AUSTRALIAN JOURNAL OF BASIC AND APPLIED SCIENCES

ISSN:1991-8178 EISSN: 2309-8414
Journal home page: www.ajbasweb.com

The Determinants Of Technical Efficiency: Case Of Islamic Banks

[1]Ellouz Siwar and [2]Marwa Jawada

[1]Esc sfax
[2]Fseg sfax

Address For Correspondence:
ELLOUZ SIWAR, Esc sfax
E-mail: ellousiw@yahoo.fr

ARTICLE INFO

Article history:
Received 18 January 2017
Accepted 28 March 2017
Available online 1 May 2017

Keywords:
Islamic banks, technical Efficiency, SFA, Governance mechanisms, behavioral biases.

ABSTRACT

This paper analyzes the impact of bank's internal governance mechanisms, i.e., classical mechanisms, on the technical efficiency of Islamic banks. Furthermore, we introduce another category of determinants derived from CEO's psychological biases and in particular the impact of Managerial Optimism. With reliance on the parametric SFA approach, we studied the Islamic banks' efficiency scores in Asia and we also explained the inefficiency of the internal corporate governance over the period 2009 and 2014. The results suggest that behavioral aspects can influence the Islamic bank efficiency as it can do with the classical mechanisms of corporate governance.

INTRODUCTION

Islamic finance, financial institutions and Islamic products have been designed to respect the basic principles of the Shariah (Islamic law) and constitute one of the most dynamic segments of the world's financial industry. Academic research on banking and Islamic finance has grown considerably, seeking a better understanding of the new form of the bank.

The bank technical efficiency seems to be one of the most important criteria to judge the performance of banking industries, given the very competitive environment in which the banks functioned where survival became dubious.

The intensification of competition and the technological innovation obliged banks to pay more attention to control their costs in order to efficiently provide services and products.

As conventional banks, Islamic banks must in their turn give more attention to the efficiency of their activities to ensure their survival and to cope with an intense competition with their classical counterpart.

Literature examining the efficiency of banks' determinants identified many factors as sources of efficiency or inefficiency of banks. However, the impact of behavioral factors, in particular the effect of CEOs' psychological biases, on efficiency remains less studied. Since the economy and behavioral finance literature support that the psychological phenomenon prevents the decision maker from acting in a rational way, and can affect the decision taken. Therefore, it seems important to examine their impact on the decision within the financial institutions and thus their implications on performance and their efficiency. This study is an attempt to propose a new explanation of the distortion of technical efficiency derived from the managers' behavioral biases, while examining whether that can be explained by behavioral factors.

The interest of this paper consists in evaluating the technical efficiency of Islamic banks over the period 2009 and 2014, by using the Stochastic Frontier Analysis (SFA). In addition, we try to examine its determinants which derived from traditional governance mechanisms (Board of Directors, ownership structure…), as well

To Cite This Article: Ellouz Siwar and Marwa Jawada., The Determinants Of Technical Efficiency: Case Of Islamic Banks. ***Aust. J. Basic & Appl. Sci.,*** *11(6): 12-24, 2017*

from CEOs' behavioral biases, in particular the Managerial optimism, seeking to examine its impact on the efficiency of Islamic banking industry.

This paper is organized as follows: the first section develops the theoretical framework of banks' research, its technical efficiency, and the research hypotheses. The second section describes the methodological aspects. The third section presents the model of the study. The fourth section shows the main results, and finally, the last section develops the main conclusion.

Section 1: Theoretical framework: literature review and hypotheses development:

1.1. Impact of conventional governance mechanisms on Islamic banks' technical efficiency:

Islamic banks, in particular, are concerned with the banking governance considering the specificity of their role, which often exceeds the role of a single financial intermediary, especially in their relations with their customers. Unlike conventional banking, Islamic banks must set up a real partnership with its customers in order to finance a legitimate project to the principles of Shariah. Therefore, the initial objective of Islamic bank governance is the protection of stakeholders' interests rather than shareholders, especially its clientele. The specific character of Islamic governance derives from the governance rules applied by the Islamic bank which, in turn, derives from principles considered as contradictory. Indeed, the managers of the Islamic financial institutions are subject to governance regulations which are both partnership (stakeholders' governance), shareholder (shareholders' governance), and religious (Islamic governance) (Zied and Pluchart, 2006).

Therefore, Islamic banks have a complicated system of governance. They are governed by two main internal governance components: the Board of Directors and the Shariah Board. The former fulfills the traditional functions of a Board of Directors such as the preservation of shareholders' interests and the maximizing of their wealth. The latter is to ensure and enforce the compliance of all bank's activities with the principles of Shariah.

In what follows, we are examining the relationship between Islamic bank technical efficiency and traditional governance mechanisms, namely the effect of the characteristics of the Board of Directors, the Shariah Board and the ownership structure.

1.1 .1 Impact of the Board of directors characteristics:

❖ ***Board size and technical efficiency:***

According to Jensen (1993), the firm performance results primarily from the effectiveness of the internal control system that is naturally provided by the Board of Directors. According to this author, one of the characteristics that determine the effectiveness of the Board is its "size". A reduced size can enhance the effectiveness of control within the firm, which entails. A reduction of agency conflicts. Nevertheless, an enlarged size can increase coordination and communication problems between the members of the council, which can slow decision making (Jensen 1993). Many authors have also adopted an opinion in favor of a reduced size of the board (Lorsh and Lipton, 1992; Yermak, 1996).

In practical terms, through studying the impact of different characteristics of the Board of Directors (the size, the number of annual meetings, the percentage of shares held by the CEO, the percentage of independent directors...) on the performance of 35 US holding bank companies for a period between 1959 and 1999, Adams and Mehran (2005) showed that an enlarged board size is associated with a better performance.

BELKHIR (2009b) examined the impact of the ownership structure and the Board characteristics (the size of the Board, the proportion of outside directors, and the structure of the Board of Directors...) on the performance of a set of commercial and savings banks in the United States. The results reveal a positive and significant correlation between the Board size and the performance of these banks. However, the author shows that the size of the Board is a compromise between the advantages and disadvantages of an enlarged size (benefit from more monitoring and dealing with problems of control and coordination).

