Deficiency Risk in Islamic and Conventional Banks

Korbi Fakhri

Abstract—In this article, we have elaborated a study over the nature of financial intermediation in Islamic banks by comparison to those of conventional ones. We have found a striking difference between two kinds of intermediation. We tried, from another side, to study the relationship between the capital level and deficiency risk relying on econometric model, and we have obtained a positive and significant relation between the capital and the deficiency risk for the conventional banks. This means that when the capital of these banks increases, the deficiency risk increases as well. In return, since the Islamic banks are constrained to respect the Sharia Committee as well as customers' demands that may, in certain contracts, choose to invest their capitals in projects they are interested in. These constraints have as effects to reduce the deficiency risk even when the capital increases.

Keywords—Conventional bank, deficiency risk, financial intermediation, Islamic bank.

I. INTRODUCTION

THE management of assets and liability is a vital task for every bank as far as a good direction allows its stability; however, a bad running forewarns its disappearance. Equity of a bank is among the most important rubrics in the liability side because, actually, these funds ensure three notably primordial functions for the survival of the bank. From one hand, equity is useful to bankroll the investments and cover the unexpected losses. From another hand, they attract the fund lessors since they inspire trust.

For this reason, it is of a paramount importance to focus on equity and to make a comparison between those of Islamic banks and the hints to the markets about its vulnerable position, instability and threatened security in case of unexpected risks. On the same scale, an overcapitalization allows us to conclude that the capital is ill-managed and not used in an optimal and efficient way. As a matter of fact, banks must fix the level of their equity avoiding at the same time abuse and deficiency. Added to this, are the banking regulations which impose a certain Capital level toward agreements of Bale 3 that should be implemented from now till 2018.

In this article, we analyze why Islamic equities are oversized. Then, we will explain the reasons for the capital level differences between the two types of banks basing the research on the relationship between the capital level and the deficiency risk and how we can empirically prove it.

With the emergence of the Islamic banks, we have witnessed an alteration in the banking intermediation way [1], [2]. In the classical banking system, the relationship between

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the bank and its customers is restricted into lend-borrower relation, whence, the customer trusts his savings in the bank in return to an amount of benefit paid every end of a given period. Through this kind of intermediation, deposits as well as benefits are guaranteed and pre-determined.

This system is totally different from the Islamic banking system, in which case, neither deposits nor output are guaranteed. Indeed, the Islamic bank collects deposits via different types of contracts. The customer confines his money to the bank which engages itself to invest within projects. In shorter term, if the project is profit-making, benefits will be shared according to fixed proportions at the moment of signing the contract. If it is not the case, only the customer sustained the losses linked to this project [3], [4].

II. THE BANKING INTERMEDIATION

According to Khoja [3], the Islamic bank is defined as a financial institution which has as a goal to collect funds and invest, by remaining within the limits of Islamic Sharia, and this, in the optical to achieve a certain social balance, hence, a fair, by respecting the principles of Islam since they assure a better allocation of financial resources, thus, a just distribution of income. However, the principles that govern the running of an Islamic financial system are different from the conventional financial spirit. At this stage, it is legitimate to ask whether the intermediation nature in the Islamic bank is different from that of the conventional bank.

Contrary to the old banking system, depositors in the Islamic banking system may be likened to investors or shareholders as far as they are able to win dividends in case the bank makes profits, or loses a part of its capital in the opposite case. It is on the principle of profits losses sharing that Islamic banks operate. So, the most earned of investors is directly linked to the projects efficiency, to their quality, and therefore to Islamic banks [5].

The traditional financial intermediation is defined as the transformation of household's savings which have monetary surplus for the investors who are always in search for liquidity via financial intermediates. The existence of the last is primarily due to the absence of coherence between agents surplus requirements with the needs of deficit agents. No one can ever deny the primordial role of financial intermediates in the economic development in spite of the leaning toward disintermediation and the direct use of capital markets.

