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Analysis of the impact of the board of directors as a central governance body on the performance of Moroccan banks

Analyse de l'impact du conseil d'administration en tant qu'organe central de gouvernance sur la performance des banques marocaines

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Abstract

This study aims to analyze empirically the impact of the board of directors as an internal governance mechanism on the performance of Moroccan banks, based on its various roles and, above all, the specific features of bank governance.

Empirical validation is obtained by econometric modelling using panel data constructed from 6 Moroccan commercial banks listed on the Casablanca stock exchange and observed for a period of 10 years, from 2012 to 2021. We attempt to detect the impact of bank governance characteristics, through the study of board structure, on bank performance.

Our results show the absence of a significant link between the characteristics of the Board of Directors and the performance of Moroccan banks expressed by ROA and ROE. On the other hand, the size of the bank and the capital have a negative impact on the ROA of the banks in our sample. Our study also shows a negative and significant relationship between ROE and bank size.

Keywords: Board of directors; Governance; Performance; ROA; ROE.

Résumé

Cette étude se propose d'analyser empiriquement l'impact du conseil d'administration en tant que mécanisme interne de gouvernance sur la performance des banques marocaines à partir de ses divers rôles et surtout des spécificités de la gouvernance bancaire.

La validation empirique est obtenue par une modélisation économétrique en données de panel construit à partir de 6 banques commerciales marocaines, cotées à la bourse de Casablanca et observées pour une période de 10 ans, de 2012 à 2021. Nous essayons de détecter l'impact des caractéristiques de la gouvernance bancaire, à travers l'étude de la structure du conseil d'administration, sur la performance bancaire.

Nos résultats montrent l'absence d'un lien significatif entre les caractéristiques du Conseil d'Administration et la performance des banques marocaines exprimée par le ROA et le ROE. Par contre, la taille de la banque et le capital impactent négativement le ROA des banques constituant notre échantillon. Notre étude montre également une relation négative et significative entre le ROE et la taille de la banque.

Mots clés : Conseil d'administration ; Gouvernance ; Performance ; ROA ; ROE.

Introduction

Economic history has witnessed a number of crises in which the system of governance has been held primarily responsible. These include financial scandals such as Crédit Lyonnais (1993), Barings (1995) in the UK, Enron in the US (2001), Vivendi Universal in France (2002), Parmalat in Italy (2003), Société Générale (Kerviel) and Madoff (2008), and the CNSS, CIH and BNDE scandals in Morocco since 2001, in which a large number of private and public companies have been pilloried. These scandals were associated with weaknesses in the governance systems of these companies, which manifested themselves in false or fictitious financial information, calling into question the quality of financial statements and accounting audits and consequently the performance of the firm.

Banking governance is more global than that of companies in other sectors: While in a narrow sense governance is limited to defending the interests of shareholders, for banks, it is necessary to adopt a more open approach to economic and financial realities. The interests of depositors are just as important as those of shareholders, and the problem of asymmetric information is as relevant for depositors as it is for shareholders.

Effective governance is essential to the smooth operation of the banking sector and the economy as a whole. Banks play a crucial role in the economy by channelling the funds of savers and depositors into activities that contribute to the development of businesses and the country's economic growth. The safety and soundness of banks is a key factor in financial stability. The way in which banks conduct their business is therefore fundamental to the health of the economy.

Indeed, when the governance of banks, which play an important role in the financial system, shows signs of weakness, difficulties can spread to the banking sector and the economy as a whole. In this respect, the study of the governance of Moroccan banks acquires a primordial interest.

There have been many studies of corporate governance, but the study of banks remained somewhat timid until the financial crisis of 2007, when the bank's management style was called into question. Since the onset of the financial crisis, and especially since the collapse of Lehman Brothers on 15 September 2008, attitudes to the principles of bank governance have changed radically. The banking sector has been severely criticised for its role in the recent financial crisis. The weak governance of banking institutions is frequently identified as a major cause of this crisis (Kirkpatrick, 2009). In particular, the failure of a bank generates significant negative externalities that can take years to resolve.

Several studies have been carried out in various parts of the world, particularly in developed countries, and have made a significant contribution to explaining the relationship between bank governance and performance. However, such research is rare in emerging countries. Our work stands out from other research because of its contribution to testing these relationships in the Moroccan context. The aim of this article is therefore to assess the impact of the board of directors, as a central governance body, on the performance of Moroccan banks.

The problematic of our study consists on the one hand in defining the good governance practices relating to the board of directors and on the other hand in analyzing the relationship between these good practices and the performance of the banks making up our sample. Given the importance of this topic and the above, the following research question arises: How can the characteristics of the board of directors affect the level of banking performance?

In order to test our hypotheses and answer this question, we propose to use the panel regression method. This method will allow us to define the characteristics of the board of directors that can influence the different measures of the performance of the banks in our sample and to judge the explanatory scope of econometric models.

The rest of our article is organized as follows: The first part provides a review of the literature on the effects of bank governance on performance. The methodology and data used are presented in the second part. The third part will be dedicated to the statistical analysis and results while the fourth part will be reserved for the discussion of our results. Finally, the conclusion will focus on the limitations of our study and offer some suggestions for the future.

1. Review of the literature and development of hypotheses

The banking industry is characterised by a number of specific features that have a major impact on its system of governance. Banks are not like other companies, which is why they require different treatment. Thus, to talk about bank governance, we need to take into account the specific characteristics of governance in this financial sector (Adams & Mehran, 2003) and put in place a broader vision of governance in the case of banks (Macey, 2003) because :

- Banks are characterised by a high level of opacity generated by informational asymmetry (Levine, 2004) ,
- Banks are characterised by a high level of debt (Macey & O'Hara, 2003).
- Banks are subject to a high degree of standardisation (Prowse, 1997).