We can therefore advance the following hypothesis:

- ***H1: The Board size has a positive effect on Islamic bank technical efficiency:***

❖ ***independent directors and technical efficiency:***

The independence of the members is also one of the most studied characteristics in the composition of the board of directors. In fact, according to the agency theory, the presence of an effective separation between control and management functions enables independent administrators to set up a better control of the CEOs and facilitates aligning the shareholders' interests with those of managers which may reduce agency conflicts.

In the banking sector, the results related to the importance of independent directors on the bank Board remain varied. Byrd, Fraser, Lee and Williams (2001) found that US' banks, which persist in times of crises are those that promote the presence of independent directors on their boards. Andres and Vallelado (2008) prove that the existence of independent directors can improve the bank performance, but beyond a threshold it deteriorates. Therefore, there is an optimal degree of directors' independence in the Board making. However, Pi

and Timme (1993); Adams and Mehran (2003) found no link between the percentage of independent directors and the bank performance in the US.

Thus we can display the following hypothesis:

- ***H2: independent Board members have a positive effect on the technical efficiency of Islamic banks:***

❖ ***Duality of functions at the head of the board of directors & technical efficiency:***

The debate on the impact of combining the functions at the head of the board on the firm performance does not always yield consistent results. A great deal of empirical works recommends the separation of functions (Pi and Timme, 1993; Jensen, 1993). In this sense, the combination of management and control functions can enhance the power of the CEOs, increase their freedom of action and promotes their entrenchment leading to interests 'conflicts due to an inadequacy between management decisions and the shareholder objectives. Consequently, this inadequacy can reduce the company'efficiency and profitability.

In the banking sector, according to Greuning and Bratanovic (2004), "A board of directors with a strong president who does not direct the activity of the bank will certainly have a healthy influence on the bank's policy than a board whose president is also the CEO".

However, Fogelberg and Griffith (2000) did not find any connection between the bank performance and the accumulation of functions. They state that a manager does not necessarily affect the bank's performance by awarding him an additional title. Rather, it is the level of ownership that matters a lot.

Boyd (1995) tried to explain the different results concerning the relationship between the duality of functions and performance. He states that the ratio of duality/performance could change in nature and scope depending on the environment in which a firm operates: the duality can be positively correlated with performance under certain conditions (high dynamism of the sector) and negatively in other circumstances (high munificence of the sector). Thus, assume the following hypothesis 3 can be displayed as follows:

- ***H3: The duality of functions has a negative impact on Islamic banks technical efficiency:***

1.1.2 Shariah Board characteristics and technical efficiency:

Apart from the governance mechanisms exercised by the Board of Directors, Islamic bank managers are subject to a second type of mechanism, namely the Shariah Board. As an essential substance in Islamic banking governance, The Shariah Committee plays a fundamental role in ensuring the compliance of all financial transactions with the Islamic principles which is counted as one of the most crucial responsibilities of Islamic banks. As such, it creates trust with its depositors and all other operators in the market by ensuring that their operations are truthfully in harmony with the principles of Shariah.

Ghayad.R (2008) assumed that the Shariah Board plays an important role in the development of Islamic banks. Its contribution was a great incentive to the success of Islamic finance, not only by winning, the more shareholders and public trust, but also through innovation that creates new Islamic products suitable for modern banking activities.

Conducting a study on a sample of 82 Islamic banks from 11 different countries, Quttainah (2011) examined how the governance of the Islamic banking system, in particular the Shariah Board, affects management revenue behavior within banks. The results show that the different characteristics of the Shariah board, such as size, members belonging to the AAOIFI and the independence of members, significantly determine management revenue of Islamic banks.

In this scope, we propose to study two characteristics of the Shariah Board: the size (the number of members) and the percentage of members who are qualified in corporate finance and accounting. An optimum number of directors with the knowledge of Shariah principles, corporate finance and accounting qualifications could enhance control and improve the decision quality.

Therefore, we propose to test the following hypothesis:

- ***H4: There is a positive relationship between Shariah Board characteristics and technical efficiency:***

1.1.3 Impact of ownership structure:

The ownership structure is in turn an important instrument of bank governance. Its influence depends on both the nature and objectives of the shareholders, and its ability to effectively influence the management team in order to delineate their discretionary latitude and to reduce interest's conflicts. This paper proposes to study the effect of ownership structure of Islamic banks, specifically the impact of the blockholders and the effect of the presence of state and foreign shareholders.

❖ ***The impact of ownership concentration:***

The results that examine the relationship between ownership concentration and firm performance remain controversial. Given the ambiguity of the results, it becomes interesting to study the nature of this relationship in the context of Islamic banks.

Theoretically, Jensen and Meckling (1976) argued that concentrated ownership is a great motivation to maximize the company's value. The major shareholders will be more incentive to collect sufficient information to monitor effectively management decisions. Hence, they can control one of the major problems of the company, namely interest conflicts between shareholders and managers. According to Jensen and Meckling (1976), major shareholders bring good internal governance mechanisms to reduce agency costs. Yet, in the case of a dispersed ownership, the role of shareholders is reduced to the contribution of capital and therefore the problem of control becomes worse. Moreover, the dispersed ownership could encourage the CEO' opportunistic behavior if it is not averse to risk.

Empirically, Spong et al. (1996) studied the determinants of the efficiency of 143 US banks during the period 1990-1994. They asserted that the ownership concentration is an important determinant of the bank performance. Caprio et al. (2006) confirmed in turn this result by studying the determinants of bank performance in 44 different countries. They found that concentrated ownership has a positive effect on performance. Nevertheless, others find that major shareholders could lead to an expropriate behavior. They can benefit from their supervisory power to extract private benefits and expropriate minority stakeholders (Shleifer & Vishny (1997).

We can formulate the following hypothesis:

- ***H5: The ownership concentration has a positive effect on the technical efficiency:***

❖ ***The impact of State ownership:***

The impact of State participation in the bank's capital on its performance gives mixed results. Some authors have been in favor of state ownership. For instance, La Porta et al (2002). -articulated that high-level of State ownership of banks is often associated with a high frequency of price controls and strong regulation. They argued that the presence of the Government seems necessary to fund projects that are socially desirable and helps boosting both economic and financial developments in countries suffering from underdeveloped institutions.

