

Islamic Financial Stability during the US Sub-prime Crisis: Using from Data Panel

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Abstract The recent global financial crisis has induced a series of failures in many conventional banks. It has plunged the world economy into the deepest recession ever since the end of the Second World War (IMF, 2009). In fact, economic growth of around 7% in 2007 in Western Europe fell to 1% in 2009 [1]. In this case, the moral and ethical aspect of finance began to be more emphasized. This financial crisis has increased the attention on Islamic banking [2]. Indeed, Islamic Banks hold over US \$700 billion in assets and are growing at over 15% p.a [3]. In the same vision, [4] the Nobel Laureate, and at the same time the President of the Commission of Experts on Reforms of the International Monetary and Financial System, stressed that the world would have been able to avoid such a crisis if they have followed the model of Islamic finance. He added for a well-functioning financial system, it must, at its core, real cash). The aims of this paper are to test the resistance of the Islamic Banks (IBs) in comparison with the Conventional ones (CBs) to the last Sub-primes crisis. The solidity of these banks is appreciated across an empirical study of a sample of IBs and CBs in 8 banking systems. This sample is characterized by an important presence of IBs. By referring to an objective study of the solidity of banks measured by the Z-score, we conclude that Small Islamic Banks (SIBs) tend to be financially stronger than Small Conventional ones (SCBs). Large Conventional Banks (LCBs) tend to be financially stronger than Large Islamic ones (LIBs). Small Islamic Banks (SIBs) have tendency to be more solid than the Large Conventional Banks (LCBs).

Keywords: *Islamic banks, conventional banks, sub-prime crisis, stability*

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1. Introduction

At the end of 1940s, the idea of Interest-free emerged thanks to [5]. As it happened, the first modern experiment with Islamic banking was recognized in a small town in Egypt, called MitGhamr, in 1963 by Dr. Ahmed El Najjar. This bank took the form of a saving-investment bank based on profit sharing and free interest, rather than a commercial bank. [6].

In the 1970s, the Islamic banking movement re-emerged with the establishment of the Islamic Development Bank (IDB) in 1974 by the Organization of the Islamic Countries (OIC). This bank is considered as the start of the movement's second phase [7]. As a result, several Islamic banks sprung up not only in Muslim countries, but also in non-Islamic countries. Dubai Islamic Bank (1975), Faisal Islamic Bank of Egypt (1977), Faisal Islamic Bank of Sudan (1977), and Bahrain Islamic Bank (1979) were among the first commercial banks in the Arab countries. The first effort of Islamic banking, Western world, is reflected by the creation of the Islamic Finance House in Luxembourg, in 1978 [6], monitored by the

insurance company first Sharia-compliant (Takaful), in 1983 and in Luxembourg [8].

The emergence of Islamic financial principles in banks continues to appear. In fact, several traditional Western banks established Islamic windows for example HSBC Bank, ANZ Grindlays, Standard Chartered Bank, Barclays, Citibank, ABN AMBRO, Klienwort Benson, Merrill Lynch, Midland Montagu, and Goldman Sachs [9,10]. Later, the XVIIIe and the XIXe of the previous century were characterized by the convertibility of financial system of some Islamic countries to Islamic financial system such as Iran and Sudan [11]. Islamic institutions, thus, have taken various forms like commercial banks, investment banks, investment and finance companies, insurance companies, and financial service companies. In particular, the banking sector is characterized by a variety of models in their form. However, in the Islamic financial system, we found private institutions of conventional economics (as in most Arab countries and the West). Some economies are characterized by the presence of two types of funding such as the case of the Malaysian economy [11].

This variety in the model followed by Islamic banks advocates the usefulness and importance of the Islamic

financial transactions. During the last five years, the annual growth of the Islamic finance market was of 15-20% on average. In fact, it represents an international segment which recorded the fastest growth in the finance sector [8]. It should be noted that, during the last three decades the number of Islamic financial institutions increased in 1975 to more than 300 institutions in 75 countries worldwide [12].

Even more, these institutions are managing funds of about US\$200 billion, with total assets of more than US\$822 billion [13].

Islamic Finance (IF), as we noted, actually appeared in the 1970s. However, the beneficial effects of this finance which is founded on principal and stocks in keeping with the Sharia, became visible only with the multiplicity of crises and the strong shock supported by CB [14]. In fact, the last worldwide crisis, the most serious one since 1929, changed a lot the rules of the game in favor of the evolution of IF. The objective of this funding is to provide operations and services in conformity with the Islamic rules. Indeed, it aims at promoting the well being of all the people who must be financially and morally strong and to meet the essential needs without excessive expenses. It ensures the establishment of social balance. Doubtless, on the one hand, a central aim in the "Zakat" is to purify the currency of the poor on the one hand. On the other hand, it seeks to show a social balance and equality between different social strata [15].

In fact, IF is different from the traditional finance through submission of financial practices at a number of religious principles. It also proposes a model of social responsibility, based on more sustainable moral and ethical principles. It takes a broader sense, based on a moral and religious initiative. Islam is based on respect for private prosperity and has as an objective of well-being of individuals. Usury, forbidden to protect the weak, is replaced by participation and direct finance [16].

Regarding Islamic economics, Islam does not oppose the very existence of the market as a primary means of resource allocation, but it criticizes it in the relation to their distribution functions of income [17]. Obviously, it appeared as an alternative to the existing economic relations in the West.

In line with this, the objective of this paper is both theoretical and empirical. On the theoretical size, we try to give some ideas about the IF and, on the empirical side, to study the financial stability of IB compared to CB. In fact, our objective, in the present article, is to answer following the question. On the basis on the principal of the 'KORAN', what extend are Islamic Banks, more capably of overcoming the financial crisis compared with the Conventional ones?

Most of the studies on IF seek to present this finance as a particular mode of financing via their specificities in terms of fundamentals, principles and techniques of financing. However, our objective, in this work, is not the same. Furthermore, we seek to point out the benefits of this method of financing.

These benefits are weapons for the IF to establish itself outside its boundaries. They also have instruments to overcome the shortcomings of the IF. In this context, it should be noted that IF is facing some shortcomings (will be discussed later). These constitute barriers facing

emerging products and services of IF outside these geographical borders.

