

IMPACT OF GENDER AND NATIONALITY DIVERSITY ON FINANCIAL PERFORMANCE: A STUDY OF LISTED BANKS IN MOROCCO

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Abstract

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The purpose of this article is to explore the effect of the diversity of boards on the financial performance of banks. Based on an in-depth analysis of the theoretical and empirical literature, this study aims to examine the impact of gender diversity and the diversity of nationalities on the financial performance of Moroccan banks. To this end, the study uses a set of panel data from all Moroccan banks listed on the stock exchange for the period 2014-2018. The model was estimated by an ordinary least squares (OLS) regression equation, by the time fixed-effects regression model, and then by three-stage least squares (3SLS) regression analysis with time fixed effects to better understand the endogeneity problem variables of the model. The results of the study reveal that gender diversity has a negative and significant effect on the financial performance of listed Moroccan banks measured by both return on assets (ROA) and return on equity (ROE), while the national diversity is not significantly related to the financial performance of these banks. Likewise, the interaction between the two measures of diversity has no significant impact on financial performance.

Keywords: Gender Diversity, Nationality Diversity, Endogeneity, Interaction, Three-Stage Least Squares (3SLS), Bank Financial Performance

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1. INTRODUCTION

Corporate governance is becoming increasingly important, at several levels and in several countries, in the light of the various scandals and crises which have shaken the business world in recent decades and have caused significant losses for investors.

These scandals have often been associated with weaknesses in the systems of governance which ensure the control and supervision of corporate directors.

In the banking sector, corporate governance presents various specificities linked to intrinsic characteristics specific to banks such as strong

regulation, supervision, opacity, and risk related to credit activity (Furfine, 2001; Adams & Mehran, 2003; Levine, 2004) as well as by a specific financial structure (Macey & O'Hara, 2003).

Good banking governance induces health and sustainable growth of the economy (Mehran, 2004) and efficient allocation of savings (Caprio, Laeven, & Levine, 2007). On the contrary, poor banking governance is likely to trigger chain bank failures, leading to serious systemic risk and negative externalities (Pathan & Faff, 2013). The Basel Committee on Banking Supervision (BCBS, 2015) stresses that effective governance "is critical to the proper functioning of the banking sector and the economy as a whole. (...). Banks' safety and soundness are key to financial stability, and the manner in which they conduct their business, therefore, is central to economic health. Governance weaknesses at banks that play a significant role in the financial system can result in the transmission of problems across the banking sector and the economy as a whole" (p. 3).

Following the recent financial crisis of 2008, corporate governance in banks has been challenged to varying degrees. Indeed, weaknesses in corporate governance structures within banks were cited as the reason for excessive risk-taking, biased incentive compensation for senior managers, and the predominance of a culture that values short term gains at the expense of sustained long term performance (Claessens & Yurtoglu, 2012). This has led international organizations and the governments of several countries to pay particular attention to the importance of governance for financial institutions and banks in particular (García-Meca, García-Sánchez, & Martínez-Ferrero, 2014).

In this context, the steering committee of the Organization for Economic Cooperation and Development (OECD) claims that the failures of the boards of directors of financial companies are a major cause of the financial crisis (Kirkpatrick, 2009) and has launched an action plan to improve their governance.

Similarly, the BCBS published in 2015 a set of "Corporate Governance Principles for Banks" which, among other things, provides a framework for the scope of exercise of the functions of the board of directors. BCBS (2015) emphasizes that, "The board should be comprised of individuals with a balance of skills, diversity, and expertise, who collectively possess the necessary qualifications commensurate with the size, complexity and risk profile of the bank" (p. 13). This report explicitly recommends that the bank's board of director should be made up of a diverse set of directors in order to be able to exercise its functions and allow effective oversight.

According to Van der Walt and Ingley (2003), the concept of diversity "relates to board composition and the varied combination of attributes, characteristics, and expertise contributed by individual board members in relation to board process and decision-making" (p. 219). In corporate governance, several types of diversity can be considered such as age, sex, ethnicity, culture, religion, geographic representation, nationality, knowledge, experience, skills and expertise, level of education, and type of education. According to Bravo (2018), two different categories of diversity are traditionally considered in research:

observable diversity, based on the visible attributes of directors (ethnic origin, nationality, gender, and age), and unobservable diversity, based on less visible attributes (level of education, type of education, expertise).

Diversity has become an active policy issue in many countries, with some national governments establishing quotas for listed and public companies, while others simply offer guidelines for diversity (García-Meca et al., 2014). According to Reddy and Jadhav (2019) "women directors are under-represented and in response, several countries have enacted the gender quota legislation to mandate appointment of women directors on corporate boards" (p. 2).

In Morocco, for example, a guideline issued by Bank Al-Maghrib (Central Bank of Morocco) recommends that the bank's board should ensure that a policy is in place to ensure a better representation of women among the board's composition (article 8 of directive 1/W/2014, Bank Al-Maghrib, 2014), while guideline 5/W/16 published in 2016 (Bank Al-Maghrib, 2016) invites banks to respect the principle of gender parity regarding the appointment of independent directors (article 9).

There are many studies on corporate governance that deal with the impact of different characteristics of the board, including size, independence, duality on the performance of the banking firm. To date, however, diversity, which is an important dimension of a board in banks, has received little attention in the financial literature.