All of these characteristics specific to the banking firm minimise the importance of external

governance mechanisms. The operation of the latter is independent of the will of the firm's internal decision-makers, who adopt internal mechanisms in response to external constraints. This means that control in banks appears to rest with internal mechanisms (Salas & Saurina, 2003).

According to Bertrand & Masmoudi (2010), there are two dimensions to banking governance: an external dimension in the form of prudential regulation, which is the set of rules, designed to measure and control the risks generated by banking activity, and an internal dimension, which is the way in which the bank is managed. These mechanisms include two main types of disciplinary mechanism: the board of directors and the ownership structure. This article will focus exclusively on the governance of Moroccan banks, in particular their boards of directors as central governance bodies and their effects on their performance.

1.1. Characteristics of the Board of Directors

Similarly, the Board of Directors' main task is to exercise in-depth control and guarantee the security of all transactions undertaken by the firm. This is rooted in transaction cost theory (Williamson, 1985). In the same vein, however, Jenson (1993) supports the idea that the characteristics of the board (its size, composition, degree of independence and power structure, etc.) are all tools that reflect the effectiveness of the board in its task of controlling management.

The effectiveness of the Board in fulfilling its role depends largely on its characteristics. The Board of Directors, which is the central body of governance, is the first family of disciplinary mechanisms, particularly through its formal supervisory mechanisms: The size of the Board of Directors, the separation of the functions of Chairman of the Board and Chief Executive Officer, the existence of women, the presence of each type of director (independent directors, foreign directors), and finally the existence of an audit committee.

Empirical studies of the impact of the board of directors on bank performance have produced contradictory results. In what follows, we cite the main studies and explain their results in order to deduce hypotheses to be tested empirically.

1.1.1. Size of the Board of Directors

From a regulatory point of view, article 39 of law 17-95 relating to public limited companies stipulates that the board of directors must be made up of at least 3 members and no more than

12. The latter number is increased to 15 when the company is listed on the stock exchange. As for the impact of board size on performance, the results of the various studies carried out are on the whole inconclusive, divergent and show that there are mixed opinions. According to Jensen (1993), a board

made up of a large number of directors favours the domination of managers, which can give rise to coalitions and group conflicts, and consequently result in a fragmented and ineffective board that has difficulty reaching consensus on important decisions. On the other hand, a reasonably sized board, generally seven to eight members, would be more effective because it would allow better co-ordination, quicker decisions and a reduction in agency costs. Some authors, such as Mishra & Nielsen (2000), Zulkafli & Sumad (2007) and Bektas & Kaymak (2009) have found no positive impact of the size of a bank's board on its profitability. Others have shown that board size has a negative impact on bank performance (Fourgon Ees, et al., 2002; Hermalin & Weisbach, 2003; Staikouras, et al., 2007 and Pathan, et al., 2007). According to this line of reasoning, it makes sense to verify the conclusions of these studies with the following hypothesis:

H1: Board size has a negative impact on bank performance.

1.1.2. Women on the Board of Directors

The inclusion of women in governance bodies strengthens the Board's cognitive capacities, revitalises its operation and enhances its strategic and supervisory potential. According to the theory of human capital[1] , which complements the strategic stream of resources and skills, the presence of women on the Board is an alternative to building a portfolio of knowledge, experience and skills. This feminisation brings distinctive skills to the Board of Directors, through its participation in good governance (Mamadou, 2012).

A number of empirical studies have been carried out on the impact of women on boards of directors. On the whole, their conclusions are inconclusive and the results are controversial. While some authors show a positive effect (Carter, et al., 2003 ; Campbell & Minguez-Vera, 2008 ; Campbell & Minguez-Vera, 2010 ; Gulamhussen & Santa, 2015), others give inconclusive or very mixed results (Rose, 2007 ; Smith, et al., 2006 ; Farell & Hersch, 2005 ; Zahra & Stanton, 1988; Carter, et al., 2010). Conversely, some studies show that the average impact of gender diversity on company performance is negative (Ahern & Dittmar, 2012). In the same vein, Mazzotta & Ferraro (2020) find a negative and significant impact of the presence of female directors on the board of directors on performance measured by Tobin's Q.

H 2: The presence of women on the Board of Directors has a positive impact on banking performance.

[1] Dans son ouvrage Human Capital, l'économiste américain Gary Becker, définit le capital humain comme "l'ensemble des capacités productives qu'un individu acquiert par accumulation de connaissances générales ou spécifiques, de savoir-faire, etc."

1.1.3. Duality

Several reports analysing the system of governance in different countries recommend separating the functions of Chairman of the Board of Directors and Chief Executive Officer. These reports assert that the separation of the two functions is one means among others of promoting the independence of the board. The results obtained concerning the relationship between duality and performance did not confirm the superiority of one structure over the other, Godard & Schatt (2000). According to agency theory, Jensen (1993) finds that the combination of these functions increases agency costs and weakens the effectiveness of the board of directors, thereby reducing performance. This finding is confirmed by Mishra & Nielson (2000) and by Kaymak & Bektas (2008) who find that duality negatively affects bank performance. Pi & Timme (1993) also find that the combination of the two functions has a negative impact on the profitability and efficiency of banks. In contrast to these results, Fogelberg & Griffith (2000) and Bektas & Kaymak (2009) do not find a significant relationship between dual functions and performance. In short, in theory, dual roles strengthen the executive position, which exacerbates conflicts of interest, creates additional agency costs and consequently weakens bank performance. However, the separation of functions is strongly recommended both by codes of good governance practice and by numerous reports on governance. We therefore put forward the following de facto hypothesis:

H 3: Duality has a significant negative impact on banking performance.

