A Capital Adequacy Framework for Islamic Banks: The Need to Reconcile Depositors' Risk Aversion With Managers' Risk Taking

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Abstract

Conceptually, an Islamic bank has an equity-based capital structure, dominated by shareholders' equity and investment deposits based on profit and loss sharing [PLS]. There is no need for capital adequacy regulations if the Islamic banks are structured as pure PLS-based organizations. However, due to informational asymmetry and risk aversion by investors, there currently exist fixed claim liabilities on the Islamic banking balance sheets. This necessitates the imposition of capital adequacy requirements, which aim at maintaining systemic stability by achieving two fundamental objectives. First, capital regulations should protect risk-averse (assumed unsophisticated) depositors. This requires a minimum equity capital cushion and an optimal assets-liabilities composition. Second, capital regulations should give the right incentives to shareholders to promote prudent behaviour by the banks. This requires analysis of the effect of financial participation by shareholders on Pareto optimality, and analysis of potential behaviour by shareholders when facing financial uncertainty. This paper combines modern banking theory and principal-agent analysis to develop a framework for an optimal capital structure for Islamic banks. The proposed capital regulation includes a minimum risk-based equity capital cushion [as required under the Basel Accord], a prudent assets-liabilities [capital] structure [i.e. appropriate proportions of PLS- and non-PLS-based assets and liabilities] and a minimum 'financial participation' requirement. We infer from the analysis that such capital adequacy requirements will improve the soundness of current Islamic banking practice, thus paving the way for the wider use of PLS by Islamic banks in the long run.

JEL classification: *E58, G28, G32, and G38*

Keywords: Regulation; Islamic banks; Capital adequacy

1. Introduction

Capital adequacy has become one of the most important indicators for assessing the soundness of banking operations. Due to its importance, the western banking system has already established internationally-recognized capital regulations, which are formulated by the Basel Committee on Banking Supervision. In its latest form (Basel Committee, 2001), the Basel Capital Accord covers not only the calculation of capital adequacy ratios but also other supporting issues, like sound supervisory processes and market discipline.

Many steps have in the recent past been taken to devise an appropriate framework for the capital regulation of Islamic banks. The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) released a statement on the purpose and calculation of the capital adequacy ratio for Islamic banks in 1999, although the concept seems to need continual review. Khan and Chapra (2000) have also proposed a fundamental approach to capital adequacy for Islamic banks. Following up on the previous research, this paper combines western banking theory on capital regulation with an analysis of principal-agent relationships to develop new proposals for the capital regulation of Islamic banks.

The paper proceeds as follows. The next section reviews the Basel Committee's capital regulations and the current approaches adopted towards the capital regulation of Islamic banks. Section 3 proposes a new approach for the capital regulation of Islamic banks. This section includes the analysis of principal-agent relationships and the potential moral hazard faced by the shareholders. Section 4 concludes the paper.

2. Review of existing capital regulations

2.1. Capital regulation in western banking systems

Prudential banking regulation is needed to deal with imperfect consumer information and agency problems where they exist. Llewellyn (1999) mentions three particular elements for robustness while referring to the ability of the financial system to remain stable and efficient under a wide range of market conditions and shocks. First, the financial system should be able to accommodate any change in the system as the market alters (flexibility). Second, the financial system should have a capability to overcome any financial turbulence caused by external shocks, including macroeconomic instability (resilience). Third, the financial system should also have internal stability. Capital regulation is designed to enhance the capability of individual banks to absorb temporary financial shocks. The soundness of capital structure can also induce prudent behaviour by the bank since the shareholders can reasonably expect positive future cash-inflow without the bank taking excessive risks[1] (Milne and Whalley, 2001).

The current capital regulations for western banks are outlined by the Basel Committee on Banking Supervision in the Basel Capital Accord of 1988, as subsequently amended (see Hall, 2001 for a review of its evolution). Recently, the Committee has released a consultative document concerning its proposal for a New Basel Capital Accord. It covers three mutually reinforcing areas, the so-called 'pillars', comprising:

[1] Generally, the shareholders have three options to control the company, i.e. making their voices heard, management replacement and exit. Making their voices heard is the way to approach management directly and to inform them about their opinions on the appropriate way to run the business. The shareholders can also replace the management committee if they think that the management is not able to fulfil their requirements. If the shareholders, especially the major shareholders, do not agree with the way the company is run, they can simply sell the company's shares on the stock market. The selling of the shares will initiate a share price fall in the stock market and acts as a signal to managers to improve their performance.

(i) minimum capital requirements; (ii) the supervisory review process; (iii) and market discipline. The first pillar reviews the calculation of minimum capital requirements and technical issues leading to the capital adequacy requirements. The second pillar establishes key principles designed to ensure an efficient supervisory process. The third pillar reviews minimum disclosure requirements necessary to enhance market discipline (For full details see Basel Committee, 2001; and for an assessment see Hall, 2001).

As discussed by Dewatripont and Tirole (1999) and Hall (2001), the Basel Committee adopts the Cooke ratio as a common measure of solvency. The Cooke (Risk Asset Ratio (RAR)) ratio is defined as:

$$RAR(\%) = \frac{ACB}{TOWRA} \tag{1}$$

where ACB and $TOWRA$ are the adjusted capital base and the total of weighted risk assets.

The regulation requires the RAR to be equal to at least 8 percent of total assets, after applying risk-weighting coefficients to the assets, on- and off-balance-sheet. The US banking system, meanwhile, also adopts a regulatory regime of 'prompt corrective action' when dealing with ailing banks (Fries et. al., 1997). The regime implies the allocation of control to shareholders if the bank performs well and to debt-holders if the bank performs otherwise[2]. The Committee, however, continuously reviews the more sophisticated Cooke ratio to take into account other factors that influence the realistic valuation of the bank's assets.

[2] The shareholders have control over a bank's management when the net worth of the bank is adequately positive. The regulator, on behalf of the depositors, is mandated to take over managerial

The proposed New Accord will be applied on a consolidated basis to the internationally-active banks. The purpose of the consolidation is to capture financial risk throughout the whole business group that engages in banking activities. The consolidation process includes majority-owned banking, securities and other financial entities.

The New Accord also provides a range of options for the assessment of capital adequacy[3]. The banks are required to have more advanced [i.e. 'internal ratings-based] risk management capabilities if they wish to use the more advanced credit risk assessment methodologies. The internal risk management process is subject to supervisory review and intervention. A new set of disclosures and recommendations is also standardized to allow other market participants to assess critical information about the risk profiles and capital adequacy of banks.