The effect of the diversity on boards of directors has been empirically examined in numerous studies for a non-financial corporation. More recently, other research has explored this relationship in the banking sector. Despite this large body of research examining the relationship between diversity and firm performance in developed countries, studies of gender and nationality diversity in emerging economy countries has been sparse.

Therefore, the aim of this paper is to investigate the relationship between board diversity and financial performance of banks. To shed light on this issue in the banking sector of a developing country like Morocco, we simultaneously consider two attributes of diversity namely gender and nationality, and examine their impact on banking performance. To this end, we examine a sample of all listed Moroccan banks over the period from 2014 to 2018. To our knowledge, our research is unique because we are examining the simultaneous and interaction effect of nationality and gender diversity in banks, which is not common in the literature at least in the Moroccan context.

Following a multi-theoretical approach, the results of our study show that gender diversity has a negative and significant effect on the financial performance of Moroccan banks as measured by ROA and ROE whereas the nationality diversity is not significantly linked to the financial performance of these banks.

This contribution continues as follows. Section 2 reviews the main theoretical perspectives, presents empirical studies on the effect of board diversity on bank performance, and outlines our research hypotheses. Section 3 describes the sample, the procedure, the data collection methodology and the empirical method. Section 4 presents the

main results followed by a discussion in Section 5, and a conclusion in Section 6.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Theoretical framework

The literature on board diversity and its potential link with corporate performance is not based on a single theory. Rather, it draws on a variety of perspectives, including agency theory, resource dependency theory, human capital theory, and social psychology theory (Talavera, Yin, & Zhang, 2018). No one theory directly predicts the nature of the relationship between board diversity and financial performance (Carter, D'Souza, Simkins, & Simpson, 2010), but the common goal of all of these theories is to study this relationship through the board's structure, its functions, its composition and its efficiency which partially determines corporate performance.

According to agency theory, the board of directors is an important internal mechanism for mitigating conflicts between shareholders and managers (Fama & Jensen, 1983). The underlying hypothesis of the theory is the importance of an independent board of directors in resolving this principal-agent conflict of interest (Adams, Hermalin, & Weisbach 2010; Fama, 1980; Shleifer & Vishny, 1997). Board diversity can increase the independence of boards of directors, thereby enhancing their oversight and advisory roles (Hillman & Dalziel, 2003; Carter, Simkins, & Simpson, 2003). They suggest, however, that agency theory does not provide strong evidence of the link between board diversity and financial performance, especially since the relationship between board independence and performance is unclear (Adams & Mehran, 2012).

Resource dependence theory (Pfeffer & Salancik, 1978) considers the board of directors as a strategic resource through which a company can access to external sources (new skills, new methods, and opportunities, communication channels, etc.) in order to address environmental dependencies and uncertainties.

According to Carter et al. (2010), this theory provides a more convincing theoretical framework for studying the link between board diversity and corporate performance. Indeed, the diversity of directors widens board's members' networks and contacts, allows a better access to capital (Macey & O'Hara, 2003), a better response to customers' needs and a deeper penetration of the market (Mishra & Jhunjhunwala, 2013, as cited in Talavera et al., 2018), and connections to important financial, regulatory (Ferreira, 2010) and political networks.

Therefore, heterogeneity will provide the board with critical, valuable and more varied resources for better decision making, which should produce better corporate performance. The basis for arguments in favour of board diversity is that the composition of the board affects how well it fulfills its responsibilities, and that an appropriate board composition increases its effectiveness, which in turn improves performance and productivity of the firm (Van der Walt & Ingley, 2003). In sum, a more diversified board of directors is considered

positive for the company and its financial performance (Carter et al., 2010).

The human capital theory complements the resource dependence theory in some respects (Talavera et al., 2018; Carter et al., 2010). It addresses the role of the stock of education, knowledge, experience, and skills that directors provide to the board and that can be used for the company's benefit (Terjesen, Couto, & Francisco, 2016).

Social psychology theory assumes that heterogeneous groups are able to prevent majority administrators from exercising disproportionate influence over group decisions (Carter et al., 2010). Social psychology theory, however, suggests that decision making may be slower and more confrontational with heterogeneous administrators. Indeed, the existence of different perspectives and different cognitive capacities within a board can generate conflicts between different groups of managers. Such conflicts can likely hinder the development of board cohesion, create communication barriers, prolong decision-making processes, compromise board effectiveness, and thus weaken corporate performance (Wang & Hsu, 2013).

In summary, the theory devoted to this topic suggests that the diversity can have positive or negative effects on corporate performance. Much of the theory addresses the functions and responsibilities of the board by focusing either on the nature of executive oversight and reducing agency costs, or on the external benefits/resources that directors often provide to the company, ignoring that boards of directors fulfill the dual role of controllers/ supervisors on the one hand and advisers to managers on the other. In doing so, these approaches contribute to an incomplete understanding of what boards do and how they affect corporate performance, note Hillman and Dalziel (2003). A multi-theoretical approach, therefore, seems to be the most appropriate for our research subject.

2.2. Empirical research and hypotheses

In accordance with the inconsistency of theoretical perspectives on the expected impact of board diversity on corporate performance, empirical studies also offer mixed results. The first group of studies confirmed the positive impact of the diversity on performance, another group of studies reported the negative effect, while the third group of studies found no link between the board diversity and corporate financial performance.

2.2.1. Gender diversity and performance

The effect of the presence of women on boards of directors has been empirically examined in numerous studies for the non-financial corporation. More recently, other research has explored this relationship in the banking sector. However, recent reviews of the literature "show that the average correlation between female board representation and firm performance is small and not statistically significant" argue Kim, Kuang, and Qin (2020, p. 236).