Our key target is to examine the resistance of this type of financing to external shocks from a comparative study dealy with 8 banking systems, each of them comprises 6 banks 3 of which are Islamic and 3 non Islamic. In fact, a sample of 48 banks from countries dealt with Islamic principles in their financial system long ago.

2. Theoretical Background

2.1. Advantages and Disadvantages of Islamic Finance

Like classical finance, this new method of financing has advantages and constraints. Before introducing them, we had better analyze the role of the financial crisis as a primordial factor in the development of IF.

2.1.1. Crisis: A Support of Islamic Finance

The Sub-prime crisis, the worst since 1929, started in the summer of 2007 in the United States with the first significant defaults on loans "subprime"¹. This severe global crisis spilled from the financial sector to the real economy, including international trade in manufactures, commodities and services [18]. It has challenged the principal of conventional finance. Big banks, whatever statutes, have greatly nourished their growth at different degrees on the development of the market activities, and particularly of the securitization² activities (Gouverné Conseil, 2007). The slower growth of these activities is ineluctable, although, again, the magnitude of the phenomenon is difficult to define precisely at this stage of the crisis. It is sure that the authorities of the banking regulation are going to encourage, with a less strength than in the past, the operations of risk transfer [19]. This financial failure leads in a first step, to a drying up of some markets of high leverage of even the securitization markets. In a second step, it exerts a pressure on the bank liquidity. The gathering of these situations leads the bank to receive at least part of their business models. This occurs even if the risk aversion of stakeholders has been almost zero until 2007. However, this uncertainty does not alter the inevitability of a change in sustainable banking strategies. They find, in fact, IF has advantages that present themselves as a reliable alternative to conventional finance, especially in times of crisis [18].

2.1.2. Potentials of Islamic Finance

IF refers to some morality and ethical finance, excluding financing of any plan tainted with wear out,

¹ Subprime lending also referred to as near-prime, non-prime, and second-chance lending making loans to people who may have difficulties in maintaining the repayment schedule. These loans are characterized by higher interest rates, poor collateral quality, and less favorable terms in order to compensate for higher credit risk

² Securitization is the financial practice of pooling various types of contractual debt such as residential mortgages, commercial mortgages, auto loans or credit card debt obligations and selling called consolidated debt as bonds, pass-through securities, or collateralized mortgage obligation (CMOs), to various investors. The principal and interest in the debt, underlying the security, is regularly paid back to the various investors. Securities backed by mortgage receivables are called mortgage-backed securities (MBS), while those backed by other types of receivables are asset-backed securities (ABS) (www.qfinance.com)

alcohol, swine meat, trade of weapons, or even speculation³ on basic foodstuffs which every Muslim must follow in every aspect of his life. In addition, Islamic financial system has proved crucial not only for the allocation and distribution of resources, as the case of their conventional homologous, but also for the stability and growth of an economy [19]. Re-structuring financial system in line with the socio-economic goals of Islam has been recognized as essential for a meaningful socio-economic reform in the Muslim societies. It prompted Muslims to establish Islamic Financial Service Industry. The objective system is show that Islamic principles, goals and values are conducive to the establishment of a system different from the conventional one [20].

Besides, the principles of IF make it a reassuring finance [21]. The majority of investment transactions are established accordance with the PLS principle (Profit and Loss Sharing). The stakeholders in the banking business are obliged to share the risk. Therefore, they are obliged to engage in profits as well as losses. Thus, they participate at degree of risk in order to legitimize the remuneration outcome of the investment project [22]. This principle is recognized in the investment activities. Most Islamic economists contend that PLS is based on two major modes of financing, namely Mudharaba⁴ and Musharaka⁵.

Moreover, the Islamic financial system plays a vital role in the development and growth of the Islamic countries thanks to the further savings mobilizing outside the conventional interest system [23]. It is really adapted to «growth-enhancing functions» [24]. Social justice and, particularly the elimination of extreme poverty are among priority areas of the Islamic financing strategies [3].

Participative intermediation is more apt to support growth of revenues and employment [1]. Compared to conventional financing mode, more funds are oriented towards productive system. In fact, Islamic financial transactions are accompanied by an underlying productive economic activity at the macroeconomic level. The long-run financing leads to reduce under-investments [25].

The Islamic finance system finances the operations linked to the real economy and the tangible assets. In fact, IF differs from traditional counterpart by its transparency and credibility. It has reliable relationships with its customers. In this case, when it prepares the contracts, the customer has the right to know all the information about the projects, object of the contract (characteristics, source, method of financing, funding period). For its part, the

bank is obliged to answer all the questions, in the context of this contract. This relationship creates trust and security with customers. This trust is essential for the development of credible long-term relationship between the bank and its customers. By analogy, one of the shortcomings of conventional finance is the asymmetry of information⁶. It described as the problem of failure of the financial sector [26]. These authors emphasized two problems of information asymmetry.

- Adverse selection-immoral behavior that takes advantage of asymmetric information before a transaction. For example, a person who is not being in optimal health may be more inclined to purchase life insurance than someone who feels fine.
- Moral Hazard-immoral behavior that takes advantage of asymmetric information after a transaction. For example, if someone has fire insurance he may be more likely to commit arson to reap the benefits of the insurance.

Moreover, IF is supposed to be a barrier in front of the crisis [27]. Besides, after the last Subprime crisis, several analysts [28,29], emphasized that the global financial crisis, which was sparked by the US subprime mortgage meltdown, would not have occurred if Islamic principles has been applied in the international financial markets. For the simple reason that this crisis puts, in an obvious place, the fragility of the capitalist system faced with speculative drift and faced with spiral of debt [31].

