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# Regulation of Islamic banks: Basel III capital framework and profit-sharing investment accounts

Kévin SPINASSOU\*      Leo Indra WARDHANA†

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*Preliminary - do not quote without permission*

**Abstract:** This paper theoretically examines the impact of capital requirements on Islamic banks. Given the prevalence of profit-sharing investment accounts (PSIA) in Islamic banking and the recent implementation of the Basel III capital framework, we developed a simple model in which banks are able to offer PSIA contracts under regulations applying risk-weighted capital ratios and leverage ratio restrictions. We find that banks with high or low returns on assets prefer “conventional” banking, while banks with moderate returns on assets operating as Islamic banks select PSIA instead of deposits. We would further point out that capital requirements tend to increase the incentive to opt for Islamic banking, especially since Islamic banks benefit from a less competitive environment and from local capital requirements.

**JEL Classification:** G21, G28

**Keywords:** banking capital requirements; Basel III; IFSB; Islamic finance; profit-sharing investment accounts.

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# 1 Introduction

In December 2010, as a consequence of the global financial crisis of 2007-2008, the Basel Committee on Banking Supervision (BCBS) suggested a new set of reform measures, known as Basel III. This financial turmoil put the spotlight back on the issue of capital requirements, through the importance of maintaining sufficient levels of capital to absorb losses. Consequently, Basel rules now include leverage ratio restrictions in addition to risk-weighted capital ratios<sup>1</sup>. Such regulatory reforms aim at improving the robustness of the global banking sector, in order to meet the challenges of the fluctuating financial environment.

Another consequence of the global financial crisis is the rapid growth of a specific banking system based on the principles of non-interest-bearing deposit accounts and profit-sharing investment contracts, also known as *Islamic banking*<sup>2</sup>. This growth can also be seen in non-Muslim jurisdictions (e.g. Europe and North America), implying that Islamic banks are no longer a simple response to the religious duty of Muslim economic agents but also a new offer catering to demands of new customers. Currently, the Basel capital framework applies in several jurisdictions where Islamic banks are present, while this set of regulatory measures is initially suggested for conventional banking institutions.

The objective of this paper is to theoretically investigate how Islamic and conventional banks react to Basel III capital requirements. As profit-sharing investment accounts help to decrease the overall risk faced by banks, it is interesting here to consider the loss absorbency of these contracts (mainly offered by Islamic banks), in order to examine the banks' incentives to act as Islamic or conventional banks. For this purpose, the Islamic Financial Services Board (IFSB) provides prudential standards, with prescriptions to adapt conventional capital requirements for Islamic banks. Besides, IFSB guidelines also allow national regulators to implement local adjustments rel-

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<sup>1</sup>See BCBS (2010) for the original guidelines and BCBS (2014) for a more recent text relative to leverage ratio regulations.

<sup>2</sup>For further details regarding the growth of Islamic banking, see the Islamic Financial Services Board (2016).

ative to the Islamic banks' risk-weighted capital requirements. Consequently, roughly two out of three regulators within jurisdictions allowing Islamic banking activities choose to tailor conventional banking capital requirements before applying them to their local Islamic banks (Song & Oosthuizen, 2014). Our model therefore considers a regulatory framework in which capital requirements for conventional and Islamic banks are both suggested at an international level. Then we analyse how banks adapt their behaviour when Islamic banking activities benefit from locally adjusted capital requirements.

In order to meet this objective, we also take into account various degrees of competition between conventional and Islamic banking activities. Given the religious motivations of certain Muslim customers, Islamic banks may indeed benefit from captive customers: fervent religious believers seeking Sharia-compliant financial products, hence, they are reluctant to opt for conventional financial products (Beck et al., 2013). At the same time, religiosity does not prevent Islamic banks from attracting customers from conventional banks and, as a consequence, Islamic banks may face less competition than conventional banks in a dual banking system (Meslier et al., 2017; Turk-Ariss, 2010). This occurs especially in jurisdictions having a heavy Muslim population. An extension of our model thus aims at incorporating this potential competitive differential between conventional and Islamic banks, by assuming a higher return on assets for Islamic banking activities, driven by a relatively less competitive environment.