Yet others consider that the presence of the state may adversely affect the bank productivity and performance due to the bad allowance of resources and low managerial incentives by the government. In addition a State shareholding may be associated with low skills and high corruption levels in which the decision to grant credits is often under the influence of political lobby, which can lead to credit problems.

Empirically, Berger et al. (2005) examined the impact of ownership structure on the performance of a group of banks operating in Argentina from 1993 to 1999. They demonstrated that the state banks were less efficient compared to other banks. Micco et al (2007) found that state banks appear less profitable compared to private banks, from a sample of banks belong to developing countries. Farazi et al. (2011), conducting a study on a sample of 120 banks from nine countries of the MENA region, proved that non-performing loans of State banks are more important than those allocated by private banks. Thus, hypothesis 6 is displayed as follows:

- ***H6: The State ownership has a negative effect on Islamic banks technical efficiency:***

❖ ***The impact of foreign ownership:***

The theoretical discussion on the impact of foreign ownership on bank performance habitually supports the hypothesis that foreign banks are more efficient than local banks, particularly in developing countries (Hassen, 2003, Bonin et al., 2005, Sufian. 2007, Staikouras, 2008).

Bonin et al, 2005, found results in favor of the presence of foreign ownership, by studying the efficiency of 225 banks from countries in transition. They showed that foreign banks are more cost efficient than other banks and offer better service quality.

Weill (2006) studied the efficiency of Czech and Polish banks during 1997. He found a positive impact of foreign ownership by showing that foreign banks exhibit higher efficiency levels than domestic banks. Sufian (2007) examined the efficiency of Malaysian Islamic banks from 2001 to 2005. He found that foreign banks have a high level of technical efficiency compared to their domestic counterparts.

Staikouras et al. (2008) studied the relationship between foreign ownership and the efficiency of a sample of banks operating in Southeast Europe. They assumed that foreign banks and banks with high foreign ownership levels are associated with a higher level of efficiency compared to other banks. The most advanced argument explaining better performance of foreign banks compared to local banks is that foreign banks are more efficient in managing risks and have informational and technological advantages especially in developed countries.

Thus, We formulate the following hypothesis:

- ***H7: Foreign ownership is positively related to the technical efficiency of Islamic banks:***

1.2. Impact of behavioral biases on Islamic banks technical efficiency: the case of managerial optimism:

During the last decades, major interest has been revealed in the study of managers' behavioral biases and their implications in the firm. Despite these efforts, the studies are still limited and do not cover all areas of

finance. Researches that examine the correlation between these biases and financial intermediaries' efficiency remain very limited until now.

In the neoclassical model, the reference model was largely built on rational behavior of individuals assuming that participants in financial markets as well as managers still perpetrating in perfectly rational way and acting in a consistent manner with the information, can interpret and assess different alternatives to make logical and justified decisions.

However, the emergence of a new approach to economic and financial literature has greatly affected the theories of decision making. In fact, March and Simon (1956; 1958) were the first to refute the assumption of absolute rationality by introducing the concept of bounded rationality. The concept of bounded rationality, which invested later, behavioral concepts underlying the decision making, became a fundamental concept of behavioral economics, which is subsequently registered in behavioral finance to highlight that the decision maker is limited by his values, unconscious reflexes, skills and habits.

According to Payne et al. (1993) and Simon (1997), the influences on human behavior and the resulting decisions were called behavioral decisions and have been studied in many areas, notably in psychology, economics, and consumers' behavior over the last thirty years. If the first studies inherent to behavioral discipline concentrated on explaining irrational behavior of investors on the market (Hirshleifer,; Barberis and Thaler, and Daniel et al, etc.), from the year two thousand studies have taken a new axis by turning to the company, seeking to provide answers to the problems encountered by conventional theories of corporate finance, showing that decision making within the firm is affected by cognitive and emotional factors, which differ from rationality attributed to the classical model.

Behavioral corporate finance theories are based on CEOs' cognitive and emotional biases to explain the investment in the company, seeking to promote a more realistic behavior of the manager. In this part, we are interested in studying the impact of managerial optimism as one amongst the most common and documented biases in the psychological literature affecting managers and is one of the most which has been tested in several samples, including those of CEOs. Indeed, optimism is a common feature of human perception which has been well established in the psychology. It can be defined as a situation that leads a person to believe that his future is more promoter than other. It's a subjective risk assessment that leads people to overestimate the chances of success and underestimate the risk of failure. This bias is as well present in both entrepreneurs and managers. Cooper et al. (1988) pointed out that managers would particularly prove a high degree of optimism since they overestimate their chances of success. Excessive optimism can alter the apprehension of the future by leading them to amplify the reproduction of favorable events and minimize the likelihood of unfavorable events. This would result not only in their belief that they will succeed in putting their business on foot, but also in their overestimation of potential sales.

According to Bessière (2007) " Optimism is an unrealistic overestimation of the future events, not related to personal skills, while overconfidence reflects an overestimation of the past." Managers overestimate their ability to influence the company's performance and at the same time, they are overconfident regarding their own management capacities. As a result, they display unjustifiable optimism behaviors on the prospects for their business. They systematically overestimate the probability of a good performance of the company and underestimate the likelihood of poor results.

Previous works have revealed that this bias affects major financial decisions. March and Shapira (1987) found that too optimistic CEOs tend to believe that the results are largely controllable and projects under their supervision are less risky.

Sujan (1999) confirmed that entrepreneurs who have high levels of optimism tend to believe that their goals will be achieved in all situations, which makes them less effective, especially in using the production factors and in the decision making.

Heaton (2002) stated that managerial optimism can lead to a bogus investment policy, either in the forms of underinvestment or overinvestment. He concluded that excessive optimism can affect more corporate policy; specifically, optimistic managers will present greater investment sensitivity to the cash flow.

