this context becomes crucial. To address these aspects, we utilize a panel dataset comprising 134 listed commercial banks across 15 countries in the Middle East and North Africa (MENA) and Central Asia regions, spanning a nine-year period (2012–2020).

This research contributes to existing literature in several significant ways. First, it sheds light on board gender diversity, which has received limited attention in literature concerning emerging economies, and examines the moderating effect of the national culture of countries by using four cultural indices of Hofstede (1983). This provides additional evidence of the effect of board gender diversity, particularly in emerging countries where cultural approaches are more predominant. Second, it expands the scope of the literature on banking governance by incorporating a cross-border component, going beyond the predominantly country-focused analyses found in many previous studies, such as those conducted in Türkiye and Tunisia (Kilic, 2015; Othmani, 2021). Third, the study's timeframe from 2012 to 2020 is particularly noteworthy as it captures the developments related to governance practices in numerous countries, especially in the aftermath of the Arab Spring.

The structure of the paper is as follows. Section 2 presents a literature review examining the impact of board diversity on performance and the formulation of hypotheses. Section 3

outlines the empirical framework. Section 4 provides and analyzes the findings. The final Section 5 concludes the study by emphasizing its implications and limitations, and by proposing potential directions for future research.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 2.1. Board gender diversity and bank performance

Agency theory is a key framework used to explain the effect of gender diversity on board effectiveness. Gender diversity serves as a key mechanism of corporate governance (Báez et al., 2018; Gallego-Álvarez et al., 2010; Sahu et al., 2025). The presence of women on boards is expected to strengthen the monitoring role of directors and contribute to reducing agency costs. Consequently, it has been associated with a positive relationship between female board representation and firm value (Adams & Ferreira, 2009; Isidro & Sobral, 2015; Liu et al., 2014). The presence of women on the board allows the board to increase creativity and innovation (García-Meca et al., 2024; Robinson & Dechant, 1997; Torchia et al., 2011), improves access to and flow of information (Beckman & Haunschild, 2002; Carter et al., 2010), enhances decision-making (Erhardt et al., 2003; Simons et al., 1999), and supports effective problem-solving (Daily & Dalton, 2003; Hillman et al., 2002). Women directors are often independent members (Bender et al., 2016; Nekhili & Gatfaoui, 2013). However, other studies dispute the benefits of having women on the board. Adams and Ferreira (2009), analyzing the characteristics of 1,939 US companies between 1996 and 2003, indicate that boards with greater gender diversity put more effort into control functions. In addition, Huse (2007) finds that board diversity can lead to coordination problems, requires more time in discussion, and loss of board cohesion.

The existing corporate governance literature has extensively studied the effect of the presence of women on boards of non-financial companies, whereas relatively few studies have examined this relationship in financial institutions. In this context, empirical studies suggest mixed results. Some authors stipulate the existence of a positive relationship between the presence of women directors and banks' performance (Farag & Mallin, 2017; García-Meca et al., 2015; Gupta et al., 2021; Owen & Temesvary, 2018), and others report a negative association (Adams & Ferreira, 2009; Athar et al., 2023; Sbai & Meghouar, 2017), while some studies do not find any link (Baselga-Pascual & Vähämaa, 2021; Issa et al., 2021; Talavera et al., 2018).

*H1: The proportion of women on the board of directors is positively associated with the financial performance of banks.*

### 2.2. Board gender diversity, national culture, and bank performance

If empirical studies had demonstrated a positive relationship between women on boards and board monitoring (Carter et al., 2003; Farhan Jedi & Nayan, 2018), cultural dimensions somehow moderate this monitoring. Indeed, the perception of women's roles in society varies across countries. Considering the influence of culture on these perceptions, the effect of gender diversity on boards in

developing countries is shaped by the prevailing social context. Doidge et al. (2007) support the idea that contextual characteristics affect the relationship between gender diversity and firm performance. Ismail and Abdullah (2013), analyzing the emerging markets, report that the presence of women on the board is positively related to the information content of the reported accounting numbers and negatively associated with earnings management and accounting manipulation. Examining the impact of society's attitude towards working women on the effectiveness of board gender diversity in Asian countries, Low et al. (2015) find that greater gender diversity on boards is associated with improved financial performance. They also note that this effect is attenuated in countries where women's participation in the workforce is less encouraged. In the present study, we adopt Hofstede's (1983) cultural framework, focusing on four specific dimensions: power distance, masculinity-femininity, individualism-collectivism, and uncertainty avoidance.

Power distance refers to an unequal distribution of power among the board members of a company. According to Hauff and Richter (2015), this cultural dimension plays a determinant role in managerial perceptions of gender. Instructions that are provided by top members restrict women's room for maneuver in distant hierarchical power organizations (Salloum et al., 2016). However, a higher representation of women on boards can lead to greater organizational decentralization, as women are more likely to take initiative and challenge distant hierarchical authority (Daniels & Greguras, 2014). This point benefits the company and allows it to achieve its performance objectives. A second cultural dimension that moderates the relationship between a firm's performance and board diversity is masculinity. According to Hofstede (2001), masculinity is a cultural dimension with a focus on ambition, acquisition of wealth, and distinctly differentiated roles for men and women. For Satam et al. (2018), countries with high masculinity in an organization lead to a more differentiated gender-diverse board where board members are mostly object-oriented. Conversely, in feminine culture, there is an equality of genders, and board members are very compromising and friendly. In this case, women are mainly relationship-oriented rather than object-oriented.

