

## **ISLAMIC BANKS' PROFITABILITY IN AN INTEREST RATE CYCLE**

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*Islamic finance relies on the cardinal principle of profit and loss sharing (PLS) between stakeholders taking part in a risky economic activity. Such a rule is also applicable to Islamic banks' depositors, who either choose not to be remunerated at all, or place their savings in "investment accounts", bringing variable returns, dependent on the bank's profitability. At the end of the period, an Islamic bank has to share its "profits" with the depositors who accepted the investment risk. In fact, such an Islamic bank does not share its "profits", defined as the wealth transferred to shareholders, but shares an amount of wealth one can call an "income before cost of funding" (IBCF). How Islamic banks manage to smooth their profitability, measured by their ROE, is the purpose of this article, which comes to three main conclusions:*

- 1. In theory, an Islamic bank is effectively in a position, thanks to profit sharing, to make its profitability less volatile over the cycle.*
- 2. In addition, empirical evidence tends to show that Islamic banks are certainly more profitable than their conventional peers enjoying the same balance sheet structure. The main reason for such a difference is that Islamic banks benefit from a market imperfection, i.e. the availability of large amounts of non-remunerated deposits in their books, which considerably decrease the cost of funding.*
- 3. Finally, Islamic banking, in spite of its advantage on the grounds of profitability, is not a panacea for bankers in the Islamic world, because they are constrained by several recurrent weaknesses in terms of liquidity, concentration risks and operational efficiency.*

### **Introduction**

Some 180 Islamic banks together with about 120 Islamic non-bank financial institutions operate throughout the world. Their assets are close to US\$200 billion, and the annual growth of their core business has been standing at about 10% over the last couple of years. According to Islamic law, the Shariah, these banks and financial institutions are not allowed to pay or charge interest. However, instead of interest-bearing banking, Islamic bankers have developed over the last two decades a wide range of innovative financial products and services actively involving both clients and banks in economic activity that seeks financing. Such an approach to banking activities implies however the principle of profit and loss sharing (PLS), on both banks' assets and liabilities sides.

The asset-side of profit sharing is not directly the subject of the following study, which lays particular stress on the liability side, i.e. an Islamic bank's obligation to share its "profits" with its depositors, or at least those of its depositors who accept to keep their money in remunerated "investment accounts", and not in non-profit-bearing current accounts. Indeed, some Muslims are still reluctant to get any return from their deposits, even within Islamic banks, as they still consider this as "riba" (prohibited usury).

As a matter of fact, Islamic banks do not share their “profits” with depositors, because profit is defined as the final amount of wealth attributable to shareholders in a period of time. What is shared between shareholders and depositors is a variable one can define as the bank’s “income before cost funding” (IBCF), equities being excluded here from the scope of funding. The cost of non-equity funds is precisely what distinguishes Islamic banks from conventional banks. While conventional banks rely on debt and deposits with mainly fixed interest rates, Islamic banks rely on a funding base whose cost depends on the return of its assets.

That said, the purpose of the following model and empirical evidence is to answer two main questions:

- On the one hand, is an Islamic bank’s return on equity less volatile than that of a conventional bank through an interest rate cycle, assuming that the structure of their balance sheet is exactly the same?
- On the other hand, is there any empirical evidence supporting the assertion that Islamic banks are, within certain countries and under the assumption of equivalent balance sheet structures, more profitable than their peer conventional banks?

Section 1 develops a simple model with two banks, one Islamic bank and one conventional bank, in order to make their respective returns on equity comparable. In section 2, the theoretical model’s results are subject to a calibration based on empirical data, which allows the introduction of some cyclicity in interest rates and the observation of the behaviour of the two banks’ respective ROEs. Section 3 provides some empirical evidence highlighting higher performance at Islamic banks, as far as profitability is concerned. Finally, some concluding remarks lay stress on weaknesses and challenges Islamic banks have been recurrently facing for years, which somewhat offset their profitability advantage.

## **Section1: The Theoretical Model**

### **Definition of variables**

Let us assume the existence of two banks: one Islamic bank, and one conventional bank. Suffix  $t$  stands for time, while  $C$  and  $I$  respectively refer to conventional and Islamic banks. Table 1 is a summary of the variables used in the following simple theoretical model. Some variables are common to the two banks, and some others are specific to each category.