Assuming that managers are too optimistic, Heaton (2002), Baker and Wurgler (2004a) had developed a behavioral corporate finance model to identify optimal amounts of investment and financing in an efficient market. Malmendier and Tate (2005) found that the presence of the optimism bias, or overconfidence among CEOs, affects the investment sensitivity to cash flow. The debate between theory and practice raises many questions and ambiguities due to the lack of research. This theme is still one of the most difficult questions to answer, especially when there is a lack of data for practical cases, or lack of specific assumptions for the theoretical case.

On this basis, we can develop the following hypothesis:

Australian Journal of Basic and Applied Sciences, 11(6) Special 2017, Pages: 12-24

- ***H8: Managerial Optimism has a negative effect on Islamic banks' technical efficiency:***

Section 2: Methodological aspects:

In this paper, we empirically attempt to validate the impact of traditional and behavioral governance mechanisms on the technical efficiency of Islamic banks. The efficiency scores are estimated using the parametric approach, notably the «Stochastic Frontier Analysis" (SFA) modeled by a translog production function on the data panel proposed by Battese and Coelli (1995). The "Frontier 4.1" software is used to estimate the efficiency scores and the depending coefficients, using the approach on one step (Coelli 1995) that avoids the pitfalls of a two-step approach, whereby the estimated efficiency scores obtained from the stochastic frontier are regressed during the same step on a set of explanatory variables.

2.1. Data:

This study expands on a sample of 30 Islamic banks operating in the regions of the Middle East and Asia from 2009 to 2014. The data are collected from the databases provided by "The Thomson Financial database» and the missing variables were collected from the annual reports of these banks.

- ***The Bank inputs and outputs:***

To determine the inputs and outputs, we must first choose the appropriate approach to measure the bank activity. In theory, there are two opposing approaches: the intermediation approach and the production approach. Indeed the nature of the Islamic banking activity is often considered as an intermediary between savers and investors by transforming deposits in productive assets, rather than as a producer of services and loans. Therefore, it seems more consistent to opt for the intermediation approach to evaluate the Islamic bank efficiency and its determinants. Consequently deposits, labor and fixed assets are considered as inputs, while loans are treated as outputs. This approach has been widely used in Islamic banking researches. As for the choice of inputs and outputs and given the multi-product nature of Islamic finance, there is not always an explicit agreement on the definition and measurement of inputs and outputs, which justifies the variety of variables used.

The output:

In this paper, a single output will be retained:

Y1: Total loans: it includes all the sums granted by the bank to its customers (all the financing instruments used by Islamic banks) including commissions, taxes and other fees that the borrower is required to pay for the conclusion and execution of the contract and which are known to the creditor. This cost also includes ancillary services relating to credit agreements, costs which are required by the lender to obtain credit, including insurance premiums.

According to Yudistria (2004), the total Islamic banking loans constitute a central operation since the specificity and the nature multi-products of the Islamic banking system.

The inputs:

The output mentioned above is produced by a vector of inputs as follows:

- Total deposits (D): include all funds held by the bank on behalf of its customers.
- Labor (L): estimated by the expenses and salary paid to the bank employees and officers, included all benefits.
- Fixed assets (K): estimated by the net assets. It includes buildings, furniture, equipment, rights of franchises and licenses, vehicles and software, etc.

2.2. Stochastic Frontier Analysis (SFA):

The approach of parametric frontiers (stochastic) or econometric frontier approach is originally proposed by Aigner et al. (1977). It requires a functional form to costs, profits or production relationship between inputs, outputs and the environmental factors. This method estimates a frontier function normally with a form of Cobb Douglas, Translog, etc. This method determines the random error and an inefficiency specific component of each bank. Assuming the principle of the presence of measurement errors and / or exogenous hazards, SFA models both inefficiency and random effects. In this paper, we use the SFA approach modeled by a production function for the panel data proposed by Battese and Coelli (1995).

The production frontier can be interpreted as the ability to produce a maximum output from a given input vector. It indicates the optimality with which the inputs are used and shows whether there is a non-productive use of resources.

This function can be written as follows:

$$Y_{it} = \exp(x_{it}\beta + V_{it} - U_{it}) \quad (1)$$

Where:

Y_{it}: is the production of the i-th Islamic bank (i = 1,2, ..., N) in the t-th period (t = 1,2,…, T);

X_{it}: is a (1*k) vector of the input quantities of the i-th Islamic bank

β : is the parameter vector (K + 1) to be estimated

V_{it} is a measurement of errors and non-negative random factors assumed to be identically and independently from U_{it} and follows a normal distribution N $(0,\sigma^2_v)$;

U_{it} : A non- negative random variable representing the technical inefficiency of producing.

According Battese and Coelli (1995), the component U_{it} is independently distributed according to a normal distribution truncated at zero , N(μ , σ^2_u) where $\mu = z_{it}\delta$ (the mean) and σ^2_u (the variance) ; z_{it} is the vector (1 * p) of the explanatory variables of the inefficiency of Islamic banks and δ is the vector (p * 1) of the coefficients of these variables.

We estimate the stochastic frontier model production function using the translog form. Thus, the stochastic model of the production frontier is defined as follows:

$$\ln(Y_{it}) = \beta_o + \beta_1 \ln D_{it} + \beta_2 lnL_{it} + \beta_3 lnK_{it} + V_t - U_t \quad (2)$$

Where y_i is the log of the maximum output of the the i-th Islamic bank in the t-th period obtained from a vector of logarithm of inputs, namely: D (annual deposits of the i-th Islamic bank in the t-th period); L (labor input estimated by all the labor costs of the i-th Islamic bank in the t-th period) and K (The bank net fixed assets).

Section 3: The modeling of technical efficiency and measurement of variables:

To study the determinants of the technical efficiency of Islamic banks, the inefficiency term (μ_{it}) is regressed on the explanatory variables of our study.