On the other hand, Hofstede (1991) defined individualism as a preference for a "loosely-knit social framework in which individuals only take care of themselves and their immediate families" (p. 45), and collectivism as a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in group to look after them in exchange for unquestioning loyalty. Empirical studies reported that females are generally more collectivist than their male counterparts (Zeffane, 2018). Thus, a board with more women tends to promote collectivist values in a firm. Conversely, having more male directors would appear to be more legitimate in a highly individualistic culture. Finally, a fourth cultural index considered in our study is uncertainty avoidance. This index reflects the extent to which members of a society attempt to cope with anxiety by minimizing uncertainty. Hofstede (1980) reported that in cultures characterized by high uncertainty avoidance, members are accustomed to clear-cut procedures, explicit strategies, and precisely delineated rules to limit uncertainties and cope with ambiguous situations. Conversely, in cultures

that exhibit low uncertainty avoidance, there is a greater tolerance for uncertainty, different ideas, approaches, and concepts. Studies have reported that having more women on the board is equal to a greater range of skills for solving complex problems (Hillman et al., 2002; Jackson, 1992).

*H2a: Financial performance of banks is positively related to board diversity, while moderated by power distance.*

*H2b: Financial performance of banks is positively related to board diversity, while moderated by masculinity.*

*H2c: Financial performance of banks is negatively related to board diversity, while moderated by individualism.*

*H2d: Financial performance of banks is positively related to board diversity, while moderated by uncertainty avoidance.*

### 3. RESEARCH METHODOLOGY

#### 3.1. Sample and data collection

This study adopts a quantitative explanatory research approach to examine the relationship between gender diversity and bank performance under the moderating effect of culture. The target population includes all listed commercial banks in the MENA region and Central Asia.

Our final sample is made up of 1206 observations for 134 listed commercial banks belonging to 15 emerging countries (Saudi Arabia, Bangladesh, Egypt, the United Arab Emirates (UAE), Jordan, Kuwait, Lebanon, Malaysia, Morocco, Pakistan, Qatar, Tunisia, and Türkiye) during the period 2012–2020. The choice of this period is mainly motivated by data availability and continuity, and by the desire to provide recent and updated results. In addition, we have eliminated banks that do not have all the necessary information. Financial data is available in the Refinitiv database, while data on board characteristics is collected manually from banks' annual reports. Finally, macroeconomic data, i.e., gross domestic product (GDP) growth, is collected from the online database of the World Bank. In Table 1, we present the distribution of our sample by country and bank type.

**Table 1.** Distribution of the sample by country

Countries	Sample size	Percentage (%)	Observations
Saudi Arabia	8	6%	72
Bangladesh	25	19%	225
Egypt	4	3%	36
Jordan	11	8%	99
Kuwait	7	5%	63
Lebanon	6	4%	54
Malaysia	6	4%	54
Morocco	6	4%	54
Pakistan	19	14%	171
Qatar	7	5%	63
Tunisia	8	6%	72
Türkiye	12	9%	108
UAE	15	11%	135
Total	134	100%	1206

#### 3.2. Measures of variables

##### 3.2.1. Dependent variables

Following previous studies (Arnaboldi et al., 2020; Farag & Mallin, 2017; García-Meca et al., 2015; Gupta et al., 2021; Issa et al., 2021; Pathan & Faff, 2013; Sbai & Meghouar, 2017), we use return on equity

(ROE) and return on assets (ROA) as the performance measures of banks. The ROA expresses the accounting evaluation (Felicio et al., 2014). ROE measures shareholder return on investment (Talavera et al., 2018). We calculate the ROA ratio as net income divided by total assets, while we define the ROE ratio as net income divided by equity.

### 3.2.2. Independent variables

Gender diversity is measured as the proportion of women on the board. This measure is widely used in previous works (Aljughaiman et al., 2023; Farag & Mallin, 2017). To test the robustness of our results, we use the Blau index as an alternative measure of gender diversity. The Blau index, also known as the Blau concentration index, is a statistical index used to measure the diversity or concentration of a categorical variable, such as gender, within a group (Adams & Ferreira, 2009; Benaguid et al., 2023; Terjesen et al., 2016). The Blau index is calculated as follows:

$$D = 1 - \sum_{i=1}^N d_i^2 \quad (1)$$

where,  $d$  = share of individuals in a category,  $N$  = number of the category.

The maximum and minimum values of the Blau index variable are respectively 0.5, when the directors are perfectly balanced between these two categories (50% women and 50% men), and 0 (no women on board).

### 3.2.3. Moderating variables: Measures of national culture

According to Hofstede (1985, 2001), culture is the collective programming of the mind, distinguishing the members of one group or category of people from others. We focus on the initial four dimensions of Hofstede (masculinity — *MAS*, uncertainty avoidance — *UAV*, individualism — *IND*, and power distance — *PDI*) as these have been used most frequently in prior studies (Frijns et al., 2016; Griffin et al., 2015). The values range from 0 to 100, with scores above 50 considered indicative of a high level on the respective cultural dimension. The data is freely available on the Geert Hofstede website (<https://geerthofstede.com/culture-geert-hofstede-geert-jan-hofstede/6d-model-of-national-culture/>) and is intended to facilitate the comparison of the national culture values between comparable samples of respondents from two or more societies. These are country-level variables that are time-invariant.

### 3.2.4. Control variables

The control variables are the characteristics of the board of directors (board size — *BS*, independence of members — *INDE*, the duality of the functions of the board's chairman and the chief executive officer (CEO) — *Duality*), banks' characteristics (*Size*, *Age*, *Capital* ratio), and macroeconomic characteristics of the country (GDP growth — *GDPG*). Table 2 presents a summary of variable measurements.