Accordingly, this paper contributes to the current debate on the regulation of Islamic banks. Academic literature has developed an extensive theoretical body of work on conventional banking capital requirements. The relation between risk-weighted capital requirements and bank risk-taking behaviour is examined by Kim & Santomero (1988), Giammarino et al. (1993), Besanko & Kanatas (1996), Repullo & Suarez (2004), and summarised in Freixas & Rochet (2008) and Camara et al. (2013). More recently, the interest in new leverage ratio restrictions motivated certain theoretical papers to investigate how such requirements impact banking stability through conventional bank behaviour (Blum, 2008; Rugemintwari, 2011; Kiema & Jokivuolle, 2014; Spinassou, 2016). We also note that many recent empirical

papers focus on risk-taking by Islamic banks: Cihak & Hesse (2010), Hassan & Dridi (2010), Abedifar et al. (2013), Baele et al. (2014). Nevertheless, very little theoretical work has been done on Islamic banking behaviour (Aggarwal & Youssef, 2000; Muljawan et al., 2004), especially concerning banking regulations: to the best of our knowledge, academic literature does not provide a theoretical investigation covering Basel III capital requirements and Islamic banking.

To better understand the implications of BCBC/IFSB capital requirements for Islamic banking, we built a simple model in which banks can select their activity (safe or risky). This banking activity can be financed by raising deposits and offering profit-sharing investment accounts as *Shariah*-compliant financial investments based on *Mudharabah* contract principles. We find that banks do not offer such contracts without capital requirements, while banks with an intermediate return on assets use PSIA instead of interest-bearing deposits if risk-weighted capital requirements are imposed. Furthermore, as a first step, our results show that the implementation of leverage ratio restrictions lowers the expected profit of Islamic banks. Nevertheless, as a second step, the new capital requirements can lead to a higher number of Islamic banks, especially if the national regulator strongly reduces the local Islamic banks capital requirements, and/or if Islamic banks benefit from a relatively less competitive environment.

This model is developed in Section 2. Section 3 presents our results when different capital requirements are imposed on banks having regulatory frameworks in the spirit of Basel II and Basel III. Section 4 presents an extension of our analysis, with consideration for local specificities towards dual banking systems, and Section 5 concludes the paper.

## 2 Model set up

Consider a banking system populated by  $n$  independent banks, with total assets normalised to one. Banks can be financed by deposits ( $D$ ), profit-sharing investment accounts ( $\mu$ ), and capital ( $K$ ). Deposits are guaranteed by full deposit insurance, riskless, and with a gross interest rate set to one.

Capital is assumed to be the most expensive source of funding, where the cost of capital is  $k > 1$ .

A profit-sharing investment account (hereinafter PSIA) is a contract between the bank and an investor, in which gains and losses are shared based on a *Mudharabah* contract. We denote *Islamic banks* (hereinafter IBs) as any bank offering PSIA instead of deposits, since interest-bearing deposits are explicitly forbidden by the rules of traditional Islamic finance. On the other hand, banks taking in deposits are hereinafter referred to as *conventional banks* (CBs). In other words, banks choose to be CBs or IBs by selecting their source of funding. The gain/loss shared with the investor is  $r \in ]\frac{1}{2}, 1[$ , thus giving the bank the share  $1 - r$ .