$U_{it} = \delta_0 + \delta$ [(Board of directors characteristics) + (Shariah Board characteristics) + (Ownership structure characteristics) + (Managerial Optimism) + (bank characteristics)] $_{it} + w_{it}$ (3)

The measure of explanatory variables:

The Table below shows the different variables used and their measures:

Table 1: Definition of variables and measures

VARIABLE	MEASURE
Managerial Optimism	A binary variable that takes the value 1 if the C is considered as optimistic (if he has the best salary) and 0 otherwise
Board Of Directors size	Total number of directors who make up the Board.
The independence of directors	The percentage of independent members operating in the Board of Directors
Duality	A Binary variable that takes the value of 1 if the Chairman of the board is himself the CEO of the bank and 0 otherwise
Shariah Board size	The total number of members that make up the Shariah Board.
Members with finance and accounting knowledge	Percentage of members of Shariah Board who are qualified in corporate finance and accounting.
Ownership concentration	The percentage of shares held by the major shareholder.
Foreign ownership	the number of shares held by foreign shareholders in the total number of shares
state ownership	The percentage of shares held by the government and public companies
Bank size	The natural logarithm of total assets
Bank age	Number of years since the establishment of the bank or the date from which it is converted into an Islamic bank

Section 4. Results and discussion:

4.1. Analysis of efficiency scores:

First, we start by analyzing the results of estimations of the efficiency scores in the two regions. In fact the investigation of the banks' efficiency, according to their geographical regions is one of the most considerable interest to assess the potential impact of regional characteristics on bank efficiency. The tables below illustrate an annual descriptive analysis of technical efficiency scores by region.

Table 2: Technical Efficiency of Islamic banks in the Middle East:

	Mean	Max	Min	standard deviation
2009	0,831	0,959	0,380	0,161
2010	0,833	0,962	0,407	0,174
2011	0,854	0,958	0,386	0,156
2012	0,876	0,967	0,537	0,124
2013	0,900	0,971	0,687	0,087
2014	0,899	0,972	0,700	0,079

From the Table above, we notice that efficiency scores showed an increase during the period of our study (2009-2014) with an average level of technical efficiency equal to 0,866, which comes to notify that Islamic banks in the Middle East produce only 86.6% of the amount of outputs (loans) that they could produce when they use the same inputs (deposits, labor and capital). Islamic banks in the Middle East should improve their efficiency by 13.4% to reach the efficient frontier that is equal to the unit with the same resources involved and the same outputs produced. The highest efficiency score was recorded in 2014 (0,972) by the Saudi Islamic bank "Al Bilad". Then, the lowest score was recorded in 2009 by the Islamic Bank of Jordan.

Table 3: Technical efficiency of Islamic banking in Asia:

	Mean	Max	Min	Standard Deviation
2009	0,635	0,861	0,328	0,155
2010	0,680	0,927	0,323	0,180
2011	0,757	0,936	0,376	0,185
2012	0,791	0,943	0,327	0,182
2013	0,831	0,939	0,386	0,166
2014	0,830	0,946	0,461	0,149

The previous Table demonstrates that Islamic banks in Asia exhibit an average level of efficiency of 0.745 during the study period, which means that these banks produce on average 74.5% of the maximum output that they could produce using the same inputs. Therefore, they should improve their efficiency level of 25.5% to achieve the efficient frontier which is equal to unity. Nevertheless, the efficiency scores were still growing throughout the study period and peak in 2013 with an average efficiency level of 83.1%.The highest efficiency score was recorded in Indonesia. However the lowest efficiency score was recorded in 2010 by "Meezan Islamic Bank" in Pakistan.

By comparing the efficiency scores of Islamic banks in both regions, we note that banks operating in the Middle East exhibit higher levels of technical efficiency than their counterparts in Southeast Asia over the past six years. (Average efficiency scores equal to 0.866 in the Middle East against 0,745 in Asia). This reflects somewhat a better control of resource utilization and a higher level of production for these banks. Indeed, Islamic banks in this region have experienced a significant growth over the recent years to the extent that they were able not only to attract customers who preferred to conduct financial transactions comply with Shariah principles, although they succeed to attract the international community who is seeking to benefit from a significant liquidity especially in the Gulf countries. Even these banks were able to locate in different regions of the world like Asia, Africa and even in Europe and North America.

However the efficiency scores of Islamic banks in Asia evolved at a faster pace than Islamic banks in the Middle East during the study period with an average annual growth rate of 5.56% against 1.61% for Islamic banks in the Middle East.

4.2 Determinants of technical efficiency of Islamic Banks:

In addition to estimating the efficiency scores, we have attempted to study the impact of a number of corporate governance characteristics, from both classical and behavioral approaches, on the efficiency of Islamic banks. Our linear model of efficiency concerns the influence of 12 variables, though the sign of parameters that explain the inefficiency means an adverse effect on technical efficiency. The results of estimation of production function parameters and the determinants of inefficiency are presented in Table 4.

AS Table 4 indicates, we're originally trying to test whether our model is globally explanatory by comparing the value of the maximum likelihood ratio (LR) to the theoretical value of the chi-square at 1%. If the theoretical value of chi-square is less than the empirical ratio (LR), we can conclude that the adjustment is broadly considered explanatory. Concerning our model, we can deduce that it is globally significant given that the theoretical value of chi-square is equal to 3 degrees of freedom (number of exogenous variables) at the 1%.

[χ 1% (3) = 11.34] is less than the empirical value (LR) which equals to 56.18. The estimation parameter of variance (γ = 0.39) is positive and significant at the 1% threshold (rejection of the null hypothesis H0: γ = 0, which stipulates that Islamic banks are fully technically efficient). Hence the determinants of inefficiency seem to be significantly on the technical efficiency of Islamic banking. Consequently, the distance of a bank from the border of the "best practices" can be explained by the explanatory variables associated with technical inefficiency.

