Effect of board quality on the financial performance of conventional and Islamic banks in a stable financial context: Comparative study on the international evidence

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Abstract

Returning to the literature of finance and banking governance, our article provides the first logical analysis that detailed the process of comparative analysis between the correlation of board determinants' quality and the financial performance of conventional and Islamic banks. Previous research has always discussed the main role of the board as an internal mechanism of governance on the financial performance separately in each bank type. However, we have never encountered rewarding studies that compared these impacts. In our study, we distinguished between the impact of the board of directors on the financial performance in conventional and Islamic banks. Settings of the financial performance and board of directors of the conventional and Islamic banks are collected from 30 countries located in four continents: America, Europe, Asia, and Africa. Two equal samples were collected that each of them is composed of 112 banks. By using the GLS method, data were used to explore the impact of the board of directors on the financial performance between both types of banks over the period 2010-2018, giving us 1008 bank-year observations in each sub-sample. On the whole, empirical results have shown that in conventional banks the board of directors has negatively affected the financial performance, while the impact of the board on the financial performance of Islamic banks is ambiguous. Nevertheless, the degree of the positive impact on financial performance is more significant in Islamic banks.

1. Introduction

Several theories have been developed to provide the financial and accounting literature with a description of the board composition (Booth et al., 2002; Kiel and Nicholson, 2003; Anderson et al., 2004; De-Andres et al., 2005; Cheng and Courtenay, 2006; Chen et al., 2014), whether about its effectiveness, as a mechanism of governance, within the framework of shareholder theory, stakeholder theory, and resources' dependence theory, or its impact on bank performance. From a shareholder theory perspective, a good board faces fewer conflicts of interest because it is more likely to protect shareholders' interests, oversee the execution of responsibilities, and exercise better quality control (Huang, 2010) and provide a critical appraisal of executive performance (Daily and Dalton, 2015). According to stakeholder theory, a qualified board should be positively associated with their PFs, on the one hand, because it is less subject to pressure from shareholders, on the other hand, it supports the interests of all stakeholders against bad practices of managers and personal enrichment objectives that deviate from the social interest. It depends on the degree of alignment between the objectives of both owners and managers (Jaskiewicz and Klein, 2007). The board is the most important internal mechanism of governance (Brown et al., 2011). Its primary roles are to set goals, plan long and medium-term strategies, plan for the future operational management of the banks, oversee their implementation, and make strategic decisions (Zahra and Pearce, 1989). A bank board monitors the effectiveness of the internal and external risk oversight system, as well as the performance of executives (Aguilera et al., 2011).

Before the Subprime crisis, several researchers focused on board effectiveness on firms' samples. After the crisis, most studies have addressed the effect of board effectiveness on the quality of both governance and FP of banks (Adams and Mehran, 2012). Since the bankruptcy affected almost all banks' types, failure of boards of directors was considered among the causes, the attribution to the board was justified by its importance within the banks as an essential governance mechanism. Thus, the lack of qualifications in the board composition and general management is undoubtedly the major causes of the bankruptcy of several banks around the world. In our work, we have chosen the two best-known categories which are conventional and Islamic banks to compare the importance of the impacts of their boards of directors on their PF. Moreover, we have assumed that the role desired by the board is actually broader than compared to what is accepted by these two types of banks. The board function, normally, goes beyond the conventional intervention obviously known to defend the potential financial changes. In banking institutions, it is essential to improve the operational efficiency of a governance mechanism at the level of its operating environment. The board role is not limited to supervision, but also encompasses the planning of development strategies and the mobilization of the resources needed to achieve the banks' objectives. Its role extends to preserving performance. More specifically, according to Onali et al. (2016), BOD plays a fundamental role in determining the structure of banks' ownership and the level of their FP. Also, this mechanism is responsible for developing control procedures to manage the various risk situations to which the bank could be exposed.

The effectiveness of the banks' internal governance as a whole depends on the detailed efficiency of its elements, notably the number of directors on the board, the percentage of external directors, the ownership of internal directors, the structure of as well as the number of meetings held (Hermalin and Weisbach, 2003; Nam and Lum, 2004). With more details on the criteria for the ideal choice of board members, Chapra (2007) identified three important points to respect for the appointment of the IBs' board members: The directors of a high degree of moral integrity and professional competence, the board members are well trained to the Sharia rules, and the board members must ensure sufficient transparency in the disclosure of information relating to the IBs' activities.

Limits of previous research have allowed us the opportunity to explore new perspectives by proposing a more advanced synthetic view. Our work could expand the issues explored in their research, so further enrichment is needed. This is why we have opened reflection on possible questions on this topic and the related issues to be explored. They mainly concern the deepening of the theoretical research paradigm and the development of new procedures, auditing, control and governance techniques, and the enrichment of the banks' evaluation chain.

Our explanatory research aims, firstly, to study the relationship between a set of FP measures and sum variables of board quality in order to interpret the signs of correlation. Secondly, the purpose of this research is to show the extent of the BOD on the profitability, the efficiency, the liquidity, and the solvency of each bank type in order to choose the most effective and efficient governance approach which is the most valid for all financial

institutions of all types. In other words, this study attempts to compare the degree of the impact of the board on IBs' FP of with the relative impact of its conventional competitors in order to answer the following question: in what type of banks, the impact of board quality on FP is more meaningful?

We synthesized the contributions of our research into two points. The first contribution is that our results can be a valuable source of knowledge for investors, policymakers, funders, economic agents, and regulators, especially in the financial services sector and in the development of financial objectives and planning of strategic plans for boards' control. The second contribution is that we gave the board its real vital importance in each bank type and we revealed its insufficient role on the FP of large conventional and Islamic banks, future research can address the implications of board quality for monetary policy in some developed, emerging and developing countries.

The remainder of the paper is organized as follows. Section 2 reviews previous research on this topic and the hypotheses of the study. Section 3 describes the methodology which is employed, the data sources, variables, and the models' specifications. Empirical results and discussion are presented in section 4. Finally, section 5 contains concluding remarks.

2. Literature Review: Board Determinants

The BOD is at the center of a banks' governance system. Since the board is the most influential governance mechanism, in this section we looked at the impact of the board quality on the FP of conventional and Islamic banks. We examined whether the characteristics of the BOD affected the banks' FP in a period of financial stability. Our objective is to compare the correlation between the board of Islamic and conventional banks on FP's indicators.

In our study, we insisted on four characteristics of a board composition which are board size, independent directors on board, separation of board chairman and CEO roles, and board meeting. Our choice is justified by two reasons; firstly, because of the availability of observations relating to these variables, secondly, the variables used are the most widespread and the most frequently used in the literature (Mollah and Zaman, 2015; Gebba and Aboelmaged, 2016; [Vallascas et al., 2017](#); Farag et al., 2018; García-Ramos and Díaz, 2019; Naciti, 2019; Chen et al., 2020; [Tran and Turkiela, 2020](#)). The formulation of our hypotheses is based on the results of previous research in the direction of stakeholder theory.

2.1. Board size

According to the literature review, the size of the board is an important characteristic to obtain an optimal governance structure (Tulung and Ramdani, 2018 and Paniagua et al., 2018). Large boards could include more representative directors in terms of quantity and quality. Multiple choices give more opportunities for senior managers to choose directors with more experience and specialized expertise (Williams et al., 2005; Kent and Stewart, 2008; Ntim et al., 2012). The board size improves governance reporting and is expected to impact the director's quality oversight (Ntim et al., 2012). As already noted, some studies have found that companies with large boards have a positive influence on FP, especially companies with complex and large businesses operating in multiple segments (Coles et al., 2008). Besides, small boards lead to the creation of conflicting relationships, either by aligning the interests of executives with those of shareholders or by aligning the interests of executives and directors.

In the same vein, Dalton et al. (1999) discovered a positive and significant relationship between the board size and the banks' FP. The significant effect added by the Big boards is due to the presence of agency problems, to the conflicts of interest, to the communication challenges, to the coordination failures, to the transmission of accounting problems, to the transfer of financial information, and the decision-making. In addition, Adams and Mehran (2012) carried out a study that aims to analyze the relationship between the BOD determinants and the FP based on a sample of 35 US banks listed throughout the period 1986-1999. In conclusion, they stated that the board size is positively correlated with FP. Similarly, Adams and Mehran (2003) completed a study aimed at verifying the impact of board size on banks' performance. They found that when the banks' board size is large, banks have high levels of performance, implying that they are necessarily associated with higher risks than banks with small boards. As a result, if the board size is small, members can easily misappropriate their own interests through manipulations, and directors are influenced by their superiors.

In the case of the Middle East, other academics stipulate that the small board easily suffers the influence of the leaders more than the large one, because it has a variety of experiences belonging to the different administrators (Gary and Gleason, 1999). Along the same lines, Naushad and Malik (2015) tested the impact of board size on FP in 24 banks covering the GCC region over the period 2012-2013. The results revealed that small-sized boards are significantly capable of monitoring the management of banks in the CCG region.