2.1.3. The deficiencies of Islamic Finance

The benefits mentioned above do not neglect the shortcomings of IF which are considered as obstacles for development: IF proves to have socio-cultural obstacles. Indeed, the term 'Islamic' could be a factor that attracts some people to their financial decisions. However, others refuse, in the financials operations, to be attached to religion. Muslims are considered terrorists especially after the events of September 11. In fact, after this date, there was a decline in the funding of Islamic products. [32]

Furthermore, the Islamic world is characterized by an extreme diversity. If the fundamentals of IF are universally shared by all the players in Islamic finance, in practice, their interpretation and implementation are far from homogeneous. Since the 1970s, Islamic financial institutions have an expert advice, the Sharia board (The Shariah Committee was established in accordance with the requirements of the Islamic Banking act and the bank's article of association, to ensure that the bank conducts its affairs in accordance with the Shariah principles) [33]. It is composed of experts in the Islamic law that validates compliance of the financial products offered by the rules of the KORAN [34]. The "Islamic" character of a financial mechanism is not defined by specific and immutable rules but it is determined by the appreciation of the Sharia scholars. There are different interpretations of the rules of Sharia between countries. Generally, Saudi Arabia was less liberal than the Southeast Asian countries. Oman prohibits Islamic finance while the University of Al-Azhar

³ Speculation is the practice of engaging in risky financial transactions in an attempt to benefit from short or medium term fluctuations in the market value of a tradable good such as a financial instrument, rather than attempting to benefit from the underlying financial attributes embodied in the instrument such as capital gains, interest, or dividends. Many speculators pay little attention to the fundamental value of a security and, instead, focus purely on price movements. Speculation can, in principle, involve any tradable good or financial instrument. Speculators are particularly common in the stocks markets, bonds, commodity futures, currencies, fine art, collectibles, real estate, and derivatives (www.qfinance.com)

⁴ Mudharaba is a passive participation where Islamic bank is an investor that provides the full capital amount while the client is responsible for business management. The Profits are shared in agreed portion but potential losses are supported by the Islamic bank except in the case of the manager negligence. However, IBs offer other particular types of financing such as "Zakat" financing and commercial financing based on Salam and Istisn'a

⁵ Musharaka is equity participation (active participation) of Islamic bank in the capital of a firm

⁶ Sharpe (1964) specifies that information asymmetry is a situation in which one party in a transaction has more or superior information compared to another. This often happens in transactions where the seller knows more than the buyer, although the reverse can happen as well. Potentially, this could be a harmful situation because one party can take advantage of the other party's lack of knowledge

in Egypt issued a fatwa authorizing the interest rates. The frontiers between these various positions are also unstable. The creation of Islamic bond-type instruments (in the 1980s in Malaysia) was first condemned and then copied by countries in the Middle East [35]. This divergence is explained by the difference in the analyzes and interpretations of the four schools the Islamic thought. In fact, there are four schools of thought (Almaliki, Achafi'i, Alhanafi and Alhanbali) [36]. Beside these constraints, there is the shortage of the human resources. In this case, the Islamic field is characterized by a global shortage of experienced professionals in the area of IF and gaps, such as transparency in governance and in risk management. These shortcomings are weaknesses that could undermine the credibility of the sector, particularly in times of a crisis.

2.2. Stability of Islamic Banks: Testable Propositions

A number of studies have discussed the risk implications the Islamic banks on a theoretical level [37]. Nonetheless, few studies provide rigorous empirical evidence. The majority of empirical studies on Islamic banks focus on issues of efficiency and profitability [31,38,39,40]. In this case, the only exceptions of these studies are [30,41], who show that the Islamic model is relevant in dealing with the impact of the hostile current financial crisis. These studies studying the impact of the dollar collapse as a result of the "subprime" crisis, on the return on assets during the financial period (1998-2009). The objective of [42] is to focus whether Islamic banks are more or less financially stable than the conventional banks, they authors performed a comparative analysis on a wide sample of 77 Islamic and 397 conventional banks from 20 banking systems over the period 1993-2004 with a total observation of 520 and 3,248 respectively. These authors point out that from a sample of banks divided into four sub-samples depending on the size of the bank point, the SIBs tend to be financially stronger than the SCBs, the LCBs tend to be financially stronger than the LIBs, and that SIBs tend to be financially stronger than the LIBs. Both of the last two studies refer to the Z-score as a measure of the risk of each bank.

[43] aim to examine the case of Malaysian financial system in order to determine whether banks which provide Islamic financing are less riskier than those that do not. This study has the interest of a sample of 23 banks for the period 1988-1996 and assesses interest rate, credit and liquidity risk individually. The result is that banks that provide Islamic financing facilities have significantly lower credit and liquidity risk and significantly higher interest rate risk. The studies attribute the lower liquidity risk result to the central bank (Bank Negara), a lender of last resort support for Islamic financing in Malaysia; while they attribute the credit risk results to the low credit risk products utilized by the Malaysian Islamic Financial providers. Moreover, these writers discuss the higher interest rate risk to the fact that Islamic banks are constrained in their assets by fixed rate instruments, while being subject to paying variable rate distributions to their depositors. [30-44] analyzed the effect of the recent financial crisis on the IBs and the CBs. It dealt with the effects of the crisis on profitability, credit and asset growth and external ratings of 120 Islamic and

conventional banks in 8 countries. They found that the IBs showed stronger resilience in the early phases of the crisis. However, in 2009, as the crisis moved to the real economy, the IBs profitability steeply declined relatively to the CBs. This study concludes that IBs contributed to the financial and economic stability during the crisis, given that their credit and asset growth was at least twice as high as that of the CBs. [23,45,46] declare that the dominance of less risky, low return assets deprives the bank from the benefits of portfolio diversification. Besides, Islamic financing is based on more profitable operation as the case of Mudharabah and Musharakah. They explain this behavior by the fact that sale-based transactions are less associated with moral hazard and adverse selection problems than the PLS investments [47]. Indeed, the latter need additional effort to capture good investment opportunities and analyze projects adequately. Besides, Islamic banks do not have collaterals to reduce the credit risk. Thereby, risk sharing investments require a high level of confidence and transparency between the investors, banks and depositors.

Referring to some empirical studies on the stability of the Islamic banks compared to the conventional banks, we can mention those of [41] 'The Islamic banks and the financial crisis: An empirical analysis' showed that the Islamic model is relevant in dealing with the impact of the hostile current financial crisis. These studies are devoted to the study of the impact of the dollar collapse, the results of the "subprime" crisis, on the return on assets during the financial period (1998-2009). This result is confirmed by the work of [42]. These authors, from a sample of banks divided into four sub-samples depending on the size of the bank, state that the SIB tend to be financially stronger than the SCB, the LCB tend to be financially stronger than the LIB, and the SIB tend to be financially stronger than the LIB. Both studies refer to the Z-score as a measure of the risk of each bank.