2.2. The existing capital regulation for Islamic banks

a. Islamic banking: The building blocks

An Islamic bank uses various types of financial contracts. Exhibit 1, section (a) shows three types of deposits on the liabilities side of an Islamic bank: non-investment deposits [SA]; unrestricted profit-sharing investment deposits [$PSIA^U$]; and restricted profit-sharing investment deposits [$PSIA^R$]. Islamic banks guarantee the principal amount of deposits and share any monetary surplus with the SA, whilst they share the profit or losses with the $PSIA^U$. Islamic banks provide only administrative services to the $PSIA^R$ since the depositors are themselves actively involved in investment

control if the bank cannot perform well financially since the regulator will be the ultimate guarantor for any systemic costs incurred.

decision making[4]. This demonstrates that Islamic banks perform fiduciary and agency roles at the same time.

Islamic banks should maintain their repayment capabilities for the risk-averse depositors, and deliver the highest monetary return possible to the risk-taking investors. However, the proportion of $PSIA^U$ to total assets varies depending upon the preferences of the investors; the higher the proportion of $PSIA^U$, the more significant the agency role undertaken (i.e. the $PSIA^U$ give full authorization to the bank to take all decisions relating to the investment process). On the contrary, the higher the proportion of SA, the more significant the fiduciary role undertaken (i.e. the bank should strive to maintain the value of the SA first and foremost). The capital regulations for Islamic banks should be capable of enhancing the fiduciary roles performed for risk-averse depositors, and the agency roles performed for risk-taking investors.

[Exhibit 1 here]

Exhibit 1, section (b) shows various types of investment on the assets side of an Islamic bank. These investments can be classified into PLS- and non-PLS-based investments. Mudaraba and musharaka modes of financing can be classified as PLS-based investments [PLSI], whilst murabaha, ijara and salam can be classified as non-PLS-based investments [MUI-denoting 'mark-up'-based investments]. In practice, there also exist hybrid-types of investment [HYBI] that combine the two basic modes

[3] Explicit capital charges have been set not only to cover credit risk but also operational risk. The Basel Committee has also floated the possibility of allowing the banks to use portfolio credit risk models (market-based credit risk assessment) as a future option.

[4] The $PSIA^R$ depositors have the right to determine the investment types chosen; the banks merely provide them with information about feasible investments. Therefore, the $PSIA^R$ depositors take responsibility for investment risk.

of finance [i.e. some part of the claims is fixed and some part is variable]. For example, lending money with a guarantee on the repayment of principal but also sharing the profits. Individual Islamic banks select their preferred compositions of assets. [For more details about the variety of permissible Islamic investments, see Haron and Shanmugam, 1997; Errico and Farahbaksh, 1998; and Haron, 1997].

Exhibit 1, section (c) shows the pivotal position of the banking regulator, who is trying to ensure the sustainability of the savings/investment process. The regulations implemented should be able to provide the right incentives and protection for all market players to induce them to behave prudently. Besides designing a proper set of financial ratios for capital regulation, the regulators of Islamic banks should also consider adopting the second and third pillars of the Basel Committee's new capital accord to empower the supervisory process and to improve transparency in the banking system.

b. The AAOIFI's approach to capital regulation

The existence of Profit Sharing Investment Accounts [PSIA] raises some fundamental issues in calculating the Capital Adequacy Ratio [CAR] for an Islamic bank. The basic issue surrounds the possibility of including PSIA as a component of capital because they have a risk-absorbing capability. In this respect, the AAOIFI's *Discussion Memorandum on the Calculation of the Capital Adequacy Ratio for Islamic Banks* [issued in January 1998] is relevant. This document tries to design a capital adequacy framework for Islamic banks within the Basel's capital adequacy framework. Following this, the AAOIFI issued the *Statement on the Purpose and Calculation of the Capital Adequacy Ratio for Islamic Banks* in March 1999. According to this statement, Islamic banks' own capital is exposed to normal

commercial risk, fiduciary risk and displaced commercial risk[5], implying that these types of risk should underlie the design of the capital regulations. It proposes three things. First, that there should be no inclusion of $PSIA$ in the risk-bearing capital[6]. Second, that all assets financed by debt-based liabilities and own-equity should be included in the denominator of the CAR. And, third, 50% of $PSIA$-financed assets should be included in the denominator of the CAR. The last measure is needed to cover possible losses arising from misconduct or negligence in investment activities[7]. Thus:

$$CAR = \frac{OC}{W_{OC+L}(OC + L) + W_{PSIA}(0.5 * PSIA)} \tag{2}$$

where OC[8] is the bank's own capital; L[9] represents its non-PLS-based deposits; W_{OC+L} represents the average risk weight for assets financed by OC and L; and W_{PSIA} represents the average risk weight for assets financed by $PSIA$. Like the Basel standards, the AAOIFI standard requires the CAR to be at least 8%.

[5] Displaced commercial risk expresses the possibility that depositors will withdraw their funds if the return paid to them is lower than that paid by the other banks. As a result, some Islamic banks give minimum guaranteed returns to depositors, although it is prohibited by the sharia principles (AAOIFI, 1999).

[6] In fact, the statement does not distinguish between $PSIA^U$ and $PSIA^R$; arguably, the former should be included in the capital base.

[7] If the bank's management acts in breach of the investment contract, or is guilty of misconduct or negligence in the management of the investors' funds, then the bank may be legally liable in respect of losses sustained on those funds (AAOIFI, 1999).

[8] The Islamic bank's own capital is calculated according to the Basel methodology and comprises two tiers: Tier 1 and Tier 2. This basic calculation has been adopted by the AAOIFI's Financial Accounting Standard (No 11: Provision and Reserves).

3. The proposed capital adequacy regulation for Islamic banks

3.1. A critique of the AAOIFI's approach

Although significant efforts have been made to design a more appropriate capital regulation for Islamic banks, there are a number of criticisms to be addressed. First, the existing capital adequacy ratio developed by the AAOIFI is only designed to assure a given level of solvency and ignores the agency roles performed by Islamic banks and the principal/agent relationships involved. Second, there has been an inconsistency in defining the restricted-investment deposits. According to the international accounting standard developed by the AAOIFI [AAOIFI, 1997], $PSIA^R$ deposits cannot be recognized as liabilities of Islamic banks and should not be reflected on the banks' statement of financial position. This is because the depositors are highly involved in investment decisions. Thus, it can be argued that $PSIA^R$-financed assets should be excluded from the risk-weighted assets in the denominator of the CAR. Yet in the CAR, no distinction is drawn between $PSIA^R$ and $PSIA^U$. [From now on, we exclude $PSIA^R$ from the analysis] And third, the possibility of a bank facing 'an abnormal risk' arising from a managerial dispute (i.e. where the $PSIA^U$ depositors consider that a bank has neglected or breached the contract agreed upon) should be seen as legal risk, which ideally requires a case by case approach being taken (i.e. depending on the terms used in the contract). In this case, the banks should be able to identify the difference between deposits taken on a pure PLS basis and those representing a hybrid contract. Deposits with any potential claim (partly) should be classified as hybrid-based deposits. Exhibit 2 shows the differing

[9] The AAOIFI uses L to include all other (non-PLS-based) deposits. From now on we use SA to represent all other non-PLS-based deposits.

expectations of different types of depositors, and the corresponding bank roles in investment decision-taking.