In Asia, by performing a panel study on a sample of Chinese and Indian banks listed during the Subprime financial crisis, Battaglia and Gallo (2015) investigated the association between some governance mechanisms, risk management and the banks' performance in China and India during the period 2007-2011. They noted that banks with a large BOD are governed by a positive and significant impact on the FP indicators. Also, Yung (2009) analyzed the impact of banking governance arrangements in Hong Kong on bank performance. He monitored the governance quality by both the size and the composition of the board. He concluded that banks with large boards and low loan levels between related parties tend to perform better. To protect the shareholders' rights and to ensure that managers cannot defend their interests to the detriment of shareholders, a correlation between loans and related parties has been established as a parameter for valuing the governance system efficiency. The higher the level of loans granted, the more the bank exports a bad reputation to the banking market. This consequence can damage the degree of effectiveness of its existing governance

system. As a result, this affects its FP because banks facilitate the inefficient allocation of resources. This finding reflects the importance of governance in improving banks' FP.

Other studies have invested in determining the optimal board size; they have found that there is a non-linear effect between board size and bank performance (Andres and Vallelado, 2008). As for Booth et al. (2002), their empirical results have shown that banks with large boards perform better than their counterparts with reduced boards. They suggested that the average size of banks' boards is 16 directors. This current research argued that a small directors' number is easily influenced by the CEO. Moreover, Belkhir (2009) conducted a study to determine the preferable number of BOD, so that the bank can deliver the expected return. He showed that when the board size extends to about 19 members, performance increases. At the limit of this threshold, increasing the board size results in performance growth. Beyond 19 members, the performance decreases. While there is some debate about whether banks should be large or small, some other studies have suggested that institutions with more complex operations should have more members in their BOD (particularly banks). They verified that the board size has a positive effect on FP (Coles et al., 2008; Bassem, 2009). Within a comparative framework between banks, Wasiuzzaman and Gunasegavan (2013) conducted a comparative study between the performance of Islamic and conventional banks operating in Malaysia during the period 2005-2009. They found that the assets' profitability, the board size, and the CBs' sizes are higher than those of the IBs.

After a rich literature exposure, we expected that a large board could ameliorate the parameters of profitability, efficiency, liquidity, and solvency of the banks' board. For this reason, we have proposed a theoretical suggestion that confirms that the board size has a strictly positive impact on the banks' FP:

Hypothesis 1: The board size has a positive effect on the FP of conventional and Islamic banks.

2.2. Rooting of the board chairman or the CEO / Chairman duality

Returning to the literature, good governance asserts the real separation between the positions of CEO and chairman to limit the power of the chairman (Daily and Dalton, 2015; Chang et al., 2018; Wang et al., 2019). As other studies show that cards with a very centralized power structure lead to a very volatile and highly variable FP. For example, Adams et al. (2005) revealed that the more powerful the CEOs, the more they lead to greater variability in company FP. In this topic, previous research has attempted to demonstrate the effectiveness of the board and its impact on the CBs' performance. However, in IBs the subject of rooting is not yet widely treated. This may be due to the weakness of the board impact or because of its limited power as a mechanism of governance in this banks' type. Theoretically, rooting means the occupation of the same post by a manager after the end of their first fixed-term contract. It manifests itself in two methodical forms leading to the same results. Either through the duality of the CEO and that of the board chairman by the same person. Either the same person in which designation as a board chairman will exceed his first contract or he automatically renewing his mandate without verifying the conditions of his independence.

The separation of roles means higher board oversight and lower CEO power, while duality means lower board oversight and stronger CEO power (Krause et al., 2017 and Chang et al., 2018). Nevertheless, If the CEO also holds the position the board chairman, monitoring and control processes cannot be effective, precise, and useful to monitor agent actions (Allegrini and Greco, 2013 and Hussain et al., 2018). In this way, Silveira and Barros (2013) stated that if the CEO or chairman has strong power, they can get out of control, adopt reckless policies, and left unchecked by a board of directors which can lead to poorer performance. The same, Naushad and Malik (2015) examined the effect of the CEO duality on FP of 24 banks selected from the GCC zone for two years 2012 and 2013. The results revealed that the CEO, who also serves as the board chairman, is likely to improve the banks' FP. Owners of blocks have a positive and significant effect on the banks' performance. Duality can have important advantages for institutions, if the CEO is also the chairman, he will make his knowledge and experiences available to other administrators, which will allow them to produce more resources (Adams and Ferreira, 2007). Indeed, Al-Hawary (2011) studied the association between some mechanisms of banking governance measured by the ownership concentration, the majority shareholding, the capital adequacy ratio, the board size, the presence of external directors and the duality between the CEO and the board chairman on the performance of Jordanian banks during the period 2002-2009. Results showed that duality and external directors have a positive and statistically significant effect on Tobin's Q. In this way, he deduced that banks in Jordan need to arrange good quality of governance to positively and effectively influence banking performance.

Based on the majority of research highlighted in this theme, we have predicted the presence of a positive correlation between the CEO rooting and the banks' FP (Donaldson and Davis, 1994; Kota and Tomar, 2010).

Hypothesis 2: There is a positive relationship between the rooting of the board chairman and the FP of conventional and Islamic banks.

2.3. Board Independence

The independence of directors is considered to be the most important measure of board effectiveness (Aggarwal et al., 2008; Jackling and Johl, 2009; Bruno and Claessens, 2010; Pombo and Gutiérrez, 2011; Liu et al., 2015). Are considered as independent directors all members who do not have any affiliation with the bank, except for their membership in the board as directors (Brown et al., 2011). A non-executive board member only has a business relationship with the bank director who is qualified by his/her integrity and expertise to protect the interests of all stakeholders (Young, 2000). This director type should not be a current employee, a former employee of the bank, or a member close to the top of the hierarchy and has no significant business relationship with the bank (Pathan, 2009). Previous research supposed dependent all directors having a previous executive

function, familiar with the bank manager, or have other business links with the bank (Aebi et al., 2012). According to Cotter et al. (1997), the board is assumed to be independent when the number of independent directors within it exceeds 50% of the total members.

Some studies have found that the presence of independent directors among board members is not associated with any effect on FP. To test this observation Yermack (1996); Bhagat and Black (2002) and Hermalin and Weisbach (2003) have pointed out the absence of a significant relationship between the qualified composition of the board, which has been measured by the directors' independence degree, and the FP. They argued that the lack of a significant correlation between board composition and FP is evident. This relationship is generally consistent with the relative economic situation and taken into consideration during a financial crisis. Other studies have associated market measures to detect the independent directors' impact on the FP. They found no significance between the composition of the board and the FP (Hermalin and Weisbach, 1991; Bhagat and Black, 2002). For this reason, Gebba and Aboelmaged (2016) indicated that a typical board should contain a heterogeneous mix of executive and non-executive directors. The revised Malaysian Corporate Governance Code (CGCM, 2007) also provided that all publicly traded companies should have a BOD, which should have a balance between executive and non-executive directors to avoid decisions dominated by one group or by some board members (Kallamu, 2016).

However, several researchers have adopted another discordant explanatory approach which stipulates that external directors are not able to understand the complexity of the banks' activities. They considered outside directors to be agents with insufficient expertise to carry out their stakeholder control missions, to detect the opportunistic behavior of the managers, and to monitor the overruns against the sense of increased performance. Besides, due to stakeholder theory, the independence of BOD can be negatively associated with the sustainability of banks' FP, as they have less information about the situation of the bank, hence they will be those most subject to pressure from shareholders. As a result, a board composed of a significant portion of independent directors may lose the ability to oversee management and protect the interests of shareholders and stakeholders. Moreover, within this opposite argument, some researchers have found that the presence of foreign directors on the board has a negative and significant effect on banks' future FP (Adnan et al., 2011). In the same topic, Coleman and Biekpe (2006) examined the effect of the board composition on the financial decisions of 47 companies listed on the Nairobi Stock Exchange over the period 1995-2004. They found that larger firms were more in debt. However, short-term debt is negatively correlated with board independence. This explains why this type of directors is very likely to make consecutive and massive debt decisions to exploit them for purposes prejudicial to the bank interest, which confirms the presence of opportunistic behaviors. Even more, Minton, et al. (2010) investigated the correlation between risk-taking, the performance of US banks, and the board directors' independence in financial crises. The results indicated that board independence is positively related to risk-taking and bank performance before the crisis, but it has shown a poor impact on banks' performance during the crisis. Also, Michelon and Parbonetti (2012) and Allegrini and Greco (2013) found no relationship between the number of independent directors and the disclosure of information on sustainable development. Furthermore, independent board directors may receive misleading and manipulated financial information from other executives (Kravet and Volkan, 2013).