Table 4: Results of estimates of the production function parameters

Variable	Parameter	Coefficient/t-Student
Constant	β0	2,3402
		(8,2660)***
Ln D	β1	0,6584
		(19,5582) ***
Ln L	β2	0,114
		(2,3994)**
Ln K	β3	0,07089
		(2,5140)**
Inefficiency determinants	Parameter	Coefficient/t-student
Constant	δ0	-0,0885
		(-0,1628)
BSize	δ1	0,0945
		(3,1748)***
INDD	δ2	-0,7124
		(-1,6539)*
DUAL	δ3	-1,1307
		(-1,0652)
		-0,2245
Managerial Optimism	δ5	0,5022
		(2,5656)**
ShB Size	δ6	0,0899
		(1,7249)*
MQCFA	δ7	-1,4624
		(-3,0826)***
Conc	δ8	0,6439
		(2,0230)**
statsh	δ9	1,113
		(2,1179)**
foreignsh	δ10	1,8057
		(3,2373)***
BQSize	δ11	-0,0765
		(-1,96964)**
BQAge	δ12	-0,03495
		(-3,52292)***
sigma-squared	$\sigma^2 = \sigma_V^2 + \sigma_U^2$	0,15989
		(5,40045)***
gamma	$\gamma = \frac{\sigma_U^2}{\sigma_V^2+\sigma_U^2}$	0,39178
		(2,87971)***
log likelihood function = -62,859015		
LR test of the one-sided error = 56,185072		

• Impact of Board of directors characteristics:

The first specification test includes the variables inherent to the characteristics of the board of directors. Starting with the first predictor of the size of the board, we see that it has a positive and statically significant impact on inefficiency (see Table 1), reflecting a negative relationship with the technical efficiency of Islamic banks. Subsequently, we can conclude that an enlarged size of the Board affects negatively technical efficiency (rejection of the hypothesis 1). We demonstrate that an Islamic bank board with reduced members is preferred to maintain the bank efficiency and mitigate the problems of coordination, divergence of interests among members and supporting decision making. This result is consistent with the empirical works of Lipton and Lorsh (1992) and Yermak (1996) who reveal that a reduced board size can enhance the effectiveness of control and the coordination between members and can also facilitate decision making. This implies that it can mitigate agency conflicts.

Regarding the second variable which concerns the members' independence, we find that it is negatively correlated with inefficiency, indicating a positive relationship with the technical efficiency of Islamic banks. Therefore, our second hypothesis concerning the board members' independence is confirmed. In the literature, independent directors allow a better control of ~~the~~ team management and ensure that they pursue shareholder interests which can reduce agency conflicts. Therefore, we deduce that members' independence is an important feature that helps reduce the efficiency, distortion of Islamic banks, ensure more effective control of the leaders and control the bank's lending policy. This result coincides with those of Andres and Vallelado (2008) and Byrd, Fraser, Lee and Williams (2001).

Again with reference to Table 4, we can see that the double functions of the head of the board of directors show a positive, but not significant, connection with efficiency (negative with inefficiency), indicating that there is no direct relationship between the accumulation of functions at the head of the board and the Islamic banks' technical efficiency. Thus, we can deduce that accumulation of functions does not affect the efficiency, showing that the addition of another title to the CEO does not necessarily allow him to alter the bank performance. This result corroborates with the results of Fogelberg and Griffith (2000).

• Impact of Shariah board characteristic:

In this paper, we found that the size of the Shariah Board divulges a statistically significant and negative relationship with Islamic banks technical efficiency (positively correlated with inefficiency). We can conclude that the expanded size of the Shariah board has a negative impact on the efficiency of Islamic banks. This, in turn, can be explained by coordination and collaboration problems between different members of the board. The differentiation of interpretation can delay decision making which can threaten the customers and market operators' confidence.

Concerning the second variable that measures the percentage of members of the Shariah Board who are qualified in corporate finance and accounting, we can deduce that this criterion can reduce efficiency distortion of Islamic banks. In fact, members with knowledge of Islamic principles and rules, combined with knowledge in accounting and corporate finance, would allow the board to be very independent in decision making and contribute to the bank performance. These members help the Shariah Board to have a strong understanding of what was happening with regard to the daily financial operations of the bank. Indeed, a lack of this knowledge can lead the Shariah council not to be aware of the true implications of products and the complex financial transactions of the bank. In order to ensure a better quality of supervision and consultation, Ghayad (2008) suggested that it the Shariah Board members would benefit of qualification in corporate finance and commerce.

• Impact of ownership structure:

The second governance mechanism examining its impact on the technical efficiency is the shareholding structure of Islamic banks. In this paper, we find that the ownership concentration is statistically significant, but it is negatively correlated with the efficiency (positive relationship with the inefficiency). Contrary to our expectations, we find that ownership concentration has a negative impact on Islamic bank technical efficiency. This can be explained by an expropriation behavior that may accompany the presence of bloc-holders. They can take advantage of their monitoring powers to acquire private benefits and expropriate on the detriment of minority shareholders (moral problem of majority shareholders). In fact, large shareholding encouraged by the risk toward increase profits (because their capital is varied) can push the leaders to adopt a less careful credit policy, which can menace the bank efficiency. This result correlates with the findings of Leech and Leahy (1991) who establish a negative relationship between performance, firm value and the ownership concentration in the UK.

According to our anticipations, a negative sign of the coefficient attached to State shareholding with the efficiency has been found (positive sign with inefficiency).

Indeed, the empirical literature supports that State banks are less efficient and display high risk of credit because they finance risky projects (according to the argument of social well-being). They are also very vulnerable to political lobby (according to political argument) which can negatively affect the bank productivity and performance due to misallocation of resources and low managerial incentives.

In fact, in a society affected by corruption, internal control in State banks has been often ineffective. Informal relationships are forged between the public and the private sector, for an unlawful monopolization of economic rent from which certain interest groups can benefit. Therefore, the credit risk of public bank is greater in societies with high corruption levels.

According to Lang and So (2002), State banks are expected to bear a lower disciplinary effect from the financial market and the environment than private banks. This would encourage their leaders to follow their own interests at the expense of the interests of their institutions. All this could threaten the bank production and lead to a distortion of the efficiency of Islamic banks.

As for the presence of foreign investors, a negative relationship with the efficiency was found (positive and statistically significant sign with inefficiency). Indeed, the assumption that foreign banks are associated with better performance by reporting to other banks has not been validated (rejection of the hypothesis 6). This result is fine-tuned with those of Sufian and Habibullah (2010) who find that the entry of the foreign bank does not improve the Islamic bank efficiency in Malaysia. They report that the impact of foreign ownership depends on both the understanding of the market and the country regulation. Moreover, the empirical literature shows that better risk management and the informational and technological advantage of foreign banks are often attached to banks from developed countries. We are not surprised to find a negative effect of the presence of foreign shareholders on Islamic banks' efficiency since the collection of the data indicates that most foreign investors are from developing countries.