Each bank selects its type of activity: *risky* or *safe*. Safe banks have a gross rate of return on assets of  $R > 1$ , while the return on assets of risky banks provides the following:

$$\begin{cases} R + \Delta R & \text{with probability } p \\ 0 & \text{with probability } 1 - p \end{cases} \quad (1)$$

Where  $\Delta R > 0$  is the extra return on assets from additional risk taking. We assume that banks have diverse skills to manage their risky projects, leading to different values of  $\Delta R$  in the banking system, given by nature with  $\Delta R \in [\underline{\Delta R}; \overline{\Delta R}]$ . The probability density function of  $\Delta R$  is denoted by  $f(X)$ , with

$$1 = \int_{\underline{\Delta R}}^{\overline{\Delta R}} f(\Delta R) d\Delta R \quad (2)$$

If a risky bank fails (with probability  $1 - p$ ), the bank bears losses equal to the amount of capital plus its share of the PSIA. Due to its limited liability, the amount of deposits does not appear in losses in the event of bankruptcy. We therefore distinguish two expected profits, based on the banks activity:

$$\pi_{noreg}^{safe} = R - (1 - K - \mu) - \mu(1 + rR) - Kk \quad (3)$$

as the safe banks profit, and

$$\pi_{noreg}^{risky} = p((R+\Delta R)-(1-K-\mu)-\mu(1+r(R+\Delta R))-Kk)-(1-p)(K+(1-r)\mu) \quad (4)$$

as the risky banks expected profit  $1 - K - \mu = D$ . Evaluating these two expected profits, we can then state:

**Result 1.** *Without capital requirements, both safe and risky banks prefer conventional banking: banks that do not offer PSIA and select a level of deposits equal to 1.*

*Proof.* We find  $\frac{\partial \pi_{noreg}^{safe}}{\partial \mu} = -rR < 0$  ;  $\frac{\partial \pi_{noreg}^{safe}}{\partial K} = 1 - k < 0$  ;  
 $\frac{\partial \pi_{noreg}^{risky}}{\partial \mu} = (2-k)p-1 < 0$  ;  $\frac{\partial \pi_{noreg}^{risky}}{\partial K} = -(1-r)+p(1-r(R+\Delta R+1)) < 0$ .

When no capital requirements are applied, safe and risky banks have expected profits of:

$$\pi_{noreg}^{safe*} = R - 1 \quad (5)$$

$$\pi_{noreg}^{risky*} = p(R + \Delta R + 1) \quad (6)$$

As a result, in the absence of capital requirements, banks select risky projects if  $\Delta R > \frac{(R-1)(1-p)}{p}$ . On the other hand, all banks with  $\Delta R < \frac{(R-1)(1-p)}{p}$  are safe banks.

### 3 Bank choice and capital regulation

In this section, we consider exogenous capital requirements suggested by a supranational committee that are then applied by a national regulator. Firstly, we analyse how risk-weighted capital requirements affect banking behaviour. Secondly, we focus on a Basel III capital framework, by examining the implications of introducing leverage ratio restrictions together with risk-weighted capital requirements.

### 3.1 Solely risk-weighted capital requirements

We assume a capital ratio of  $\bar{K} \in ]0, 1[$  imposed on safe CBs, and  $\bar{K} + \Delta K \in ]0, 1[$  as the minimum capital ratio for risky CBs.

Conversely, banks with PSIA benefit from higher loss absorbency. Indeed, such contracts provide banks the capacity to pass-on losses to investors: the higher the amount of PSIA as a source of funds, the better the solvency of the bank<sup>3</sup>. This loss absorbency is the main motivation of *Islamic Financial Services Board* adjustments, where a reduction of capital requirements is allowed for banks holding a large share of PSIA<sup>4</sup>. To incorporate these lower capital requirements into our analysis, we assume a capital ratio equal to  $\bar{K} + \Delta K(1 - \frac{\mu}{1-\bar{K}})$  for risky banks using PSIA. In other words, this capital ratio is equal to  $\bar{K}$  (i.e. similar to the safe CBs capital requirements) if the bank does not raise deposits, and  $\bar{K} + \Delta K$  (i.e. similar to the risky CBs capital requirements) if the bank does not use PSIA.