Table 2. Definition of variables

Variables	Abreviation	Description
<b>Dependent variables</b>		
Return on assets	ROA	Net income to total assets.
Return on equity	ROE	Net income to total equity.
<b>Independent variables</b>		
Percentage of women on the board	PWB	Total number of female directors divided by the total number of directors on the board.
Board gender diversity	BGD	In the formula of Blau (1977), $P_i$ represents two categories: the proportion of men and the proportion of women on the board: $D = 1 - \sum_{i=1}^N P_i^2$ .
<b>Moderating variables</b>		
Masculinity	MAS	Hofstede's national culture of masculinity degree.
Power distance index	PDI	Hofstede's national culture of power distance degree.
Uncertainty avoidance index	UAV	Hofstede's national culture of uncertainty avoidance degree.
Individualism	IND	Hofstede's national culture of individualism degree.
<b>Control variables</b>		
Board size	BS	The number of directors on the board.
Independent director	INDE	Number of independent directors divided by total directors.
CEO duality	Duality	Dummy variable that takes the value of 1 if the CEO is also the chair of the board, 0 otherwise.
Bank size	Size	Natural logarithm of total assets.
Capital ratio	Capital	The ratio of the book value of equity to total assets.
Bank age	Age	Natural logarithm of the number of years since the bank's foundation.
GDP growth	GDPG	Per capita GDP growth.

### 3.3. Empirical model

To investigate the effect of board gender diversity on bank performance, as well as the moderating influence of culture, we use the following empirical model, where we regress performance on variables capturing board composition, bank characteristics, country-level cultural values, and country-level macroeconomic variables. Our model is specified as follows:

$$PERF_{i,t} = \beta_0 + \beta_1 PWB_{i,t} + \sum \beta_k Controls + \varepsilon_{i,t} \quad (2)$$

where,  $PERF$  = one of the alternative performance proxies ( $ROA$  or  $ROE$ ). Board gender diversity is measured by the percentage of women on the board ( $PWB$ ). To complete the model, we add the previously identified control variables (*Controls*) and an error term ( $\varepsilon_{i,t}$ ).

To investigate the influence of culture on the relationship between board gender diversity and performance, we extend our regression model by incorporating cultural dimensions and interaction terms as follows below.

$$PERF_{i,t} = \beta_0 + \beta_1 PWB_{i,t} + \beta_2 MAS_{i,t} + \beta_3 MAS_{i,t} * PWB_{i,t} + \sum \beta_k Controls + \varepsilon_{i,t} \quad (3)$$

$$PERF_{i,t} = \beta_0 + \beta_1 PWB_{i,t} + \beta_2 UAV_{i,t} + \beta_3 UAV_{i,t} * PWB_{i,t} + \sum \beta_k Controls + \varepsilon_{i,t} \quad (4)$$

$$PERF_{i,t} = \beta_0 + \beta_1 PWB_{i,t} + \beta_2 IND_{i,t} + \beta_3 IND_{i,t} * PWB_{i,t} + \sum \beta_k Controls + \varepsilon_{i,t} \quad (5)$$

$$PERF_{i,t} = \beta_0 + \beta_1 PWB_{i,t} + \beta_2 PDI_{i,t} + \beta_3 PDI_{i,t} * PWB_{i,t} + \sum \beta_k Controls + \varepsilon_{i,t} \quad (6)$$

Cultural dimensions are derived from Hofstede (1985, 2001) and include masculinity (*MAS*), individualism (*IND*), uncertainty avoidance (*UAV*), and power distance (*PDI*). The moderating role of culture in the relationship between board gender diversity and bank performance is captured through the interaction term *PWB × Cultural dimension*.

We employ panel data ordinary least squares (OLS) estimation techniques, controlling for industry, country, and time fixed effects. For robustness, we also implement an instrumental variable (IV) approach using two-stage least squares (2SLS) estimation.

## 4. RESULTS AND DISCUSSION

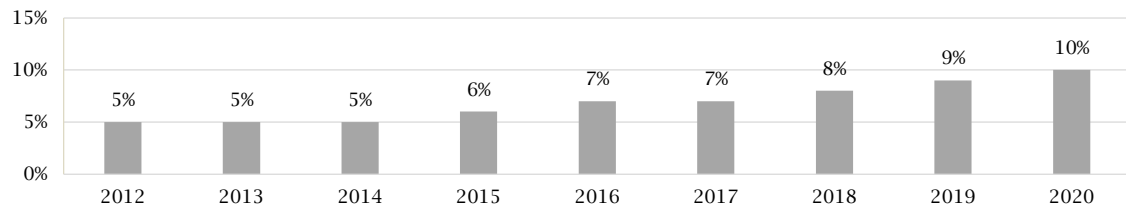
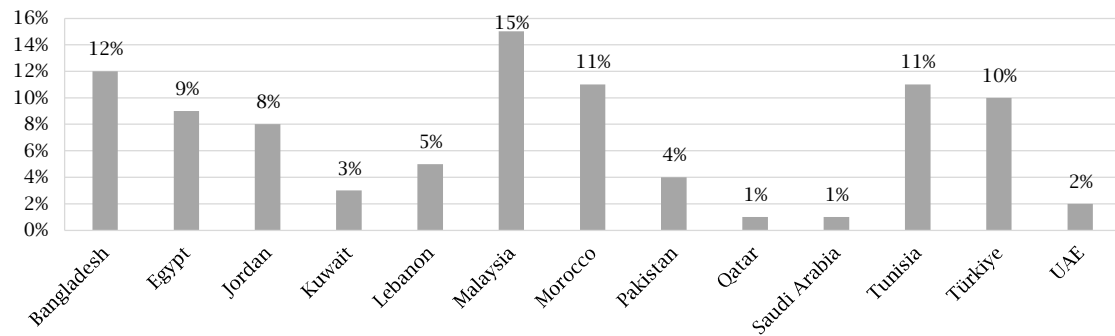
### 4.1. Description statistics