**Table 1. Variables.**

	<b>Conventional bank</b>
Equity	$K (t)$
Non equity liabilities	$L (t)$
Assets	$A =$
Leverage	$\tau =$
Non-interest expenses	$N$
Return on equity	$r_{K,t}^C$
Gross return on assets	$r$
Income before cost of funding	$IBCF_t = r$
Cost of fundin	$r_{L,t}^C .L$
Efficiency ratio	$\epsilon_t =$
Correlation index between credit and debit interest rates	$\alpha \in [0;1]$ with : $r_{K,t}^C = \alpha . r_{A,t}$

It is assumed that the two banks have exactly the same balance sheet structure. In particular, Capitalization ( $K/A$ ) is the same for the two entities and assumed to be invariant over time. Non-interest expenses ( $NIE_t$ ) are also equivalent for the two banks, but vary over the cycle. Islamic and conventional banks' assets pay the same average interest rate  $r_{A,t}$ . Only funding costs are different.

The conventional bank pays  $r_{L,t}^C . L$  in period  $t$ , while the Islamic bank pays  $\lambda IBCF_t$ , meaning that the latter shares its IBCF between shareholders and depositors at a rate  $\lambda$ , that we assume, for the moment, to be variable. Finally, debit and credit interest rates respectively paid and charged by the conventional bank are linearly correlated, at a rate  $\alpha$

### **Expressing return on equity for the two banks**

#### **The conventional bank:**

Its net profit can be expressed in the following way:

$$\begin{aligned} r_{K,t}^C .K &= (r_{A,t} .A - NIE_t) - r_{L,t}^C .L \\ &= IBCF_t - r_{L,t}^C .L \end{aligned}$$

This gives:

$$r_{K,t}^C = K^{-1} .(IBCF_t - r_{L,t}^C .L)$$

**The Islamic bank:**

Its net profit can be expressed in the following way :

$$\begin{aligned} r_{K,t}^I \cdot K &= IBCF_t - \lambda_t \cdot IBCF_t \\ &= IBCF_t \cdot (1 - \lambda_t) \end{aligned}$$

This gives:

$$r_{K,t}^I = K^{-1} \cdot IBCF_t \cdot (1 - \lambda_t)$$

**Under what condition is the Islamic bank more profitable?**

The condition under which the Islamic bank is more profitable than the conventional one is simply:

$$r_{K,t}^I > r_{K,t}^C$$

Inequality (5) has to be retreated as follows:

$$K^{-1} \cdot IBCF_t \cdot (1 - \lambda_t) > K^{-1} \cdot (IBCF_t - r_{L,t}^C \cdot L)$$

$\Leftrightarrow$

$$\lambda_t \cdot IBCF_t < r_{L,t}^C \cdot L$$

$\Leftrightarrow$

$$\lambda_t < \frac{r_{L,t}^C \cdot L}{IBCF_t}$$

$\Leftrightarrow$

$$\lambda_t < \frac{r_{L,t}^C \cdot L}{r_{A,t} \cdot A - NIE_t}$$

$\Leftrightarrow$

$$\lambda_t < \frac{r_{L,t}^C \cdot L}{r_{A,t} \cdot A - \frac{NIE_t}{A} \cdot A}$$

$\Leftrightarrow$

$$\lambda_t < \frac{r_{L,t}^C \cdot L}{r_{A,t} \cdot A - \varepsilon_t \cdot A}$$

$\Leftrightarrow$

$$\lambda_t < \frac{L}{A} \frac{r_{L,t}^C}{r_{A,t} - \varepsilon_t}$$

$\Leftrightarrow$

$$\lambda_t < \tau \frac{\alpha \cdot r_{A,t}}{r_{A,t} - \varepsilon_t}$$

$\Leftrightarrow$

Two theoretical scenarios can be discussed:

$\lambda_t$  is an exogenous variable, perfectly controlled by the Islamic bank. In this case, the Islamic bank can always be more profitable than its conventional peer for given values of  $\alpha$  and  $r_{A,t}$ , which are common to the two entities.

2.  $\lambda = \lambda$  which means that  $\lambda$  is fixed. The Islamic bank provides its depositors with the same percentage of income before cost of funding over time.