Independent directors with conflicting interests lead to poor governance practices, as the situation is favorable for the appearance of interest between the BOD and managers (Hermalin and Weisbach, 1991) leading to a decline in performance (Yermack, 1996; Bhagat, and Black, 1999; Ghazali, 2010). They observed a negative relationship between the proportion of independent directors on the BOD and the performance per share. In the same research path, Erkens et al. (2012) studied the association between banks' corporate governance and FP in 30 countries in the Subprime Crisis period 2007-2008. They found that board independence and ownership concentration are associated with poor rates of profitability during the crisis. They argue that the independent boards raised a lot of equity during the crisis, banks with a high concentration of property took more risks before the crisis, the risks translate into significant losses for shareholders during the crisis, the wealth of existing shareholders was transferred to the creditors thereafter. Similarly, Adams (2012) showed that banks with more independent members on their boards performed poorly. Also, Minton et al. (2010) and Hoque and Muradoglu (2015) found that the financial expertise of the independent directors of commercial banks is negatively related to the variations of their values. They went through financial troubles which led to a decrease in the banks' performance. Moreover, Mollah and Zaman (2015) analyzed the effect of the governance effectiveness on performance in conventional and Islamic banks during the period 2005-2011. They found that in IBs, the size and independence of the board significantly and negatively influence their FP. Besides, they noted that the duality and the internal recruitment of the CEO have a negative and significant impact on the IBs' FP. Empirically, they have proven that the Sharia Committee contributes positively and significantly to the IBs' FP during a supervision mission. This impact becomes negligible when it is an advisory role. Even more, Bansal et al. (2018) put forward another explanation for this negative impact, they demonstrated that the behavior of independent directors can be influenced by reputational risk during CSR disclosure.

In the Asian context, referring to more in-depth research, Kallamu (2016) studied the moderating role of independent directors in the interaction between the ownership structure and the FP of Malaysian banks between 2007 and 2011. He noted that the existence of independent directors among board members adversely affects FP. In Malaysian banks, the majority of owned directors have mixed and confused their interests with the interests of other shareholders. On the contrary, the presence of independent directors on the BOD constitutes a positive and significant moderating effect on the relationship between the directors' ownership and the FP. This reflects that independent directors positively moderate the relationship between directors' ownership and improved the FP of the institution, as there will be an alignment between directors' and shareholders' interests. In conclusion, he stated that the independent directors exercise a guiding force on the banks' FP.

Therefore, based on previous selective studies, we formulated our third research hypothesis in the following form:

Hypothesis 3: There is a negative relationship between the proportion of the board's independent directors and the FP of conventional and Islamic banks.

2.4. Number of meetings held by the board of directors

Based on the literature review, several studies have identified the importance of the frequency of board meetings as a mechanism able to influence the governance quality in different contexts (Sánchez, 2010; Choi and Lai, 2014; Thu et al., 2016) or also as a control parameter of the FP (EL-Maude et al., 2018). The effect added by this governance mechanism has led us to distinguish two groups of previous studies. Although many studies discussed the effect of the meetings' number held by the CBs' board, the studies discussing the effect of the board meetings' number on FP in Islamic banking are almost non-existent.

In contrast, an intermediate stream has established coordination among governance mechanisms to determine whether the quality of one mechanism affects or enhances the quality of the other. These researchers found no correlation. In a recent study, Thu et al. (2016) have indicated that the performance of commercial banks in Vietnam does not depend on the board meetings' frequency.

Nevertheless, some studies have found that there is a negative association between the governance quality and the meetings' number held by the BOD. In this sense, Sánchez (2010) analyzed the impact of some governance determinants on the governance quality in Spain banks over the period 2004-2006. He studied the influence of board characteristics, including board size, independence, and diversity of mechanisms on the governance quality. He found that board activity is limited by a small number of annual meetings.

Moreover, the frequency of meetings has been considered by many authors as empirical evidence that slows down the FP of institutions. As stated by Vafeas (1999), one can expect a negative relationship between board meetings and FP. If outside directors do not take advantage of the time, they spend together to exchange meaningful ideas with or among directors, the frequency of meetings becomes unnecessary (Lin et al., 2014). Besides, stakeholders cannot wait for the board members' meetings to address emergency issues, prepare strategic programs, monitor stakeholder interests or make effective decisions since they do not have sufficient time at meetings to discuss all the alternatives (Huse, 2009). Also, Jensen (1993) indicated that routine tasks absorb the time of board meetings, and reduce the quality of board control to leaders. Even more, considering the time costs, travel costs, and benefits paid to directors because of meetings, the high frequency of meetings is not beneficial and probably a response to poor FP (Lin et al., 2014). Furthermore, Choi and Lai (2014) analyzed the effect of bank governance on the FP of Asian banks during the period (2007-2012) by using multiple linear regression analyses. The system of bank governance has been assessed by three characteristics, a variable reflects the governance quality, a variable measures the board size, and a variable symbolizes the frequency of board meetings. The findings indicated that there is a negative and statistically significant relationship between assets quality and board meetings.

We have drawn from the foregoing the following hypothesis:

Hypothesis 4: There is a negative relationship between the frequency of board meetings and the FP of conventional and Islamic banks.

3. Empirical Method: Distinction Between The Effect Of The Board Quality On The Financial Performance Of The Islamic And Conventional Banks

To investigate the relationship between the board quality and the FP in the two banks' types, we employ the multivariate regression framework using the GLS method. This method is the best which allows to concretize the comparison between the individual effects and to show the variability between these effects. Moreover, this method is the most suitable for drawing detailed conclusions about the effect of each characteristic of counseling on each measure of FP. Indeed, we have worked on panel data with which the chosen method is complemented by also indicating that it is the most appropriate with the general approach of our study.

3.1. Methodological aspects

The methodology applied in our exploratory study is a demonstrative comparison by resorting to modeling. This helps to identify the impact factors affecting the relationships between basic FP measures and the influences due to the BOD. The research plan to be followed to answer the questions already mentioned began with the clarification of the data sources, then we quoted the variables to be modeled, finally, we exposed our models.

3.1.1. Data collection

Two samples were taken from two reference populations. The choice of banks is limited to countries whose banking systems incorporate both Islamic and conventional banks over the period 2010-2018 regardless of the proportion of each model in each country's banking market. These populations are made up of 2,974 conventional financial institutions and 683 Islamic financial institutions. The countries part of our study are USA, France, Singapore, Algeria, Thailand, India, Egypt, Bangladesh, Indonesia, Pakistan, Tunisia, Malaysia, Canada, Sudan, Turkey, United Kingdom, Luxembourg, Bahrain, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, South Africa, Senegal, Nigeria, Sri Lanka, Kazakhstan, and Lebanon. However, we have excluded all specific financial institutions subject to particular regulations. The tested samples include only purely conventional or Islamic banks. Besides, due to difficulties in collecting information on FP and BOD, we excluded banks marked by some missing observations, variables, or data. We also removed the multi-type mutated banks (Islamic-conventional window banks and conventional-Islamic

window banks). These three conditions led us to eliminate 2862 conventional financial institutions and 571 Islamic financial institutions. Subsequently, we have reduced the banks' number remaining for each bank type based on qualitative and quantitative filtering criteria (samples equality, activity type, similarity of origin country, bank width), each CB has its Islamic equivalence in terms of capital and size taken from the same country. This restriction reduced the size of our samples to 112 banks each. Finally, after several elimination and deletion steps, we obtained two pairs of equal samples ($n_1 = n_2$).

3.1.2. The measurement of the variables to be tested

3.1.2.1. Endogenous variables

In this sub-section, we presented FP measures. The main variable to explain was represented by four dependent variables: profitability, efficiency, liquidity, and solvency. Table 1 shows the parameters we worked on, the symbols, and the relative reports.

3.1.2.2. Exogenous variables

Throughout the remaining part of this work, banks' FP is explained by four determinants of BOD. Referring to the review of the previous literature, the predominantly independent variables have been described in Table 2 as follows:

3.1.2.3. Measurements of control variables

Table 3 displays the list of control variables supported by some previous studies that employed the same variables and their measures.

3.1.3. Presentation of models to estimate

Before proceeding to the estimations, it is necessary to present the typical models to reassess several times the FP and each time the dependent variable will be changed according to the FP measures and the bank type.

Conventional models of multiple regressions are of the following form:

Model n1: Association between CBs' profitability and board quality:

$$\begin{aligned} \text{LnRtc} = & +\text{LnTCONSc} + \text{ENRADIRc} + \text{LnINDCONSc} + \text{LnREUCONSc} + \\ & \text{LnTAc} + \end{aligned} \quad (1)$$

Model n2: Association between CBs' efficiency and board quality:

$$\begin{aligned} \text{Etc} = & +\text{LnTCONSc} + \text{ENRADIRc} + \text{LnINDCONSc} + \text{LnREUCONSc} + \\ & \text{LnTAc} + \end{aligned} \quad (2)$$

Model n3: Association between CBs' liquidity and board quality:

$$\begin{aligned} \text{Ltc} = & +\text{LnTCONSc} + \text{ENRADIRc} + \text{LnINDCONSc} + \text{LnREUCONSc} + \\ & \text{LnTAc} + \end{aligned} \quad (3)$$

Model n4: Association between CBs' solvency and board quality:

$$\begin{aligned} \text{LnStc} = & +\text{LnTCONSc} + \text{ENRADIRc} + \text{LnINDCONSc} + \text{LnREUCONSc} + \\ & \text{LnTAc} + \end{aligned} \quad (4)$$

Islamic models of multiple regressions are of the following form:

Model n5: Association between IBs' profitability and board quality:

$$\begin{aligned} \text{LnRti} = & \text{LnTCONSi} + \text{ENRADIRi} + \text{LnINDCONSi} + \text{LnREUCONSi} + \text{TYi} + \\ & \text{LnAGi} + \text{LnTAi} + \end{aligned} \quad (5)$$

Model n6: Association between IBs' efficiency and board quality:

$$\begin{aligned} \text{Eti} = & \text{LnTCONSi} + \text{ENRADIRi} + \text{LnINDCONSi} + \text{LnREUCONSi} + \text{TYi} + \\ & +\text{LnTAi} + \end{aligned} \quad (6)$$

Model n7: Association between IBs' liquidity and board quality:

$$\begin{aligned} Lti = & \text{LnTCONSi} + \text{ENRADIRi} + \text{LnINDCONSi} + \text{LnREUCONSi} + \text{TYi} \\ & + \text{LnTAi} + \dots \end{aligned} \quad (7)$$

Model n8: Association between IBs' solvency and board quality:

$$\begin{aligned} \text{LnSti} = & \text{LnTCONSi} + \text{ENRADIRi} + \text{LnINDCONSi} + \text{LnREUCONSi} + \text{TYi} \\ & + \text{LnTAi} + \dots \end{aligned} \quad (8)$$

3.2. Econometric validation of models

The FP of conventional and Islamic banks depends on the systematic use of explanatory variables. Interdependence between the board determinants forced us to test also the correlation between the explanatory variables one by one.