1.1.4. Independent directors

A director is said to be independent when he or she has no commercial, family or other ties with the company or any other company in its group" (Guberna, 2012). In Morocco, the concept of the independent director has been included in the Corporate Governance Code since 2008, but few structures are currently aware of the role that the independent director can play. There are not many studies on the impact of the degree of independence of the board of directors on bank performance, and the results are controversial. Some authors have shown that director independence has a positive impact on company performance (Daily & Dalton, 1992; Lasfer, 2002). This finding is also confirmed by event studies by Rosenstein & Wyatt (1990), Kaplan & Mintou (1994) and Shivdasani & Yermack (1999). These authors have shown that the appointment of an outside director leads on average to positive abnormal returns. However, other studies have asserted that independent directors have no influence on performance, such as (Alexandre & Paquerot, 2000). Nevertheless, other studies such as Hermalin & Weisbach (1991); Agrawal & Knoeber (1996); Yermack (1996); Bhagat & Black

(2002); Kiel & Nicholson (2003), tend to support a negative perspective between performance measured by Tobin's Q and the number of outside directors. Based on a study of a sample of large European banks over the period 2002 to 2006, Staikouras, et al. (2007) found that the increase in the number of outside directors was negatively associated with bank performance. To verify the divergence of the results obtained, we put forward the following hypothesis:

H 4: There is a positive relationship between board independence and bank performance.

1.1.5. Presence of foreign directors

Foreign directors can bring experience and a new vision for the bank. A board of directors with a foreign director exercises its disciplinary function more effectively and is distinguished by its independence from the management team. According to (Choi & Hasan, 2005; Gulamhussen & Guerriero, 2009), foreign directors are much more independent and experienced than other directors. According to Gulamhussen & Guerriero (2009), their presence on bank boards is seen as a sign of good governance. Berger, et al. (2000), agree that the presence of foreign directors can influence the management of banking activities. They point out that the role of the foreign director may be hampered by socio-cultural differences and geographical distance. Nevertheless, the liberalisation of capital markets has made it easier to open up bank capital to foreign investors. This openness was previously hampered by regulatory restrictions, mainly in emerging countries (Bonin, et al., 2005; Domanski, 2005). Choi & Hasan (2005) have shown that there is a positive and significant impact of the presence of foreign directors on the performance of the Korean banks studied over the period from 1998 to 2002. Their study suggests that the presence of a foreign director on the board of a Korean bank brings more knowledge, expertise and, above all, objectivity than that of an independent director from the same local environment. The presence of a foreign director helps to create a board that is more effective in its role of monitoring management. In the same vein, Oxelheim & Randoy (2003) have shown, on the basis of a study of more than 200 companies in Norway and Sweden from 1996 to 1998, that foreign directors have a positive impact onthe performance of firms. We therefore assume that:

H 5: The number of foreign directors has a significant positive impact on banking performance.

1.1.6. Existence of an audit committee

In order to achieve its objectives in terms of reliability of financial reporting, operational efficiency and compliance with laws and regulations, the bank must establish a reliable system of internal control, inspected by the bank's Board of Directors, senior management and audit committee[53].

In Morocco, setting up a remuneration and audit committee is not compulsory, but the board of directors

is free to set up specialised committees. Laing & Weir (1999) have shown that the existence of a remuneration and audit committee had a positive effect on the performance of British companies during the period 1992-1995

According to a study conducted on 50 commercial banks in the Arabian Peninsula, Al-Baidhani, et al. (2013) showed that the audit committee has a significant and positive influence on performance, his results are in line with those of Pincus, et al. (1989) Anderson, et al. (2003) and Barth, et al. (2004) . Therefore, we test the conclusions of these studies with the following hypothesis:

H 6: The existence of an audit committee has a significant and positive impact on banking performance.

2. Research methodology

In order to test our hypotheses, we opted for a quantitative approach aimed at closely studying the governance of Moroccan banks, in particular the characteristics of their boards of directors as central governance bodies and their effects on their performance. The board characteristics we tested include: the size of the board, the separation of the functions of chairman of the board and chief executive, the presence of women on the board, the number of independent directors, the number of foreign directors and the existence of an audit committee. As for the performance of banks, we used the two ratios commonly used to measure financial performance: Return On Assets and Return On Equity.

2.1. Sample

On a basic population of 19 banks, our empirical study is based on a sample of six Moroccan commercial banks listed on the Casablanca Stock Exchange (BVM) over a 10-year period from 2012 to 2021[2]. We only looked at listed banks for the availability of data that was collected from the financial statements published by the banks. These banks are:

Table N° 1: List of banks in our sample

Banks	*Acronyms*
Attijari wafa bank	**AWB**
Bank Of Africa	**BOA**
Moroccan Bank for Trade and Industry	**BMCI**
Banque Populaire	**BP**
	CDM

[2] **L'année 2022 n'est** pas **prise** en compte **dans la mesure où les comptes annuels correspondants** ne **sont** publiés **qu'en 2023.**

Crédit du Maroc	**CIH**
Real Estate and Hotel Credit	

Source: the authors

2.1. Definitions and measurements of variables

In what follows, we present the different types of variables: dependent variables, independent variables and control variables.

2.1.1. Dependent variables

Bank performance is the endogenous variable on which the other variables in our estimates act. The objective of this article is to study the impact of explanatory variables on performance. We considered two ratios for measuring financial performance: Return On Assets and Return On Equity. These ratios are financial ratios commonly used in the banking sector to measure competitiveness and management efficiency.