Muller-Kahle and Lewellyn (2011) find that the higher the percentage of women on the board,

they are less likely inclined they be specialized in risky loans. Since excessive risk-taking could damage value, the appointment of a female executive could create wealth for the bank's shareholders.

Using a sample of 159 banks from different countries (Canada, France, Germany, Italy, Netherlands, Spain, Sweden, the United Kingdom, and the United States) during the period 2004 -2010, García-Meca et al. (2014) find that gender diversity improves the performance of banks, confirming the positive role of women directors on bank performance.

On a sample of 461 large banks from OECD countries, Gulamhussen and Santa (2015) confirm the positive influence of the presence and percentage of women on boards of directors on the performance measured by several ratios including ROA, Tobin's Q and ROE.

Elsharkawy, Paterson, and Sherif (2018) report a significant positive association between gender diversity and the performance of a sample of 54 UK banks listed on the stock exchange over the period 2005-2015.

Using data from 68 banks in the GCC region for the period from 2013 to 2017, Elbahar (2019) found a positive impact of female board representation on ROE.

Nguyen, Hagendorff, and Eshraghi (2014) examined the effect of the announcement of senior executives appointments in US banks between 1999 and 2011. Overall, their results show that the heterogeneity creates value for banks, except in the case where the administration board is highly independent.

Toumi and Kabbaj (2019) tested the effect of the presence of women on the board of directors on the financial performance of the 6 Moroccan banks listed over a period of 10 years. The results show a positive and significant relationship between the presence of women and the financial performance expressed by ROE and ROA. These results have also been confirmed in Nigeria by Onyekwere, Wesiah, and Danbatta (2019) for a sample of banks for the period 2006-2017.

On the contrary, Setiyono and Tarazi (2014) find that the proportion of women on the board of directors is negatively correlated with ROA and ROE.

Talavera et al. (2018) examined the link between the age diversity of boards of directors and the performance of a sample of 97 Chinese banks over the 2009-2013 period. Their results show a negative relationship between age diversity and the bank profitability measured by ROA and ROE.

Other research fails to find a significant relationship between female board membership and corporate performance. In this sense, Carter et al. (2010) find no significant relationship between the gender or ethnic diversity of the board and the financial performance (ROA and Tobin's Q) of a sample of large US companies in the S&P 500 index for the period 1998-2002.

Following a meta-analysis of 20 studies published in peer-reviewed scientific journals, Pletzer, Nikolova, Kedzior, and Voelpel (2015) concluded that the overall weighted average correlation between the percentage of women on boards and the performance of companies (ROA, ROE, Tobin's Q) was low and not significant.

Applying instrumental variable methods to data from 90 US bank holding companies over the 1999-2015 period, Owen and Temesvary (2018)

argue that there is a non-linear U-shaped relationship between gender diversity on boards of directors and various measures of bank performance.

Abubakar (2017) assessed the effects of board diversity on the financial performance of the 10 deposit banks in Nigeria over the 2010-2014 period. They found that gender diversity had no significant effect on the financial performance of banks (ROE).

Consistent with the predictions of agency theory and resource dependency theory, and knowing that most studies suggest that gender diversity has a positive impact on bank performance, we hypothesize:

Hypothesis 1 (H1): Gender diversity on boards has a positive impact on the performance of banks.

2.2.2. Nationality diversity and performance

The nationality of directors is the second main dimension of board diversity. In the banking sector, there is a clear lack of empirical studies examining the link between performance and diversity of nationality (Fernandes, Farinha, Martins, & Mateus, 2018).

Liang, Xu, and Jiraporn (2013) argue that foreign directors could implement new technologies and management techniques, leading to better performance. Similarly, Sarhan, Ntim, and Al-Najjar (2018) find that the board diversity, measured by the gender and nationality of directors, has a positive effect on the financial performance (ROA and Tobin's Q) of a sample of 100 companies from five Middle East countries during the period 2009-2014.

Nevertheless, García-Meca et al. (2014) reported that diversity of nationality, measured as a percentage of foreign directors, had a negative impact on the performance of 159 banks in nine countries over the 2004-2010 period.

Finally, the third set of empirical studies found no link between board diversity and corporate financial performance. Indeed, Fich (2007) as cited in Fernandes et al. (2018) finds that the "nationality mix" does not affect the stock market returns of US bank during the crisis.

Elsharkawy et al. (2018) highlight an insignificant impact of foreign members on the performance of a sample of British banks. In addition, Abubakar et al. (2017) reported that the presence of foreign directors on the board has no impact on the return on equity of deposit banks in Nigeria over the 2010-2014 period.

In Morocco, using panel data from eight main Moroccan universal banks during the period 2007-2016, Belkebir, Daanoune, and Moulalum (2018) concluded that the financial performance in terms of return on average assets (ROAA) is negatively associated with the proportion of foreign directors on the board. A similar result was observed by Sbai and Meghouar (2017) in the case of a panel of Moroccan banks listed over the 2009-2015 period.

Berger, Deyoung, Genay, and Udell (2000) analyze this divergence of results according to two hypotheses: the home field advantage hypothesis and the global advantage hypothesis.

Based on this reasoning, we formulate the second research hypothesis in null format:

Hypothesis 2 (H2): Diversity in terms of nationality has no significant impact on the performance of banks.