Table 3 presents descriptive statistics. The mean *ROA* for our sample is 1.03% and the mean *ROE* is 11.3%. The average percentage of women on the board (*PWB*) is 7.10%. This low representation of women on the board is consistent with most studies in the MENA region (Issa et al., 2021; Sbair & Ed-Dafali, 2023). The data indicate that women remain a minority among board members in firms from emerging countries. Panel B of Table 1 presents

the sample distribution by country. The proportion of women on boards is highest in Malaysia (15.37%) and lowest in Qatar and Saudi Arabia (1.00%). As for control variables, the average board size (*BS*) and independence of members (*INDE*) are 11 members and 32.4%, respectively, for the full sample. Table 3 also shows that the average *Capital* structure of the banks in our sample is 10.11%. They are worth an average of 21,102.99 billion dollars, and their *Age* is 47 years. Finally, for the macroeconomic variable, the average GDP growth (*GDPG*) of our sample is 3.27%. Figure 1 shows that the average share of women directors on the board during the study period increased from 5% in 2012 to 10% in 2020, and this suggests a modest increase in the share of women on the board over the recent years. As shown in Figure 2 below, there are significant variations in board gender diversity (*BGD*) among the countries studied. Malaysia has the highest diversity rate at 15%, while Saudi Arabia and Qatar have the lowest, with just 1% each. However, the proportion of women administrators is very low compared to the quota legislation introduced by some countries, such as Norway or France, where female representation is significantly higher. Table 4 reports the correlation matrix and the variance inflation factor (VIF) test results.

**Table 3.** Descriptive statistics of the key variables over the study period and by country

Panel A: Descriptive statistics of key variables over the study period										
Variables	N	Mean	Median	Maximum	Minimum	Std. dev.				
ROA	1206	0.013	0.012	0.434	-0.097	0.015				
ROE	1206	0.113	0.115	0.533	-0.896	0.083				
PWB	1206	0.071	0.000	0.429	0.000	0.091				
BGD	1206	0.115	0.000	0.489	0.000	0.136				
BS	1206	10.54	10.00	21.00	5.00	2.832				
INDE	1206	0.324	0.286	1.000	0.000	0.209				
Duality	1206	0.13	0.000	1.000	0.000	0.334				
Size	1206	8.879	8.553	12.358	5.564	1.306				
Capital	1206	0.101	0.095	0.428	-0.019	0.039				
INDIV	1206	22.194	24	48	5	14.77				
PDI	1206	28.403	25	47	14	9.45				
MAS	1206	49.216	50	55	40	5.06				
UAV	1206	66.962	66	85	36	10.67				
Panel B: Descriptive statistics by country										
Countries	ROA (%)	ROE (%)	PWB (%)	BGD	BS	INDE (%)	Duality (%)	Size (billions \$)	Capital (%)	Age
Bangladesh	0.87	11.63	12.06	0.19	13.38	19.58	4.00	2752.64	7.50	26.24
Egypt	1.77	21.16	8.71	14.73	10.81	46.70	25.00	6821.54	8.28	38.50
Jordan	1.13	9.15	7.59	0.13	11.38	34.94	5.05	3538.29	12.44	41.45
Kuwait	0.80	7.20	3.40	0.06	9.49	44.22	7.94	15269.79	11.92	36.71
Lebanon	1.40	8.54	5.33	0.09	10.18	42.49	96.30	15730.28	8.58	74.17
Malaysia	1.30	9.77	15.37	0.23	9.41	60.40	0.00	52203.60	10.50	45.00
Morocco	1.07	8.82	10.64	0.17	10.74	16.67	66.67	19028.88	8.97	78.83
Pakistan	1.18	12.63	3.77	0.07	9.56	30.02	2.34	6715.54	8.08	43.52
Qatar	1.77	13.95	1.00	0.01	8.76	29.80	46.03	38199.71	11.07	33.00
Saudi Arabia	1.82	13.08	1.00	0.13	9.81	46.49	0.00	41981.77	14.33	40.00
Tunisia	1.24	12.17	10.51	0.18	10.81	18.89	5.56	3041.52	9.38	55.25
Türkiye	1.96	12.06	9.86	0.16	10.33	28.95	3.70	44832.39	10.63	59.10
UAE	1.43	8.95	2.22	0.04	8.62	40.45	0.00	24222.89	13.75	32.68

**Figure 1.** Average proportion of women on the board**Figure 2.** Distribution of board gender diversity by country**Table 4.** Pearson correlation matrix

Variables	VIF	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) ROA		1.000													
(2) ROE		0.44***	1.000												
(3) PWB	1.08	-0.07**	-0.06*	1.000											
(4) BGD	1.11	-0.08**	-0.06*	0.99**	1.000										
(5) BS	1.56	-0.12***	-0.01	0.15***	0.18***	1.000									
(6) INDE	1.26	0.09***	0.08***	-0.05	-0.07**	-0.26***	1.000								
(7) Duality	1.05	0.03	-0.01	-0.09**	-0.1**	-0.1**	0.06*	1.000							
(8) Age	1.26	0.08***	0.04	0.13***	0.16***	-0.04	-0.02	0.16***	1.000						
(9) Capital	1.12	0.21***	-0.05*	-0.11***	-0.12***	-0.23***	0.22***	-0.04	0.05*	1.000					
(10) Size	1.37	0.12***	0.17***	-0.08**	-0.09**	-0.21***	0.33***	0.08**	0.36***	0.04	1.00				
(11) PDI	-0.044*	-0.071***	0.313***	0.304**	0.259***	0.042**	0.104***	0.042**	-0.184***	0.019**	0.126**	1.000			
(12) MAS	-0.049	0.077**	0.083***	0.062*	0.160**	-0.150**	0.111**	-0.204**	-0.252***	-0.150**	0.350***	0.064**	1.000		
(13) IND	0.166***	-0.070**	-0.125***	-0.122***	-0.278***	0.258***	0.003	0.227***	0.449***	0.538***	-0.285***	0.056*	-0.563***	1.000	
(14) UAV	0.076**	0.009**	-0.189***	-0.172***	-0.146**	-0.201***	-0.023	0.091**	0.097**	0.127**	-0.101**	-0.453***	-0.403***	0.290**	1.000

Note: All explanatory variables are defined as in Table 2. \*\*\*, \*\*, \* designate significance levels of 1%, 5%, and 10%, respectively.