Table N° 2: List of accounting indicators measuring performance
Source: the authors

Ratio	Formula	Meaning
Return On Assets	$\mathbf{ROA} = \frac{\text{Operating profit}}{\text{Total assets}}$	Measures the bank's economic profitability in relation to the scale of its activities, without taking account of exceptional items. This is the ratio most commonly used to measure bank profitability (Goddard, et al., 2004).
Return On Equity	$\mathbf{ROE} = \frac{\text{Operating profit}}{\text{Shareholders' equity}}$	Expresses the capacity of capital invested by shareholders to generate a certain level of profit. It is the ultimate measure of the strength of any financial institution. (Hopkins, et al., 1997)

2.1.2. Independent variables

Our explanato variables include: the size of the Board of Directors, the separation of the functions of Chairman of the Board of Directors and Chief Executive Officer, the presence of women on the Board of Directors, the number of independent directors, the number of foreign directors and the existence of an audit committee.

Table N° 3: List of independent variables related to the Board of Director

Independent variable	Acronym	Abbreviation, description, calculation
The size of the turnover	TCA	Measured by the total number of directors on the Board of Directors
The form of the board	FCA	FCA= Binary variable which takes the value 1 if the

		board is a board of directors, 0 otherwise.
of female directors	FEMCA	$\mathbf{FEMCA} = \frac{\text{Number of female directors}}{\text{Size of the Board of Directors}}$
Separation of the roles of BCP and CEO	SEP	Dichotomous variable, which takes the value 1 in the case of Separation of the two positions and 0 otherwise.
Independent directors	INDCA	$\mathbf{INDCA} = \frac{\text{Number of independent directors}}{\text{Size of the Board of Directors}}$
Foreign directors	ADETR	$\mathbf{ADETR} = \frac{\text{Number of foreing directors}}{\text{Size of the Board of Directors}}$
The existence of an audit Committee	CAUDIT	Binary variable coded 1 when there is an audit committee and 0 otherwise.

Source: the authors

2.1.3. Control variables

Board characteristics are not the only factors that can influence performance. Other variables must be taken into account in order to be able to estimate a more or less complete conclusion. These so-called control variables are therefore those likely to have a significant effect on performance and include the age of the bank, the size of the bank, the bank's capital and indebtedness. In our study, we have excluded the debt variable because the banking firm is a priori an institution whose main business is to take on debt in order to lend. The control variables retained are therefore:

Age of the bank: the age of the firm has often been considered as a variable that can have a significant impact on the bank's performance. Generally speaking, the age variable is measured by the logarithm of the number of years in business (Brown & Caylor, 2006; Ben Cheikh & Zarai, 2008).

Bank size: the bank size variable is measured by the natural logarithm of the bank's total assets at the end of the accounting period. This measure was also used by Pathan, et al. (2007), Pathan (2009), Azorfa & Santamaria (2011). It is a variable used to achieve economies of scale or, conversely, diseconomies of scale.

As for the impact of this variable on performance, Wall (1985), and Staikouras et al. (2007) found no positive effect of size on bank performance. Other authors, such as Smirlok (1985), Akhavein et al. (1997) and Kwan (2003) have found a positive and significant relationship between bank size and performance. On the other hand, Mbatchou et al. (2020) have shown a significant negative impact of the size of the bank on efficiency.

Bank capital: Lin & Zhang (2009), Berger et al. (2010) have used capital as a control variable, measured as the ratio of equity to total assets. Berger (1995) and Athanasoglou et al. (2005) have specified that well capitalised banks are considered less risky and can access funds easily and on preferential terms. Some researchers such as (Bourke, 1989; Molyneux & Thornton, 1992; Naceur &

Omran, 2010; Toumi, 2016) have shown a positive relationship between the capital ratio and bank profitability.

3. Statistical analysis and results

3.1. Descriptive analysis

Table N° 4: Descriptive statistics

Continuous variables								
Variables	Comments	Min	Q1	Median	Average	Q3	Max	Standard deviation
ROA	60	0.1690	0.606	0.606	0.8816	1.1562	2.3153	0.39
ROE	60	2.003	6.366	6.366	8.336	10.370	24.419	3.5321
TCA	60	9	10	10	11.02	12	14	1.6518
FEMCA	60	0	0	0	14.01	22.92	33.33	11.3137
INDCA	60	0.4546	20	20	23.7605	28.5704	41.6667	7.3983
ADETR	60	0	16.67	16.67	35.70	57.14	72.73	24.0503
SIZEBQ	60	24.26	24.76	24.76	25.46	26.15	26.68	0.7866
AGEBQ	60	4.127	4.143	4.143	4.429	4.635	4.718	0.2301
CAPITAL	60	0.05737	0.09114	0.09114	0.10727	0.12264	0.18427	0.0270
Dichotomous variables								
Variable	Terms and conditions							%
FCA	FCA takes the value 1 if the board is a board of directors, 0 otherwise.							67%
SEP	Dichotomous variable which takes the value 1 in the case of Separation of the two positions (Chairman/CEO and 0 otherwise.							67%
CAUDIT	Binary variable coded 1 when an audit committee exists and 0 otherwise.							50%

ROA is the return on assets, **ROE** is the return on equity, **TCA** is the size of the board of directors, **FEM** is the number of women on the board, **INDCA** is the proportion of independent directors on the board, **ADETR** is the proportion of foreign directors on the board, **FCA** is the form of the board, **SEP** is the separation of the functions of chairman and chief executive, **CAUDIT** isthe existence of an audit committee, **SIZEBO is** the neperian logarithm of the bank's total assets, **AGEBO** is the logarithm of the number of years in office, **CAPITAL** is the ratio of shareholders' equity to total assets.