2.2.3. Gender diversity and foreign nationality interaction and performance

In the absence of previous studies, we will also test the interaction effect between the proportion of women on the board and the percentage of foreign directors on banking performance. This interaction term is expressed by the variable: "proportion of women x proportion of foreign administrators".

For this, we consider a third hypothesis announced as follows:

Hypothesis 3 (H3): There is a positive effect of a greater female representation within the board on performance when it is associated with a high proportion of directors of foreign nationality.

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Sample and data collection

This empirical study is conducted with a sample that includes all the Moroccan banks listed (six in number) on the Casablanca Stock Exchange over the 2014-2018 period. Although our sample may seem small, we assert that these banks represent 75% of the total number of Moroccan universal banks. The business performance indicators of these banking groups also confirms their weight in the banking sector as a whole. Indeed, according to publications of Bank Al-Maghrib (BAM) for the 2018 financial year, among these listed banks only five banks hold about 79% of the total assets of the banking sector, 80% market share in terms of deposits and about 81% in terms of credits to the economy.

We restrain our sample to listed banking companies because the data regarding these banks is available and easily accessible. Thus, data on the performance and characteristics of governance bodies are collected from different reports (financial report, annual report, and governance report when available) which have been download from websites of the six banks used in the study. As a complement, other relevant sources were used such as the Casablanca Stock Exchange, the Moroccan Capital Markets Authority, and Bank Al-Maghrib.

Since we used a dataset that includes only listed banks whose financial statements are prepared in accordance with International Financial Reporting Standards (IFRS), the published financial information is presumed to be intelligible, more reliable and more relevant.

To develop our measures from these reports, we manually extracted and calculated in Excel the various performance indicators, the attributes of the diversity of the board of directors, and the intrinsic characteristics of each bank.

3.2. Variables measurement

All the dependent, independent and control variables are summarized and presented in Table 1.

3.2.1. Dependent variable: Financial performance

Return on Assets (ROA) is the most commonly used performance indicator in previous research (Barako & Tower, 2007; Claessens, Demirgüç-Kunt, & Huizinga, 2001). ROA is generally calculated as the result before extraordinary items, interest expense

and taxes divided by the average of total assets or total assets (García-Meca et al., 2014; De Andrés & Vallelado, 2008).

Other previous studies measure ROA by relating net profit to the book value of total assets (Erhardt, Werbel, & Shrader, 2003; Adams & Ferreira, 2007; Carter et al., 2010; Terjesen et al., 2016; Sarhan et al., 2019). By following these authors, we adopted this measure to calculate the return on assets for each bank from 2014 to 2018. Thus measured, this ratio expresses the firm's ability to generate income for its shareholders from a given portfolio of assets.

Return on equity (ROE) is defined as the ratio of net profit for the year to equity (Al-ahdal, Alsamhi, Tabash, & Farhan, 2020; Unite, Sullivan, & Shi, 2019). It measures the ability of firms to use investments to generate and sustain earnings growth (Elbahar, 2019).

3.2.2. Independent variables: Board diversity

In this study, we are interested in the diversity observable through gender diversity and nationality diversity. Typically, existing studies measure board diversity using two approaches: individual versus composite measures.

According to the second approach, the main indicator of gender and foreign diversity on boards is the Blau index (Unite et al., 2019; Fan, Jiang, Zhang, & Zhou, 2019; Owen & Temesvary, 2018; Bravo, 2018; Issa & Fang, 2019). Other studies estimate diversity using the Herfindahl index (Mateus, Mateus, & Stojanovic, 2020).

In order to consider the gender diversity and the presence of foreign managers within boards, we can use individual quantitative measures expressed in number (Yang, Yang, & Gao, 2019; Carter et al., 2010; Ruigrok, Peck, & Tacheva, 2007), in proportion (Beji, Yousfi, Loukil, & Omri, 2020; Gulamhussen & Santa, 2015; Terjesen et al., 2015; García-Meca et al., 2014; Setiyono & Tarazi, 2014; Erhardt et al., 2003) or both (Yang et al., 2019; Carter et al., 2003).

We estimate gender diversity (nationality diversity respectively) by the proportion of women (directors of foreign nationality respectively) on the board. When a bank has a supervisory board and a management board, the structure of the board is defined in terms of the supervisory board.

3.2.3. Control variables

In order to explore the influence of diversity more rigorously, we select a set of control variables linked to the structure of the boards and to the characteristics of the bank and the effects of those control variables have been proven in previous studies.

Based on the literature, four control variables are chosen: the size of the bank, the size of the board of directors and the independence of the directors (Morck, Shleifer, & Vishny, 1988; Arouri, Hossain, & Muttakin, 2014) and institutional ownership (Gallucci, Santulli, & Tipaldi, 2020; Terjesen et al., 2016).

The calculation formulas and the specific symbols for each variable are summarized in Table 1.

Table 1. Variables definitions

Variable name	Symbol	Unit of measure	Definition
Dependent variables:			
Return on assets	ROA	%	Net income/total assets.
Return on equity	ROE	%	Net income/equity.
Independent variables:			
Female administrators	WPROP	%	Proportion of women on the board.
Foreign directors	FORPROP	%	Proportion of directors of foreign nationality.
Control variables:			
Bank size	SIZEBank	Log	Natural logarithm of total assets.
Board size	BSIZE	Number	Total number of directors.
Board independence	BINDPRO	%	Proportion of independent directors.
Institutional ownership	INSTOWN	%	Percentage of capital held by institutional investors.