[Exhibit 2 here]

In practice, Islamic banks may have different proportions of $PSIA^U$ in their balance sheets. The variability of the $PSIA^U$ proportion is simulated in the following analysis [see Appendix A for the underlying assumptions used and for full details]. Exhibit 3, section [a] shows the ratio of OC to $PSIA^U$ as a function of the percentage of $PSIA^U$ to total assets $[TA]$[10]. This indicates that Islamic banks which have a higher proportion of $PSIA^U$ within their assets will have a lower proportion of OC to $PSIA^U$.

[Exhibit 3 here]

Exhibit 3, section (b) shows the relative agency (i.e. monitoring) cost $(\frac{V(e)}{\alpha(OC, PSIA^U)})$ as a function of the percentage of $PSIA^U$ to TA[11]. This indicates that a higher level of relative agency cost is associated with a higher proportion of $PSIA^U$ to TA as the latter implies lower monetary surplus for shareholders. A high level of relative agency cost thus implies a high probability that shareholders will

[10] TA is equal to the total of OC, SA and $PSIA^U$.

[11] Shareholders of an Islamic bank are assumed to receive monetary surplus α as a function of the proportion of (OC) to the total equity based capital $(OC + PSIA^U)$. $V(e)$ represent an opportunity cost as a result of spending time monitoring the activities of the bank. The higher the effort (e) given by the shareholders, the higher the opportunity cost. It is expressed in terms of a unit cost, $\frac{V(e)}{\alpha(OC, PSIA^U)}$, which represents agency costs as a proportion of the monetary return received by the shareholders. A higher relative agency cost for the shareholders implies a higher probability of them abandoning the task of supervising the management since the monetary reward cannot sufficiently compensate for the opportunity cost incurred. A more comprehensive understanding about agency costs can be found in Macho-Ines and Peres-Castrillo (1997) and in Holmstrom (1979).

exert less effort (e) to supervise the bank and instead, allocate their funds to a more profitable investment.

Khan and Chapra (2000) suggest the adoption of separate capital adequacy standards for SA and $PSIA^U$. They argue that such a separation of capital requirements would enhance comparability, transparency, market discipline, depositor protection and systemic stability. Furthermore, they mention the possibility of either keeping the demand deposits in a trading book, or pooling the investment deposits in a securities subsidiary. This suggestion, basically, expresses two important things. First, the need for a reliable accounting system that is able to prevent a potential dilution between fiduciary roles and agency roles. And second, the need to promote a system that will be able to accommodate different types of customer preferences without jeopardizing systemic stability.

3.2. Possible improvements

3.2.1. Possible enhancement of fiduciary roles

a. Prudent financial structure

The assets and liabilities structure is an important feature of a prudent financial structure[12]. Fulfilling the accounting principle that total assets must be equal to total liabilities, the total value of PLS_t, HYB_t, and MU_t (i.e. the values of PLS-based,

[12] Obaidullah [1999] also mentions the importance of maintaining a balance between PLS-based and non-PLS-based products on the assets and liabilities sides of an Islamic bank.

hybrid, and mark-up-based assets respectively) is equal to the total of equity-based capital [EC_t] and debt-based capital [DBC_t] in period t[13], i.e.

$$PLS_t + HYB_t + MU_t = EC_t + DBC_t \tag{3}$$

Therefore, the total cash flow of PLS [ΔPLS_{t+1}], hybrid [ΔHYB_{t+1}] and markup-based assets [ΔMU_{t+1}] in the period t+1 is equal to the total cash flow of equity-based capital [ΔEC_{t+1}] and debt-based capital [ΔDBC_{t+1}] in period t +1. That is,

$$\Delta PLS_{t+1} + \Delta HYB_{t+1} + \Delta MU_{t+1} = \Delta EC_{t+1} + \Delta DBC_{t+1} \tag{4}$$

where:

$-PLS_t \leq \Delta PLS_{t+1} < \infty$ [14],

$0 \leq \Delta HYB_{t+1} < \infty$,

$\Delta MU_{t+1} = \alpha MU_t$, α : Average rate of mark-up,

$\Delta EC_{t+1} = \beta(\Delta PLS_{t+1} + \Delta HYB_{t+1} + \Delta MU_{t+1})$ [15], and

$\Delta DBC_{t+1} = (1-\beta)(\Delta PLS_{t+1} + \Delta HYB_{t+1} + \Delta MU_{t+1})$

In an adverse condition when total cash flow is negative, risk-averse depositors [fixed claimant and hybrid deposit holders] receive nothing, i.e., $\Delta DBC_{t+1} = \Delta HYB_{t+1} = 0$. In

[13] To keep it simple, we are making no distinction between equity capital and PLS-based deposits, and between general debt and other fixed-claim deposits i.e. EC_t is assumed to include $PSIA^U$, and DBC_t is assumed to include SA and all other fixed claim liabilities.

[14] The equation shows the possibility that the future value of a PLS-based asset might be zero (totally lost).

order to prevent insolvency, the negative cash flow should be less than the equity-based capital, i.e.,

$$-\Delta EC_{t+1} \leq EC_t \tag{5}$$

Putting the value of ΔEC_{t+1} from Equation (4) into Equation (5) yields:

$$PLS_t \leq EC_t + \alpha MU_t \tag{6}$$

In an Islamic bank, collateral is applied to ensure repayment of the debt-based assets and to avoid contractual breaches in PLS contracts, with the consequence that the monetary surplus of the hybrid assets and the total value of the PLS-based assets are not also considered as liabilities[16]. Therefore, in order to implement a prudential banking operation and to ensure the sustainability of the banking operations, the value of PLS_t should not exceed the total value of EC_t plus the expected monetary surplus of the markup-based assets [αMU_t] [as shown by Equation (6) above].

b. Minimum level of net-worth

A requirement for a minimum level of net-worth (financial cushion) to enhance the capacity of a bank to maintain its solvency when facing temporary financial shocks has been adopted widely by Islamic banking regulators in many countries. However, the calculation of the CAR should only include the assets financed by debt-based

[15] The equation shows that the expected return to the shareholders is proportionate to the sharing coefficient (β), and that if the bank experiences losses, the financial losses should be less than its loss absorbing capability.