Along with the analysis of [42], we will test the stability of IBs compared to the CBs during the sub-prime crisis. From the preceding discussion, we will verify the following hypothesis:

Hypothesis: The Islamic Banks, unlike their conventional counterparts, have shown some stability and resistance to the crisis. Thus, we will assume that Islamic banks, based on the principles of "Chari'a", seem less affected by the financial crisis than conventional banks?

3. Methodology

3.1. Research Model and Measurement of the Variables

Following the example of some researches such as those of [42]; we propose to study the following model:

$$y_{it} = \alpha_i + \beta \cdot x_{it} + \varepsilon_{it} \quad (1)$$

Where:

Y: the value of Z-score;

α_i : the constant or fixed effect

x_{it} : the Vector of the explanatory variables;

ε_{it} : the error term

The explanatory variables are:

H: Herfindahl index.

MS: Market Share.
 CRD_TA: credit to assets.
 DI: Diversified Income.
 GDP: growth rate of GDP.
 MSIBD: Market Share multiplied by Islamic Bank Dummy.
 MIG: included the six governance variables.
 INF: inflation.
 ROAA: the average financial returns.
 ROAE: the average income to assets.
 CIR: Costs to Income Ratio.

3.1.1. Measurement of the Variables

3.1.1.1. Dependent Variable

The dependent variable is Z-score as a measure of the risk of each bank. The Z-score is a measure of strength of the different groups of the financial institutions. An important feature of the Z-score is the objective measure of the soundness of financial institutions. This is an objective measure. It focuses on the risk of insolvency. In other words, that a commercial, Islamic or other bank has their operations outside their reserves and equity. The Z value is explained by other variables that we will present in the next section.

3.1.1.2 Independent Variables

• Nominal variable

In order to distinguish the impact of the type of bank on the value of Z-score, we include a dummy variable. It takes value 1 if the bank in question is Islamic and 0 otherwise (for example, the case of a commercial bank). In fact, if the IBs are relatively weaker than the commercial banks, the dummy variable would have a negative sign in the regression explaining the z-score.

• Variable of interest

In our system, we examine the impact of the IB on the other banks and the hypothesis which states that the presence of IB reduces the systemic stability. For this reason, we calculated the market share (MS) of IB by assets for each bank and for each country. It reflects, in fact, the degree of market concentration. According to the study of [48], a negative sign of the interaction between the MS and the model may indicate that a higher proportion of the IBs reduced their strength (reduced Z-score).

To measure the concentration of the banking sector, most empirical studies have used indicators called concentration indices, derived from the basic financial parameters of an accounting nature, such as the customer credit, and deposits or the size measured height, in particular, by the turnover or the total assets.

To account for the variations between countries in stability caused by the difference in the market concentration, we include the Herfindahl index, defined as the sum of the squared MS (in terms of total assets) of all the banks in the country. The index can take values from 0 to 10,000 (for a system with one bank) [48].

Several empirical studies have used the Herfindahl Hirschman (HM) index of concentration. The HM index measures the concentration and the competitive pressure in the banking sector. According to [49], this index shows the concentration of the bank resources.

• Macroeconomic variables

The growth rate of the GDP: As the bank is the financial engine of development, especially in the developing countries, it is necessary to examine the effect of economic growth, measured by the growth rate of the GDP, in the banking business. Based on empirical studies, the results show that the impact of economic growth on the banking business is mixed and sometimes insignificant. [50] found that the annual change in the gross domestic product (GDP) has a positive impact on the return on equity. [51] observed an insignificant impact. While [52] reported that the intermediation margin of banks depends on the type of impact on the real activity and the direction of the relationship between the credit demands. However, the cyclical activity depends on the difference between investment and financing capacity, which can also easily increase or decrease with the cyclical activity.

Inflation: Inflation affects the banking sector through its influence on the bank credit market. Indeed, an increase in inflation causes a decrease in the real rate of returns, which will consequently affect the credit market and thus the bank profitability, because with high inflation, banks will give less credit. According to [51], an increase in inflation should have a positive impact on the net interest margin, and thus on performance.

• Participation of the state

The banking system in most economies is dominated by the State. Thus, [52] show that 40% of the banking system assets in the emerging markets are still in the public banks and the government is both the owner and supervisor of these banks, which may cause conflict of interest between the two functions.

We also considered the impact of governance on stability using the indicator of governance compiled by [53]. We have six variables measuring governance (The voice and the accountability, the political stability, the government effectiveness, the quality regulations, the supremacy of the law and the control of corruption). Those variables are into a single index per country throughout the study period (2005-2009). Captures of governance indicator inter difference between the institutional developing countries could have an effect on the bank risk.

• Control variables

To control the level of difference of the banks size, we include their variable size. Some authors such as [54,55], show that performance is positively associated with the size of the bank. According to [56], large firms tend to be closer to the efficiency frontier than small firms are. As explained by [57], large banks tend to have high market power and can therefore have input at a lower cost.

To control the composition of assets, we have introduced the loans variable over the total assets (CRD / TA) [56].

In order to control the bank's profitability, we have incorporated the cost-income ratio (CIR).

Therefore, to control the difference in the income structure of banks and their commercial orientation, we calculated a It measures the income diversity (ID) which is defined by [54] as the "Risk management in the Islamic banks". "This variable captures the extent to which banks diversify traditional loans activities (the generators of net interest income) to other activities. It should be noted that for the IB, the net interest income is generally defined as the sum of the positive income and negative cash flows

related to the agreement (SLL). The Control of these variables is important, because there are differences between the IB and the other types of banks.

3.1.2. Research Methodology

3.1.2.1. Data

Our original sample consists of the Islamic banks experiencing in Islamic finance. In fact, our sample is composed of banks considered as the first Islamic banks in the world, such as Dubai Islamic Bank established in 1975. This year is marked, as we have already shown, by the official entry of the principles of Islamic Finance in the financial systems of some countries it is the case of the Islamic Development Bank in Saoudia Arabia. All the more, our sample is drawn from countries that have incorporated the principles of Islamic finance for a long time like Bahrain and Kuwait in the 1970s. Even were some countries have opted for a convertibility of their financial system according to the principles of Islam, such as the case of Sudan. The variables in our econometric model variables were extracted from the database for each bank on the basis of the Bank-Scope provided by the Bureau van Dijk (2010) and the database published on the site: <http://www.govindicators.org>. From this data panel, the following modifications were made: since the data for Islamic and conventional banks are not available, they are excluded from the analysis sample. These various changes made us end up with a sample of 48 banks of 8 countries including 24 Islamic and 24 conventional banks, that is to say a total of 240 observations seen over a 5 years period (2005-2009).