3.3. The research model

In order to understand the impact of diversity variables on performance in the banking sector, we

have specified the empirical model which has the following general form:

$$Perf_{it} = \beta_0 + \beta_1 WPROP_{it} + \beta_2 FORPROP + \beta_3 WO \times FOPROP + \beta_4 SIZEBank_{it} + \beta_5 BSIZE_{it} + \beta_6 BINDPROP_{it} + \beta_7 INSTOWN_{it} + \mu_{it} \quad (1)$$

where $Perf_{it} = ROA_{it}$ or ROE_{it} ; and β_0, \dots, β_7 parameters to estimate.

This model is estimated on panel data using the Stata software. The use of panel data is justified by the double dimension of our data: one for individuals (in our model the listed banks) and one for time (the study period 2014 to 2018), for a total of 30 observations.

For each of the performance equations (ROA and ROE), we estimate three statistical versions of this model, an ordinary least squares regression (OLS), a fixe-effects model with time fixed effects and a three-stage least squares (3SLS) regression.

Indeed, several previous studies on corporate governance have proven the endogenous nature of performance and most of the characteristics of the board (Hermalin & Weisbach, 2003). Endogeneity biases can have different origins (omitting variables, errors in variables and simultaneous causality) and different methods are available to address them.

If the endogeneity of the variable is proven, the results of the OLS tests are inconsistent and inconclusive. Consequently, the researcher must understand the sources of the problem and take reasonable measures to reduce the negative impact in order to effectively manage endogeneity (Ullah, Akhtar, & Zaefarian, 2018). Adams and Ferreira (2009) used, for example, the individual fixed-effects model to account endogeneity biases linked to the omission of variables by assuming that these variables are invariant overtime.

The second problem associated with endogeneity is the reverse or simultaneous causality that occurs when two variables affect each other simultaneously and have reciprocal feedback loops. This problem has been addressed by the adoption of the GMM method (García-Meca et al., 2014; Ullah et al., 2018; Merendino & Melville, 2019) or through the use of instrumental variable methods using 2SLS or 3SLS estimators (Adams & Ferreira, 2009; Carter et al., 2010; Gulamhussen & Santa, 2015; Bravo, 2018).

Based on this discussion, the empirical test of our model is carried out in three stages.

First, an OLS estimate is performed to examine the direct effect of our independent variables (diversity, other attributes of corporate governance

and characteristics of banks) on our dependent variables, ROA and ROE.

Secondly, we apply the fixed-effects estimation model with time effects that can potentially control unobservable heterogeneity (Adams & Ferreira, 2009).

Finally, we identify endogeneity problems using the Durbin-Wu-Hausman test. In the presence of endogeneity, the fixed effects model in all its varieties (the intra-groupe estimator, time effects or individual effects, Robust standard errors) provides consistent estimates only under the assumption of a strict exogeneity of variables, i.e., assuming that the past achievements of the dependent variable (ROA and ROE) are not correlated with the current values of the independent variables (Wintoki, Linck, & Netter, 2012; Zaefarian, Kadile, Henneberg, & Leischnig, 2017).

Since the GMM method is designed for situations with “small T, large N” panels (Ullah et al., 2018) and in view of our limited sample size (N = 6), we perform a 3SLS regression. This method requires the use of instrumental variables to better capture this relationship.

In compliance with previous studies (Bhagat & Bolton, 2008; Carter et al., 2010; Terjesen et al., 2016) that have used the instrumental variable method, we retained the lagged variable values of performance as an instrument in each question.

The corresponding variables are named ROA.lag for the lagged value of ROA and ROE.lag for the lagged value of ROE. We estimate the equations with a one year lag (Farrell & Hersch, 2005). Similarly, the lagged values of the independent variables are used as predetermined variables although “they are not completely determined outside the system of equations” (Hermalin & Weisbach, 2003, as cited in Carter et al., 2010, p. 404).

4. EMPIRICAL RESULTS

4.1. Descriptive statistics

Table 2 presents the descriptive statistics for the different variables of our model.

Table 2. Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
ROA (%)	30	.9133333	.2816005	.15	1.4
ROE (%)	30	10.26133	3.634495	1.79	15.4
WPROP	30	.1106127	.0945219	0	.25
FORPROP	30	.3854396	.2447393	0	.69230
SIZEBank	30	11.23104	.4226573	10.6348	11.7075
BSIZE	30	10.9	1.66816	9	14
BINDPROP	30	.1651167	.1143661	0	.41666
INSTOWN	30	23.53233	11.48995	10.49	45.09

As mentioned in the table, the average ROA of our sample is 0.913% with a minimum 0.15% and a maximum of 1.4%. This average rate remains close to that observed in the case of Tunisian banks (0.821%) over the 2005-2018 period (Daadaa, 2019). Moreover, the return on equity (ROE) ranges from 1.79% to 15.4% and has an average of 10.26% and a standard deviation of 3.63%. The banks in our panel also have much less volatile profitability, as evidenced by the lower standard deviations for ROE and ROA.

Regarding the structure of the board of directors, the statistics reveal an average size of around 11 directors against a minimum of 9 and a maximum of 14 directors. Independent directors represent an average 16.5% of the total workforce of the board.