In this case, the Islamic bank is more profitable if:

$$\frac{r_{A,t}}{\varepsilon_t} < \frac{\lambda - \tau\alpha}{\lambda}$$

### Conclusions from the theoretical model

According to inequality (7), one can conclude that:

- if returns on assets are high and non-interest charges are low (which is the case when the cycle is in its upward phase), the probability of the Islamic bank being more profitable than conventional banks is low ;
- but on contrary, if the cycle trends downward,  $r_{A,t}$  is low while  $\alpha$  trends upward (essentially because of increasing provisioning needs) ; thus inequality (7) is more likely to be true, meaning that Islamic banks are, in this case, more profitable.

In short, if we assume that Islamic banks perfectly control the rate at which they share profits, then they are certainly always more profitable. If, on the contrary, it is assumed that this rate is fixed ( $\lambda = \lambda$ ), then Islamic banks are characterized by another interesting feature : their profitability, over the cycle, is apparently less volatile than that of conventional banks, thanks to the cushioning role played by profit and loss sharing.

### Section 2. Simulation by Calibration of the Theoretical Model

In order to illustrate, on an applied basis, the lower volatility of Islamic banks' profitability, we shall adopt the technique of calibration. This consists of assigning values to certain parameters of the model, after estimating them from empirical data. Table 1 summarizes our estimation of these calibrated parameters.

**Table 2. Calibration.**

Parameters	$\tau$	A/K	$\alpha$	$\lambda$	$\overline{r_A}$
Estimated values	0.9	10	0.66	0.7	6.35

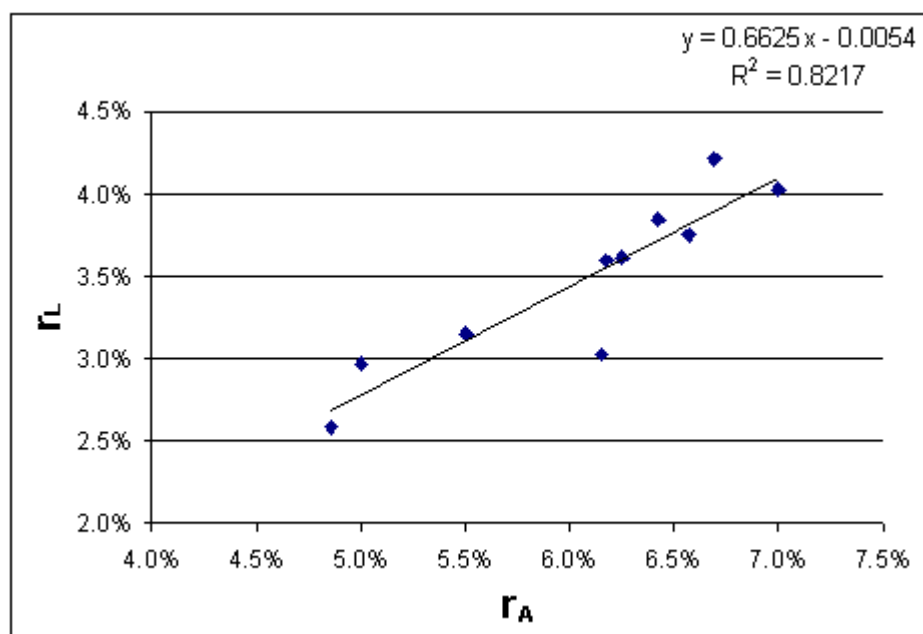
## The principle of calibration

In principle, calibration consists of attributing consistent and plausible numeric values to certain parameters of the model, in order to make them stick, as closely as possible, to the observed reality. Then, by introducing some cyclicality into both the rate of return on assets ( $r_{A,t}$ ) and the banks' efficiency ratio ( $\alpha$ ), we will be able to examine the behaviour of the two banks' profitability over the cycle. To achieve this aim, one specific and representative banking market has to be chosen to calibrate the model. Saudi Arabia is undoubtedly the largest, deepest and most sophisticated market where we can find both Islamic and conventional banks with close balance sheet structures, efficiency ratios and returns on assets.