#### 4.2. Regression results

Table 5 presents the results of board diversity on banks' financial performance. The results obtained show that the presence of women on the board of directors (measured by the proportion of women on the board) is negatively and significantly correlated with financial performance. This negative effect seems to be consistent with the studies of Kilic (2015), Mateos de Cabo et al. (2012), Talavera et al. (2018), and Bhatia et al. (2023). On the other hand, our results differ from those of Pathan and Faff (2013) and Garcia-Meca et al. (2015). This finding is consistent with social categorization theory, which suggests that gender diversity may hinder the efficiency of board operations (Phillips & O'Reilly, 1998). Regarding board size, the results indicate a significant negative relationship with ROA, whereas this effect loses its significance with respect to ROE. This suggests that there is no clear evidence of an effect of board size on banks' financial performance. Concerning the presence of independent directors on banks' boards, this factor shows a positive effect on banks' performance (ROE), while the duality variable does not appear to influence banks' performance.

Regarding control variables, we find a positive and significant relationship between the size of the bank and its performance measured by ROA and ROE. This result is in line with the conclusions of

Almutairi and Quttainah (2021) and Issa et al. (2021). This suggests that bank size in MENA and Central Asia countries exerts a significant influence on financial performance. Capital variable shows a mixed result when it comes to the significant impact on bank performance. The latter would be positive according to the ROA ratio and negative according to the ROE ratio. This result is not consistent with previous studies, which reported that the more capitalized banks are, the more efficient they would be (Molyneux & Thornton, 1992; Ben Naceur & Omran, 2011). At a macroeconomic level, GDP per capita is positively associated with performance. This finding is compatible with Grigorian and Manole (2002). This suggests that an increase in GDP stimulates demand and could lead to corporate borrowing to produce goods and services to meet the customers' demands and, therefore, to reach better bank profitability. Finally, the results indicate a positive and significant effect of the age variable on banks' performance (ROA), suggesting that the number of years since a bank's founding positively influences its financial performance. However, the post-policy period negatively affects banks' performance (ROE). Moreover, the introduction of boardroom gender diversity policies (whether through legislation or governance codes) does not appear to improve banks' performance.

**Table 5.** Board gender diversity and financial performance

Variables	Model 1	
	ROA	ROE
PWB	-0.008* (-1.802)	-0.058** (-2.276)
BS	-0.0003** (-2.053)	-0.0005 (-0.527)
INDP	0.002 (0.791)	0.0288** (2.309)
Duality	0.002 (1.486)	-0.003 (-0.451)
Size	0.001*** (3.122)	0.012*** (6.198)
Capital	0.076*** (6.835)	-0.111* (-1.859)
Age	0.002** (2.05)	0.007 (1.641)
GDPG	0.082*** (6.588)	0.688*** (10.349)
Intercept	-0.01** (-2.428)	-0.029 (-1.285)
Year fixed effects	Yes	Yes
R-squared (%)	9.4	13.0
VIF mean	1.19	1.19
Number of observations	1206	

Note: Table 5 reports the results of the baseline regression. Dependent variables: ROA and ROE. The main independent variable is PWB. All the explanatory variables are defined in Table 2. All continuous variables are winsorized at the 1st and 99th percentiles. All regressions are estimated using OLS. \*\*\*, \*\*, \* designate significance levels of 1%, 5%, and 10%, respectively.

Moreover, we examine the effect of national culture on the relationship between board diversity and banks' financial performance by studying four cultural dimensions. Indeed, the cultural traits of a nation may also impact the framework and results of corporate governance. Hofstede (1980) defined "culture" as the set of values, beliefs, and attitudes that are commonly held by a group of people. There are four cultural components to a nation's characteristics: power distance, masculinity/femininity, individualism/collectivism, and uncertainty avoidance. Countries with collectivistic cultures and those with individualistic cultures, for instance, may see very different effects of gender diversity on company performance. According to Hofstede's cultural dimensions, "power distance" and "masculinity-femininity" have an impact on board gender diversity as well as on firm performance and may affect board diversity. On the other hand, Hauff and Richter (2015) report that managers' perceptions of gender are influenced by power distance. Additionally, diversity benefits can be lessened in nations with high masculine rankings. Therefore, focusing on the moderating influence of culture can offer additional proof of the effect of board gender diversity, particularly in emerging countries where cultural practices and attitudes are more prevalent. Results are presented in Table 6.

**Table 6.** Gender diversity, financial performance, and the impact of national culture

Variables	ROA				ROE			
	(2)	(3)	(4)	(5)	(2)	(3)	(4)	(5)
PWB	0.078 (1.499)	-0.046* (-1.848)	-0.012 (-1.562)	0.006 (0.183)	0.479* (1.737)	-0.204 (-1.512)	-0.057 (-1.365)	0.101 (0.603)
MAS	0.00003 (0.287)				0.001 (1.107)			
UAV		0.0005 (0.094)				0.0006 (0.217)		
IND			0.0004 (0.941)				-0.001*** (-4.269)	
PDI				-0.0006* (-1.436)				-0.001* (-1.936)
PWB × MAS	-0.002* (-1.668)				-0.011** (-1.959)			
PWB × UAV		0.0006 (1.593)				0.002 (1.149)		
PWB × IND			0.0002 (0.657)				-0.001 (-0.296)	
PWB × PDI				-0.0001 (-0.4)				-0.002 (-0.87)
BS	-0.0003** (-2.047)	-0.0003** (-2.05)	-0.0003** (-2.010)	-0.003* (-1.898)	-0.004 (-0.538)	-0.0004 (-0.513)	-0.001 (-0.754)	-0.0003 (-0.317)
INDP	0.002 (0.859)	0.003 (1.274)	0.002 (0.849)	0.002 (0.957)	0.031** (2.45)	0.034*** (2.634)	0.027** (2.186)	0.032** (2.578)
Duality	0.002 (1.528)	0.002 (1.528)	0.002 (1.48)	0.002 (1.437)	-0.004 (-0.525)	-0.003 (-0.421)	-0.003 (-0.48)	-0.004 (-0.534)
Size	0.001*** (3.182)	0.001*** (3.069)	0.001** (1.985)	0.001*** (3.507)	0.013*** (6.257)	0.012*** (6.04)	0.018*** (7.881)	0.014*** (6.733)
Capital	0.074*** (6.437)	0.074*** (6.543)	0.068*** (5.278)	0.08*** (6.979)	-0.118** (-1.946)	-0.123** (-2.042)	0.054 (0.789)	-0.094 (-1.563)
Age	0.0012 (1.581)	0.0013* (1.772)	0.001* (1.906)	0.001 (1.49)	0.005 (1.257)	0.006 (1.439)	0.006 (1.616)	0.003 (0.844)
GDPG	0.085*** (6.527)	0.083*** (6.619)	0.084*** (6.681)	0.082*** (6.599)	0.685*** (9.925)	0.689*** (10.373)	0.651*** (9.812)	0.69*** (10.401)
Intercept	-0.011 (-1.495)	-0.010* (-1.791)	-0.007 (-1.618)	-0.006 (-1.237)	-0.058 (-1.509)	-0.031 (-1.042)	-0.07*** (-2.906)	-0.001 (-0.041)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	9.7	9.7	9.5	9.71	13.4	13.00	15.00	13.77
VIF mean	1.14	1.21	1.37	1.22	1.14	1.21	1.37	1.22
Number of observations	1206							