Thanks to the intervention of these intermediates, we are able to respond to the savers' requirements and investors' needs. Indeed, households' deposits have to undergo some alterations so that they respond to the expectations of Capital Applicants in order to be useful to economy. The major conversions are at the level of the amount and the date of

payment because savings are in general small amounts and short-termed whereas loans stand for high, average and long-termed amounts.

The relationship between Islamic banks and their depositors differs so much from that of the conventional banks with theirs. Indeed, the majority of contracts between the Islamic banks and the savers are based on the Mudaraba contract. Through this contract, banks do not guarantee a fixed output over the deposited amount. The return on savings is defined according to the sharing of earnings and losses principle, which means also a risk sharing contrary to the conventional banks. In fact, through the investment accounts which constitute the main source for Islamic banks funds, customers save their money in an Islamic bank which engages itself to look for a profitable investment without, however, warranting the rate of the return. At maturity, depositors perceive remuneration based on the sharing of profits losses principle [5].

It is noteworthy that for the investment accounts, we can discern two account categories: the standard accounts and the assigned accounts. The difference between both of them is that in the first category, called also unrestricted Investment Account, funds are unlimited and integrated in an instantaneous manner with the bank's funds to create a pole investment; which means the minimal risk compared to the assigned (2nd category) or restricted Investment Account where the amount of investment is limited and the customer is the only responsible for the investment choice. This account is less diversified, so, it is in general riskier. In practice, all the conditions are imposed by the bank. The minimum capital, the term/date of payment, the financial commitment and even the distribution rate in order to reduce risk.

It is noticeable that the Islamic bank stands for funds manager. It collects the deposits of excess agents and meets the needs of Applicants Capital. It ensures through these contracts a link between these two types of customers. By signing the Mudaraba contract with the bank, depositors trust a sum of money to their bank and allow it to invest in profit-making projects. This profitability is not assured. The customer runs the risk of losing his initial capital, as he may has a positive return and therefore his capital increases. From another side, the bank injects this savings within economy through the contracts suggested to the contractors who have projects to achieve, the knowledge to succeed, but they have lack of funds. In this case, the bank ensures the role of a real partner [6].

Consequently, it is obvious that the Islamic bank way of operating is very different from that of a conventional bank which fulfills predetermined profits depending on the benefit margin: the conventional bank collects the savers' deposits, guaranteeing to them their initial deposits with interests, then, it makes these deposits available for borrowers by requiring interests as well, which are most of the time greater than the interest rates promised to depositors. As a matter of fact, the bank makes profits drawing gains from the difference between the two interest rates. For the Islamic bank, it is a totally different way of functioning. The latter is basically operating on the principle of sharing profits and losses. Indeed, banks collect excess agents' deposits and put them at the disposal of managers in search for capitals to make them fruitful and fulfill profits. These achieved earnings will be then shared between managers and the Islamic bank according to predetermined proportions. After that, the bank shares the same earnings with the savers always into proportions fixed at the moment of depositing money. Similarly, if the manager does not succeed in making gains, losses will be divided according to the capital contribution. Thus, the system is called system of profits losses sharing. Accordingly, the system applied by the Islamic banks is more fair and egalitarian. In the modern capitalist economy, the interest is the only instrument which allows a return on funds invested. In Islamic doctrine, interest is strictly prohibited and cannot be used to fructify these funds. Consequently, independently from achieved benefits or undergone losses, interests predetermined by a fixed rate, even consented between the lender and the borrower, does not answer the needs of economy [7]. Contrary to the Islamic contracts which do not consider a fixed rate of return, the return is based on the real profit achieved by the company.