3.2.1. Error Heteroscedasticity Test

Heteroscedasticity qualifies data do not have constant variances; the objective of this test is to know if the errors' variance for each individual is constant. This situation is frequently encountered in the case of panel data. It is therefore important to know how to detect heteroscedasticity before correcting it. Heteroscedasticity does not generally bias the coefficient estimate, but it remains uncommitted because of the poor quality of the standard deviations.

To identify heteroscedasticity in linear regression, there is a range of specific tests designed mainly for this reason, among which we mention the most common name the Cook-Weisberg test, Breusch-Pagan test, White test, Modified Wald test, Goldfeld test, Gleisjer test, etc. In our study, we chose the Breusch-Pagan test and the Modified Wald test to check for this type of problem.

If the probability associated with the test is below the tolerance threshold (5%), we reject the hypothesis of heteroscedasticity (H_0). Nevertheless, if the probability is greater than (5%), the null hypothesis will be retained, it is possible in this case to confirm the heteroscedasticity of the residues.

Before starting the analysis of the results, first, we referred to the agreement of choice between the applied tests. Depending on whether it is fixed or random-effect, for models that are confirmed fixed, such as those affiliated with the efficiency and solvency of IBs (Table 5), we compared these models to the Modified Wald test. Nevertheless, in the case of models relating to the profitability, the efficiency, the liquidity, and the solvency of CBs (Table 4) and the models specific to the profitability and liquidity of IBs (Table 5), the Breusch-Pagan test proves more appropriate to detect heteroscedasticity.

Table 4 illustrates the heteroscedasticity test results of CBs for random-effect models (LnRtc, Etc, Ltc, and LnStc). For this effect type, the random-effects models have highlighted the need for the Breusch-Pagan test. We speak of heteroscedasticity when the magnitude of the error risk is constant over time. The χ^2 statistics of these models showed risks associated with the rejection of the heteroscedasticity hypothesis well below the desired threshold of 5%. The probabilities of χ^2 test of banks' profitability, efficiency, liquidity, and solvency models are lower than the minimum risk acceptance rate of the null hypothesis, leading to the rejection of the proposal of heteroscedasticity problems at the level of these models. Therefore, we concluded that the CBs' models are not heteroscedastic.

Similarly, Table 5 showed the heteroscedasticity tests' results of the IBs sample for fixed-effects models (Eti and LnSti) as well as for random-effects models (LnRti and Lti). Furthermore, the Modified Wald test gives a probability of the χ^2 lower than the predetermined threshold of 5%, the fixed-effects Eti and LnSti models recorded values of χ^2 equal to (0.0000). Therefore, we rejected the heteroscedasticity problems hypothesis, the variance of errors in these two models is not the same for all IBs.

Moreover, results of the Breusch-Pagan test revealed χ^2 statistics below 5% for the models assumed until now random, more specifically, the probabilities of the models relating to the profitability and the liquidity of IBs equal respectively to (0.0006) and (0.0000). Therefore, we have been able to reject the null hypothesis, LnRti and Lti models are not heteroscedastic and the variance of their errors is not the same for all IBs. As well as we have deduced that our data do not have a heteroscedastic structure.

In the case of fixed-effects models, whatever the model is heteroscedastic or not, if it does not contain individual effects, reasoning procedure requires direct navigation to analyze the correlation. However, with a random-effect model, we must check before, if the square of the residuals can be explained by the model variables. In this case, we confirm that there is a problem of heteroscedasticity. The choice of one test or another depends on the need, the type of variables, and the econometric effect of the models.

3.2.2. Residual autocorrelation test

The autocorrelation of residues test is used to detect for each individual in the sample whether the errors of a period are influenced by the errors of the previous period. The autocorrelation hypothesis of the residues is a necessary condition before the validation of the estimated results. It also facilitates the choice of the best modeling method that lends itself to our data after the classification of existing effects.

There are several autocorrelation errors' tests, among which we have chosen the Wooldridge test and the Durbin-Watson test. Each of them is employed in a well-defined econometric situation. In our research, we have insisted on the most often known: the Wooldridge test is generally the most suitable when the model is subjected to a fixed-effect, however, the Durbin-Watson test is the most applicable in the case of random-effects models because of its ability to detect particular forms of autocorrelation.

The hypotheses of the autocorrelation test are as follows:

H0: The errors are not autocorrelated.

H1: The errors are autocorrelated.

The decision rule of this test is as follows: if the risk obtained is greater than the critical value ($\text{Prob} > F < (5\%)$), we reject the null hypothesis, in this case, the errors of the individuals (conventional or Islamic bank) are considered autocorrelated and vice versa.

The results of the autocorrelation tests for residues are shown in Tables 6 and 7 below:

For the models provisionally classified with fixed-effects, the (Wooldridge, 2002) test results referring to the efficiency and the solvency of IBs (Table 7) have shown two values greater than 5%. They are illustrated with respective risks equal to (0.000) for Eti and LnStc. Since the risk of rejecting the null hypothesis is not high, therefore, it was rejected to confirm that the errors are autocorrelated. Based on these results, we concluded that their errors are autocorrelated, hence, we have rectified the class of these two models to random-effects.

After the Durbin Watson test, Fisher statistics on the profitability and the solvency models of CBs (Table 6) and the liquidity model of IBs (Table 7) generated p-values strictly greater than 5%, the risks being respectively equal to (0.0841) for LnRtc, (0.8583) for LnStc and (0.5246) for Lti. For this reason, we confirmed the absence of autocorrelation of errors, which indicates that in these models, the errors are dependent on each other. Therefore, these models have purely random-effects. Furthermore, for the specific model to the efficiency and the liquidity of CBs and the profitability of IBs recorded risks of less than 5%, equal to (0.0003) for Etc, (0.0000) for Ltc, and (0.0338) for LnRti respectively. The Durbin Watson test displayed a rate of risk null, which indicates the presence of autocorrelation between the errors. Hence, we have rectified the class of these two models to fixed-effects.

Given these results, 3 final models took the form of heterogeneous panels with fixed-effects that vary from one individual to another (Etc, Ltc, and LnRti) and 5 models took the final form of heterogeneous panels with random-effects (Etc, LnStc, Eti, Lti, and LnSti). The second models' types assume that the relationships between the FP measurement of conventional or Islamic banks and the ownership structure determinants in each sample are not identical for all individuals of the same sample.

Apart from the distinguishing features and differences between the organizational structures of Islamic and conventional banks, there are financial peculiarities that separate each banking model from the other and prevent the merger and proximity of the two models (Nganga, 2013). Each CB in our first sample is governed by its own effect regardless of individual temperaments, conflicts of individual interests, internal or external environmental factors of the bank, location of governance mechanisms, regions, etc. Similarly, identifying the effects associated with IBs implies that each of them is governed by a varying effect among banks, but it is unchangeable over time.

3.2.3. Verification of multicollinearity problems

The multicollinearity test is performed to prevent the instability risk of the coefficients estimated by the GLS method. It also makes it possible to see if the matrix of the exogenous variables is regular. Any linear regression calls for the presence of collinearity and multicollinearity problems will be integrated into the same model, between the exogenous variables.

To verify the degree of correlation of the independent variables between them, when the majority of the explanatory variables did not satisfy the normality condition, we examined Spearman's correlation coefficients, the non-parametric version of Pearson (Ricco, 2015). The solution consists in eliminating the collinear variable or the block of exogenous variables containing the same types of information, affecting the quality of the regression. The correlation that deviates from the significance level of the Spearman test meaning is considered useless in the model.

Tables 8 and 9 illustrate the matrices of Spearman's correlation coefficients measuring the degree of linear connection, on the one hand, between the variables to be explained and the explanatory variables, and on the other hand, between the explanatory variables between them. Table 8 displayed the CBs' Spearman matrix, whereas Table 9 displayed the IBs' matrix. Each coefficient is between -1 and +1, the sign takes into account the meaning of the relationship.

There is collinearity between two independent variables when the correlation between them is greater than 0.8 (Gujarati, 2004). The appearance of collinearity makes the signs and values of the estimated coefficients seem contradictory; in this case, their variances are unstable. Since collinearity

leads to redundant estimates and misleading significance, it must be detected by performing the necessary corrections and treatments before completing the analysis of the results.