Profits described in equation (3) and equation (4) are decreasing functions of capital  $K$ , in that banks only hold the required capital. Safe banks profit is then

$$\pi_{rw}^{safe} = R - (1 - \bar{K} - \mu) - \mu(1 + rR) - \bar{K}k \quad (7)$$

with  $\frac{\partial \pi_{rw}^{safe}}{\partial \mu} = -rR < 0$ : safe banks prefer conventional banking and do not offer PSIA to investors.

$$\pi_{rw}^{safe*} = R - (1 - \bar{K}) - \bar{K}k \quad (8)$$

The expected risky banks profit is now:

$$\begin{aligned} \pi_{rw}^{risky} = & p((R + \Delta R) - (1 - (\bar{K} + \Delta K(1 - \frac{\mu}{1-\bar{K}}))) - \mu) - \mu(1 + r(R + \Delta R)) - \\ & (\bar{K} + \Delta K(1 - \frac{\mu}{1-\bar{K}}))k) - (1 - p)((\bar{K} + \Delta K(1 - \frac{\mu}{1-\bar{K}})) + (1 - r)\mu) \quad (9) \end{aligned}$$

<sup>3</sup>See Dalla Pellegrina (2007), Lopez Mejia et al. (2014) and Song & Oosthuizen (2014) for further details about the regulation of Islamic banks and its future challenges.

<sup>4</sup>In the standard formula provided by the IFSB for the computation of risk-weighted capital requirements for IBs, even the assets financed by investment account holders are excluded.



with  $\frac{\partial \pi_{rw}^{risky}}{\partial \mu} = \frac{\Delta K(1-(2-k)p)}{1-\bar{K}} + (r+p-1) - pr(R+\Delta R+1)$ . An evaluation of the risky banks newly expected profit leads to the following result:

**Result 2.** *When solely risk-weighted capital requirements are implemented, risky banks with  $\Delta R > \rho'_{rw}$  increase deposits instead of offering PSIA contracts ( $\mu = 0$ ), with  $\rho'_{rw} = \frac{\Delta K(1-(2-k)p)}{(1-\bar{K})pr} + \frac{r+p-1}{pr} - R - 1$ . Otherwise, risky banks are IBs and hence finance their activity through PSIA and capital (not deposits).*

Proof. Follows straightforwardly from equation (9).

We thus obtain the expected risky CBs profit:

$$\pi_{rw}^{riskyCB*} = p(R + \Delta R - 1) - (\bar{K} + \Delta K)(1 - p(2 - k)) \quad (10)$$

and the expected risky IBs profit:

$$\pi_{rw}^{riskyIB*} = p((\Delta R + R)(1 - r(1 - \bar{K})) + (\bar{K} - 1)(k + 1)) - (1 - p)(\bar{K} + (1 - \bar{K})(1 - r)) \quad (11)$$

Similar to the previous section, we can evaluate the expected profit of safe banks and risky banks, thus obtaining:

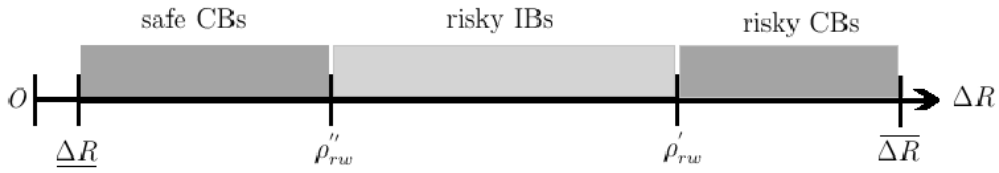
**Result 3.** *There exists a threshold of  $\rho''_{rw} = \frac{\Delta K(1-(2-k)p) - (1-p)(1-(2-k)\bar{K}-R)}{p}$ , with  $\rho''_{rw} < \rho'_{rw}$  and where banks with  $\Delta R > \rho''_{rw}$  select risky projects, while banks with  $\Delta R < \rho''_{rw}$  select safe activity.*

Proof. Follows straightforwardly from equation (8), equation (10) and equation (11).