In case of classic loan, the donor cannot sustain any loss whereas in the Islamic contract; he can undergo a loss if the company does not manage to make earnings. Islam considers the interest as an unfair financial instrument since it brings about injustice for the creditor as well as debtor. If the debtor sustains a loss, it is unjust from the creditor part to ask him for a fixed return rate. As well, if the debtor receives a very high return rate, it is unfair, from his part, to give only a small proportion of the earnings and keeps the remains for him. From the above data, we conclude that the Islamic financial system is not only completely different from the conventional system but also more equitable and beneficial to real economy.

Another feature of the Profit-Sharing Investment Accounts (PSIA) is that they are classified in a balance sheet in Islamic banks in a specific case [8]. They are not considered as classic debts toward depositors because these funds are not guaranteed. By saving his money in investment account, the customer must expect either an increase of his capital in case of a positive return, or a decrease of his capital in case of loss. The bank is not concerned with guaranteeing his capital. We cannot consider them as equity because they are determined, also their holders do not have the rights that shareholders do (right of voting, right of management). The Islamic bank classifies its PSIA accounts within an intermediate category between debts and equity. They are considered as hybrid capitals which are capable of soaking up eventual losses.

We can find also in this intermediate case Profit Equalization Reserves (PER) and Investment Risk Reserves (IRR). These two reserve accounts are made in place in order to smooth the return efficiently deposited for the benefit of investment accounts holders. Indeed, this return smooth is a very widespread practice among Islamic banks. It is about making aside a proportion of the assets return as being reserves when this return exceeds a given level and to vanish

in these reserves when the return is under this level. These reserves are, then, considered as parts of equity. So, it is this feature of calculating capital ratio which takes into account specificities of investment account PSIA as well as the establishment of PER and IRR reserves which mirrors the over-dimension of Islamic banks capitalization vis-à-vis to their conventional counterparts [9].

III. The Relationship between the Capital and the Deficiency Risk

In spite of the efforts made on the subject, the relationship between the capital and the deficiency probability has not been defined with certainty. Indeed, a negative relation may occur between the deficiency risk and the capital level as far as this latter represents the ability of the bank to sustain losses in case of specific crisis or insolvency. In this case, the higher the capital of the bank is, the weaker the risk of bankruptcy will be. From another side, we can pretend a positive relation between the capital and the deficiency risk because since the capital is very expensive, banks are induced to take proportional risk in order to obtain a sufficient profitability. This motivation to undergo risk, sometimes disproportionate as it may be, makes the deficiency risk increase. Another argument which explains this positive relation between the capital and the deficiency risk is by considering the capital as a margin of security in case of loss, a high level of capital may reduce the effort in the subject of project selection and supervision. According to these two hypotheses, the relation between the capital and deficiency risk remains ambiguous [10], [11]. Despite this ambiguity, the capital remains always the most revealing indicator of the bank solidity. It has been the object of many regulations in order to find the best combination which does assure us over the solidity of banks. Thus, in 1992, the Cooke ratio was introduced on a worldwide basis. This ratio has as a target to fix the limits the relation between capital of a bank and its risky assets up to 8% so that banks can cope with imponderables. Many critics refer back to this ratio notably that it takes into account the level of risk linked to attributed credits. For this reason, Cooke's ratio was replaced by that of McDonngh. Considered to be more delicate, this ratio will separately take into account the risk linked to credits, market risk and the operational risk. In spite of this device, the banking system remains very vulnerable. It is certain that the solidity of banks increased but we are still too far from an ensuring banking system. The 2007 crisis rang the alarm bell among the banking field. New measures have been taken to strengthen the financial system and new ratios must see the light sooner. We have already studied reforms of Bale3 which have as an aim to establish liquidity ratios for international banks and of a ratio of lever effect. The agreement of Bale3 puts into question the definition of proper funds (notably tiers1) and requires the establishing of countercyclical measures. Two liquidity ratios begin to present themselves: The first is the Liquidity Coverage Ratio (LCR) which is one-month ratio and aims at allowing banks to resist sharp liquidity crisis. Its principle is that the reserves of liquidity must be always superior to possible losses after a crisis. The second ratio is the Net Stable Funding Ratio (NSFR) which aims, from its part, at allowing banks to resist when meeting crisis linked to the institution. Its principle is that the needs of stable resources must be inferior to the available resources.