Source: the authors

Based on descriptive statistics detailed in Table 4, the six Moroccan banks in our sample achieved an average ROA of 0.88% over the study period from 2012 to 2021, with a minimum of 0.16% and a maximum of 2.31%.

The level of ROE recorded during our study period is higher than that of ROA. Moroccan banks achieve an average return of 8.33% on capital invested by shareholders, with a minimum return of 2% and a maximum return of over 24%.

The size of boards of directors varies between 9 and 14 members, with an average of around 11. For

25% of boards, the number of directors varies between 12 and 14 members, and for 75% of boards, the number is less than 12.

Similarly, the boards of Moroccan banks are characterised by the presence of women directors (14.01% on average). In fact, 25% of boards of directors have no women at all.

According to the table, 23.76% of the directors of Moroccan banks are independent. This percentage ranges from a minimum of 0.4% to a maximum of 41.66%. Foreign directors account for an average of 35.70% of the total size of boards of directors. With regard to the control variables, we find that the average size of Moroccan banks is 24.46 and their average age is 4.429. In terms of average capital, the Moroccan banks in our sample have an average capital of 0.10727.

Half of the banks in our sample have an audit committee on their board of directors. This shows that the idea of creating such a committee within boards of directors is generally adopted by Moroccan banks. Two-thirds of Moroccan banks have a board of directors. Of a total of six listed banks, four have a board (67%) and the other two have a management board under the supervision of the supervisory board (33%).Also, 67% Moroccan banks are opting to separate the functions of chief executive and chairman of the board of directors.

3.2. Multivariate tests

3.2.1. Verification of the absence of multiple collinearity

Before testing our basic model, it is essential to ensure the suitability of the variables used and the independence of the explanatory variables by using the Pearson correlation matrix.

Table N° 5: Pearson correlation matrix

	ROA	*ROE*	*FC*	*SEP*	*CAUDIT*	*IND CA*	*TCA*	*FEM*	*ADM ETR*	*SIZEBQ*	*AGEBQ*	*CAPITAL*
ROA	1	0.84***	0,35	-0,35	0,1	-0,43	-0.23(-)	-0.35**	-0.20	0,29*	-0,36**	0,39**
ROE		1	0,4	-0,4	0,1	-0.21	-0.28*	-0.45***	-0.20	0,25*	-0, 31(-)	-0,13
FC			1	-0,1	0	-0,03	-0,04	-0,58	-0,79	0,62***	0,08	-0,1
SEP				1	0	0,03	0,04	0,58	0,79	-0,62***	-0,08	0,1
CAUDIT					1	-0,1	0,42	-0,3	0,31	0,42***	0	0,08
IND CA						1	0.12	0.27(-)	0.07	-0,16	0,39	-0,42
TCA							1	0.17	0.00	0,2	0,53	0,21
FEM								1	0.39**	-0,37	0,09	0,018
ADM ETR									1	-0,15	0,01	0,05
SIZEBQ										1	0,2	0,1
AGEBQ											1	0,03
CAPITAL												1

ROA is the return on assets**, ROE** is the return on equity, **TCA** is the size of the board of directors, **FEM** is the number of women on the board, **INDCA** is the proportion of independent directors on the board, **ADETR** is the proportion of foreign directors on the board, **FCA** is the form of the board, **SEP** is the separation of the functions of chairman and chief executive, **CAUDIT** is the existence of an audit committee**, SIZEBQ** is the neperian logarithm of the bank's total assets, **AGEBQ** is the logarithm of the number of years in office, Capital is the ratio of shareholders' equity to total assets, Debt is the ratio of total debt to total assets.

(***): significance <0.001, (**): significance<0.01, (*): significance<0.05, (.): significance<0.1

Source: the authors

As shown in the table n° 5:

All the Pearson correlation coefficients between the independent variables are below 0.8, the critical limit at which we can confirm the existence of a serious autocorrelation problem (Kennedy, 1985).[78]

ROA varies in the same direction as ROE and an increase in one leads to an increase in the other (coefficient = 0.84)***.

The ROA has a significant negative correlation with the four variables INDCA (coefficient = - 0.43***), TCA (coefficient = -0.23$^{(-)}$), FEMCA (coefficient = -0.35**) and AGEBQ (coefficient = -0.3**). On the other hand, it had a positive and significant correlation with the two control variables TAILLEBQ and CAPITAL, with coefficients of 0.29* and 0.39** respectively. Its correlation with the ADMETR variable remains weak and insignificant.

ROE correlates, significantly in the opposite direction, with the two variables TCA (r = -0.28$^{(.)}$) and FEM (r = -0.45***). It also varies with the two control variables TAILLEBQ and AGEBQ with 0.25* and -0.31 respectively.

The FEM variable correlated significantly and in the same direction with ADMETR (r = +0.39**) and with TCA (r = +0.27*).

The control variable AGEBQ had an identical correlation but in the opposite direction with the two variables HR (r= 0.62) and MS (r= -0.62), and a positive correlation (r= 0.42) with the variable CAUDIT. All three correlations were significant at 1%.

Overall, the correlation matrix shows low correlations between the explanatory variables anda high correlation between the two performance indices.

3.2.2. Specification testing

In this article, we propose to use the panel regression method. This method will enable us to judge the explanatory power of the econometric models. Given the specific nature of these data, it is imperative to follow the order of certain econometric steps.