[16] Referring to the Basel Committee's principles about credit mitigation, the collateral is mandatory to back-up the repayment if the loans are defaulted on. An asset which is not sufficiently backed-up by sound collateral, should be backed-up by equity capital. In the case above, the expected value of the PLS-based assets and the monetary surplus of the hybrid-based assets should be considered as zero ($PLS_{t+1} = 0$ and $\Delta HBY_{t+1} = 0$).

liabilities and own capital[17]. In other words, the capital adequacy ratio should be calculated as follows:

$$CAR' = \frac{OC}{RWA_{OC+DBC}}, \tag{7}$$

where RWA_{OC+DBC} is the value of the risk weighted assets financed by OC and DBC. Subject to this caveat, the regulators should adopt the same methodology used by the Basel Committee.

3.2.2. Possible enhancement of agency roles

a. Minimum level of net-worth and shareholder value

The requirement for a minimum financial cushion is aimed at protecting the risk-averse depositors. This is also expected to enhance the agency role of Islamic banks, as explained below. In an Islamic bank, the level of OC is not the only factor determining shareholder value. The $PSIA^U$ also proportionally affect shareholder value. The higher the proportion of $PSIA^U$ in total deposits, the higher the financial buffer for the bank; but, at the same time, the shareholders enjoy a lower level of earnings. Shareholder (deterministic) value is thus directly proportionate to the level of financial participation; $a = \frac{OC}{OC + PSIA^U}$. If SA is dominant ($a \approx 1$) in the deposit mix, the shareholder value resembles that of a western bank. If the net worth of the bank is negative (i.e. OC plus $PSIA^U$ is negative), the bank is operated under the threat of liquidation by the banking regulator. In the liquidation process, the shareholders and equity-based depositors receive nothing. The savings depositors

[17] Insolvency in an Islamic bank happens when $TA < DBC$.

receive their financial claims in full (government deposit insurance arrangement) and the financial guarantor pays the difference between the claimed value and the real asset value of the bank.

[Exhibit 4 here]

As illustrated in Exhibit 4 (see Exhibit B.1 for data simulation), the shareholders with a higher level of financial participation increase their risk aversion way before the net worth of the bank becomes negative, as compared with the shareholders holding a lower level of financial participation in a bank. This is because the former would suffer more from monetary loss than the latter. It can be concluded that a bank with a higher capitalization will have a wider risk aversion threshold for shareholders, which might be able to act as a safer internal insurance mechanism.

This theoretical analysis addresses the importance of financial participation by shareholders, especially when SA is significant. From the analytical derivation (see Appendix B), it is found that the proportion of $PSIA^U$ in total deposits is negatively correlated with the level of risk aversion shown by shareholders[18]. And, the higher the financial participation by the shareholders, the more prudently the shareholders will behave. This phenomenon is quite important since the shareholders play important roles in directing the management of the bank.

[18] This analysis, as a matter of fact, is a modification of the analysis by Milne and Whalley (2001) and aims at analyzing the shareholder value of Islamic banks under the threat of liquidation if the banks become insolvent. The reason for the liquidation process is because the banking regulator wants to minimize the systemic costs. In order to strengthen systemic stability, some countries that operate Islamic banks establish a safety net scheme to enhance the repayment capacity of the Islamic banking system for the risk-averse depositors. The implementation of a safety net scheme may, however, create moral hazard since there is a possibility of transferring bankruptcy cost from the bank to the government.

b. A requirement for minimum financial participation by shareholders

PLS, at least in theory if not in practice, is the most distinguishing feature of Islamic finance. However, due to information asymmetry, agency problems are likely to exist[19]. The regulations implemented should be able to improve the quality of the contracts entered into, so that all the contracting parties benefit[20]. One possible option to improve the quality of the contracts is to require a minimum level of financial participation by the shareholders, OC, proportionate to the $PSIA^U$ [imposed in addition to the Basel's capital adequacy framework]. The mutual benefits for the contracting parties can be obtained under several assumptions [see Appendix C for the mathematical derivation]. First, the level of effort is positively affected by the sharing ratio. Second, the higher level of effort brings a positive monetary benefit. And third, the total increment of monetary surplus is higher than the opportunity cost. This is expected to enhance the agency role of Islamic banks.

c. Higher level of transparency

Another possible option to enhance the banks' agency role is to require the banks to provide comprehensive financial reporting to the investment depositors describing the actual financial conditions of the investments. Holmstrom (1979) proves, analytically, that a higher level of shared information will improve the quality of the contracts. This informational requirement, in fact, has been included in the third pillar of the proposed new capital accord of the Basel Committee. The regulators of Islamic banks can also benefit from this approach.

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[19] $PSIA^U$ depositors engage in fixed term contracts; hence, they have less flexibility to withdraw their funds if the banks do not perform well financially.

[20] Mathematically, this is expressed in Pareto optimality. Baldwin [2000] develops a basic framework for financial participation in a profit-sharing contract.

3.2.3. The implications of the minimum capital ratio requirements

In the simulation (see Exhibit D.1 in Appendix D), we choose a minimum financial participation $\left[\frac{OC}{PSIA^U}\right]$ of 6% arbitrarily[21]. And, as in the previous simulations, the analysis is conducted by inputting all possible variations of the proportion of $PSIA^U$ to SA. Shareholders' minimum equity stake should be determined by the minimum CAR of 8% [as indicated in equation 7] or the minimum financial participation requirement, whichever is the higher. This requirement has significant implications when $PSIA^U$ dominate the total liabilities of an Islamic bank.

[Exhibit 5, parts (a) and (b) here]

Exhibit 5, section [b] and Exhibit D.1 show that the OC to $PSIA^U$ ratio becomes binding when the percentage of $PSIA^U$ to TA becomes dominant. This can, alternatively, be expressed in terms of a requirement for a maximum level of relative agency costs (see section [a] of exhibit 5). In other words, the shareholders should always maintain their financial contribution (equity stake) so that their effort to supervise the bank's management is adequately compensated. The thick, thin and dotted lines represent possible risk-weighted asset values for 100%, 50% and 150% average risk weights respectively.