Several studies focus on the relationship between the capital and the deficiency risk, but results are very nuanced. Indeed, according to the used empirical method and the sample selected [11], [12]. We estimate that this work will be more complicated if we add the Islamic aspect or not of banks. By making this distinction between Islamic banks and conventional ones, we study at the same time differences between banks and the relation between the capital and the deficiency risk inside each one of them.

IV. Data

For this, we consider a sample of 270 Islamic and conventional banks in 12 countries (Bahrain, Egypt, Indonesia, Jordan, Kuwait, Malaysia, Mauritania, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen). These ratios are calculated using the banks' balance sheets which are extracted from the Bankscope database, provided by bureau Van Dijk. In this study, we focused only on fully fledged Islamic and conventional banks and we used unconsolidated bank statements whenever consolidated statements are not available. Our sample is constituted of 39 Islamic banks and 231 conventional banks countries where Islamic banks assets account more than 1% of the total banks assets at least in one year in the period of analyse during 1993-2011.

V. Methodology:

Referring back to financial literature, we keep models suggested by Roy [13], Boyd, Graham [14], Goyeau and Tarazi [15] who allow us to define a measure for deficiency risk. These models define bankruptcy probability of a bank as the probability that these losses become superior to these proper funds: we can therefore deduce:

Deficiency probability = Prob ($\prod$ < - K)

Going back to the method used by Boyd and Graham [14] which is an approach in terms of assets' return, we obtain:

$$deficiency\ probability = prob\left(\frac{\Pi}{A} < \frac{-K}{A}\right)$$

where A = total assets; R_A = ROA return on assets

If we suppose that $R_A \frown \boxed{}\ (ER_A, \sigma\ R_A)$ and $(K/A) = \lambda$ we find

$$deficiency\ probability = prob(\frac{R_a - E_{Ra}}{\sigma R_a} < \frac{-\lambda - E_{Ra}}{\sigma R_a})$$
$$= prob\left(\frac{R_a - E_{Ra}}{\sigma R_a} < -\left(\frac{\lambda}{\sigma R_a} + \frac{E_{Ra}}{\sigma R_a}\right)\right) = prob\left(\frac{R_a - E_{Ra}}{\sigma R_a} < -Z\right)$$

with Z is the indicator of the bank deficiency. A strong value of Z corresponds to a weak deficiency risk.

We will proceed to three estimations: First, we will explain the relation between the capital and the deficiency risk. We

will measure then, the impact of the same capital ratio over the economic profitability and the standard deviation of this profitability, two variables entering in the construction of deficiency indicator. Such decomposition will allow knowing whether the sign of the relation between the capital and deficiency risk is explained by the risk or the profitability. The estimated relations are written as 3 equations:

- $Z_i = Xi\ \alpha_j + \boxempty i_{,j}$
- $ROA_i = Xi\ \alpha_j + \boxempty_{i,j}$
- $\sigma ROA_i = Xi\ \alpha_j + \boxempty_{i,j}$

Xi represents the explanatory variables

$$Xi = \{CAP_i\ ,\ DEP_i\ ,\ LLP_i\ ,\ LOAN_i\}$$

with CAP_i = Capital to assets; DEP_i = Total deposit to liability; LLP_i = Loan Loss Provision; $LOAN_i$ = Loan to assets.

After being assured that there is no multicollinearity between the explanatory variables of our model; estimations are made first on the whole sample, after that, we will execute estimations for each bank aside.

VI. INTERPRETATION OF RESULTS

For our first sample which represents the whole of banks (Islamic and Conventional), we find results in Table I.