Correlation measures the intensity of the relationship between variables. The link strength between the variables is classified into three types, there is a strong, medium, or weak correlation. It is also positive if the correlation coefficient is positive and negative if this coefficient is negative. From Table 8, analysis of the Spearman correlation matrix of the CBs' sample revealed that the signs of the explanatory variables on the FP vary from one model to another. As a result, the separate interpretation of each model gave us a clear idea of the individual effect of each variable.

Beginning with the CBs' profitability (LnRtc), the matrix conceded that (LnAGc) and (LnTAc) have acted positively on the CBs' profitability. This leads us to argue that the more the effects of the cited variables develop, the better the CBs' profitability will progressively improve. However, (LnTCONSc), (LnREUCONSc), and (LnINFc) are negatively affected the CBs' profitability. This led us to conclude that the greater the impacts of these variables are, the more the CBs' profitability deteriorates.

The shift to efficiency analysis (Etc) revealed that only variables related to (TYc), (LnAGc), and (LnINFc) are positively correlated with the CBs' efficiency. This has indicated that as the value of these variables grows, more CBs will become more efficient. Nevertheless, (LnTCONSc), (ENRADIRc), (LnINDCONSc), (LnREUCONSc), and (LnTAc) reflected the negative and destructive impacts of the bank efficiency.

Concerning the liquidity (Ltc), the correlation matrix arrangement found that (LnREUCONSc) and (LnAGc) are positively correlated with the CBs' availability. This summarizes that the more the tendency of these variables is evaluated, the more CBs increase their wealth. However, other variables demonstrated the opposite, an inverse impact was generated by (ENRADIRc), (TYc), (LnTAc), and (LnINFc), they generally recorded negative effects on bank performance and specifically their liquidity powers. This explains why any improvements in these variables lead to the weakening of bank liquidity.

Similarly, after an inventory of solvency (LnStc), we attributed to the conclusion that (LnREUCONSc) supported the CBs' solvency. The more this variable has protected the CBs' solvency, the more its effects are propagated within the decision-making nodes, the more they guarantee its solvency capabilities. However, (LnTCONSc), (TYc), (LnAGc), (LnTAc), and (LnINFc) harmed the sustainability of the bank solvency, therefore, the evolution of the impact associated with these variables contributes, no doubt, to the deterioration of the CBs' solvency.

Finally, the analysis of the correlation between the explanatory variables did not reveal any inter-variable correlation coefficient greater than 0.8. For this, we admitted the absence of collinearity problems in all the models reasoning the board quality's impacts on the FP parameters.

Based on Table 9, an overview of the Spearman correlation matrix that collects with the IBs sample showed a heterogeneous mixture of the various signs, sometimes the variables' signs coincide with those detected by its conventional counterparts and sometimes they diverge. In what follows, we have listed the conclusions obtained on the effect of each variable on each FP measure.

First, the analysis of the IBs' profitability (LnRti) highlighted the presence of three variables playing an important role in the process of creating profitability; (LnINDCONSi), (TYi), and (LnAGi). However, (LnTCONSi), (LnREUCONSi), (LnTAi), and (LnINFi) revealed an opposite effect, the more the impacts of these variables grow, the more the IBs' profitability decreases.

Then, the correlation coefficients relative to the IBs' efficiency (Eti) signed a very important cumulation of the positive effects generated by some variables mainly due to (LnTCONSi), (ENRADIRi), (LnAGi), and (LnTAi). This has proven that the more the effect of its organizations extends, the more IBs improve its short-term returns, and the more they guarantee its sustainable returns.

Turning to the impact of the explanatory variables on the IBs' liquidity (Lti), we pointed out that (ENRADIRi), (LnINDCONSi), and (LnTAi) played a favorable role of protecting their liquidity capacity. These mechanisms have all been factors for improving monetary dependence. On the contrary, (LnTCONSi), (LnAGi), and (LnINFi) have an adverse effect on the effectiveness of IBs' liquidity.

Finally, we looked at the dependency analysis between solvency (LnSti) and another explanatory variable, the Spearman test revealed a positive correlation between (LnINDCONSi) and IBs' solvency. In contrast, Spearman matrix testified to the presence of a considerable but suspicious cumulative effect on the part of (LnTCONSi) and (LnINFi). This led us to conclude that the more significant its effects, the more IBs will keep its solvencies.

The correlation coefficients between the independent variables of the 2nd matrix revealed that the intersection between all the variables did not generate any correlation coefficient greater than 0.8. Hence, there are no collinearity problems between the variables.

4. Results And Discussion

4.1. Results

Before judging the impacts of the board quality, we should estimate the separate impacts provided by the board determinants and the effects generated by the other control variables on the FP measures. To do this, we have established multiple linear models.

To correctly decide the individual significance of the variables, we referred to the Student statistics. When the estimated statistic's probability is less than one of the reference significance thresholds, we have selected the variable in question. Otherwise, the effect of the variable is considered insignificant. The list of tables from 10 to 17 summarizes the coefficients of the different explanatory variables estimated by the model of each sample.

The BOD may have a positive or negative influence on the banks' FP depending on the situations encountered. So far, we have checked the significance of the variables that explain the quality of the BOD in each model. In the next step, we established a comparative study between the same impacts of similar models, which highlights the importance of the board in their existence. Finally, we made a comparison between the pre-established signs (expected) and the signs already found.

4.1.1. Impacts of the board quality on the profitability of conventional and Islamic banks

Based on the Table below, the CBs' profitability coefficients saw two conclusions. About the variables LnTCONSc, LnINDCONSc, and LnREUCONSc, they deteriorated the CBs' profitability, but only the impacts of LnTCONSc and LnREUCONSc are significant at the threshold of 1%. By contrast, ENRADIRc showed a positive but no significant effect on the CBs' profitability. About control variables, TYc, LnAGc, and LnTAc reported positive impacts on profitability, but only LnAGc and LnTAc recorded significant impacts at the levels of 5% and 1%. Nevertheless, LnINFc negatively affected the CBs' profitability significantly at the 5% level. As shown in Table 10, hypothesis n°4 has been confirmed in the case of CBs. Thus, we successively rejected hypotheses n°1, n°2, and n°3.

The results in Table 11 have distinguished two determinants of board quality adopting signs of negative and significant impacts on profitability, LnTCONSi is significant at the 10% threshold and LnREUCONSi is significant at the 5% threshold. Nevertheless, only LnINDCONSi recorded a positive and significant impact on the IBs' profitability at a rate of 1%. For the control variables, TYi and LnAGi revealed positive and significant impacts at the 1% level. However, LnTAi and LnINFi negatively affected the IBs' profitability. As LnTAi is significant at the level of 5%, but LnINFi is significant at the level of 1%. Consequently, we adopted hypothesis n°4. However, contrary to what is anticipated, according to Table 11, the hypotheses n°1, n°2, and n°3 were rejected in the case of the Islamic banking model.

4.1.2. Impacts of the board quality on the efficiency of conventional and Islamic banks

As revealed in Table 12, the correlation between board determinants and the CBs' efficiency showed that ENRADIRc and LnINDCONSc negatively affected bank efficiency at the 1% level. Similarly, LnTCONSc and LnREUCONSc affected the efficiency of BCs, but at the 5% threshold. Concerning the additional variables, LnAGc and LnINFc generated a positive sign to reinforce the CBs' efficiency at the level of 1%. Also, TYc revealed a positive impact on the efficiency of BCs, but only at the limit of 10%. Notwithstanding the three mentioned variables, LnTAc adopted a negative effect that has acted significantly at the 5% level. Compared to previous results, we confirmed the hypotheses n°3 and n°4. However, referring to the decision rules, we rejected the hypotheses n°1 and n°2 (Table 12).

After analyzing Table 13, in IBs we mentioned that the same variables have another combination of impacts on the bank efficiency of our sample. LnTCONSi and ENRADIRi recorded a positive and significant effect on the IBs' efficiency at the threshold of 1%. However, LnINDCONSi and LnREUCONSi negatively correlated with the efficiency of IBs, but only the impact of LnREUCONSi is significant at the level of 5%. About the impacts of control variables, all the variables acted negatively on the IBs' efficiency, among which only the impacts relating to LnAGi and LnTAi have recorded negative and significant influence effects on efficiency at the rate of 1%. Therefore, the hypotheses n°1, n°2, and n°4 were accepted. Subsequently, we rejected the third hypothesis specifically in the case of IBs (Table 13).

4.1.3. Impacts of the board quality on the liquidity of conventional and Islamic banks

According to the Table 14, the specific coefficients of the board effect on the liquidity available within CBs or produced by the operating work showed that LnTCONSc and LnREUCONSc play a fundamental role in forcing the liquidity production, whereas, this effect is only partially significant with LnREUCONSc at the level of 1%. However, ENRADIRc and LnINDCONSc negatively affected availabilities but not necessarily significantly, with the exception made, the incidence received by ENRADIRc is significant at the level of 5%. Regarding the additional variables, TYc, LnTAc, and LnINFc showed negative effects that are significant only with LnTAc and LnINFc at the rate of 1%. Nevertheless, LnAGc revealed a positive and significant impact at the 1% threshold on the CBs' efficiency. Therefore, we explicitly rejected all our hypotheses (Table 14).