• Managerial optimism and efficiency:

Regarding the behavioral governance mechanisms, the literature of psychology suggests that most people naturally have optimistic expectations about the future. Managers tend especially to present optimistic behavior in their decision making. In this study, we found that managerial optimism reveals a statistically significant and negative relationship with Islamic banks' technical efficiency (Positive with inefficiency). We can conclude that managerial optimism contributes to technical inefficiency, thereby adversely affecting the technical efficiency. (Hypothesis 8 is validated). Indeed, the literature of corporate behavioral finance argues that optimism can affect managerial decisions. It distorts the understanding of the future by bringing the managers to overestimate their abilities, the likelihood of good events and underestimate the probability of bad events. It creates a subjective assessment of risk by overvaluing the chances of success and underestimating the risk of failure. Consequently, optimistic managers who overestimate their abilities and underestimate the appearance of bad situations may adopt less careful and risky credit policies that can affect bank efficiency. This result is consistent with those of Jarboui et al. (2014). They assume that optimism bias prevents managers to invest in an efficient manner and can affect all other decisions of the company, including optimal allocation of resources, production and use of technology.

Finally, concerning the control variables, we have perceived a positive and a statically significant relation between the Islamic bank size and its efficiency (negative relation with the inefficiency). Thus, we can conclude that the enlarged size of Islamic banks is associated with higher technical efficiency scores than their counterparts with small size. The current result is consistent with those of Al-Jarrah and Molyneux (2003), Yudistia (2004) and Nor Hayeti (2010) who found that large Islamic banks are more efficient than small Islamic banks.

The age of Islamic banks in turn revealed a positive and statistically significant sign at 1% level with technical efficiency (negatively correlated with inefficiency). We can deduce that the oldest Islamic banks are more efficient than their counterparts recently created. These results confirm those of Ahmad Mokhtar et al. (2007) and Ariff et al. (2008). One of the most advanced explanations is that older banks have several advantages over the newly established banks with extensive experience and a better control of all aspects of their activities.

Section 5: Conclusion:

The aim of this study was is to study the different determinants of Islamic bank efficiency derived from both classical and behavioral approaches. It had double objectives: on the one hand, it seeks to estimate the technical efficiency scores of Islamic banks in the Middle East and Asia. On the other hand, it aims at studying the different factors affecting its efficiency. The use of the stochastic frontier approach (SFA) permitted to achieve such objectives in a single step (a model in a single step suggested by Battese and Coalli (1995).

The results of estimation showed that the scores of efficiency have increased along the period of study (from 2009 to 2014) and marked a superiority of banks in the region of the Middle East in terms of technical efficiency. From maximum verisimilitude estimation, we have deduced that an enlarged size of the Board of Directors has a negative impact on the Islamic bank efficiency notably because of problems of coordination and collaboration between the members. We have also deduced that the proportion of independent directors on the composition of the Board affects positively the technical efficiency thanks to a better supervision practiced by independent administrators who allowed protecting the interests of the minority shareholders to the detriment of the majority and helps to reduce the agency conflicts.

With regards to the Shariah Board characteristics, the results showed that the fact that the members having good knowledge on corporate finance and accounting can reinforce the technical efficiency, which reveals the crucial role of the Shariah board to determine the efficiency of the Islamic bank activity.

As for the behavioral factors, we have noted that managerial optimism can explain the efficiency' distortion of the Islamic banks, which confirms the implication of psychological aspects in financial and investment decisions within the firm This also reveals that the behavioral phenomenon could as well influence the performance and the efficiency of the company.

REFERENCES

Aggarwal, R., 2014. « A Review of deviations from Economic Rationality ». International Review of Financial Analysis, 32: 179-187.

Adams. R.B and H. Mehran, 2003. « Board structure and banking firm performance ». Federal Reserve Bank of New York Economic Policy. Review, 9: 123-142.

Adams, R.B and H. Mehran, 2005. Corporate Performance, Board Structure and its determinants in the Banking Industry. Research paper of the Federal Bank of New York, pp: 1-42.

Ahmad Mokhtar, H.S., N. Abdullah and S.M. Alhabshi, 2007. « Efficiency and Competition of Islamic Banking in Malaysia, Humanomics, 24(1): 28-48.

Al-Jarrah, I and P. Molyneux, 2005. « Efficiency in Arabian banking ». Islamic Perspectives on Wealth Creation.

Ariff, M., M. Bader, M. Shamsher, T. Hassan, 2008. « Cost, revenue, and profit efficiency of Islamic versus conventional banks: international evidence using data envelopment analysis». Islamic Economic Studies, 15(2): 23-76.

Andres, P., E. Vallelado, 2008. « Corporate governance in banking: The role of the board of directors ». Journal of Banking and Finance, 32: 2570-2580.

Baker, M and J. Wurgler, 2004a. « A Catering Theory Of Dividends », The Journal of Finance, 59(3): 1125-1165.

Batesse, G.E. and T.J. Coelli, 1995. «A Model For Technical Inefficiency Effects In A Stochastic Frontier Production Function For Panel Data, Empirical Economics, 20: 325-332.

Belkhir, M., 2009. « Board of directors' size and performance in the banking industry», International Journal of Managerial Finance, 5(2): 201-221.

Berger, A.N. and G.F. Udell, 2005. « Small business and credit finance ». In Zoltan, Z. I. and Audretsch, D. B., Handbook of Entrepreneurship Research, 1: 299-328.

Bessière, V., 2007. « Excès de confiance des dirigeants et décisions financières : une synthèse » Finance Contrôle Stratégie, 0(n° 1) : 39-66.

Bonin, J.P., I. Hasan and P. Wachtel, 2005. « Bank performance, efficiency and ownership in transition countries ».' Journal of Banking and Finance.

Boyd Brian, k., 1995. « CEO duality and firm performance: A contingency model ». Strategic ManagementJournal., 16(4): 301-312.

Byrd, J., D. Fraser, D. Lee and T. Williams, 2001. « Financial crises, natural selection and governance structure: evidence from the thrift crisis. » Working paper, Texas A&M University.