## Estimating calibrated parameters in the Saudi banking market

Bank capitalization in Saudi Arabia is close to 10% for almost all commercial banks. Consequently, it is legitimate to assign to  $\alpha = L/A$  a value of 0.9, meaning that  $A/K = 10$ . In the Gulf region, banking sectors are still not highly sophisticated, and within conventional commercial banks, credit and debit rates are very closely correlated. It is assumed that debit and credit rates are linearly linked, at a rate of  $\alpha$ . Such an assumption has to be tested, and if valid, has to be evaluated. To achieve that, a linear regression is implemented on two series of data: on the one hand, the average returns on earning assets for Saudi commercial banks; and on the other hand, refinancing costs as a percentage of non-equity liabilities for the same Saudi banks. Data are recorded for the past 10 years, i.e. for the 1992-2001 period, and are taken from Standard & Poor's database. The results of the regression are given in graph 1.

**Graph 1. Estimating  $\alpha$  with a simple linear regression.**



Source : Standard & Poor's.

The regression gives:  $\alpha = 0.66$ .

The variable  $\lambda$  can be more easily determined: an approximation for  $\lambda$  is the average remuneration provided to Islamic depositors as a percentage of Islamic banks' IBCF in Saudi Arabia. Given that there is only one fully Islamic bank in the Kingdom, we can only observe this bank's ratio, which has historically stood at about 70%. Consequently, we calibrate  $\lambda$  at 0.7.

The respective means and standard deviations of  $r_A$  and  $\epsilon$  have been calculated from data contained in the annual reports of six out of the ten Saudi commercial banks. These six banks are characterized by a balance sheet structure that is close to that of their single Islamic peer. These series have been built for the 1994-2001 period (i.e. 8 years). Here is a summary of the calculations:

Years	2001	2000	1999	1998	1997
$r_A(t)$	6.15%	7.00%	6.57%	6.42%	6.18%
$\bar{r}_A$	<b>6.35%</b>				
$\sigma_{r_A}$	<b>0.45%</b>				

*Source : Standard & Poor's*


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### **Simulating cyclicity**

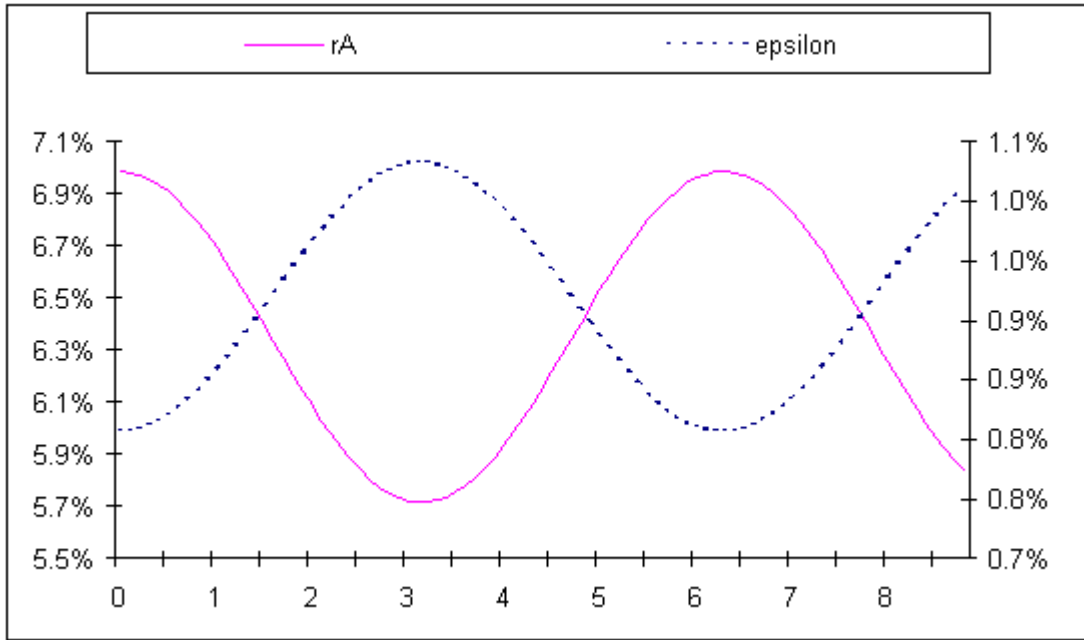
We then try to reproduce cyclicity in the return on assets  $r_A(t)$  and the efficiency ratio ( $\epsilon$ ). For the sake of simplicity, we assume that there is no drift in these series. For that purpose, we express  $r_A(t)$  and ( $\epsilon$ ) with trigonometric relations, knowing that  $r_A$  is procyclical and  $\epsilon$  is contracyclical.