The previous result is illustrated in Figure 1. The excess return on assets  $\Delta R$  is clearly key to determining whether Islamic or conventional banking is preferable, as well as whether banks need to opt for safe or risky activities. Within our profit-maximisation perspective, the implementation of capital requirements now increases the number of Islamic banks, while incentives to act as Islamic banks do not exist without capital requirements. We can see that a banking system with high return on assets includes a large number of CBs (i.e. having a large concentration of banks close to  $\bar{\Delta R}$ ), while a banking

system with lower return on assets incorporates a more significant number of IBs. These findings are in line with the current expansion of Islamic finance in several countries. The 2007-2008 banking crisis indeed reduced the overall returns on banking activities, while the Islamic banking system has grown faster than the conventional banking system over the past decade<sup>5</sup>.

Figure 1: Bank choice with risk-weighted capital requirements



### 3.2 Leverage ratio and risk-weighted capital requirements

In this subsection, we consider a minimum leverage ratio  $K^{lr}$ , suggested by the supranational authority in addition to the previous risk-weighted capital ratio of  $K^{lr} \in ]\bar{K}, (\bar{K} + \Delta K)[$ . In other words, this new regulation does not affect risky CBs because they already maintain the highest capital ratio  $\bar{K} + \Delta K$ . Note that the addition of this leverage ratio regulation allows us to rewrite the capital requirements relative to the amount of PSIA, as  $K^{lr} + (\Delta K - \gamma) \left(1 - \frac{\mu}{1 - \bar{K}}\right)$ , where  $\gamma = K^{lr} - \bar{K} < \Delta K$ . In a nutshell, a high value of  $\gamma$  represents a significant increase in regulatory stringency, with the implementation of a highly binding regulatory constraint.

We obtain the new safe banks profit as:

$$\pi_{lr}^{safe} = R - (1 - K^{lr} - \mu) - \mu(1 + rR) - K^{lr}k \quad (12)$$

with  $\frac{\partial \pi_{lr}^{safe}}{\partial \mu} = -rR < 0$ . As before, evaluation of the safe banks profit shows that safe banks prefer conventional banking, with  $\mu = 0$ .

$$\pi_{lr}^{safe*} = R - (1 - K^{lr}) - K^{lr}k \quad (13)$$

<sup>5</sup>See Malaysian International Islamic Financial Centre (2014) for further details.

The implementation of a leverage ratio affects the risky banks expected profit as follows:

$$\begin{aligned} \pi_{lr}^{risky} = & p((R+\Delta R)-(1-(K^{lr}+(\Delta K-\gamma)\left(1-\frac{\mu}{1-\bar{K}}\right))-\mu)-\mu(1+r(R+\Delta R))- \\ & (K^{lr}+(\Delta K-\gamma)\left(1-\frac{\mu}{1-\bar{K}}\right))k)-(1-p)((K^{lr}+(\Delta K-\gamma)\left(1-\frac{\mu}{1-\bar{K}}\right))+ (1-r)\mu) \end{aligned} \quad (14)$$

$$\text{with } \frac{\partial \pi_{lr}^{risky}}{\partial \mu} = \frac{p+r-1+\Delta K(1-p(2-k))-K^{lr}-p(r(R+\Delta R+1)-(2-k)K^{lr})+\bar{K}(2-r-p(3-k-r(R+\Delta R+1)))}{1-k}.$$

Consequently, we can state:

**Result 4.** *With the addition of leverage ratio restrictions to risk-weighted capital ratios, risky banks with  $\Delta R > \rho'_{lr}$  do not offer PSIA contracts ( $\mu = 0$ ), where  $\rho'_{lr} = \frac{\Delta K(1-(2-k)p)-\gamma(1-(2-k)p)}{(1-\bar{K})pr} + \frac{r+p-1}{pr} - R - 1$ . In contrast, risky banks with  $\Delta R < \rho'_{lr}$  finance their activity with PSIA and do not raise deposits (IBs).*

Proof. Follows straightforwardly from equation (14).