In term of gender diversity, women are represented on the board at an average of 11%. The minimum and maximum values for this variable are 0% and 25% respectively. Even if women remain underrepresented in the board, this 11% rate exceeds the average of 2.71% recorded among the MENA region companies (Sarhan et al., 2018) or banks in some emerging countries (e.g., the average among banks in India is 7.1%, Rafinda, Rafinda, Witiastuti, Suroso, & Trinugroho, 2018). This proportion even exceeds that observed by García-Meca et al. (2014) for banks in nine developed countries (10%) but for the period prior to 2014.

Likewise, directors of foreign nationality represent on average 38.5% of the total number of the board with a maximum of around 70%. We, therefore, note an over-representation of foreign directors, notably of French nationality, on the board of Moroccan banks. This can be explained by the strong presence of foreigners in the capital of these banks. In the study by García-Meca et al. (2014) on banks in nine developed countries, this proportion is 18%.

4.2. Data validity test

Before proceeding with the econometric tests, it is first necessary to ensure the validity of the data used in this study. To do this, three standard tests

$$ROA_{it} = \beta_0 + \beta_1 WPROP_{it} + \beta_2 FORPROP + \beta_3 WO \times FOPROP + \beta_4 SIZEBank_{it} + \beta_5 BSIZE_{it} + \beta_6 BINDPROP_{it} + \beta_7 INSTOWN_{it} + \mu_{it} \quad (2)$$

$$ROE_{it} = \beta_0 + \beta_1 WPROP_{it} + \beta_2 FORPROP + \beta_3 WO \times FOPROP + \beta_4 SIZEBank_{it} + \beta_5 BSIZE_{it} + \beta_6 BINDPROP_{it} + \beta_7 INSTOWN_{it} + \mu_{it} \quad (3)$$

A priori, this research uses three models to describe the impact of board diversity on financial performance. Therefore, the regression test is conducted in three stages. First, we estimate the OLS regressions where performance (measured by ROA and ROE) depends on the effect of the two

were carried out: the multicollinearity test, the normality test, and the heteroskedasticity test.

The multicollinearity test is based on the analysis of the correlation matrix between the independent variables of our model as well as on the Variance Inflation Factors (VIFs). The correlation matrix shows that all the correlation coefficients are less than 0.8 and that all of our explanatory variables have a VIF value of less than 10 which generally correspond to the limits from which we begin to have serious problems of multicollinearity (Gujarati, 2015). The maximum VIF in the current study is 3.01, while 1.94 is the mean of VIF. In addition, the correlation matrix indicates the highest coefficient is 0.5614. These results allow us to conclude that the multicollinearity between the independent variables does not pose a serious problem in the interpretation of the results of the multivariate analysis.

The normality test (SK test or Jarque-Bera test) indicates a p-value of 0.0639 and 0.1162 respectively for the ROA model and the ROE model. These results (p-value > 0.05) therefore show that the data of the model to be tested have a normal distribution.

Finally, the heteroskedasticity test is performed to check whether the residual variance is constant with respect to each other for each observation. The Breusch-Pagan test of the null hypothesis of constancy of variance reports a p-value of 0.4509 and 0.1666 respectively for the two models. The significance level exceeds the 5% threshold; we then accept the null hypothesis of heteroskedasticity absence.

The complete and detailed tables of these tests are not reported in the document for reasons of space-saving. These results are however available from the authors.

4.3. Regression result

The objective of this study is to examine the impact of the gender and nationality diversities on performance in the Moroccan banking sector. Since financial performance is measured by ROA and ROE, there will be two regression equations to perform in this research:

explanatory variables (gender or foreign nationality) and their interaction associated with other governance mechanisms.

Second, we estimate the ROA and ROE equations using the fixed effects models with time fixed effect. In this case, the model is written:

$$ROA_{it}/ROE_{it} = \beta_0 + \beta_1 WPROP_{it} + \beta_2 FORPROP + \beta_3 WO \times FOPROP + \beta_4 SIZEBank_{it} + \beta_5 BSIZE_{it} + \beta_6 BINDPROP_{it} + \beta_7 INSTOWN_{it} + \gamma_2 A2_t + \gamma_3 A3_t + \gamma_4 A4_t + \gamma_5 A5_t + \mu_{it} \quad (4)$$

where $A2_t, \dots, A5_t$ dummy variables; $A1_t$ is neglected to prevent perfect multicollinearity” (Stock & Watson, 2020, p. 372). $A2_t = 1$ si t (annee) = 2015 et $A2_t = 0$ otherwise and so on. β_0, \dots, β_7 parameters to estimate. The results of the two regression models are summarized in Table 3. And where $\gamma_2, \dots, \gamma_5$ time effects; it is “a time fixed effects model where the first binary variable

Table 3. OLS & time fixed-effects model regression

Explicative variables	ROA		ROE	
	OLS(1)	FEM(2)	OLS(3)	FEM(4)
WPROP	-1.4168665	-2.5889096**	-9.7827414	-20.052064*
FORPROP	-4.7417567	.00677763	-3.0810616	2.7726143
WO×FOPROP	1.6705829	7.7811867**	9.8036999	79.527872**
SIZEBank	.06754862	.12340493	.36437086	1.7088428
BFSIZE	.01749834	.00562424	-.52936914	-.11349932
BINDPROP	-.94431283	-.8009213	-2.9676658	-11.582008
INSTOWN	.01122133	-.0072976	.21269526*	-.1282044
cons	.10965943	-.36870287	9.1910283	-6.2031244
N	30	30	30	30
Time fixed effects		yes		yes
F-Statistic	2.72	1.45	4.57	1.57
Prob > chi²	0.0343	0.2575	0.0028	0.2174
R-squared:	0.4636		0.5927	
within		0.5517		0.5706
between		0.3887		0.5266
overall		0.1211		0.2704
Adj R-squared	0.2930		0.4631	

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

The OLS Model 1 and 3 of Table 3 shows that, when considering simultaneously the percentages of female and foreign directors, the diversity under these two attributes is negatively associated with ROA (-1.416 and -0.474 respectively) and ROE (-9.782 and -3.081 respectively).