- **Significance test for coefficients Student's t test**

First of all, we performed the **Student's t test** to check the significance of the coefficients of the explanatory variables, i.e. whether a variable plays an explanatory role in a model. For our study, the

variables retained after the Student test are ADMETR, SIZEEBQ, AGEBQ and CAPITAL

❖ **Test for the existence of a fixed effect Fisher test**

The use of panel econometrics also requires the existence of a fixed effect to be tested. The hypotheses of the test are as follows:

∉ H0: No fixed effect

∈ H1: Presence of a fixed effect

The Fisher test carried out using gives the following results

Likelihood Ratio Test (Fisher Test)

	p-value	Null hypothesis	F =
ROA	1.67310^{-05} <0.05	Rejected	7.7029
ROE	0.001088 <0,05	Rejected	5.342

Source: Authors using the software R

❖ **Test for the existence of a random effect Breusch-Pagan test**

We used the Breusch-Pagan test to test the hypothesis of the existence of a random effect. The hypotheses we tested were:

∉ H0: No random effect

∈ H1: Presence of random effect

Breusch-Pagan test

	p-value	Null hypothesis	BP =
ROA	0,519	Accepted	1,3119
ROE	0,3958	Accepted	1,8535

Source: Authors using the R software

The Breusch-Pagan test performed using R confirmed the absence of a random effect, and we therefore accept the null hypothesis.

3.3. Regression results and interpretation

3.3.1. Estimating the effect of board characteristics on performance

Table N° 6: Estimation results for panel data models

Variables	ROA				ROE			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
FC	-0.222 (0.333)				-0.013 3.396			
SEP								
CAUDIT	-0.051 (0.200)				-2.751 2.042			
TCA	-0.003 (0.039)	0.001 0.047			-0.139 0.399	0.148 0.468		
INDCA	-0.055 (0.784)	0.409 (0.978)			3.136 7.986	3.682 9.841		
FEM	-0.631 (0.560)	-0.839 (0.653)			-9.554 5.704	-8.505 6.574		
ADMETR	**1.204**** **(0.43)**	0.892 (0.620)	-0.328 (0.209)	0.087 (0.380)	10** 4.718	9.026 6.245	-4.045* 2.119	-0.546 3.319
Constant	1.619 (0.689)		0.999*** (0.090)	0.992*** (0.257)	17.896* 10.053		10.784***	9.790*** 2.216
N	60	60	60	60	60	60	60	60
R^2	0.555	0.555	0.041	0.21	0.436	0.223	0.061	0.17
R^2 adjusted	0.453	0.453	0.024	-0.013	0.307	-0.018	0.029	-0.018
F	5.437***	5.437***	2.476	1.228	3.375***	1.439	1.866	0.982

* significant at the 10% level ** significant at the 5% level *** significant at 1% level

Source: Authors using the R software

Table N° 7: Model selection according to the AIC criterion

Model	*Estimate*	*AIC*
Model 1	$ROA_{it} = \alpha + \beta_1 ADMI_{it} + \beta_2 TCA_{it} + \beta_3 FC_{it} + \beta_4 FEM_{it} + \beta_5 SEP_{it} + \beta_6 ADME_{it} + \beta_7 CAUDIT_{it} + \varepsilon_{it}$	33.74
Model 2	$ROA_{it} = \alpha_i + \beta_1 ADMI_{it} + \beta_2 TCA_{it} + \beta_3 FC_{it} + \beta_4 FEM_{it} + \beta_5 SEP_{it} + \beta_6 ADME_{it} + \beta_7 CAUDIT_{it} + \varepsilon_{it}$	26.58
Model 3	$ROA_{it} = \alpha + \beta_1 ADME_{it} + \varepsilon_{it}$	59.78
Model 4	$ROA_{it} = \beta_1 ADME_{it} + a_{it}$	34.37
Model 5	$ROE_{it} = \alpha + \beta_1 ADMI_{it} + \beta_2 TCA_{it} + \beta_3 FC_{it} + \beta_4 FEM_{it} + \beta_5 SEP_{it} + \beta_6 ADME_{it} + \beta_7 CAUDIT_{it} + \varepsilon_{it}$	312.32
Model 6	$ROE_{it} = \alpha_i + \beta_1 ADMI_{it} + \beta_2 TCA_{it} + \beta_3 FC_{it} + \beta_4 FEM_{it} + \beta_5 SEP_{it} + \beta_6 ADME_{it} + \beta_7 CAUDIT_{it} + \varepsilon_{it}$	303.67
Model 7	$ROE_{it} = \alpha + \beta_1 ADME_{it} + \varepsilon_{it}$	324.88
Model 8	$ROE_{it} = \beta_1 ADME_{it} + a_{it}$	310.24

Source: Authors using the R software

According to the AIC criterion, the best models among the eight mentioned above are the second model to explain ROA and the sixth for ROE. These two models show that the performance of Moroccan banks, measured by the two indicators ROA and ROE, is not significantly linked to the explanatory variables and depends rather on the individual effect of each bank. The estimates of these individual effects are as follows:

Table N° 8: Estimated individual effects on performance

	BANK	ESTIMATE	Std. Error	t-VALue	Pr (>I t I)
ROA	AWB	1.57984	0.16849	9.3767	7.602^{e-13} <0.001
	BMCI	0.87320	0.12006	7.2732	1.639^{e-09} <0.001
	BOA	0.76877	0.12386	6.2067	8.475^{e-08} <0.001
	BP	1.46739	0.33429	4.3895	5.451^{e-05} <0.001
	CDM	0.89344	0.19372	4.6120	2.559^{e-05} <0.001
	CIH	1.28107	0.22574	5.6751	5.924e-07 <0.001
ROE	AWB	13.7976	1.67420	8.2411	4.618^{e-11} <0.001
	BMCI	6.7652	1.19300	5.6708	6.017^{e-07} <0.001
	BOA	9.5506	1.23080	7.7597	2.712^{e-10} <0.001
	BP	12.1398	3.32180	3.6545	0.0005919 <0.001
	CDM	9.3644	1.92500	4.8647	1.067^{e-05} <0.001
	CIH	12.3081	2.24310	5.4871	1.170^{e-06} <0.001