The risky CBs expected profit is here equal to equation (10), while the IBs expected profit is now as follows:

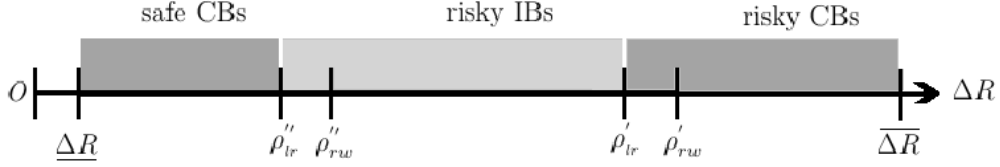
$$\begin{aligned} \pi_{lr}^{riskyIB*} = & p((\Delta R + R)(1 - r(1 - K^{lr})) + (K^{lr} - 1)(k + 1)) - \\ & (1 - p)(K^{lr} + (1 - K^{lr})(1 - r)) \end{aligned} \quad (15)$$

Evaluation of equation (10) and equation (15) is summarised in the following result.

**Result 5.** *There exists a threshold  $\rho''_{lr} = \frac{\Delta K(1-(2-k)p)-(1-p)(1-(2-k)\bar{K}-R)-(k-1)\gamma}{p}$ , where  $\rho''_{lr} < \rho'_{lr}$ , under which banks select safe activity. Conversely, if  $\Delta R > \rho''_{lr}$ , banks select risky activity.*

Thresholds  $\rho'_{lr}$  and  $\rho''_{lr}$  are respectively lower than  $\rho'_{rw}$  and  $\rho''_{rw}$ , meaning that the implementation of leverage ratio restrictions increases the banks' incentives to act as risky CBs. These findings are illustrated in Figure 2.

Figure 2: Bank choice under Basel III capital regulation



Such capital requirements increase the number of IBs if

$$\int_{\rho''_{lr}}^{\rho''_{rw}} f(\Delta R) d\Delta R > \int_{\rho'_{lr}}^{\rho'_{rw}} f(\Delta R) d\Delta R \quad (16)$$

Otherwise, the number of CBs is larger if leverage ratio restrictions are implemented with risk-weighted capital requirements.

Nevertheless, Result 4 and Result 5 respectively show that  $\rho''_{rw}$  and  $\rho''_{lr}$  are unaffected by a change of the share of  $r$  borne by PSIA holders; while, for all  $\Delta\rho' = \rho'_{rw} - \rho'_{lr}$ , we find  $\frac{\partial\Delta\rho'}{\partial r} = \frac{\gamma(1-(2-k)p)}{(K-1)pr^2} < 0$ . In other words, as the difference of  $\rho'_{lr}$  and  $\rho'_{rw}$  is driven by the decrease of the IBs expected profit following the addition of leverage ratio restrictions, IBs can moderate this reduction by offering PSIA contracts with a higher share  $r$  provided to the investor. In short, this regulatory framework increases the IBs' incentives to benefit from the loss absorbency of PSIA contracts, due to the banks' desire to minimise their expected losses through this specific source of funding. In this simple model, we assumed an exogenous value of  $r$ , driven by the banks competitive pressure. However, one could state that when IBs are able to select an optimal share  $r$  in PSIA contracts, the implementation of a leverage ratio regulation reduces the share  $1 - r$  borne by banks. In summary, the proportion of IBs in the banking system may be expanded by the Basel III capital requirements<sup>6</sup>.

<sup>6</sup>The consideration of this point in another model could represent an interesting extension of this current work.