• Preliminary Analysis

Comparison of Z-score between IBs and CBs.

The values of Z-score are presented in the chart below

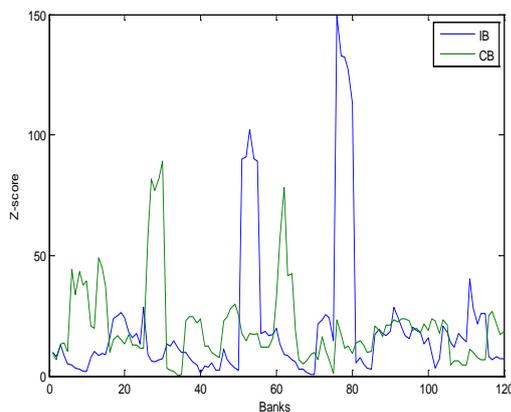


Figure 1. Comparison of Z-score between IBs and CBs.

The variable Z-score reflects the degree of the financial soundness or even stability. A preliminary look at the z-scores shows high variability across the sample. However, we compare the values of Z-score for both types of samples. We can note that, in general, there was not much difference between the two sub-samples of both types of banks. This approximation in the values of Z-score shows that IBs does not completely escape this latest crisis. Indeed, the recent financial and economic crisis is considered the worst since 1929. It affects all the sectors and services. It appeared in the United States during 2007 and spread through contagion affecting other countries in

the world. As a part of the financial system and interdependence from other parts, the IBs are also affected by the crisis. By reference to the empirical studies in this context [42,58,59], we shouldn't explain this doubt on the stability of the Islamic banks by their principles and funding modalities. More important too is the mean and median of the Z-score value⁷. We found that the IBs are more stable on average. However, the median value shows a greater stability for the CBs compared to the IBs. Taking into consideration the character of the average sensitivity, we can deduce that our sample of IBs is dominated by some banks that have a high stability. This shows an even heterogeneity within the sample of IBs. Nevertheless, taking the median as a comparative tool, we find that its value is greater for CB compared to IB. Therefore, CBs appear a more favored position in terms of Z-score. We can't move without noting, in this context, that Islamic banking must undertake various actions to improve its stability and compete with its conventional counterparts.

In summary, we can say that the difference in mean is much greater than the one in median. However, the curve that traces the evolution of the Z-score for both categories of banks shows a superiority of the value of Z for some Islamic banks, which gives a more favorable opinion to the IBs than to the CBs in terms of stability.

Comparison of market share for IBs and CBs

The chart below outlines the evolution of the two curves of MS for the two subsamples.

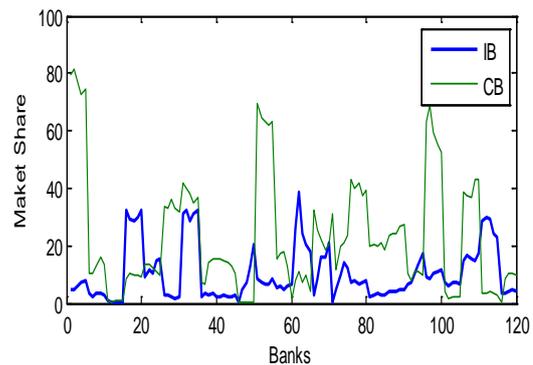


Figure 2. Comparison of Market Share between IBs and CBs

The apparent remark deduced from the curve confirms that there is a big difference in MS between the two types of banks in favor of CBs. The values of the mean and the median are superior in the case of CBs over IBs⁸. Our results are also confirmed by Statistical, Economic and Social Research and Training Centre for Islamic Countries on May 2012. In fact, they noted that the global market for Islamic financial services, as measured by the total volume of Shariah compliant assets, is estimated to have reached US\$ 1.1 trillion at end-2011. The Islamic finance industry is still growing at an exceptional rate as more companies expand into or further develop their offerings in this area. These results are compatibles with the logic of the IF's history. The Islamic finance industry is still

⁷ The arithmetic average of Z-score = 23.81 (IBs) > the arithmetic average of Z-score = 18.66 (CBs) # the median value of Z-score = 16.94 (CBs) > the median value of Z-score = 14.80 (IBs)

⁸ The arithmetic average of MS = 22.86 (CBs) > the arithmetic average of MS = 10.38 (IBs), the median value of MS = 13.49 (CBs) > the median value of MS = 14.80 (IBs)

growing at an exceptional pace as more companies expand further on develop their offerings in this area.

These results highlight crucial remarks. In fact, it is essential to focus on the opportunity of the IB stabilization during the crisis to become known worldwide with its resources and financing techniques. In addition, to overcome the shortcomings mentioned above, especially in terms of heterogeneity of conduct's rules, IBs are not solely responsible in this context. It is a matter of cooperation and coordination between the different partners namely the State, the researchers, the managers ... to present these new financing techniques. Indeed, with the media, programs and training sessions, we can help customers to know the products and the principles of Islamic economics in a broader perspective. Certainly, compared to other economic theories, the latter is in its early stages despite its distant origins.

The total assets of the Islamic financial institutions increased from 20 billion in 1983 to more than \$ 700 billion (Rapport mondialsurl'argent dans le monde 2008, Association d'économie financière). Especially, it has been experiencing a remarkable total since the 2006 boom. This date coincides with the early stages of the outbreak of the latest crisis. This shows the usefulness of Islamic products to customers in their financing. Thus, it is necessary, to introduce the other products such as Salam, Mouzara'a, Mugharasa, Musakat... beside the Murabaha, Mucharaka, Ijara ... to attract more customers. This strategy helps the bank, on one side, to increase its profitability and on the other side to expand its market share.