Consequently, to be in conformity with table 2, we write that:

$$r_A(t) = 6.35\% + 0.45\% \cdot [\sqrt{2} \cos(t)] = 6.35\%$$

$$\epsilon(t) = 0.92\% - 0.08\% \cdot [\sqrt{2} \cos(t)] = 0.92\%$$

**Graph 2. Cyclical behaviour of  $r_A(t)$  and  $\epsilon(t)$ .**



Graph 2 shows us that  $r_A(t)$  and  $\epsilon(t)$  behave in opposite phases. In addition, equations (8) and (9) effectively imply that  $\sigma_{r_A} = 0.45\%$  and  $\sigma_{\epsilon} = 0.08\%$ .

As a consequence, we can express  $r_K^C$  and  $r_K^I$  as functions of time (t) only, and represent their behaviour in the cycle.

We know that:

$$\begin{aligned}
 r_K^C(t) &= K^{-1}[r_A(t).A - \epsilon(t).A - r_L(t).L] \\
 &= \frac{A}{K}[r_A(t) - \epsilon(t) - \alpha \tau r_A(t)] \\
 &= \frac{A}{K}[r_A(t)(1 - \alpha \tau) - \epsilon(t)]
 \end{aligned}$$

In addition :

$$\begin{aligned}
 r_K^I(t) &= K^{-1}[r_A(t).A - \epsilon(t).A](1 - \lambda) \\
 &= \frac{A}{K}[r_A(t) - \epsilon(t)](1 - \lambda)
 \end{aligned}$$

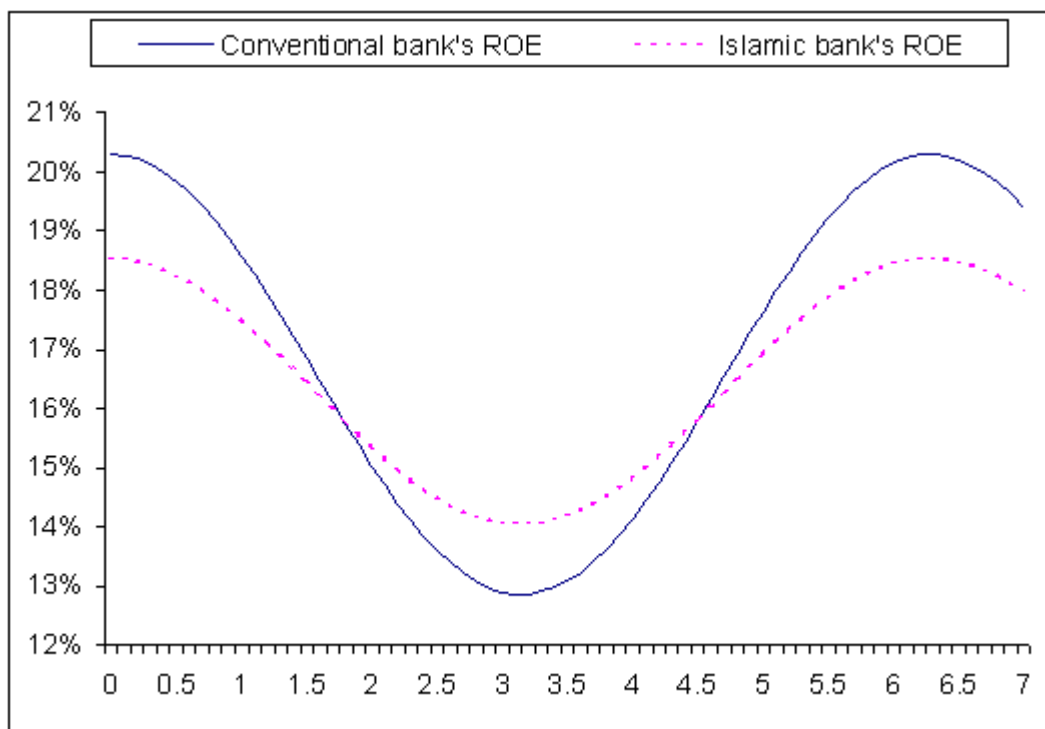


Equations (8) and (9) together with expressions (10) and (11) give:

$$\begin{aligned} r_K^C(t) &= 0.1[1.658+0.372\cos(t)] \\ r_K^I(t) &= 0.1[1.629+0.225\cos(t)] \end{aligned}$$

Functions (12) and (13) are shown in graph 3.