## 4 Local regulations and degrees of competition in dual banking systems

In this section, we go one step further by providing an extension of our analysis, with assumptions relative to two local particularities of banking systems where conventional and Islamic banks operate side by side. Thus, we build a model in which banks choose to be Islamic or conventional solely within a profit-maximisation perspective, without considering the religious beliefs of the banks *management*. Here, we take into account the religious beliefs of the banks *customers*, by assuming that some IB customers may be reluctant to switch to CBs. This assumption concerning captive customers adhering to religious principles is represented by an excess return for IBs, denoted as  $\epsilon$ : a high value of  $\epsilon$  means that IBs benefit from a relative low competitive environment, hence where CBs face strong difficulties attracting IB customers.

On the other hand, the capital requirements applied in dual banking systems are currently very dissimilar, since many national regulators decide to adapt capital requirements initially suggested at an international level, before imposing them on local IBs (Song & Oosthuizen, 2014). This heterogeneity of national IB capital requirements is driven by the IFSB guideline, which leaves up to the national regulators' discretion a "factor of reduction" relative to the computation of domestic IBs risk-weighted assets (see IFSB, 2013). In order to consider this point in our analysis, we assume in this section a similar factor of reduction, denoted as  $\alpha$ , with  $\alpha \in [0, 1]$ . A strong value of  $\alpha$  represents, therefore, an important reduction of IB capital requirements at the local level, compared to the CB requirements.

In summary, these new assumptions do not affect the CBs expected profits, while the IBs expected profit is then:

$$\begin{aligned} \pi_{loc}^{riskyIB*} &= (p((R + \Delta R + \epsilon) - (1 - (K^{lr} + (\Delta K - K^{lr} + K)(1 - \alpha))) - \mu) \\ &\quad - \mu(1 + r(R + \Delta R + \epsilon)) - (K^{lr} + (\Delta K - K^{lr} + K)(1 - \alpha))k) \end{aligned}$$

$$-(1-p)((K^{lr} + (\Delta K - K_{lr} + K)(1-\alpha)) + (1-r)\mu) \quad (17)$$

Evaluating expected profits of IBs and CBs, we can then state:

**Result 6.** *There exists two thresholds, denoted as  $\rho''_{loc}$  and  $\rho'_{loc}$ , in which banks decide to operate as risky IBs  $\forall \Delta R \in [\rho''_{loc}, \rho'_{loc}]$ . Otherwise, banks choose to act as CBs, with safe activity  $\forall \Delta R < \rho''_{loc}$  and with risky activity  $\forall \Delta R > \rho'_{loc}$ .*

*Proof.* The risky CBs expected profit is larger than the IBs expected profit for all  $\Delta R > \rho'_{loc} = \frac{\alpha(\Delta K + K - K^{lr})(1-(2-k)p) - (1-r) + p(\epsilon + 1 - r)}{pr} - R - \epsilon$ . On the other hand, the IBs expected profit is lower than the safe CBs profit for all  $\Delta R < \rho''_{loc} = \frac{((1-\alpha)(K + \Delta K) + \alpha K^{lr})(1-p(2-k)) - K^{lr}(k-1) + R - r(1-p)}{p(1-r)} - R - \epsilon$ , with  $\rho''_{loc} < \rho'_{loc}$ .

As before, banks with intermediate returns on assets select Islamic banking. We observe here that the choice of a bank is affected by the excess return  $\epsilon$  driven by the degree of competition differential, the local adjustment of capital requirements imposed on IBs  $\alpha$ , and the extent of leverage ratio restrictions  $K^{lr}$ .