Note: Dependent variables: ROA and ROE. Independent variables are the percentage of women board (PWB), the four cultural dimensions: masculinity (MAS), uncertainty avoidance (UAV), individualism (IND), and power distance (PDI), and the corresponding interaction terms between the PWB and the cultural dimensions. Explanatory variables are defined in Table 2. All regressions are estimated using OLS and include year fixed effects. The figures in parentheses are T-statistics. \*, \*\*, and \*\*\* indicate significance levels at 10%, 5% and 1%, respectively.

Our results remain robust to various measures of gender diversity. They show that in an environment with high levels of individualism and of power distance, the presence of women on boards negatively impacts banks' performance. However, in an environment with low levels of masculinity and of power distance, gender diversity positively affects a bank's performance. These results are consistent with the conclusions of Martin-Ugedo et al. (2019), Frijns et al. (2016), and Griffin et al. (2015) and could explain the mixed findings in the literature on the relationship between gender diversity and financial performance.

When interacting each of the four cultural dimensions with board gender diversity (*PWB*), we find that the interaction between masculinity and the proportion of women on boards ( $PWB \times MAS$ ) is negative and significant, as shown in Model 1. This indicates that the positive effect of gender diversity on bank performance diminishes in countries with higher levels of masculinity and may even become negative. In contrast, the other cultural dimensions — power distance, individualism, and uncertainty

avoidance — do not significantly moderate the relationship between board gender diversity and bank performance.

### 4.3. Robustness check and additional analysis

#### 4.3.1. Alternative measures of gender diversity

To verify the robustness of our findings and rule out potential biases related to the measurement of board gender diversity, we re-estimate the baseline regression using the Blau index. The results, reported in Table 7, show that the coefficient of the Blau index for bank boards is negative and significant. Consistent with our earlier results, both power distance and individualism are negatively associated with financial performance. Furthermore, the coefficients of the interaction terms ( $BGD \times MAS$  and  $BGD \times PDI$ ) are negative and significant. Overall, the results in Table 7 confirm the robustness of our baseline findings.

**Table 7.** Robustness check: Alternative measure of board gender diversity

Variables	ROA					ROE				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
<i>BGD</i>	-0.006* (-1.856)	0.003 (0.591)	-0.007 (-1.594)	-0.004 (-0.94)	-0.001 (-0.196)	-0.042** (-2.406)	0.015 (0.513)	-0.026 (-1.148)	-0.023 (-0.973)	-0.017 (-0.623)
<i>MAS</i>		0.0001 (0.483)					0.001 (1.347)			
<i>UAV</i>			0.0001 (1.068)					0.004 (1.603)		
<i>IND</i>				0.0001 (1.507)					-0.001*** (-3.984)	
<i>PDI</i>					-0.0001** (-2.018)					-0.001** (-2.635)
$BGD \times MAS$		-0.013** (-2.045)					-0.084** (-2.472)			
$BGD \times UAV$			0.0038 (0.605)					-0.031 (-0.911)		
$BGD \times IND$				-0.003 (-0.581)					-0.048 (-1.553)	
$BGD \times PDI$					-0.0001 (-1.634)					-0.001** (-2.409)
<i>BS</i>	-0.0003** (-1.982)	-0.0003** (-2.103)	-0.0003* (-1.803)	-0.0003* (-1.921)	-0.001* (-1.943)	-0.0004 (0.436)	-0.001 (-0.529)	-0.0003 (-0.33)	-0.001 (-0.691)	-0.002 (-0.957)
<i>INDP</i>	0.002 (0.788)	0.0023 (1.001)	0.003 (1.251)	0.002 (0.797)	0.003 (1.07)	0.029** (2.309)	0.033*** (2.614)	0.034** (2.579)	0.026** (2.118)	0.043** (2.938)
<i>Duality</i>	0.002 (1.48)	0.0018 (1.349)	0.002 (1.485)	0.002 (1.531)	0.001 (0.658)	-0.003 (-0.462)	-0.005 (-0.729)	-0.003 (-0.476)	-0.003 (-0.365)	-0.006 (-0.748)
<i>Size</i>	0.001*** (3.071)	0.0012*** (3.077)	0.011*** (2.811)	0.001** (1.961)	0.001 (1.509)	0.012*** (6.118)	0.012*** (6.121)	0.012*** (5.846)	0.018*** (7.849)	0.012*** (4.693)
<i>Capital</i>	0.076*** (6.838)	0.074*** (6.449)	0.074*** (6.506)	0.067*** (5.218)	0.061*** (3.748)	-0.111* (-1.866)	-0.118* (-1.952)	-0.118* (-1.952)	0.049 (0.726)	-0.127* (1.623)
<i>Age</i>	0.002** (2.102)	0.0013* (1.724)	0.001* (1.922)	0.016** (2.190)	0.0014 (1.298)	0.007* (1.728)	0.006 (1.439)	0.008* (1.885)	0.01* (1.919)	0.011** (2.063)
<i>GDPG</i>	0.082*** (6.591)	0.084*** (6.477)	0.083*** (6.64)	0.084*** (6.684)	0.097*** (5.908)	0.689*** (10.359)	0.681*** (9.874)	0.687*** (10.326)	0.647*** (7.848)	0.715*** (9.02)
Post policy	0.001 (0.907)	0.001 (0.541)	0.0004 (0.327)	0.001 (0.607)	-0.0003 (-0.228)	-0.013** (-2.199)	-0.014** (-2.41)	-0.013** (-2.172)	-0.004 (-0.611)	-0.019*** (-2.635)
Intercept	-0.01** (-2.445)	-0.012* (-1.651)	-0.013** (-2.405)	-0.009* (-1.89)	0.0089 (1.003)	-0.029 (-1.304)	-0.065* (-1.694)	-0.059** (-2.028)	-0.077*** (-3.18)	0.017 (0.39)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	9.4	9.81	9.64	9.6	8.37	13.0	13.63	13.37	15.06	17.28
Number of observations	1206									