[Exhibit 5, part (c) here]

Exhibit 5 (c) shows the impact of applying the new capital framework proposed (see Exhibit D.1 in Appendix D for data simulations). The analysis shows that there are

[21] The optimal minimum financial participation, as a matter of fact, should be determined empirically.

two constraints for a minimum level of capital adequacy for Islamic banks. Capital adequacy should be determined by:

[1] the capital adequacy ratio (to assure the repayment capability) if the bank's liabilities are dominated by debt-based contracts (hybrid products)(to the left of the star on Exhibit 5 (c)); and

[2] the minimum proportion of financial contribution $\left[\frac{OC}{PSIA^{U}}\right]$ if the bank's liabilities are dominated by investment deposits (i.e. $PSIA^{U}$)(to the right of the star on Exhibit 5 (c)).

4. Summary and concluding Remarks

The Islamic banks conduct fiduciary and agency roles concurrently in the presence of savings deposits [SA] and investment deposits [$PSIA^{U}$]. The existing capital regulations emphasize only their repayment capabilities without adequately paying attention to the principal-agent relationship which exists between investment depositors and shareholders. The proposed capital regulation for Islamic banks outlined in this article seeks to enhance both repayment capacity and the quality of PLS contracts.

We demonstrate, formally, that the fiduciary role can be enhanced by requiring Islamic banks:

[1] to have prudent asset-liabilities (capital) structures; and

[2] to have adequate financial cushions.

The former is necessary because, although Islamic economics recommends the use of PLS contracts, their excessive use on the assets side can jeopardize the sustainability of the banking operations if the Islamic banks are not financially supported by equity-based capital.

We also demonstrate, formally, that the agency roles can be enhanced by requiring:

[1] the shareholders of Islamic banks to observe a minimum level of financial participation; and

[2] the banks to disclose crucial financial information to investors.

Theoretically, higher financial participation and a higher quality of information will both improve the quality of the contracts entered into by the banks and their customers.

Acknowledgement

We are grateful to Christopher Green and especially David T. Llewellyn for comments and very helpful discussion.

Exhibit 1
Relationships within an Islamic banking system

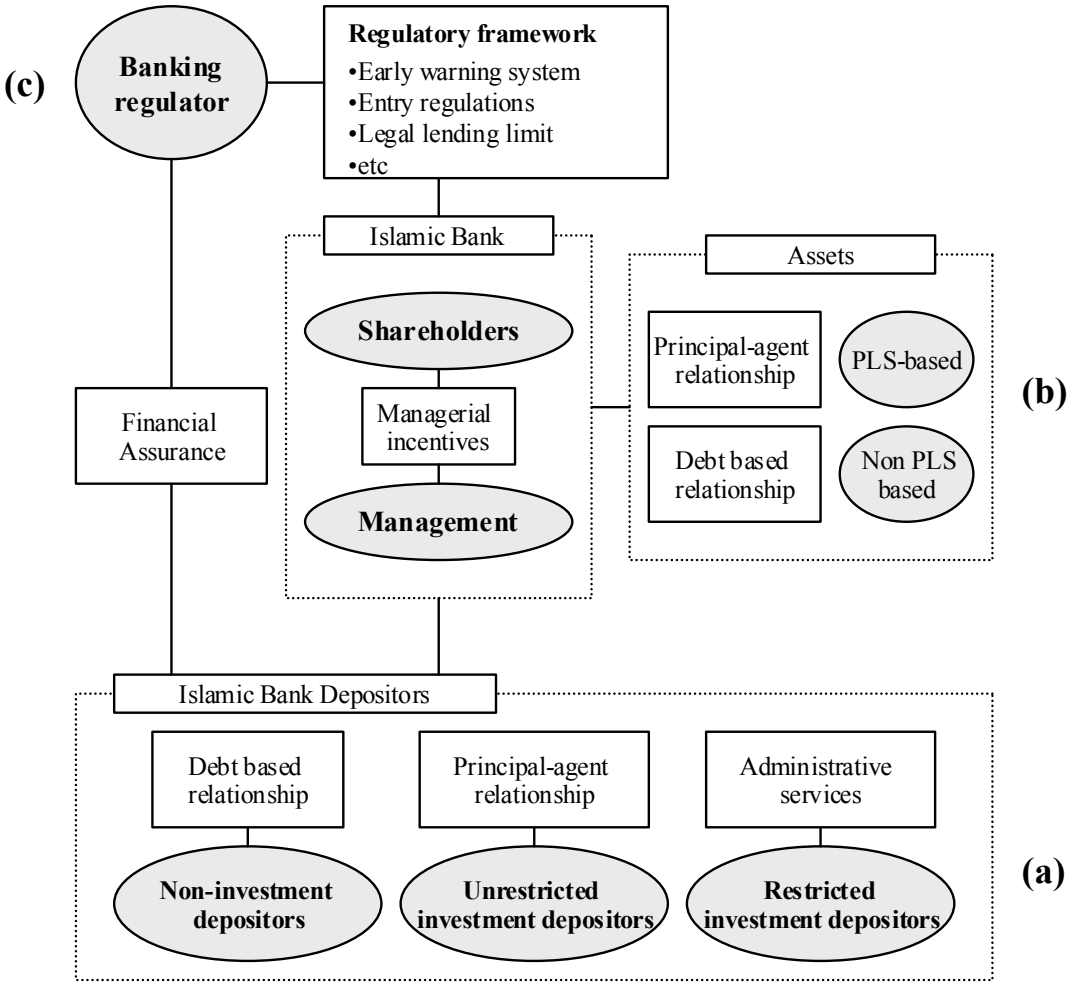
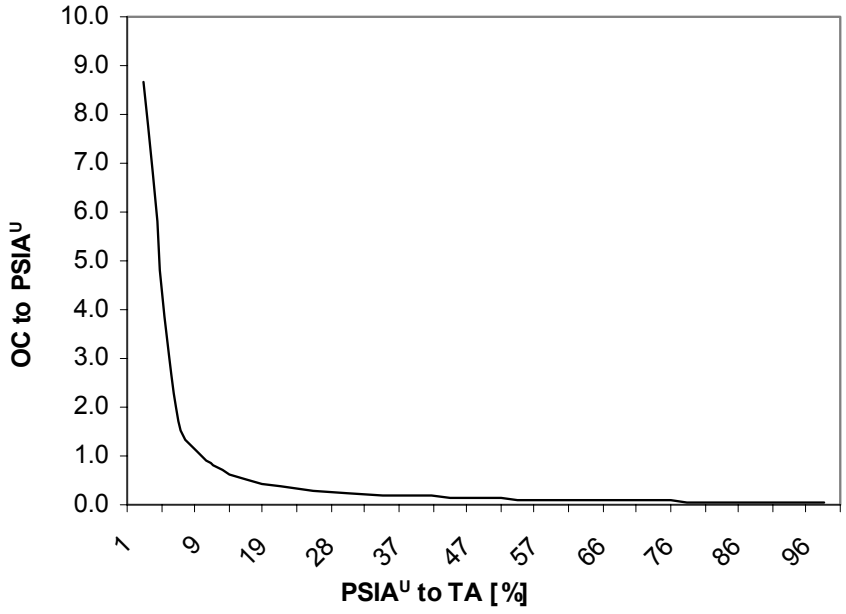