Source: Authors using the R software

3.3.2. Estimating the effect of control variables on performance

Table N° 9: Estimation results for panel data models

Variables	ROA			ROE		
	Model1	Model 2	Model 3	Model 1	Model 2	Model 3
SIZEBQ	0.183^{***} (0.054)	-0.584^{**} (0.223)	0.126 (0.082)	1.677^{***} 0.551	-5.508^{**} 2.330	1.425^{**} 0.704
AGEBQ	0.701^{***} (0.185)	.....	0.648^{**} (0.290)	5.853^{***} 1.876	.....	5.620^{**} 2.441
CAPITAL	5.012^{***} (1.529)	4.417^{**} (2.104)	5.378^{***} (1.831)	-23.729 15.470	-33.236 22.005	-22.524 17.476
Constant	-7.412^{***} (1.783)	.....	-5.775^{**} (2.716)	17.896^{*} 10.053	.....	10.784^{***}
N	60	60	60	60	60	60
R2	0.379	0.209	0.215	0.225	0.115	0.134
R^2 adjusted	0.346	0.103	0.173	0.183	-0.004	0.088
F	11.408^{***}	6.889^{***}	15.319^{***}	$5,419^{***}$	3.393^{**}	8.659^{**}

Source: Authors using the R software

❖ **Specification testing**

Table N° 10: Estimation results for panel data models

Testing for the existence of an individual effect

Variable	Fixed effect	Random effect	The accepted hypothesis

ROA	p-value = 0.003	p-value = 0.17	Fixed effect model
ROE	p-value = 0.015	p-value = 0.1144	Fixed effect model

Source: Authors using the R software

Table N° 11: Model selection according to the AIC criterion

	Model	*EstIMATE*	*AIC*
ROA	Model 1	$ROA_{it} = \alpha + \beta_1 taille_{BQ_{it}} + \beta_2 Capital_{it} + \beta_3 ageBQV2_{it} + s_{it}$	37,67
	Model 2	$ROA_{it} = \alpha_i + \beta_1 taille_{BQ_{it}} + \beta_2 Capital_{it} + \beta_3 ageBQV2_{it} + s_{it}$	15,78
	Model 3	$ROA_{it} = \beta_1 taille_{BQ_{it}} + \beta_2 Capital_{it} + \beta_3 ageBQV2_{it} + a_{it}$ with $\alpha_{it} = \alpha_i + s_{it}$	33,81
ROE	Model 4	$ROE_{it} = \alpha + \beta_1 taille_{BQ_{it}} + \beta_2 Capital_{it} + \beta_3 ageBQV2_{it} + s_{it}$	315,40
	Model 5	$ROE_{it} = \alpha_i + \beta_1 taille_{BQ_{it}} + \beta_2 Capital_{it} + \beta_3 ageBQV2_{it} + s_{it}$	297,48
	Model 6	$ROE_{it} = \beta_1 taille_{BQ_{it}} + \beta_2 Capital_{it} + \beta_3 ageBQV2_{it} + a_{it}$ with $\alpha_{it} = \alpha_i + s_{it}$	313,65

Source: Authors using the R software

According to the AIC criterion, the best model to explain the performance of Moroccan banks is the fixed-effect model, i.e. model no. 2 to explain ROA and model no. 4 to estimate ROE. Thus, the estimates of the individual effects can be presented as follows:

Table N° 12: Estimated individual effects on performance

	BANK	*EstIMATE*	*Std. Error*	*t-VALue*	*Pr (>I t I)*
R.O.A	AWB	16.3291	5.9596	2.7400	0.008399(**) <0.01
	BMCI	14.7000	5.5986	2.6257	0.011332(*) <0.05
	BOA	15.4775	5.8202	2.6593	0.010385(*) <0.05
	BP	15.6323	5.8693	2.6634	0.010274(*) <0.05
	CDM	14.6455	5.5365	2.6453	0.010770(*) <0.05
	CIH	14.8933	5.5244	2.6959	0.009435(**) <0.01
R.O.E	AWB	161.856	62.336	2.5965	0.01222(*) <0.05
	BMCI	147.153	58.561	2.5128	0.01512(*) <0.05
	BOA	154.140	60.879	2.5319	0.01440(*) <0.05
	BP	155.575	61.392	2.5341	0.01432(*) <0.05
	CDM	145.904	57.911	2.5194	0.01487(*) <0.05
	CIH	148.228	57.785	2.5652	0.01324(*) <0.05

****): significance <0.001, (**): significance<0.01, (*): significance<0.05, (.): significance<0.1*

Source: Authors using the R software

4. Discussion

In the light of the estimates detailed in Table 6, the characteristics of the board of directors do not have a significant effect on either ROA (model 2) or ROE (model 6):

The size of the board of directors (TCA) has a positive and statistically insignificant relationship on the performance of Moroccan banks, measured by ROA and ROE. This result confirms the findings of Lehn et al,

(2009) , Adams & Mehran (2012) and Tai (2015) which reveal that institutions with large boards perform better than those with small boards and contradicts the results of Al-Hawary (2011) , Liang et al. (2013) and Pathan and Faff (2013), which goes against our hypothesis.This relationship actually depends on a trade-off between the benefits of effective board-led control and the costs associated with its size.