**Graph 3.**  $r_K^C(t)$  and  $r_K^I(t)$  over the cycle.



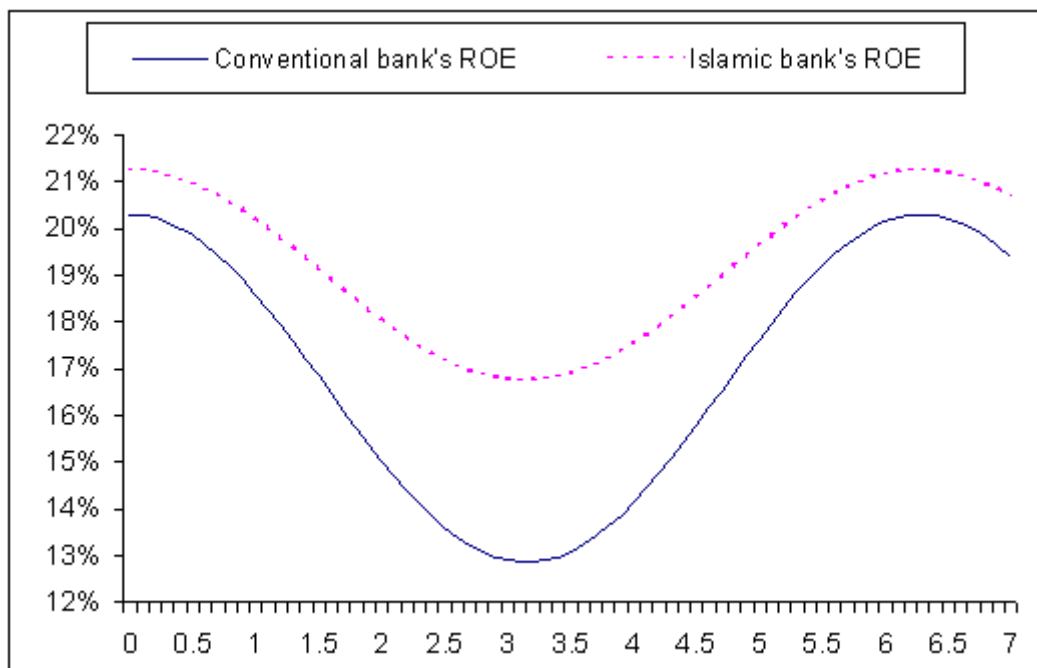
The Islamic bank's ROE is less volatile than that of the conventional one. Such a smoothing effect comes from the ability of the Islamic bank to absorb shocks on assets' returns through profit and loss sharing. This technique plays the role of a cushion, or an insurance against cyclicity in returns, which the conventional bank cannot rely on, because it has to pay interest charges, which are less flexible.

### Section 3. Are Islamic Banks More Profitable than Their Conventional Peers? Empirical evidence.

**A critical variable:  $\lambda$**

As a matter of fact, the variable  $\lambda$  is critical.  $\lambda$  determines the relative position of the two curves  $r_K^I$  and  $r_K^C$ . If remunerated deposits represent small amounts of total deposits at the Islamic bank,  $\lambda$  will be small and shareholders will capture a high portion of the IBCF. In this case, the Islamic bank will be more profitable than its conventional peer. For example, if  $\lambda$  is calibrated at 0.65 rather than at 0.7, graph 3 becomes:

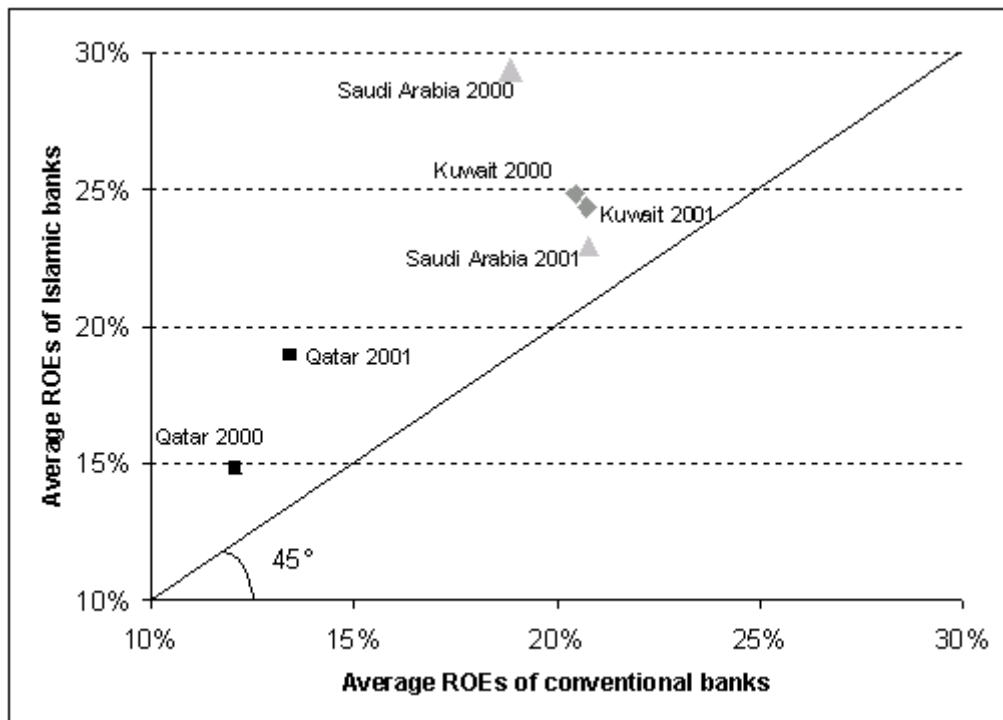
**Graph 3.  $r_K^C(t)$  and  $r_K^I(t)$  in the cycle when  $\lambda=0,65$ .**



However, empirical evidence of higher profitability at Islamic banks still needs to be provided. A simple case study is undoubtedly legitimate in this respect.

The following graph 5 represents average ROEs of Islamic and conventional commercial banks in three of the six countries of the Gulf Cooperation Council (GCC), for the years 2000 and 2001.

**Graph 5. Compared average ROE for Islamic and conventional banks in the Gulf (2000-2001).**



Graph 5 shows that, on average, for three out of the six countries constituting the GCC, Islamic banks' profitability, as measured by ROE, was higher than that of conventional commercial banks. The reason for that seems quite clear: Islamic banks rely, for their funding, on high amounts of non-profit bearing deposits, or non-remunerated current accounts. Their  $\lambda$ s consequently very low, and their IBCF is thus mainly directed toward shareholders' remuneration. Funding cost is the main element differentiating between Islamic and conventional banks as far as profitability is concerned. This is a *market imperfection*, which constitutes a "free lunch" Islamic banks tend to exploit.

## Conclusion

All in all, not only does Islamic banks' profitability seem less volatile than that of conventional peers, but it is also higher on average, at least in the GCC region. These two elements are essential for assessing the soundness of Islamic banks' financial profile and creditworthiness. Islamic banks thus seem less vulnerable to the cyclical nature of returns on assets and costs of liabilities. Does it mean that Islamic financial principles are the panacea for all bankers in the Islamic world? Of course not, for mainly two reasons.

On the one hand, not all bank clients are necessarily willing to earn no return on their deposits. Making Islamic banks a general model for an entire banking industry in a given country would certainly lead the vast majority of depositors to ask for investment deposits with returns close to those prevailing in non-Islamic markets, and the comparative advantage of Islamic banks (i.e. cost of funds) would consequently vanish. Islamic banking could not easily be generalized to a whole banking sector, even in a country like Saudi Arabia. Islamic banks can benefit from the funding "subsidy" as long as they operate a niche strategy, capturing a certain category of clients and depositors, who are prepared to accept only moral benefits, not economic tangible returns considered as "riba".

On the other hand, Islamic banks lose on the grounds of liquidity, assets and liabilities concentrations and operational efficiency what they tend to win in the field of profitability. Nevertheless, Islamic banks' ability to smooth their return on assets by absorbing shocks remains a positive element, particularly in a banking sector that is characterized by its systemic nature, where the collapse of one entity could spur contagion to the whole industry. Islamic banking could be a further guarantee, however still marginal, against systemic risks in certain emerging financial markets.

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**Note:**

In Table 2, the  $\bar{\phantom{x}}$  sign is used for the mean of a variable, while  $\sigma$  represents