TABLE I
REGRESSION OF 270 BANKS

	Regression 1	Regression 3	Regression 3
	Z	ROA	σROA
	Overall Sample(270 Banks)		
CAP	1.1035**	0.0451***	0.0662***
	(-2.52)	(5.32)	(6.80)
DEP	0.0354***	-0.0020*	0.0132
	(-6.23)	(-1.81)	(1.10)
LLP	2.2366***	0.0215**	0.1018**
	(-5.23	(-1.98)	(1.99)
LOAN	1.8621*	0.0069*	0.0081**
	(1.89)	(1.88)	(2.01)
Constant	23.2059***	15.9476***	13.5852***
	(4.51)	(5.23)	(8.19)
R²	0.21	0.19	0.21

Note: *, ** and *** indicates significant at the 10%,5%,and 1% levels, respectively.

We notice the existence of a positive and significant relation between the capital and the deficiency risk. This means that when the capital of the bank increases, the risk of deficiency increases as well. This result is opposed to what is expected since we have usually in mind that great banks like great companies are sheltered from bankruptcy. However, in reality, this idea is unjust. Indeed, a high level of capital encourages banks to take more risks in order to achieve the best profitability. This also explains the positive relation between the capital ratio and return on assets in the second regression and between the capital and the risk in the third regression. We find also a weak positive relation between deposit ratio and deficiency risk. This result is coherent since

the deposits are considered to be a debt of the bank toward its depositors. Thus, more the institution (whatever is his nature) is in debt, more it is exposed to deficiency risk. This ratio measures up the effect of lever that may have dangerous results in case of malfunction. The negative relation between the deposit and return on assets strengthens our argumentation and shows that a non-proportional effect of lever may impact the output of the bank (-0.002) and increase the involved risk (0.0132). Concerning the loan loss provisions ratio, we find a positive and significant relation with the deficiency risk. In accordance with the banking literature, the high provision ratio means that the bank has doubts over of its customers to honor their engagement and therefore repay their debts, which increases the deficiency risk of the bank. Finally, for the ratio of loans, the relation is also positive since more a bank attributes credits to its customers, more it has the probability to have doubtful clients.

To have a clearer idea over eventual differences that may emerge between the two banking system, we have remake the same estimations but for each type of bank separately. Results for the conventional banks are presented in Table II and those of Islamic banks in Table III.

TABLE II
REGRESSION OF CONVENTIONAL BANKS

	Regression 1	Regression 3	Regression 3
	Z	ROA	σROA
	Conventional Banks (231 Banks)		
CAP	0.3122*	0.0836***	0.2923*
	(1.88)	(3.36)	(1.92)
DEP	0.008**	-0.0001***	0.0000
	(2.02)	(-3.66)	(0.98)
LLP	3.3214**	-2.6522**	1.2365***
	(-2.01)	(1.93)	(5.23)
LOAN	-0.2228**	2.0360	0.0566
	(2.06)	(0.86)	(0.48)
Constant	-16.3283*	13.2159**	11.2558*
	(1.98)	(2.25)	(1.99)
R²	0.25	0.38	0.42

Note: *, ** and *** indicates significant at the 10%,5%,and 1% levels, respectively.

TABLE III
REGRESSION OF ISLAMIC BANK

	Regression 1	Regression 3	Regression 3
	Z	ROA	σROA
	Islamic Bank (39 Banks)		
CAP	-0.0250***	0.1203**	0.1884***
	(6.23)	(-2.20)	(6.63)
DEP	1.21*	0.0012	0.0013
	(-1.97)	(0.98)	(0.52)
LLP	5.2369***	-0.9892**	0.0122**
	(6.21)	(-2.31)	(-2.36)
LOAN	0.0012**	0.0102***	0.12320
	(2.21)	(4.02)	(1.10)
Constant	-52.6989***	8.2300***	12.5462***
	(6.56)	(6.20)	(5.98)
R²	0.23	0.17	0.22

Note: *, ** and *** indicates significant at the 10%,5%,and 1% levels, respectively.