The growth in the size of the banking sector for CBs provides a greater market diversification both geographically and spectrally levels. If one refers to the mode of operation of conventional banks, it appears that their market power allows them to set up branches in many areas. In addition, their capacity of innovation in products and technology makes them adapt many potential financial activities. The only requirement for the implementation of these innovative processes is the cost of generating substantial long-term profits. The two factors (economies of scale and performance) clearly explain the movements of the increasing bank concentration. According to the classical hypothesis of structure-conduct-performance, single concentration can acquire windfall profits [60].

This advantage of CBs, consequently, improves competition between these two types of banks. The IFIs must innovate in terms of financing products and more particularly those of long-term such as Istisna and Salam. Murabaha and Ijara are, globally, the dominant mode of Islamic finance. However, profit and loss sharing transactions only account for about five per cent of the operations of Islamic financial institutions [61]. In a typical Islamic Bank, non-PLS forms dominate the assets portfolio and can exceed 80%" [62]. An empirical investigation in this area, during the period (1994–1996), while focuses on the financing patterns of the world 10 largest Islamic banks, confirms these observations. This study indicates of the US \$8.56 billion of financing during this period, PLS accounted for only less than 14% of, with Murabaha alone accounting for 65.66% [63].

• Descriptive statistics

The statistical summaries for both categories of banks are given in the table in the Table 1 below.

Table 1. Descriptive statistics

Variables	Islamic banks		Conventional banks	
	Average	Std-dev	Average	Std-dev
CDR_TA	43,90	21,61	41,97	21,55
ID	0,56	0,53	5,85	58,32
ROAE	16,12	69,17	14,77	15,17
CIR	278,70	1618,70	178,38	958,04
SCORE	23,81	32,09	18,66	15,62
MS	10,38	9,46	22,86	20,80
Equity_TA	24,33	24,52	20,24	18,58
ROAA	1,00	10,17	1,9	3,05
H	0,34	1729,65	0,29	1950,18

The values in italics show a big difference between the IBs and the CBs. The diagnosis of the table shows that there is a big difference between them in some variables, such as ID, CIR, MS and H.

The ID value, in the context of CBs, is greater than that give IBs⁹. Revenues are more diversified for CBs. This result is anticipated: IBs have constraints dictated by the Islamic law to manage their businesses. The principle of prohibition of financial illegal sectors dictated by Islamic law reduces the fields of application and funding IFIs compared to their conventional counterparts. In effect, the IFIs are confronted with an environment of intense cultivation [64]. In addition to the constraints dictated by the laws of finance, these institutions have constraints imposed by Islam, such as the three negative principles (Prohibition of interest on loans, conviction Maysir and gharar (speculation) and prohibition of financial illegal sector. This finding confirms our previous results related to the market share. Similarly, it is necessary for the IFIs to innovate and diversify the financing products in order to overcome these various constraints. Moreover, Islamic economics presents a range of financing products and investment. The role of the IBs, in this context, is to focus on these products. More particularly, these banks should focus on participatory operations (Musharaka) and SLP which enable them to attract more customer. The table shows a large difference in the values of CIR for both types of banks. Under their financing operations, IBs are based on more reliable and credible operations than CBs. As we have previously reported, the IF is a reassuring finance. It enters in more credible and secure operations. A critical review of this finance can reveal that it is strongly linked to the real economy. These features help reduce the problem of information asymmetry, one of the shortcomings of conventional finance. The certainty in the various operations and techniques of Islamic finance makes Islamic financing certain. In addition, it reduces the financial risk, in particular the risk of default against the party.

MS for CB is 22.86. It is superior to that of the IB, which is equal to 10.38. Based on the analysis of [48], CBs are more efficient than IBs. This can be explained by the strategy of consolidation adapted by CB. This strategy is, therefore, the formation of a group of "Holding" banking. This combination improves the efficiency of banks. Besides, the difference in the values of the MS confirms our findings discussed above. It recalled the different strategies that should be followed by the IB in terms of product diversification.

The comparison of the concentration index (H: Herfindahl index), shows that IBs, with an index of 0.34, are more concentrated in a few CBs. These results are

⁹ ID (CBs) = 5.58 > ID (IBs) = 0.56

anticipated. Even more, they are compatible with the reality. In fact, some IB appeared about 40 years ago such as Dubai Islamic Bank. However, others came out more recently on the financial market. The most important thing is that the difference in the value of H improves the argument relating to the stability of IB. Moreover, referring to the value of the average Z-score, this gives more support in terms of stability for the IBs. In fact, an average analysis, in general, as we have already noted, shows the concentration of the sample of the study in some individuals. The particularity of these individuals will influence the overall characteristics of the study sample in our case.

We must also note that there is a small difference between the two categories of banks in terms of concentration. It is clear that in both sub-samples, there is an unequal distribution of resources, which shows that wealth is concentrated within a limited group of the banks.

For the five remaining variables, Equity_TA, ROAE, ROAA, CDR_TA and the score Z, the difference is not significant. Therefore, we conclude that variables ID, CIR, PM and H discriminate the IBs against the non-Islamic ones.

Referring to the value of the Z score, we can say that, for our sample, there is not much difference between traditional banks and IBs. This approximation to the values of Z leads us to use our results with caution. In order to find an adequate response, we will eventually deepen our study. According to the size of the bank (large or small), we divide the two categories of banks in two subsamples. Referring to the size of the bank, we will decompose the study sample into four sub-samples (large Islamic banks, small Islamic banks, large conventional banks and small conventional banks). Then we will compare the Z-score of the four groups of banks. It is our objective in the rest of our study.

• Comparison of Z-scores for the SIBs, the SCBs, the LIBs and the LCBs

The SIBs show a significant value of Z 27.95 higher than that of SCBs with a value of 14.25. Thus, the SIBs are more stable than the SCBs. These results are the same as the ones generated by Martin and Heiko but with a difference in the degree of significance. Since, in their study, they found that the SIBs are slightly more stable than the SCBs. The figure below presents the value of Z-score.