Also, Table 15 revealed that the estimated model of the IBs' liquidity reported an improvement of the board characteristics that gave coefficients with positive signs just as ENRADIRi, LnINDCONSi, and LnREUCONSi. The analysis showed positive effects on liquidity, among which only LnINDCONSi recorded a significant impact at a rate of 1% and ENRADIRi scored a significant impact at the level of 5%. Conversely, LnTCONSi acted significantly on liquidity at the level of 1%. Focusing on auxiliary variables, we noted that LnINFi negatively affected the IBs' liquidity at the 10% significance rate, while the LnAGi effect is negative and significant at the 5% rate. However, TYi and LnTAi generated a positive and significant impact at the 1% threshold on the IBs' liquidity. As pre-established, based on Table 15 we validated the hypothesis n°2, for the IBs' model. Nevertheless, contrary to what is planned, we rejected the hypotheses n°1, n°3, and n°4.

4.1.4. Impacts of the board quality on the solvency of conventional and Islamic banks

In the same line, through Table 16 we noticed that the solvency coefficients associated with the board determinants revealed that ENRADIRc, ENRADIRc, and LnREUCONSc participate in the preservation of the bank solvency rates, but more specifically, only the role of LnREUCONSc is significant at the threshold 1%. However, LnTCONSc raised the CBs' solvency significantly to the 1% threshold. For the secondary variables, we noticed that TYc and LnINFc contributed to the decline in the solvency rates of banks at the significance level of 1%, the impact relative to the LnTAc is significant at the 5% level and the effect of LnAGc just at the 5% level. Therefore, referring to Table 16, all our hypotheses were rejected.

As shown in Table 17, through the estimation of the CBs' solvency model, we found that there are three board characteristics involved in the protection of the solvency of this bank type, like ENRADIRi, LnINDCONSi, and REUCONSi, by which only LnINDCONSi and LnREUCONSi reported significant impacts on solvency at the levels of 1% and 10%. However, LnTCONSi has an unfavorable and significant impact on the IBs' solvency at the threshold of 1%. Symmetrically, other additional variables reported negative effects. More particularly, we cite, TYi, LnAGi, and LnINFi, but only the effect of LnINFi on solvency is significant at the 1% threshold. However, LnTAi positively and significantly influenced the solvency of IBs at the rate 5%. Hence, according to Table 17, these results allowed us to reject all the hypotheses in the case of IBs.

4.2. Discussion

From the foregoing, the mono-analysis already carried out has shown an ambiguity of confirmation or assertion of the hypotheses from a single FP measure. First, not all the board determinants of the two bank types revealed significant effects on FP measures. Besides, not all board determinants of each bank type recorded the same signs. To overcome the problem of inconsistency of the non-significant impacts, we were limited to the variables that revealed significant signs. Then, the incompatibility of the signs led us to establish a state of reconciliation between the significant effects of the board determinants specific to each bank type. To better appreciate the difference in board effects on the FP of each bank type, we compared the individual effects of each board determinant on the same FP measure for each bank type. Table 18 illustrates the reconciliation results specific to CBs with their Islamic counterparts.

From Table 18, we noted that the exclusion of non-significant impacts and the aggregation of significant impacts clarifies and simplifies the vision. On the one hand, the bringing of all the BOD impacts on FP together has shown that the CBs' board quality has deteriorated their profitability, their efficiency, their liquidity, and their solvency even though the board features have improved some of their liquidity and their solvency. On the other hand, the IBs' board quality has revealed a non-decisive impact on FP. BOD has improved their efficiency, their liquidity, and their solvency, but at the same time, it has affected their profitability and some of their liquidity, and their solvency. In conclusion, the degree of significance of the negative impact on the advice of CBs is more influential on FP than the degree of significance of the positive impact on IBs.

5. Conclusion

This article examined the relationship between the composition of a board of directors and the FPs of conventional and Islamic banks within the framework of stakeholder theory. We have noticed that our empirical results are not conclusive in the case of two models of banks, we pointed out that the board quality in the banking environment represents a two-way destiny that does not have a decisive impact on FP. By evidence, we have estimated that board size and board independence have normally contributed to improving the FP of conventional and Islamic banks. Also, we have planned that the rooting of the board chairman and the number of meetings held by the board have influenced negatively their FP. However, the reality has revealed mixed results, all depend on the FP measure. The degree of partial impact varies from one board determinant to another and from one FP variable to another for the same control variable. Besides, the results vary from one FP measure to another for the same board characteristic, depending on the study context, the accounting standards applied and the governance approach followed.

Due to previous factors, we discovered a new classification method of the heterogeneous and detailed impacts of the board quality on the FP through which we argued that the board quality has revealed a driving impact on FP in each bank type. The development of new accounting and auditing aspects aimed at steering the control of the BOD has become a necessity.

The global unification of auditing standards allows us to adjust and arrange boards of directors, while respecting the particularities of each banking model, to facilitate the supervision and monitoring of the governance systems introduced in banks independently of their types. Based on this proposal, the creation of an international institute for monitoring bank boards is possible. The initiative also opens the horizon for highlighting an international non-profit organization with the power to the mandatory application of the standards of organizing the boards of directors and improving their working qualities.

Conventional or Islamic banks of large sizes are too big to fail, but also too easy not to go bankrupt. Everything is proportional, as long as there are failures in their governance systems, FP remains a relative dependent variable. The complexity of the large banks' activities goes beyond the traditional role of the BOD in that the degree of risk is higher, independently of the bank type. Nevertheless, the collective competence to identify and monitor challenges, overruns, conflicts, manipulations, agency relationships, opportunistic behaviors, and banking risks is lower. This raises an important question about the feasibility and sufficiency of the traditional board structure.

Board administrators of conventional and Islamic banks should develop an information system and a risk rating system that facilitates for them credit monitoring. Also, banks are expected to implement credit restrictions and limits, new credit approvals, and debt rescheduling. Credit management should be subject to a robust and well-defined credit-granting process that allows them to detail their target markets, establish a

thorough understanding of the borrower, their sources of repayment, and the purpose of the credit. Moreover, the credit system should determine the adequacy of loan loss provisions and reserves. When assessing credit risk exposures, banks should take into account potential future changes and economic factors, such as inflation, gross domestic product, and growth rate. Bank boards should install more stringent credit distribution policies for the reduction of defaults that result in an accumulation of defaulted loans and non-performing loans in order to maintain the coverage of loan loss provisions and distinguish between high-risk portfolios and low-risk portfolios.

Our study enriched this literature by examining how the attribution of the power of the board influences the volatility of the FP of conventional and Islamic banks to be able to distinguish between these two banks' types through the impact of their board quality on their FP. For future lines of research, this study can be extended by using unbalanced panel data to include all conventional and Islamic financial institutions. Other econometric techniques can be applied to compare the importance of BOD on the FP of conventional and Islamic banks.

Abbreviations

CB: Conventional Bank; CBs: Conventional Banks

IB: Islamic Bank; IBs: Islamic Banks

BOD: Board of Directors

FP: Financial Performance

Declarations

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Tables

Table 1: Description of variables to explain

FP measurement	Rating for CB	Rating for IB	Measurement	Previous studies
Profitability ratio	Rtc	Rti	Marginal Profit / Total Revenues	Sujan et al. (2013); Atyeh et al. (2015); Ogbeide and Akanji (2017); Haddad et al. (2019b).
Liquidity ratio	Ltc	Lti	Net Loans / Total Assets	Olson and Zoubi (2008); Onakoya and Onakoya (2013); Osama et al. (2013); Haddad et al. (2020).
Efficiency ratio	Etc	Eti	Operating result / Average Total Assets	Moin (2008); Emilia and Judit (2012); Rashid and Khaleequzzaman (2015); Haddad et al. (2019a).
Solvency ratio	Stc	Sti	Total Loans / Total Deposits	Olson and Zoubi (2008); Onakoya and Onakoya (2013); Ola and Suzanna (2015); Haddad et al. (2019c).

Table 2: Description of the explanatory variables

The internal governance mechanism	Rating for CB	Rating for IB	Measurement	Previous studies
Board of directors	Board size of CB (TCONSc)	Board size of IB (TCONSi)	The number of directors in the BOD.	Uwuigbe and Fakile (2012); Aebi et al. (2012); Fanta et al. (2013).
	Rooting of the board chairman or accumulation of the post of CEO and the board chairman (ENRADIRc)	Rooting of the board chairman or accumulation of the post of CEO and the board chairman (ENRADIRi)	Binary variable: 1: if the CEO also holds the post of board chairman of the bank or the board chairman exceeded the mandate 0: if not	Coleman and Biekpe (2007); Al-Hawary (2011); Hoque and Muradoglu (2015).
	Board independence: presence of external directors in the BOD (INDCONSc)	Board independence: presence of external directors in the BOD (INDCONSi)	Number of directors who are not related to any professional/ family relationship, nor the bank nor the executives, except for their roles in the board on the total number of the BOD.	Rachdi and Ameur (2011); Pan (2014); Hoque and Muradoglu (2015).
	Number of meetings held by the CB's board (REUCONSc)	Number of meetings held by the IB's board (REUCONSi)	Number of meetings held by the BOD in a year.	Chen et al. (2006); Choi and Lai (2014); Thu et al. (2016).