On the other hand, the application of the time fixed effects Model 2 and 4 shows that the presence of women on the board has a negative (-2.588) and significant effect at the 1% level on the ROA. The results of this model also reveal a strongly negative (-20,052) and statistically significant effect at the 5% level of gender diversity on ROE.

In contrast to the two Models 1 and 3, the results of the fixed-effects model show that directors of foreign nationality have a positive and not significant impact (0.0067 and 2.772) on the financial performance of the banks in the sample.

The combined effect of female and foreign administrators on ROA and ROE is positive for

the four models. This effect is very significant at the 1% level once the fixed effects model is applied.

Before performing the three-stage least squares regression (3SLS) and discussing the results of our regression in detail, it is first necessary to test the endogeneity of the variables in our empirical model.

4.3.1. Endogeneity test

We conduct a Durbin-Wu-Hausman test of endogeneity for each of the models of the ROA and ROE estimating equations. The results polled in Table 4 indicate a very low p-value (less than 5%) for testing the null hypothesis of exogeneity.

This leads to reject null hypothesis and concluding that the gender diversity, board nationality diversity and financial performance variables are endogenous in both models.

Table 4. Durbin-Wu-Hausman test

	ROA		ROE	
Durbin (score) $\chi^2(1)$	7.42918	(p = 0.0064)	5.6553	(p = 0.0174)
Wu-Hausman F(1,15)	6.72494	(p = 0.0204)	4.6242	(p = 0.0482)

4.3.2. 3SLS regression analysis

To perform the 3SLS test, the lagged values of the performance variables are used as instruments and the lagged values of the independent variables as predetermined variables.

The endogenous dependent variable is ROA. The independent board diversity variables are also

considered endogenous. Consequently, we use a system of simultaneous equations where the lagged one year value of ROA is used as instruments (Bhagat & Bolton, 2008) and the lagged values of the independent endogenous variables as predetermined variables (Carter et al., 2010; Terjesen et al., 2016).

Table 5 summarizes the results obtained using the 3SLS regression of the ROA equation.

Table 5. 3SLS regression results using ROA

<i>Endogenous variables: ROA, WPROP, FORPROP</i>			
<i>Equation</i>	<i>R-sq</i>	<i>chi²</i>	<i>Prob.</i>
WPROP	0.8492	209.73	0.0000
FORPROP	0.9174	1145.93	0.0000
ROA	0.6962	69.13	0.0000
<i>ROA regression result</i>			
	<i>Coef.</i>	<i>z</i>	<i>P> z </i>
WPROP	-2.418269**	-3.07	0.002
FORPROP	-.2711864	-0.59	0.557
WO×FOPROP	2.033247	0.79	0.432
SIZEBank	.1941151*	2.48	0.013
BFSIZE	.0318883	1.36	0.173
BINDPROP	-1.707198***	-3.79	0.000
INSTOWN	.01006	1.58	0.113
cons	-1.243197	-1.30	0.194
Time fixed effects		yes	

Note: Endogenous variables: WPROP, FORPROP, ROA. Exogenous variables: WO×FOPROP, SIZEBank, BFSIZE, BINDPROP, INSTOWN, A2, A3, A4, A5, ROA.lag, WPROP.lag, FORPROP.lag, WO×FOPROP.lag. * $p < .05$; ** $p < .01$; *** $p < .001$.

The chi² test (p-value = 0.0000) shows that the model is statistically significant at 1% level and that the R-squared coefficient is around 70% (for the ROA equation) which gives our estimates a high explanatory power.

The coefficients for the proportion of women and foreign nationality directors are (-2.418) and (-0.271) respectively, which is synonymous with a negative impact of their proportions lagged by one year on the ROA. This negative impact is stronger and is significant at the 1% level for the proportion of women on the board. This result is consistent with the estimates by the FEM model given in Table 3. On the other hand, the combined effect of

female and foreign directors on ROA is also positive (coefficient = 2.033) but not significant.

The results also reveal a weak positive and insignificant association between the size of the board and the institutional shareholding on the one hand and the financial performance measured by the ROA on the other hand, while the size of the bank has a positive and significant effect at the 5% level. Finally, the proportion of independent directors has a negative and statistically significant effect at the 1% level.

Table 6 reports the results of the 3SLS test of the ROE equation.