As for duality, the fact that this variable is constant for each bank throughout the study period, our model considered it as an individual effect. However, according to the correlation matrix, duality negatively impacts ROA and ROE, which confirms the results of Panddya (2011) and El-chaarani (2014) stipulating that the combination of the two positions of CEO and chairman negatively affects the bank's performance. Which goes with our hypothesis and comes in contrast to the results of Mishra et al. (2000), Kaymak & Bektas (2008) and Hajer et a.l (2016). Therefore, according to our results, it is strongly recommended to separate the two functions.

The coefficient on the independent director variable is positive but insignificant. This confirms the insignificant link found by Pandya (2011) when studying the Governance Structure and the financial performance of some Indian banks. On the other hand, Al-Baidhani (2013) finds a negative relationship between board independence and the performance of banks from the Arabian Peninsula. These results are in opposition with our hypothesis and with the findings of Al Manaseer et al. (2012), Liang et al. (2013) and El-Chaarani (2014) which show the existence of a positive relationship between board independence and performance.

As for the impact of the CAUDIT variable on performance, our estimates corroborate the conclusions of Klein (1998) that the presence of an audit committee had no effect on performance and that the composition of the audit board did not generate any exceptional performance. Similarly, Vafeas & Theodorou (1998) refute the idea that the structure of board sub-committees significantly affects performance. This insignificant relationship may be the result of a lack of expertise on the part of audit committee members or the manner in which the committee exercises its powers.

The coefficient of the FEMCA variable is negative and insignificant. This finding confirms the results obtained by Rose (2007), Smith et al. (2006), Farell & Hersch (2005), Zahra & Stanton, (1988), Carter et al. (2010) and Chebri (2023) and contradicts the conclusions of Carter et al. (2003), Campbell & Minguez-Vera (2008), Campbell & Minguez-Vera (2010) and Gulamhussen & Santa (2015) having shown a positive link between the existence of women among board members and performance. The results of our estimations are not consistent with the literature review we have developed.

As for the ADMETR variable, the absence of a significant link may be the consequence of the

difficulties faced by the foreign director in understanding and adapting at least easily to the institutional and economic environment of the Moroccan context. Our estimate shows a positive but insignificant impact of the ADMETR variable on the performance of Moroccan banks. This finding is not consistent with our hypothesis and contradicts that of Sbai & Meghouar (2017), the latter find that the presence of foreign directors on the board of Moroccan banks negatively impacts their performance measured by ROA and ROE. On the other hand, Liang et al. (2013) argue that the existence of foreign directors could bring new technologies and management techniques, leading to better performance.

The size of the bank has a negative and statistically significant impact at the 5% threshold on the performance of Moroccan banks measured by ROA and ROE, thus confirming our first hypothesis. These results contradict those of Smirlok (1985), Akhavein et al. (1997) and Kwan (2003) who find a positive and significant relationship between bank size and performance. Other authors, such as Wall (1985) and Staikouras et al. (2007) observe that size has no positive effect on bank performance.

The variable CAPITAL has a positive and significant impact on the return on assets (ROA) of Moroccan banks. On the other hand, our model estimating the return on equity (ROE) showed a negative but insignificant link. These results are in line with our correlation matrix according to which the CAPITAL variable varies in the same direction with ROA (significance at the 5% threshold) and in the opposite direction with ROE. Our conclusions therefore refute the results obtained by Bourke (1989), Molyneux & Thornton (1992), Naceur & Omran (2010) and Toumi (2016) which showed a positive relationship between the equity ratio and bank profitability.

Conclusion

The aim of this paper was to study empirically the simultaneous impact of the characteristics of the board of directors as a central governance body and of control variables on the performance of Moroccan banks. It provides an insight into governance practices, especially mechanisms related to the board of directors (size of the board of directors, presence of women, duality, presence of independent directors, presence of foreign directors and presence of the audit committee), in Moroccan commercial banks listed on the Casablanca Stock Exchange and their effects on economic and financial performance measured by ROA (return on assets) and ROE (return on equity). These effects were analysed using panel data modelling over the period 2012 to 2021.

According to our results, 67% of Moroccan banks have a board of directors. The Boards of Directors of these banks are characterised by an average size of 11 members, which is within the norms according to article 39 of law 17-95 relating to public limited companies, stipulating that the Board of Directors

must be composed of at least 3 members and at most 12. The proportion of women on the Boards of Moroccan banks remains low, averaging no more than 14.01%. On the other hand, independent directors and foreign directors represent 23.76% and 35.70% respectively of the total size of boards of directors. In addition, two thirds of Moroccan banks have separated the functions of chief executive and chairman of the board. 50% of Moroccan banks have an audit committee.

On the other hand, this work confirms the ambiguity and complexity of the nature of the link between bank governance through the characteristics of the Board and performance. Empirical validation reveals divergent results. These results indicate that the performance measures of Moroccan banks (ROA and ROE) depend mainly on the individual effect of each bank and the two control variables TAILLEBQ and CAPITAL. The variables representing the size of the board, the degree of its independence and the participation of foreign directors have a positive but insignificant effect, while the participation of women on the board showed a negative and still insignificant impact.

Our study, like any empirical study, cannot claim to be exhaustive, and obviously has certain shortcomings which may point to interesting avenues of research, in particular:

- The integration of new variables linked to the board of directors, such as executive remuneration systems and the existence of ethics and governance committees, or even the study of mechanisms relating to the ownership structure, such as employee shareholding, majority shareholding, institutional investor shareholding, state shareholding and foreign shareholding.
- The use of other performance measurement variables such as the "Price earning ratio" and the "Market to book ratio" to measure stock market performance.
- Comparison with practices in other countries

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