Caprio, L., R. Barontini, 2006. « The effect of family control on firm value and performance. Evidence from Continental Europe » European financial Management, 12(5): 689-723.

Cooper, A.C., C.Y. Woo and W.C. Dunkelberg, 1988. « Entrepreneurs' perceived chances for success». Journal of Business Venturing, 3: 97-108.

Fadzlan, Sufian and M.Abdul Majid, 2007. « Bank Ownership, Characteristics, and Performance: A Comparative Analysis of Domestic and Foreign Islamic Banks in Malaysia ». JKAU: Islamic Econ., 21(2): 3-36.

Fadzlan, Sufian and M.S. Habibullah, 2010. Developments in the efficiency of the Thailand banking sector: a DEA approach. International Journal of Development, 9(3): 226-245.

Farazi, S., E. Feyen and R. Rocha, 2011. « Bank Ownership and Performance in the Middle East North Africa Region ». World Bank Policy Research Working, pp: n° 5620.

Fogelberg, L and J.M. Griffith, 2000. « control and bank performance ». Journal of Financial and Strategic Decisions, 13: 3.

Ghayad, R., 2008. « Corporate governance and the global performance of Islamic banks » Journal: Humanomics, 24(3): 207-216.

Greuning, H.V. and S.B. Bratanovic, 2004. « Analyse et gestion du risque bancaire : un cadre de référence pour l'évaluation de la gouvernance d'entreprise et du risque financier » traduction de Rozenbaum M., Edition Eska, Paris, p: 384.

Hackbarth, D., 2008. «Managerial traits and capital structure decisions», journal of financial and quantitative analysis, pp: 843-882.

Hassan, M.K., A.H.M. Bashir, 2003. «Determinants of Islamic Banking Profitability». Paper Presented at the 10th ERF Annual Conference

Heaton, J.B., 2002. « Managerial Optimism and Corporate Finance ».Financial Management, 31(2): 33-45.

Jarboui, S., P. Forget, Y. Boujelbene, 2014. « Transport firms' inefficiency and managerial optimism: A stochastic frontier analysis ». Journal of Behavioral and Experimental Finance (2014), http://dx.doi.org/10.1016/j.jbef.2014.07.003.

Jensen, M., 1993. « The modern industrial revolution, exit, and the failure of internal control systems», The journal of finance, 48(n°3): 831-880.

Jensen, M.C. and W.H.M eckling, I 976. « The theory of the firm: managerial behavior, agency costs and ownership structure ». Journal of Financial Economics, 3.

La Porta, R., F. Lopez-de-Silianes, A. Shleifer, 2002. « Government ownership of banks ».The Journal of Finance, 57(n° 1): 265-301.

Lang, L.H.P. and R.W. So, 2002. « Ownership Structure and Economic Performance». Working Paper

Laurie K. Lewis, 2007. « An Organizational Stakeholder Model of Change Implementation Communication ». Communication Theory, 17(2): 176-204.

Lipton, M., J.L orsch, 1992. « A modest proposal for improved corporate governance ». Business Lawyer pp: 59-77.

Leech, D and J. Leahy, 1991. « Ownership Structure, Control Type Classifications and the Performance of Large British Companies ». The Economic Journal, 101(409): 1418-1437.

Lin, Yueh-hsiang, Shing-yang Hu and Ming-shen Chen, 2005. « Managerial Optimism and Corporate Investment: Some Empirical Evidence from Taiwan » Department of Finance, National Taiwan University, Taipei, Taiwan.

Lynn. Pi and Stephen G. Timme, 1993. « Corporate control and bank efficiency ». Journal of Banking & Finance, 17(2-3): 515-530.

Malmendier, U and G. Tate, 2001. « CEO Overconfidence and Corporate Investment » Working Paper, Harvard University.

Malmendier, U and G. Tate, 2005. « Does Overconfidence Affect Corporate Investment? CEO Overconfidence Measures Revisited ». European Financial Management, 11(5): 649-659.

MARCH, James G. and A. Simon, Herbert, 1958. « Organizations, New York»: John Wiley and Sons.

March, James G and Zur Shapira Source, 1987. « Managerial Perspectives on Risk and Risk Taking » Management Science., 33(11); 1404-1418.

Micco, A., U. Panizza and M. Yanez, 2007. "Bank Ownership and Performance: Does Politics Matter". Journal of Banking and Finance, 31: 219-241.

Quttainah, M.A., 2011. « Do Islamic Banks employ less earnings management? » Working Paper 645 October 2011 The Economic Research Forum (ERF)

Shefrin, H., 2001. « Behavioral Corporate Finance » Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing» (Boston: Harvard Business School Press).

Shleifer, A. and R. Vishny, 1997. « A Survey of Corporate Governance ». The Journal of Finance, 52: 737-783.

SIMON, Herbert A., 1997 An Empirically Based Microeconomics, Cambridge, UK: Cambridge Uni- versity Press.

Spong, K., R. Sullivan and R. DeYoung, 1995. « What makes a bank efficient? A look at financial characteristics and bank management and ownership structure » Financial and Industry Perspectives, Federal Reserve Bank of Kansas City

Staikouras, P., C. Staikouras and M.E. Agoraki, 2007. « The effect of board size and composition on European bank performance ». European Journal of Law and Economics, 23: 1-27.

Sujan, H., 1999b. « Optimism and street smarts: identifying and improving salesperson intelligence ». Journal of Personal Selling & Sales Management, XIX(3): 17-33.

Weber, M., G. Markus and S. Philipp, 2008. « Managerial Optimism and Corporate investment: Is the CEO Alone Responsible for the Relation? ». The European Summer Symposium in Financial Markets.

Weill, L., 2006. « Propriété étrangère et efficience technique des banques dans les pays en transition une analyse par la méthode DEA ». Presses de Sciences Po | Revue économique 2006/5 – 57 : 1093-1108.

Yudistira, D., 2004. « Efficiency in islamic banking: an empirical analysis of eighteen banks ». Islamic economic studies, 12(1).

Zied, C and J.J. Pluchart, 2006 «La gouvernance de la banque islamique ». Communication à l'IAE Poitiers.