Table 3: Description of control variables

Control variable	Rating for CB	Rating for IB	Measurement	Previous studies
Bank Type	TYc	TYi	A qualitative variable takes three forms: 1: if the bank is a commercial bank 2: if the bank is an investment bank 3: if the bank is a universal bank	Cornett et al. (2009); Kim and Rasiah (2010); Farazi et al (2011); Charles et al. (2015).
Bank Age	AGc	AGi	Age of conventional / Islamic bank for each year.	Jemric and Vujcic (2002); Jeff et al. (2010a); Filip et al. (2013); Arif et al. (2017).
Bank Size	TAc	TAi	Logarithm of book value of total assets of conventional / Islamic bank at the end of each year.	Rachdi and Ameur (2011); Berger et al. (2014); Saha et al. (2015); Rashid and Jabeen (2016)
Inflation	INFc	INFi	The rate of inflation in the country of origin of the conventional / Islamic bank object of study.	Gul et al. (2011); Rashwan and Ehab (2016); Nahar and Sarker (2016); Tugba et al. (2017).

Table 4: Heteroscedasticity tests of the CBs' sample

Model type	Modified Wald Test	Breusch-Pagan Test	χ^2	Prob> χ^2	Heteroscedasticity
LnRtc	-	Breusch-Pagan Test	11.69	0.0003<5%	Absence of the heteroscedasticity problem
Etc	-	Breusch-Pagan Test	172.06	0.0000<5%	Absence of the heteroscedasticity problem
Ltc	-	Breusch-Pagan Test	224.67	0.0000<5%	Absence of the heteroscedasticity problem
LnStc	-	Breusch-Pagan Test	49.80	0.0000<5%	Absence of the heteroscedasticity problem

Table 5: Heteroscedasticity tests of the IBs' sample

Model type	Modified Wald Test	Breusch-Pagan Test	χ^2	Prob> χ^2	Heteroscedasticity
LnRti	-	Breusch-Pagan Test	10.45	0.0006<5%	Absence of the heteroscedasticity problem
Eti	Modified Wald Test	-		0.0000<5%	Absence of the heteroscedasticity problem
Lti	-	Breusch-Pagan Test	194.48	0.000<5%	Absence of the heteroscedasticity problem
LnSti	Modified Wald Test	-		0.0000<5%	Absence of the heteroscedasticity problem

Table 6: Autocorrelation tests of the CBs' sample

Model type	Wooldridge Test	Durbin Watson Test	F of Fisher	Prob>F	Autocorrelation	Decision
LnRtc	-	Durbin Watson Test	3.172	0.0841> 5%	Absence of autocorrelation	Random-effect
Etc	-	Durbin Watson Test	16.518	0.0003<5%	Presence of autocorrelation	Fixed-effect
Ltc	-	Durbin Watson Test	56.355	0.0000<5%	Presence of autocorrelation	Fixed-effect
LnStc	-	Durbin Watson Test	0.032	0.8583>5%	Absence of autocorrelation	Random-effect

Table 7: Autocorrelation tests of the IBs' sample

Model type	Wooldridge Test	Durbin Watson Test	F of Fisher	Prob>F	Autocorrelation	Decision
LnRti	-	Durbin Watson Test	4.889	0.0338<5%	Presence of autocorrelation	Fixed-effect
Eti	Wooldridge Test	-	74.399	0.0000<5%	Presence of autocorrelation	Random-effect
Lti		Durbin Watson Test	0.412	0.5246> 5%	Absence of autocorrelation	Random-effect
LnSti	Wooldridge Test	-	70.944	0.0000<5%	Presence of autocorrelation	Random-effect

Table 8: Spearman correlation matrix of the CBs' sample

	LnRtc	Etc	Ltc	LnStc	LnTCONSc	ENRADIRc	LnINDCONSc	LnREUCONSc	TYc	LnAGc	LnTAc	LnINFc
LnRtc	1.0000											
Etc	0.2982* 0.0000	1.0000										
Ltc	-0.0578 0.3344	-0.1086* 0.0742	1.0000									
LnStc	-0.0434 0.4683	-0.0862 0.1572	0.3861* 0.0000	1.0000								
LnTCONSc	-0.2904* 0.0005	-0.3677* 0.0069	-0.0305 0.5900	-0.1165* 0.0021	1.0000							
ENRADIRc	0.0536 0.3704	-0.2231* 0.0428	-0.1106* 0.0298	-0.0243 0.6672	-0.2200* 0.0001	1.0000						
LnINDCONSc	0.0113 0.8780	-0.3746* 0.0000	-0.0295 0.6652	0.0261 0.7025	0.4087* 0.0000	0.1060 0.1195	1.0000					
LnREUCONSc	-0.3737* 0.0000	-0.2919* 0.0013	0.1729* 0.0021	0.1058* 0.0066	0.0895 0.1128	-0.2472* 0.0000	-0.0974 0.1525	1.0000				
TYc	-0.0761 0.2034	0.1070* 0.0008	-0.1132* 0.0012	-0.1924* 0.0034	-0.2336* 0.0000	-0.0454 0.4221	0.0722 0.2894	-0.1770* 0.0016	1.0000			
LnAGc	0.1576* 0.0081	0.2050* 0.0007	0.1556* 0.0057	-0.1788* 0.0132	0.0425 0.4520	0.2036* 0.0003	0.0541 0.4276	0.1101* 0.0509	-0.1208* 0.0321	1.0000		
LnTAc	0.2387* 0.0014	-0.2091* 0.0005	-0.1989* 0.0025	-0.1924 0.0016	0.3212* 0.0000	0.0528 0.3507	0.3003* 0.0000	0.2056* 0.0002	-0.2402* 0.0000	0.0806 0.1537	1.0000	
LnINFc	-0.2475* 0.0000	0.1656* 0.0072	-0.3022* 0.0000	-0.1667 0.0005	0.1209* 0.0348	-0.1484* 0.0094	-0.2798* 0.0000	0.0943 0.1001	-0.0404 0.4826	-0.2928* 0.0000	-0.2047* 0.0003	1.0000

Table 9: Spearman correlation matrix of the IBs' sample

	LnRti	Eti	Lti	LnSti	LnTCONSi	ENRADIRi	LnINDCONSi	LnREUCONSi	TYi	LnAGi	LnTAi	LnINFi
LnRti	1.0000											
Eti	0.2356* 0.0001	1.0000										
Lti	0.0461 0.4528	-0.0040 0.9430	1.0000									
LnSti	0.0134 0.8269	-0.2889* 0.0000	0.4809* 0.0000	1.0000								
LnTCONSi	-0.1452* 0.0574	0.3316* 0.0002	-0.3234* 0.0292	-0.4313* 0.0004	1.0000							
ENRADIRi	-0.1280 0.3363	0.1292* 0.0028	0.1691* 0.0026	0.0408 0.4711	-0.0971* 0.0853	1.0000						
LnINDCONSi	0.2471* 0.0058	-0.0863 0.2162	0.3133* 0.0003	0.2791* 0.0008	0.1473* 0.0342	-0.0987 0.1570	1.0000					
LnREUCONSi	-0.2682* 0.0635	-0.0431 0.4462	0.0184 0.7446	0.0171 0.7627	0.1881* 0.0008	-0.1585* 0.0048	0.2203* 0.0014	1.0000				
TYi	0.2356* 0.0005	0.0665 0.2389	0.1769* 0.0016	-0.0217 0.7006	-0.1168* 0.0383	0.0426 0.4515	0.3381* 0.0000	-0.1607* 0.0042	1.0000			
LnAGi	0.1828* 0.0027	0.3297* 0.0000	-0.2425* 0.0655	-0.0620 0.2741	0.0759 0.1807	0.1679* 0.0029	-0.1635* 0.0189	0.0248 0.6627	-0.2066* 0.0002	1.0000		
LnTAi	-0.3227* 0.0413	0.1179* 0.0279	0.4264* 0.0000	0.0526 0.3811	0.2155* 0.0001	0.1591* 0.0050	0.1056 0.1300	0.0716 0.2086	-0.1476* 0.0093	0.3178* 0.0000	1.0000	
LnINFi	-0.2621* 0.0000	0.0098 0.4360	-0.2851* 0.0000	-0.2538* 0.0000	0.1285* 0.0248	-0.0459 0.4241	-0.2458* 0.0005	0.1232* 0.0314	-0.0201 0.7266	0.1029* 0.0738	-0.1956* 0.0007	1.0000

Table 10: Regression results of board impacts on CBs' profitability

LnRtc	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]		Decision
LnTCONSc	-0.2611837	0.2922487	-0.89	0.003***	-0.8380158	0.3156485	H1 rejected
ENRADIRc	0.0487419	0.1496707	0.33	0.745	-0.3441577	0.2466739	H2 rejected
LnINDCONSc	-0.1207032	0.1163481	-1.04	0.301	-0.3503478	0.1089414	H3 rejected
LnREUCONSc	-0.7874161	0.1279646	-6.15	0.000***	-1.039989	-.5348433	H4 accepted
TYc	0.0558358	0.1187091	0.47	0.639	-0.1784688	0.2901403	H5 rejected
LnAGc	0.2739893	0.1130735	2.42	0.016**	0.0508081	0.4971705	H6 rejected
LnTAc	0.196028	0.2199088	0.89	0.000***	-0.2380216	.6300777	H7 accepted
LnINFc	-0.2767731	0.1202297	-2.30	0.023**	-.514079	-.0394673	H8 rejected
Constant	4.469214	0.9143099	4.89	0.000	2.664575	6.273853	-