Exhibit 2
The expectations of different types of depositors and the corresponding bank role in investment decisions

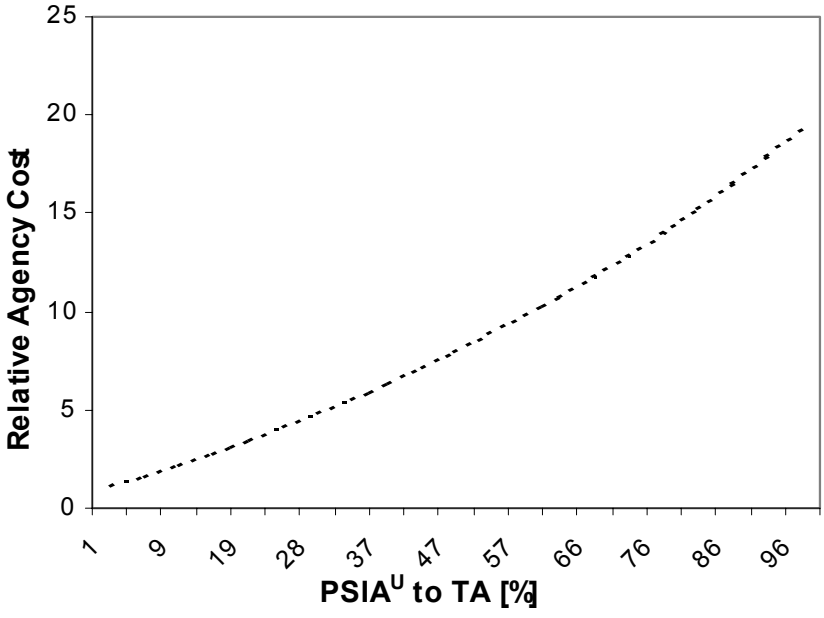
	Types of depositors	Depositors' expectation	Bank's role
Saving/current depositors	- Risk averse - Unsophisticated	Repayment guarantee (principal) with a moderately high monetary return	Full authorization to manage the funds
$PSIA^U$ depositors	- Risk taking - Unsophisticated	A high monetary return and a possibility of facing financial losses	Full authorization to manage the funds
$PSIA^R$ depositors	- Risk taking - Sophisticated	A high monetary return and a possibility of facing financial losses from a preferred investment	A limited level of authorization to manage the funds