Note: Dependent variables: ROA and ROE. All explanatory variables are defined as in Table 2. Regressions are estimated using OLS with year fixed effects. The figures in parentheses are T-statistics. \*, \*\*, and \*\*\* indicate significance levels at 10%, 5% and 1%, respectively.

#### 4.3.2. Endogeneity test

The question of the endogenous nature of the variable relating to the presence of women on the board is often raised when analyzing the relationship between gender diversity and

financial performance (Adams & Ferreira, 2009; Hermalin & Weisbach, 2003; Kahloul et al., 2022). Endogeneity may arise when board members are not randomly selected, leading to potential mutual influence between the two measures. To address this concern, we re-estimate Models 1 and 2 while



controlling for endogeneity issues. Specifically, we employed an alternative method to control this problem. In line with Campbell and Minguez-Vera (2008), Mohsni et al. (2021), Xu et al. (2022), and Sbair and Ed-Dafali (2023), we employed a 2SLS regression

to tackle this endogeneity concern. The results presented in Table 8 indicate that gender diversity has a significant negative impact on banks' financial performance, thus confirming the robustness of our findings.

**Table 8.** Endogeneity test: 2SLS regression

Variables	ROA					ROE				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
PWB	-0.009* (-1.802)	0.078 (1.499)	-0.046** (-1.848)	-0.012 (-1.562)	0.006 (0.182)	-0.058** (-2.276)	0.479* (1.737)	-0.204 (-1.513)	-0.057 (-1.365)	0.101 (0.603)
MAS		0.0003 (0.287)					0.001 (1.107)			
UAV			0.0005 (0.094)					0.0006 (0.217)		
IND				0.0004 (0.941)					-0.001*** (-4.269)	
PDI					-0.0001 (-1.436)					-0.0004* (-1.937)
PWB × MAS		-0.002* (-1.668)					-0.011* (-1.959)			
PWB × UAV			0.0006 (1.593)					0.002 (1.149)		
PWB × IND				0.0002 (0.658)					-0.001 (-0.295)	
PWB × PDI					-0.0002 (-0.399)					-0.002 (-0.87)
BS	-0.0003** (-2.053)	-0.0003** (-2.047)	-0.0003** (-2.05)	-0.0003** (-2.01)	-0.0003* (-1.898)	-0.0005 (-0.527)	-0.0005 (-0.539)	-0.0004 (-0.513)	-0.001 (-0.754)	-0.0003 (-0.316)
INDP	0.002 (0.791)	0.002 (0.859)	0.003 (1.274)	0.002 (0.849)	0.002 (0.957)	0.029** (2.309)	0.031** (2.450)	0.034*** (2.634)	0.027** (2.187)	0.032** (2.579)
Duality	0.002 (1.486)	0.002 (1.528)	0.002 (1.528)	0.002 (1.48)	0.002 (1.436)	-0.003 (-0.451)	-0.004 (-0.524)	-0.003 (-0.421)	-0.003 (-0.48)	-0.004 (-0.534)
Size	0.001*** (3.122)	0.001*** (3.182)	0.001*** (3.069)	0.001** (1.985)	0.001** (3.507)	0.012*** (6.198)	0.013*** (6.257)	0.012*** (6.036)	0.018*** (7.881)	0.014*** (6.733)
Capital	0.077*** (6.836)	0.074*** (6.439)	0.074*** (6.544)	0.068*** (5.279)	0.079*** (6.979)	-0.111* (-1.859)	-0.118* (-1.946)	-0.123** (-2.042)	0.053 (0.79)	-0.093 (-1.563)
Age	0.002** (2.047)	0.001 (1.581)	0.001* (1.772)	0.001* (1.907)	0.001 (1.489)	0.006 (1.641)	0.005 (1.257)	0.006 (1.439)	0.01 (1.616)	0.003 (0.845)
GDPG	0.082*** (6.588)	0.085*** (6.526)	0.083*** (6.619)	0.084*** (6.681)	0.082*** (6.599)	0.687*** (10.349)	0.685*** (9.925)	0.688*** (10.37)	0.651*** (9.813)	0.69*** (10.402)
Intercept	-0.01** (-2.429)	-0.011 (-1.495)	-0.01* (-1.791)	-0.007 (-1.613)	-0.006 (-1.237)	-0.029 (-1.285)	-0.058 (-1.509)	-0.032 (-1.041)	-0.07*** (-2.906)	-0.001 (-0.041)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	9.4	9.7	9.8	9.6	9.71	13.0	13.4	13.0	15.0	13.77
Number of observations	1206									

Note: The figures in parentheses are T-statistics. \*, \*\*, and \*\*\* indicate significance levels at 10%, 5% and 1%, respectively.