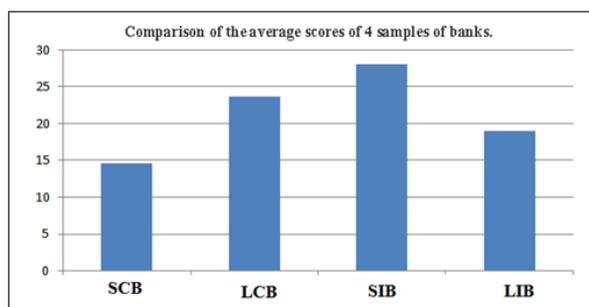


Figure 3. Comparison of Z-scores for the SIBs, the SCBs, the LIBs and the LCBs

This approximation result suggests the benefits of instruments and funding principles based on Sharia. The study of these two researchers covers the pre-crisis phase (1993, 2004), while, our study was introduced during the

crisis period. Despite the diversity of the two samples, we get the same features for the four sub-samples in terms of stability. These results may be an argument to generalize the benefits of the IFI in stabilizing and supporting the funding system as a whole.

The SIBs are more stable than the LIBs. This difference shows that the risk of Islamic activities is increasing with the size of the bank. In other words, entering into more sectors, an IB sees its stability decrease. This is another reason and another justification of the failure of IB in completely removing financial risks. These deductions advance some recommendations for IB and, IFIs in general. Touching other areas, these institutions should be more cautious and more attentive to the specific market risks. The important thing, besides expanding their activities, Islamic banks character must make a diagnosis and feedback for the new range of customers, new partners as well as the techniques of finance and investment. More downloads; they should take an interest in the real economy and the safer activities that are less risky.

The LIBs have a score of 18.93, slightly lower than that of the LCB, which is 23.54. We can then deduce that, for our sample, the LCBs manage less risky operations than those performed by the LIBs.

Moreover, a major lesson of the crisis and one of the most serious problems of the conventional system is the “decoupling” of the financial system from the real sector of the economy. In 2007, just before the crisis appeared, the total available financial instruments (mostly derivatives) represented 12.5 times the total global GDP. An inverted colossal pyramid of debt was created on a much smaller base of the real sector activities which, ultimately, have to be relied upon to validate the debt created. This is an incredibly valuable lesson for Islamic financial as it continues to innovate more liquid product. IFI should seek ways and tools of innovation, more medium to long-term instruments of risk sharing rather than short-term instruments of risk transfer or risk shifting [14].

The IFIs are based on principles of stability, investment and economic development. In fact, the practice of interest rate suffers several gaps. Keynes considered that capitalism suffers from two “evils”; first, it cannot create full employment on its own without the government intervention and second, income and wealth would be ill-distributed. He believed that the interest rate mechanism was the “villain of the peace”. Without it there would be stability in the market and the surplus income would be directed to investment activities [65].

3.2. Analysis of the Results

Our objective, in this section, is to find the variables that characterize the Islamic banks. In practice, we made use of a discriminating analysis, setting the variable as a criterion for IBD discrimination and test whether there are significant differences for the other various variables specific to banks.

Following the example of some researches [42]; we propose to study the following model:

$$y_{it} = \alpha_i + \beta \cdot x_{it} + \varepsilon_{it}$$

Where:

y_{it} represents the Z-score endogenous variable.

x_{it} represents the vector of the last indicated exogenous variables.

In order to test the presence of collinearity problem, we can use the correlation matrix.

Table 2. Correlation Matrix

	Zscore	ROAA	ROAE	INF	PIB	MIG	CDR_TA	ID	CIR	H	MS	IBD
ROAA	.791**	1										
ROAE	.627**	.496**	1									
INF	.407**	.202**	.051	1								
PIB	.387**	-.117	.132**	.514**	1							
MIG	.052	-.029	.484**	.238**	-.052	1						
CDR_TA	.067	-.027	.181**	.147*	-.142*	-.294**	1					
ID	-.094	-.051	-.263**	-.265**	.008	-.555**	-.084	1				
CIR	.220**	.846**	.791**	-.033	.077	.408**	.094**	-.294**	1			
H	.869**	.681**	-.759**	.081	-.015	-.129	.109	-.622**	-.169*	1		
MS	-.639**	-.025	.846**	.831**	.407**	.670**	-.842**	.842**	-.479**	-.094	1	
IBD	.608**	-.108	.148*	-.237	.136	.025	.142*	.003	-.068	.108	.009	1
MSIBD	.618**	.142*	.815**	-.479	.160*	.048	-.237**	-.368**	.759**	-.067	.671**	.494**

In general, the matrix shows that the correlation between the variables is not strong and that the multicollinearity problems are not several. [66] points out that multicollinearity is a problem when the correlation is above 0.8 which is not the case here. However, it is worth noting that the MS and MSIBD variables are highly correlated with most of the economic freedom variables.

3.2.2. Homogeneity Test

We notice, from this test, the presence of a significant individual effect. This result confirms the heterogeneity of our sample. Indeed, Fisher's statistics and chi-square are significant at 1%. Indeed, our study focuses on two categories largely distinctive, namely the IB and the CB. In fact, the IB have their own funding principles (prohibition of Riba, gharar and Maysir and condemnation of illicit financing sector, the payment obligation of "zakat" and financing real activities). These principles diversify these banks compared to their conventional counterparts. Moreover, the divergence of the IB to the CB is also approved by their financing products. Besides, in most financing contracts, the IBs establish a participatory financing relationship with their customers such as the case with Mudharaba. They take a financial risk with their customers.

In addition, this heterogeneities explained by the diversity of the countries in our sample. Our investigation includes countries characterized by a difference in their economic environment. It distinguishes the oil countries, such as Arabic Saudi, Kuwait, and Bahrain. According to some observers, the spectacular development of Islamic finance in the 1970s is a direct consequence of the exploitation of oil fields in the Persian Gulf and the wealth that this industry has generated. However, this method of financing is developed and rolled out in several non-oil countries such as Malaysia. This may be an argument for those who believe that Islamic finance can only grow in the oil countries (rich countries). The heterogeneity of our sample can also provide more information and improve our results.

The presence of individual effects leads us to test whether this effect is fixed or random. For this purpose, we will use the Hausman test.

3.2.1. Multi-Collinearity Test

The Table 2 below provides information on the degree of correlation between the explanatory variables used in the panel regression analysis.