More precisely, comparative statistics for Result 6 show that  $\rho'_{loc}$  is greater the larger the factor of reduction  $\alpha$  and the excess return  $\epsilon$ . On the other hand, this threshold is smaller the greater the leverage ratio restriction  $K^{lr}$ :

$$\frac{\partial \rho'_{loc}}{\partial \alpha} = \frac{(\Delta K + K - K^{lr})(1 - p(2 - k))}{pr} > 0 \quad (18)$$

$$\frac{\partial \rho'_{loc}}{\partial \epsilon} = \frac{1}{r} - 1 > 0 \quad (19)$$

$$\frac{\partial \rho'_{loc}}{\partial K^{lr}} = -\frac{\alpha(1 - p(2 - k))}{pr} < 0 \quad (20)$$

In addition, we find that  $\rho''_{loc}$  is smaller the larger the factor of reduction  $\alpha$  and the excess return  $\epsilon$ . Nevertheless, the relationship between this threshold and the leverage ratio restriction  $K^{lr}$  is ambiguous:

$$\frac{\partial \rho''_{loc}}{\partial \alpha} = -\frac{(\Delta K + K - K^{lr})(1 - p(2 - k))}{p(1 - r)} < 0 \quad (21)$$

$$\frac{\partial \rho_{loc}''}{\partial \epsilon} = -1 \quad (22)$$

$$\frac{\partial \rho_{loc}''}{\partial K^{lr}} = -\frac{\alpha(1 - p(2 - k)) - (k - 1)}{p(1 - r)} \quad (23)$$

We observe that, under a Basel III capital framework, banks have more incentives to operate as IBs in local banking systems overseen by regulators making significant reductions to IB capital requirements, and where the degree of competition differential between Islamic and conventional banking activities is strong. In other words, if IBs benefit from a large captive clientele and from tailored risk-weighted capital requirements, bank risk-taking following the implementation of leverage ratio restrictions is moderated. In short, the local environment in dual banking systems relative to banking competition and capital requirement adjustments also determines the analysis of how Basel III rules affect banking behaviour.

## 5 Concluding remarks

This study examines Islamic and conventional bank behaviour under Basel III capital requirements and IFSB standards, using a simple theoretical model. Within a profit-maximisation perspective (i.e. without religious incentives), our findings show that Islamic banking becomes attractive when capital requirements apply and with an intermediate banks' return on assets. Under these conditions, banks therefore choose not to increase deposits but rather propose profit-sharing investment accounts to customers. Alternatively, banks with low or high returns on assets prefer conventional banking, and hence raise interest-bearing deposits while this source of funding is forbidden by the rules of traditional Islamic finance. Besides, in a dual banking system, where Islamic and conventional banks operate simultaneously, we find that the implementation of leverage ratio restrictions in addition to a risk-weighted capital ratio reduces the number of safe banks, and increases the number of risky conventional banks.

Furthermore, our model takes into account the local specificities of dual banking systems in two ways. It is widely agreed that conventional banks

face more difficulties in attracting Muslim customers than Islamic banks, due to the religious motivations of these customers. We thus investigate bank behaviour under Basel III capital requirements when Islamic banks benefit from a less competitive environment than conventional banks. In contrast, we assume that national regulators are able to tailor international capital requirements for local Islamic banks, as allowed by the standards of the Islamic Financial Services Board. Our results therefore show that incentives to act as risky conventional banks under the Basel III regulation are lower if the degree of competition differential is high and/or if local regulatory adjustments for Islamic banks are considerable. In summary, the presence of such local particularities mitigates the increase in risk-taking that follows the implementation of leverage ratio restrictions in dual banking systems.

This paper highlights that the strengthening of capital requirements may increase incentives to operate as Islamic banks, as these banks benefit from higher abilities to absorb losses, and thus benefit from lower capital requirements. This point provides a new explanation of the substantial growth in Islamic banking activities over the last decade, since the global banking crisis of 2007-2008 led to a reduction of banks' return on assets and to a tighter regulatory framework. Overall, this analysis stresses the need to take into account the specificities of Islamic banking within international regulatory guidelines, especially when many conventional banks nowadays decide to engage in Islamic banking activities as a response to the current financial environment

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