#### 4.3.3. Islamic bank versus conventional bank

Table 9 reports the mean differences of variables between Islamic and conventional banks. The results indicate that conventional banks exhibit a higher level of gender diversity compared to Islamic banks (8.44% versus 4.07%). This result is consistent with the constant of Chizema et al. (2015). These authors highlight that religion negatively influences

the appointment of women to boards of directors. Nevertheless, Islamic banks tend to exhibit higher profitability, greater financial autonomy, and more independent boards compared to conventional banks. Finally, no significant differences are observed between Islamic and conventional banks in terms of ROA, bank size (Size), board size (BS), and bank age (Age).

**Table 9.** Mean difference tests between Islamic banks and conventional banks

Variables	Islamic banks (N = 42)	Conventional banks (N = 92)	Difference
ROA	1.36	1.27	0.09
ROE	12.63	10.62	2.01**
PWB	4.07	8.44	-4.37***
BS	10.31	10.65	-0.34
INDE	37.75	29.98	7.77***
Duality	4.23	17.03	-12.8***
Size	9.36	8.66	0.7
Capital	10.67	9.95	0.72*
Age	3.28	3.70	-0.42

Note: \*\*\*, \*\*, \* are statistically significant at the 1, 5, and 10% levels, respectively.

Further, we present in Table 10 the regression results according to the nature of the bank (Islamic banks versus conventional banks). The results

indicate that the type of bank influences the observed effects. Specifically, the presence of women on boards continues to have a negative

impact on the financial performance of Islamic banks, whereas gender diversity does not significantly affect the performance of conventional banks. Our analysis shows that Islamic banks have relatively fewer female directors and that the appointment of women exerts a different effect

on performance compared to conventional banks. These findings suggest that, within Islamic banks, initiatives aimed at promoting gender equality and fostering an inclusive culture may be associated with lower profitability.

**Table 10.** Islamic banks versus conventional banks

Variables	Islamic banks		Conventional banks	
	ROA	ROE	ROA	ROE
PWB	-0.018** (-4.596)	-0.079** (-2.429)	-0.006 (-0.832)	-0.025 (-0.776)
BS	-0.001 (-1.22)	0.001 (0.737)	-0.001** (-2.191)	-0.002* (-1.886)
INDP	-0.001 (-0.774)	0.025 (1.552)	0.002 (0.473)	0.02 (1.163)
Duality	-0.018 (-1.204)	0.003 (0.17)	0.004** (2.289)	0.006 (0.716)
Size	0.001*** (4.373)	0.044 (1.325)	0.001** (2.129)	0.013*** (4.967)
Capital	0.052*** (8.177)	-0.276*** (-4.167)	0.118*** (5.943)	0.132 (1.361)
Age	0.003*** (6.062)	0.028*** (4.701)	-0.0004 (-0.353)	-0.001 (-0.206)
GDPG	0.055*** (5.592)	0.48*** (4.723)	0.094*** (5.513)	0.766*** (9.151)
Intercept	-0.016*** (-5.148)	-0.004 (-0.119)	-0.006 (-1.055)	-0.024 (-0.817)
Year fixed effects	Yes	Yes	Yes	Yes
R-squared (%)	41.67	21.09	8.71	13.21
Number of observations	378		828	

Note: All regressions are estimated using OLS and include year fixed effects. The figures in parentheses are T-statistics. \*, \*\*, and \*\*\* indicate significance levels at 10%, 5% and 1%, respectively.

## 5. CONCLUSION

This study investigates the relationship between gender diversity and financial performance, focusing on banks from 15 countries in the MENA and Central Asia regions over the period 2012–2020. Using two measures of firm performance (namely, ROA and ROE), our findings indicate that the presence of women on boards of directors negatively affects financial performance. This finding is consistent with Pathan and Faff (2013), Garcia-Meca et al. (2015), and Bhatia et al. (2023). Overall, our study provides evidence that board gender diversity influences bank performance, but the effects are contingent upon contextual factors. Importantly, while gender diversity exhibits a positive main effect on bank performance, this positive relationship diminishes in countries with higher levels of masculinity. In highly masculine cultures, the net effect may even become negative, although the baseline effect remains positive. This finding underscores that the cultural context plays a significant moderating role in determining whether gender diversity enhances or constrains bank performance. Such insights carry important implications for the formulation of governance policies and the design of diversity initiatives, particularly in culturally heterogeneous or emerging markets.

The results of this study suggest the recommendations of the World Economic Forum (Ghosh, 2021) report, which consider the representation of 30% of women on boards a crucial objective on the road to gender equality. Indeed, the economic argument in favor of gender

equality links improved profitability to gender equality. Our paper corroborates that a board with three or more women improves banks' financial performance. Therefore, increasing the representation of women on boards will contribute to effective governance and competition in the global market. For female board members to effectively make decisions and enhance the performance of the bank, it is advised that policymakers increase the number of female board members.

However, this study displays limits relating to the sample, which includes a limited number of banks from certain countries because of the unavailability of data, and a limited range of diversity. We did not test other diversity variables, such as age diversity, university career diversity, or training diversity (economics, engineering, etc.). These limits are explained by the absence of a database containing this information, as well as by the lack of data relating to board characteristics in annual reports of banks. Several avenues are possible as an extension of this study. It would be interesting to study the effect of the profile of women on boards (level of education, nature of the study, and attributes) on financial performance. Also, a comparative analysis of the gender diversity effect on Islamic banks' financial performance would be promising. Moreover, we suggest an additional study to analyze the effect of diversity reform (legislation-based reform and governance code-based reform) on financial performance. In recent years, we have seen in the countries of the MENA region the introduction of quotas for women on boards of directors (e.g., Morocco and the UAE).

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