Exhibit 3

(a) Proportion of OC to $PSIA^U$ as a function of the ratio of $PSIA^U$ to TA

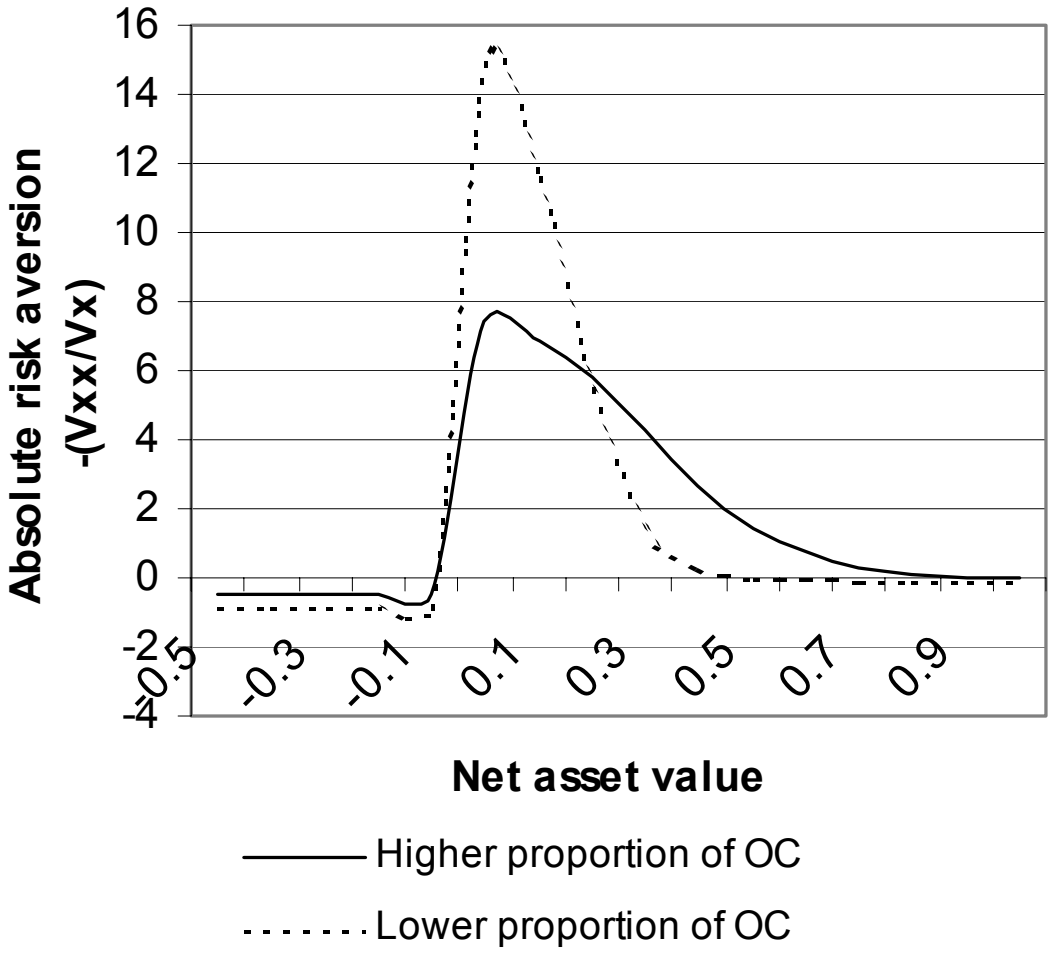


(b) Relative agency cost as a function of the ratio of $PSIA^U$ to TA



Data source: Exhibit A.1 in Appendix A

Exhibit 4
Absolute risk aversion as a function of the net asset value

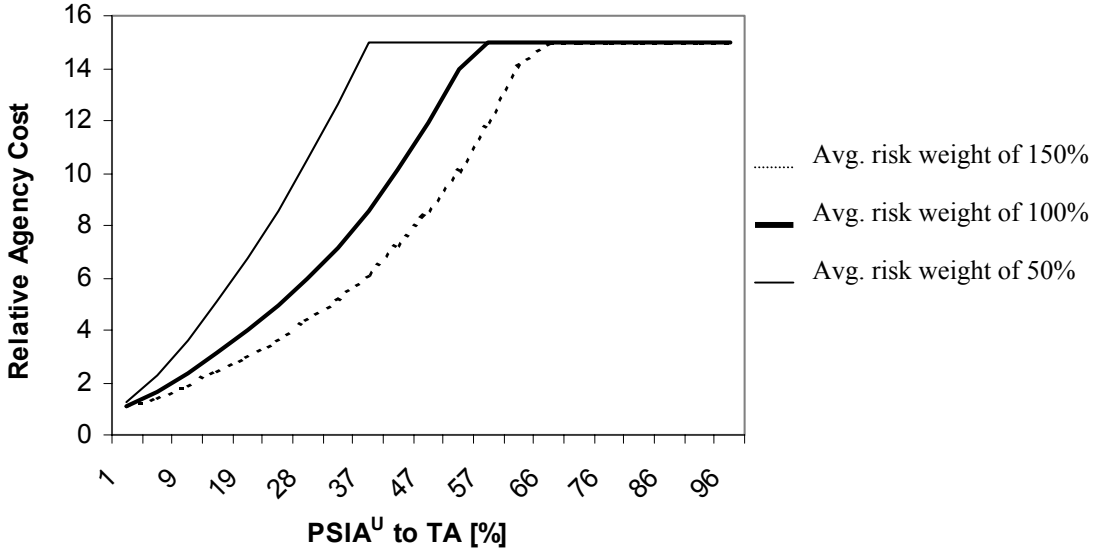


Data source: Simulation in Appendix B

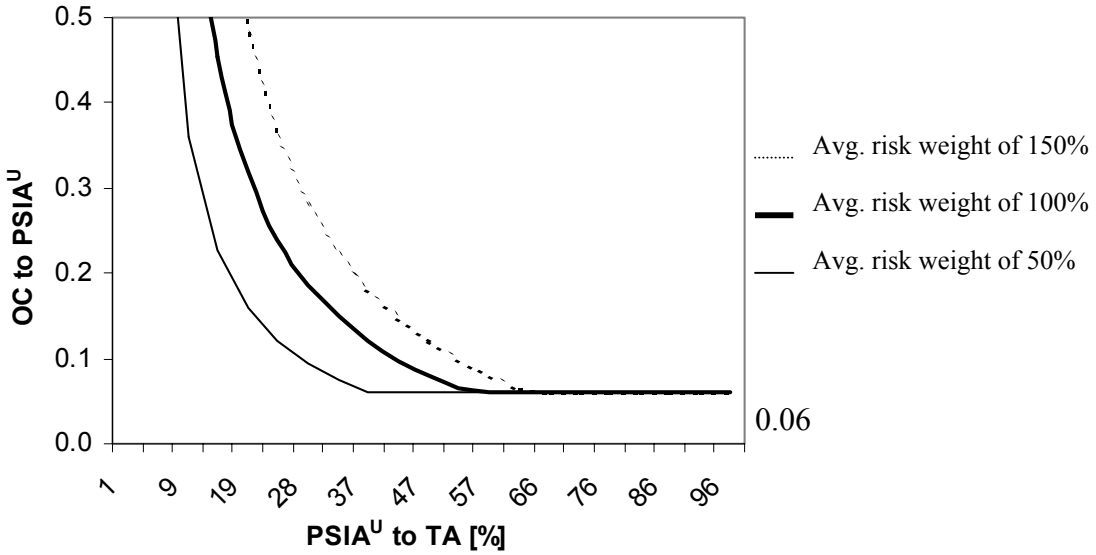
Exhibit 5

The effects of imposing a minimum financial participation on shareholders

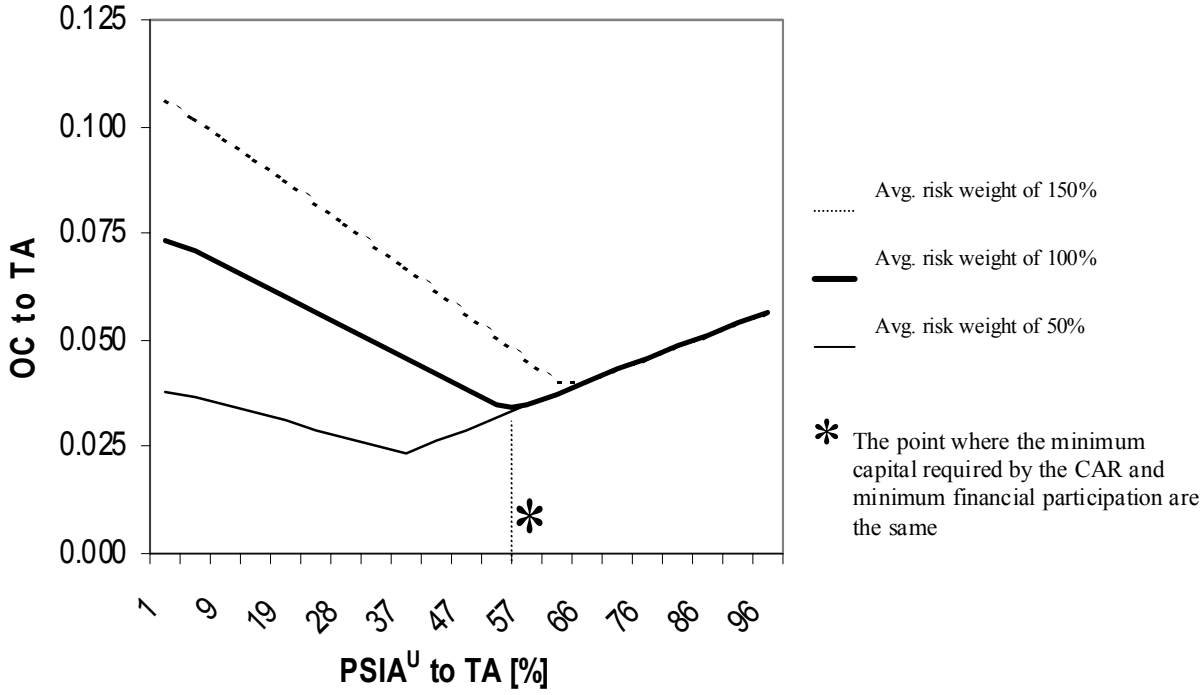
(a) On relative agency cost



(b) On the relationship between the proportion of OC to $PSIA^U$ and the $PSIA^U$ to TA ratio



(c) On the relationship between the proportion of OC to TA and the $PSIA^U$ to TA ratio



Appendix A: Mathematical simulation of capital adequacy using the AAOIFI's standard

In simulating equation [2], we assume that W_{OC+L} and W_{PSIA^U} are equal to 100 percent (all the capital sources are used in the assets side). Under the AAOIFI's approach,

$$CAR = \frac{OC}{W_{OC+L}(OC+L) + W_{PSIA^U}(0.5 * PSIA^U)}$$

By using a minimum CAR of 8% and simulating for different values of $PSIA^U$ and SA, we find OC. In the simulations, we keep the sum of $PSIA^U$ and SA (i.e. equal to total deposits) equal to 1.