According to results of the first regression, we find that the capital ratio is significant to both conventional and Islamic banks. But this ratio presents a positive sign for the first and a negative sign for the second. The positive correlation between the capital of conventional banks and deficiency risk means that when the capital of these banks increases, people in charge have the feeling that they are in security and release their efforts in subject of selection of their customers. They are also constrained to increase the output of these capitals in order to ensure a positive return for the funds owners. This explains the positive correlation between the capital and the return on assets. But this search for a superior output will have as an effect the increase of risk as well. In return, since the Islamic banks are constrained to respect the Sharia Committee as well as customers' demands, who may, in certain contracts, choose to invest their capitals in projects they are interested in. These constraints have as effects to reduce the deficiency risk even when the capital increases. This enquiry is actually imposed by Sharia Committee which compels banks not to deliberately increase the risk after a capital increase.

For the deposit ratio we find a positive relation with the deficiency risk. This means that when deposits increase, the risk of lever is more important. The coefficient is significant whatever the considered sample is. The effect is less marked for the conventional banks. The relation between loan loss provisions and deficiency risk remains positive for the whole of samples. It is approximately 5.23 for the Islamic banks and 3.32 for the conventional ones. Eventually, for the ratio of loans, results are different between conventional and Islamic banks. Whereas correlation is negative for the first ones, it is, nevertheless, positive for the second ones.

We move then to the second and third regression to study the effect of these explanatory variables over the return on assets and the risk. We find that the capital ratio exerts a positive effect on the ROA and the risk for the two samples. This means that every increase of capital generates in Return as well as risk. The impact of this ratio on ROA is higher in Islamic banks than in classical ones and vice-versa for the impact of this ratio on the risk since coefficient is higher in conventional banks. This result may have significance in the fact that Islamic banks are new actors on the financial market and so they have more opportunities to maintain without running much risk. For the deposit ratio, we do not find a significant relation with the ROA and the risk in Islamic banks. For the conventional banks a negative and significant relation exists between this ratio and the ROA but insignificant between this same ratio and the risk. Concerning the ratio of loan loss provision, we find similar signs between the two banks, with a negative effect over ROA and positive effect on the risk. Finally, for the ratio of loans, results show the existence of a positive correlation with ROA and the risk for the Islamic banks, but also for conventional ones. However, only the relation between this ratio and ROA of Islamic banks is noticeable.

VII. Conclusion

In this article, we have elaborated a study over the nature of financial intermediation in Islamic banks by comparison to those of conventional ones. We have found a striking difference between two kinds of intermediation. Whereas intermediation in classical banks is based on the interest rate which allows at the same time to make profits out of credits and repay customers, in Islamic banks, intermediation is based on contracts of sharing profits and losses. This system adopted by Islamic banks seems more equitable and fair. We mention this feature of investments Accounts and provision Account which are assimilated to hybrid capitals, and which explains the feature of Islamic bank to have a higher level of capital than the conventional banks [16].

We tried, from another side, to study the relationship between the capital level and deficiency risk relying on econometric model, and we have obtained a positive and significant relation between the capital and the deficiency risk for the conventional banks. This means that when the capital of these banks increases, the deficiency risk increases as well. This relation maybe understood via the fact that a high level of capital encourages conventional banks to run much risk in order to achieve the best profitability. People in charge have the feeling that they are in security and release their efforts in subject of selection of their customers. They are also constrained to increase the output of these capitals in order to ensure a positive return for the funds owners. This explains the positive correlation between the capital and the ROA. But this search for a superior output will have as an effect the increase of risk as well. In return, since the Islamic banks are constrained to respect the Sharia Committee as well as customers' demands who may, in certain contracts, choose to invest their capitals in projects they are interested in. These constraints have as effects to reduce the deficiency risk even when the capital increases. This enquiry is actually imposed by Sharia Committee which compels banks not to deliberately increase the risk after a capital increase.

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