3.2.3. Hausman's Specification Test

The Hausman test is to determine whether the coefficients for the two estimates (fixed and random) are statistically different. In this case, the fixed effects model is better for our case because the probability of this test (Prob> chi2 = 0.0168) is below the threshold of 5 %.

3.2.4. Regression Results

The estimation of the other coefficients associated with the various explanatory variables is given in the Table 3 below.

Table 3. Regression results

Variables	Coefficients	Std. Error	t-Statistics	Prob
C	41, 2460	9.185304	4.490437	0.0000
H	0.000656	0.001788	0.367028	0.7140
MS	-1.238760	0.338655	-3.657885	0.0003*
CDR_TA	0.031555	0.041456	0.761163	0.4476
ID	0.004657	0.010287	0.452673	0.6513
PIB	0.311086	0.256125	-1.214584	0.2261
PMIBD	0.069338	0.032841	2.111298	0.0361
MIG	10.65499	9.742370	1.093676	0.2756
INF	0.128702	0.167241	0.769560	0.4426
ROAA	0.144065	0.033808	4.261257	0.0000*
ROAE	-0.011245	0.007475	-1.504348	0.1342
CIR	-2.56005	0.000334	-0.076471	0.9391

From this table; it is clear that variable MS is important in determining the Z-score. The impact of this variable on the value of Z score is negative; however, it will have a positive effect if it is associated with the dummy variable of BI (MSIBD). For IB, the extent of the available resources is seen as a determinant of the soundness of banks.

Moreover, according to Martin and Heiko, if the IBs are relatively weaker than the CBs, the dummy variable will have a negative sign in the regression explaining the Z score, which is not the case in our model, since the coefficient of the variable MSIBD is positive (0.069). So, we can conclude that the impact of the IB in financial stability is important.

These results are largely developed by several economists [18,31,41,67,68]. Indeed, the recurrence of bank failures and the onset of the last crisis cast doubt about the principles of both systems (capitalist and socialist). Therefore, these economic changes highlight a new funding system based on Islam in its operations. In this context, it is essential for the IFs to take advantage of these various upheavals to be introduced into the global financial system. Without doubt, this is the perfect time for these institutions to expand into more territories in the world. It is also the right time for these institutions to meet some of their obstacles and enjoy more market so that they can compete with the conventional institutions.

The impact of the variable (ROAA) is also significant in determining the Z-score. Moreover, its coefficient is positive on the value of the score. Therefore, the financial profitability is also added as a key variable of the financial stability in various banking firms. This effect is clearly positive. Concerning the remaining variables, we notice that they don't have a significant effect on the determination of Z. we can mention, for example, the CIR variable which appears insignificant and has a negative effect on the value of the score, as it is the case for the GDP and ROAE variables.

The variables H, CDR-TA, ID, G, and INF don't have a significant effect on the Z-score, but have a positive effect on the value of the Z score, since the coefficients are positive in the regression explaining the Z-score.

In conclusion, our results confirm the results generated by [42]. Indeed, comparing the four groups in our sample, we find that the SIB tend to be more financially stable than the SCB, the LCB tend to be financially stronger and the SIB tend to be financially stronger than LIB. However, these researchers found that variable MS of the IB does not have a significant impact on the financial strength, which is not the case in our study. This can be explained by the specific characteristics of the sample of each study and by the difference in the period of the study.

The contrast between the stability in the SIBs and the weak stability in the LIB is particularly interesting. This suggests that the IBs, while being relatively more stable when they operate in a limited market, are less stable when they produce their work in a broad market. Moreover, it is much more complex for the IB to adjust their monitoring system of the credit risk as they become larger. Because of their limitations in the standardization of the credit risk, the management and the monitoring of the various losses and profits are rapidly becoming much more complex than the magnitude of the growing banking operation, the thing which leads to problems of more and more important adverse selection and moral hazard. Another possible explanation is that small banks concentrate on low-risk investments, while large banks perform more operations of profit-sharing and risk as the operation of Moudaraba, Moucharaka and Mourabaha in which the bank assumes the liability of losses, with the borrower. Thus, the LIB operations are exposed to more risk than those made by the SIB.

4. Summary and Conclusion

Our study deals with 48 banks of 8 banking systems half of which are Islamic banks. Thus, since the

phenomenon of growth and the spread of Islamic financial institutions, the IF becomes a global concern for researchers. However, these various concerns are directed towards the theoretical literature and show the usefulness of the IF in front of a financial crisis. However, the empirical studies on the issue of the IF are virtually ignored. Thus, our investigation can be an empirical answer to the stability of the Islamic banks in the study sample. Moreover, our sample includes banks in countries where the presence of the Islamic population is important, such as Malaysia, Pakistan and Saudi Arabia. Besides, the majority of Islamic banks in our sample have approached the principles of IF for several years, so, they have rather an important part of the Islamic practices. In addition, the study period, which lasts from 2005 to 2009, seems to be representative since it encompasses the period of the sub-prime crisis.

The dependent variable Z-score, which measures the risk of the banks, is considered a popular measure of the soundness of banks, which improves the relevance of the results of the study. It has also introduced several variables in order to provide additional information to make our results more credible.

It may be mentioned that, despite the increased utility in the professional and academic circles, the IF is a discipline insufficiently known outside its geographical 'natural' borders. The arrival of these financial products in Western economies provokes debates at various levels.

Some authors interpret IF as a useful tool to save the global economy. They see it as an opportunity to grab the values and principles that vehicle (le lauréat 2001 du prix Nobel d'économie Joseph Stiglitz). It should be noted, in this context, that it is true that the "subprime" crisis provides one more chance and benefits for the IF.

This failure introduced Islamic finance as an alternative to the conventional one. However, it brings more responsibility to the Governors of the IFs. As we have already mentioned, they must firstly diversify the financing products and investment focusing on those of participation based on the principle of PLS. On the other hand, they must ensure the compatibility of this system operation with the Sharia law.

The confusion between religious ethics and financial techniques that this new funding represents raises many more or less justified concerns and controversies. It is thus sometimes considered incompatible with a secular society built on the separation between the church and the State. In addition, the IF has brakes that hinder its development. Indeed, should Islamic financial institutions adopt the same regulatory framework as their conventional counterparts, or is it time that the authorities develop specific rules for Islamic banking?

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