Table 6. 3SLS regression results using ROE

<i>Endogenous variables: ROE, WPROP, FORPROP</i>			
<i>Equation</i>	<i>R-sq</i>	<i>chi²</i>	<i>Prob.</i>
WPROP	0.8662	505.87	0.0000
FORPROP	0.9164	1109.81	0.0000
ROE	0.7910	1143.48	0.0000
<i>ROE regression result</i>			
	<i>Coef.</i>	<i>z</i>	<i>P> z </i>
WPROP	-16.79339	-1.90	0.057
FORPROP	2.982763	0.63	0.527
WOFOPROP	-5.349565	-0.20	0.842
SIZEBank	1.523556	1.80	0.071
BFSIZE	-.3417231	-1.36	0.173
BINDPROP	-10.90424*	-2.23	0.026
INSTOWN	.1610387*	2.41	0.016
Time fixed effects		yes	

Note: Endogenous variables: WPROP, FORPROP, ROE. Exogenous variables: WO×FOPROP, SIZEBank, BFSIZE, BINDPROP, INSTOWN, A2, A3, A4, A5, ROE.lag, WPROP.lag, FORPROP.lag, WO×FOPROP.lag. * $p < .05$; ** $p < .01$; *** $p < .001$.

These results show a strong negative (coefficient = -16.79) and significant relationship at the 10% level between gender diversity and ROE. This result is close to the regression estimates made using the FEM model. On the other hand, the diversity of nationalities has a positive impact (coefficient = 2.98) and not significant on the ROE. The same result is found when applying the FEM model. Unlike the ROA model, the variable measuring the interaction between the two expressions of diversity is negatively related to the ROE. This finding is contrary to the result of the FEM model.

The results in the table also indicate a positive and significant effect at 10% and 5% respectively of the size of the bank and the share of institutional ownership on the ROE. The impact of independent

directors on ROE is negative and significant at the 1% threshold.

5. DISCUSSION

The results of the 3SLS regression, like those of the time fixed effects model, reveal a negative association between gender diversity and the two performance measures. This result leads us to reject *H1* of our study. This means that as the percentage of women on the board increases, the return on assets and return on equity decreases. This result confirms the conclusions of other previous studies conducted by Tarigan et al. (2018), Abubakar (2017), Kilic (2015), Carter et al. (2010), and Adams and Ferreira (2009). It is opposite, however, to the results of other studies that report a positive impact (Sarhan et al., 2018; Terjeson et al., 2016; Setiyono &

Tarazi, 2014; Carter et al., 2003; Ntim, 2015) or insignificant effect (Rafinda et al., 2018; Nguyen et al., 2014) of gender diversity on performance.

Our results also suggest an insignificant negative relationship between the proportion of directors of foreign nationality and return on assets (ROA) and a positive and insignificant relationship with ROE. Therefore, *H2* is accepted. These results are consistent with those of the studies by Abubakar (2017); García-Meca et al. (2014), Elsharkawy et al. (2018). On the contrary, they disagree with the conclusions of other studies such as those of Tarigan, Hervindra, and Hatane (2018), Sarhan et al. (2019) and Oxelheim and Randøy (2003).

The results also show that the interaction of the two attributes of diversity (gender and nationality) has a positive (and negative respectively) and non-significant influence on ROA (and ROE respectively). This observation makes it possible to reject *H3*.

These results contradict agency theory predictions that female directors are potentially more willing to perform better oversight than men (Adams & Ferreira, 2009), and resource dependence theory assumptions that suggest that a more diverse board will provide more valuable resources, which should produce better corporate performance (Carter et al., 2010).

Furthermore, the results of this study can be explained at least in part, by the theory of social psychology which suggests that decision-making can be slower and more conflicting with the presence of heterogeneous administrators due to the difference in styles, attitudes and perspectives embodied by these directors. In addition, diversity can result in extra costs for managing different points of view and resolving conflicts (Adams & Ferreira, 2009). These interpersonal conflicts could delay the decision-making process and lead to a lack of cohesion among board members and a decrease in strategic consensus, hindering the effectiveness of boards of directors (Pletzer et al., 2015).

On the other hand, foreign directors are likely to be less familiar with laws and regulations, governance standards, national accounting rules and management practices, which makes it more difficult for them to ensure effective oversight and follow up of managerial decisions as emphasized by Masulis, Wang, and Xie (2012). According to the home field advantage hypothesis developed by Berger et al. (2000), foreign banks will be disadvantaged because of factors such as the distance between principal and agent, language and

culture differences, prejudice against foreign institutions, and regulatory and supervisory structures.

6. CONCLUSION

The impact of the composition of the board of directors on a company's financial performance has been the preferred area of research in corporate governance. Several previous studies suggest that the composition of the board can impact the effectiveness of board decisions, which in turn improves the financial performance of companies. In this perspective, this study examines the diversity in boards of directors and its effects on performance in Morocco by applying a 3SLS regression to a panel dataset of all listed banks over the 2014-2018 period.

The results of the study indicate that there is a relatively average level of female representation (11%) on the boards of directors of Moroccan banks, compared to a strong presence of foreign directors estimated at about 39%. The regression results reveal a negative relationship between the gender diversity on boards of directors and the performance of banks expressed in terms of ROA and ROE. We also found that the diversity of nationalities had no significant effect on ROA & ROE.

This research does not provide evidence to support the theoretical predictions of agency theory and resource dependence theory. Board diversity certainly seems to affect corporate performance, but in various ways depending on the characteristics of the company (Ferreira, 2010).

Despite its contributions, this study has limitations. First, a methodological limitation. The validity of the results of such models remains dependent, to a large extent, on the relevance of the combination of the instrument variables used (Bravo, 2018; Terjesen et al., 2016). Second, our panel, even if it covers all the banks listed in Morocco which have a very strong weight in the sector, remains however limited. Third, the study focused only on the analysis of the effect of two dimensions of diversity, namely nationality and gender. Other variables related to diversity (age, education, experience, etc.) can influence performance and constitute a suitable field for future research.

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