*** Significant effect at the 1% level ; ** Significant effect at the 5% level

Table 11: Regression results of board impacts on IBs' profitability

LnRti	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]		Decision
LnTCONSi	-0.1774388	0.2237419	-0.79	0.059*	-0.2644084	0.619286	H1 rejected
ENRADIRi	-0.0743649	0.1500084	-0.50	0.621	-0.221873	0.3706028	H2 rejected
LnINDCONSi	0.0901684	0.1080109	0.83	0.001***	-0.3034693	0.1231325	H3 rejected
LnREUCONSi	-0.0016548	0.1114719	-0.01	0.018**	-0.2184809	0.2217904	H4 accepted
TYi	0.2278399	0.1186569	1.92	0.000***	-0.0064847	0.4621646	H5 accepted
LnAGi	0.1480791	0.1058007	1.40	0.004***	-0.060857	0.3570152	H6 rejected
LnTAi	-0.6806444	0.3403262	-2.00	0.036**	-1.352723	-.0085655	H7 rejected
LnINFi	-0.5886645	0.1246415	-4.72	0.000***	-0.8348076	-0.3425214	H8 rejected
Constant	3.910344	0.8142774	4.80	0.000	2.302303	5.518386	-

*** Significant effect at the 1% level ; ** Significant effect at the 5% level ; * Significant effect at the 10% level

Table 12: Results of regression of board impacts on CBs' efficiency

Etc	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]		Decision
LnTCONSc	-0.2702845	0.3660135	-0.74	0.014**	-0.9928943	0.4523254	H1 rejected
ENRADIRc	-0.3032924	0.1848024	-1.64	0.003***	-0.6681424	0.0615576	H2 rejected
LnINDCONSc	-0.5321477	0.1430173	-3.72	0.000***	-.8145026	-.2497928	H3 accepted
LnREUCONSc	-0.3555669	0.1507472	-2.36	0.019**	-0.6531828	-0.057951	H4 accepted
TYc	0.1074252	0.1518432	0.71	0.066*	-0.1923545	0.4072049	H5 accepted
LnAGc	0.5171688	0.1370093	3.77	0.000***	0.2466753	0.7876624	H6 rejected
LnTAc	-0.5997489	0.2867246	-2.09	0.038**	-1.165821	-0.0336767	H7 rejected
LnINFc	0.4434117	0.1460253	3.04	0.003***	0.1551182	0.7317052	H8 accepted
Constant	-2.673076	1.166039	-2.29	0.023	-4.975152	-0.3709987	-

*** Significant effect at the 1% level ; ** Significant effect at the 5% level ; * Significant effect at the 10% level

Table 13: Results of regression of board impacts on IBs' efficiency

Eti	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]	
LnTCONSi	0.01889	0.0086799	2.18	0.000***	0.001768	0.0360119
ENRADIRi	0.0055413	0.005647	0.98	0.008***	-0.005598	0.0166805
LnINDCONSi	-0.0020525	0.0041918	-0.49	0.625	-0.0103212	0.0062163
LnREUCONSi	-0.0041316	0.0042759	-0.97	0.035**	-0.0125663	0.004303
TYi	0.0002012	0.0043035	-0.05	0.963	-0.0086903	0.0082879
LnAGi	0.0087951	0.0034109	2.58	0.001***	0.0020668	0.0155234
LnTAi	0.0160622	0.0109614	1.47	0.007***	-0.0055603	.0376847
LnINFi	0.0025851	0.0046342	0.56	0.578	-0.0065563	0.0117264
Constant	-0.0874408	0.0277175	-3.15	0.002	-0.1421162	-0.0327653

*** Significant effect at the 1% level ; ** Significant effect at the 5% level

Table 14: Regression results of board impacts on CBs' liquidity

Ltc	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]	
LnTCONSc	0.0407239	0.050437	0.81	0.420	-0.0587266	0.1401745
ENRADIRc	-0.0186417	0.0262134	-0.71	0.035**	-0.0703287	0.0330453
LnINDCONSc	-0.017051	0.0198701	-0.86	0.392	-0.0562306	0.0221285
LnREUCONSc	0.0667284	0.0222855	2.99	0.003***	0.0227863	0.1106704
TYc	-0.0276501	0.0206222	-1.34	0.181	-0.0683125	0.0130123
LnAGc	0.0286782	0.0195426	1.47	0.000***	-0.0098555	0.0672119
LnTAc	-0.1010715	0.0370926	-2.72	0.007***	-0.1742098	-0.0279331
LnINFc	-0.0959634	0.0213501	-4.49	0.000***	-0.1380611	-0.0538658
Constant	0.7083678	0.1527436	4.64	0.000	0.4071914	1.009544

*** Significant effect at the 1% level ; ** Significant effect at the 5% level

Table 15: Regression results of the board impacts on IBs' liquidity

Lti	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]	
LnTCONSi	-0.1177794	0.0496157	-2.37	0.019**	-0.2156512	-0.0199076
ENRADIRi	0.0461289	0.0322792	1.43	0.025**	-0.0175449	0.1098027
LnINDCONSi	0.0002088	0.023961	0.01	0.000***	-0.0474743	0.0470566
LnREUCONSi	0.0082292	0.0244418	-0.34	0.737	-0.056443	0.0399845
TYi	0.0086085	0.0245996	-0.35	0.005***	-0.0571335	0.0399166
LnAGi	-0.0263483	0.0194971	-1.35	0.044*	-0.0648082	0.0121116
LnTAi	0.3085966	0.0626574	4.93	0.000***	0.1849989	0.4321943
LnINFi	-0.0151226	0.0264897	-0.57	0.069*	-0.0673761	0.0371309
Constant	0.2540035	0.158438	1.60	0.111	-0.0585305	0.5665375

*** Significant effect at the 1% level ; ** Significant effect at the 5% level ; * Significant effect at the 10% level

Table 16: Regression results of the board impacts on CBs' solvency

LnStc	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]	
LnTCONSc	-0.1869254	0.1583529	-1.18	0.006***	-0.499162	0.1253113
ENRADIRc	0.0143768	0.0823	0.17	0.862	-0.1479006	0.1766541
LnINDCONSc	0.0274607	0.0623847	0.44	0.660	-0.0955479	0.1504694
LnREUCONSc	0.0870317	0.0699679	1.24	0.000***	-0.0509294	0.2249929
TYc	-0.1720367	0.0647458	-2.66	0.009***	-0.299701	-0.0443724
LnAGc	-0.0334106	0.0613563	-0.54	0.058*	-0.1543917	0.0875704
LnTAc	-0.0217568	0.1164566	-0.19	0.028**	-0.2513833	0.2078697
LnINFc	-0.1944257	0.0670312	-2.90	0.004***	-0.3265962	-0.0622552
Constant	0.7821443	0.4795565	1.63	0.104	-0.1634345	1.727723

*** Significant effect at the 1% level ; ** Significant effect at the 5% level ; * Significant effect at the 10% level

Table 17: Regression results of the board impacts on IBs' solvency

LnSti	Coefficient	Std. Err.	Z	P> z	[95% Conf. Interval]	
LnTCONSi	-3.190637	0.5726251	-5.57	0.000***	-4.320194	-2.061079
ENRADIRi	0.049336	0.3725407	0.13	0.895	-0.784208	0.6855359
LnINDCONSi	0.8598479	0.2765391	3.11	0.002***	0.3143482	1.405348
LnREUCONSi	0.1448595	0.2820878	0.51	0.074*	-0.7013044	0.4115854
TYi	-0.1266967	0.283909	-0.45	0.656	-0.4333408	0.6867341
LnAGi	-0.3530793	0.2250199	-1.57	0.118	-0.0907939	0.7969525
LnTAi	0.21371	0.7231416	0.30	0.038**	-1.212756	1.640176
LnINFi	-0.3059663	0.3057232	-1.00	0.000***	-0.9090343	0.2971017
Constant	5.443312	1.828564	2.98	0.003	1.836296	9.050329

*** Significant effect at the 1% level ; ** Significant effect at the 5% level ; * Significant effect at the 10% level

Table 18: Summary of the significant impacts of the board determinants on FP measurements between Conventional and Islamic banks

Model	CBs		IBs	
	Positive impact	Negative impact	Positive impact	Negative impact
Rt	/	LnTCONSc LnREUCONSc	/	LnTCONSi LnINDCONSi LnREUCONSi
Et	/	LnTCONSc ENRADIRc LnINDCONSc LnREUCONSc	LnTCONSi ENRADIRi	LnREUCONSi
Lt	LnREUCONSc	ENRADIRc	ENRADIRi LnINDCONSi	LnTCONSi
St	LnREUCONSc	LnTCONSc	LnINDCONSi LnREUCONSi	LnTCONSi
Reconciliation of similar impacts	2	8	6	6