Exhibit A.1
Simulation process of capital regulation set by the AAOIFI

SA/total dep.	$PSIA^U$ / total dep.	OC/total dep.	$SA/PSIA^U$	$OC/PSIA^U$	TA/total dep.	$PSIA^U$/TA [%]	Rel. agency cost
0.99	0.01	0.0865	99.00	8.6522	1.0865	0.9	1.1
0.95	0.05	0.0848	19.00	1.6957	1.0848	4.6	1.6
0.90	0.10	0.0826	9.00	0.8261	1.0826	9.2	2.2
0.85	0.15	0.0804	5.67	0.5362	1.0804	13.9	2.8
0.80	0.20	0.0783	4.00	0.3913	1.0783	18.5	3.4
0.75	0.25	0.0761	3.00	0.3043	1.0761	23.2	4.1
0.70	0.30	0.0739	2.33	0.2464	1.0739	27.9	4.8
0.65	0.35	0.0717	1.86	0.2050	1.0717	32.7	5.6
0.60	0.40	0.0696	1.50	0.1739	1.0696	37.4	6.3
0.55	0.45	0.0674	1.22	0.1498	1.0674	42.2	7.1
0.50	0.50	0.0652	1.00	0.1304	1.0652	46.9	8.0
0.45	0.55	0.0630	0.82	0.1146	1.0630	51.7	8.9
0.40	0.60	0.0609	0.67	0.1014	1.0609	56.6	9.8
0.35	0.65	0.0587	0.54	0.0903	1.0587	61.4	10.8
0.30	0.70	0.0565	0.43	0.0807	1.0565	66.3	11.8
0.25	0.75	0.0543	0.33	0.0725	1.0543	71.1	12.9
0.20	0.80	0.0522	0.25	0.0652	1.0522	76.0	14.0
0.15	0.85	0.0500	0.18	0.0588	1.0500	81.0	15.3
0.10	0.90	0.0478	0.11	0.0531	1.0478	85.9	16.5
0.05	0.95	0.0457	0.05	0.0481	1.0457	90.9	17.9
0.00	1.00	0.0435	0.00	0.0435	1.0435	95.8	19.4

Relative agency cost is defined as the ratio of opportunity cost (expressed as a multiplicative factor) to the proportion of monetary surplus for the shareholders or $\left[\frac{OC}{OC + PSIA^U}\right]^{-1}$. For example, agency cost in a bank, which has $PSIA^U$ equal to

OC , will have an agency cost which is twice as high as that of a bank which has no $PSIA^U$. The shareholders in the latter bank will receive half of the monetary surplus while they perform the same supervising function to the bank's management (the multiplicative factor is $\left[\frac{1}{2}\right]^{-1}$ or 2).

Appendix B: Stochastic effect in the analysis of shareholder value

In order to conduct a dynamic analysis of shareholder value within an Islamic bank, let us assume that the net worth of an Islamic bank is determined by a perpetual and certain cash flow generated at a constant expected rate by the assets. The bank faces business uncertainty, which is expressed in variance (σ), and is able to make choices over $\sigma \in [\sigma_1, \sigma_2]$. Mathematically, the net worth can be modeled in a geometric Brownian motion with drift, with time (t) being a continuous variable.

$$dN = (aE - d)dt + a\sigma dz \qquad \text{(B.1)}$$

The bank is assumed to have a constant expected monetary surplus of E per unit of time with a variance of monetary surplus of $\frac{1}{2}\sigma^2$; hence, the shareholders may expect monetary surplus of aE per unit of time with a variance of $\frac{1}{2}a^2\sigma^2$. The shareholder value (which also represents the net worth of the bank) satisfies the ordinary differential equation[22]:

$$(\rho + q)V = \max_{d,\sigma}[d + (aE - d)V_N + \frac{1}{2}a^2\sigma^2 V_{NN}] \qquad \text{for } N < 0, \text{ and} \qquad \text{(B.2)}$$

$$\rho V = \max_{d,\sigma}[d + (aE - d)V_N + \frac{1}{2}a^2\sigma^2 V_{NN}] \qquad \text{for } N \geq 0$$

where ρ represents the discount factor in the time horizon and q represents a stochastic 'jump process'.

Applying proposition 1 of Milne and Robertson (1996), the optimal dividend policy takes the form that $\exists N^*$ subject to d(N) = 0 for $N < N^*$ and barrier control at $N = N^*$, where $0 < N < \infty$.

The argument for proposition 1; assuming that $r < \rho$ implies that a policy of never paying a dividend would result in $V = 0$.

$$\lim_{T\to\infty} e^{-\rho T}\int_0^T de^{r(T-\tau)}d\tau \leq 0$$

Optimal dividend policy is to retain all earnings in order to increase the survivability of the company, thus $V(N^*) = E/\rho$.

Some assumptions for pasting conditions at $N = 0$ and smoothing at N^* are given by:

i. The sample path for $N = 0$ (liquidation threshold) is continuous.
ii. $V_N = 1$ at N^*. For $N \geq N^*$, the shareholder value is given by $V(N) = V(N^*) + N - N^*$.

[22] The differential equation adopts the Bellman equation for non-finite time horizon problem solving where there is no final value function from which we can work backwards. This problem solving equation applied for analyzing the moral hazard in the banking industry is also analyzed in Milne and Whalley (2001), and in Milne and Robertson (1996).

iii. Therefore $V_{NN} = 0$ at $N*$.

Applying proposition 2 of Milne and Robertson (1996) that for all values of N, $0 < N < N*$, the boundary condition (i), (ii), (iii) and $V_{NNN} > 0$, $V_{NN} \le 0$, and $V_N \ge 1$, the general solution satisfies the ordinary differential equations with boundary conditions:

$$V(N) = A\exp(m_1 N) + B\exp(m_2 N)$$

where m_1 and m_2 are the roots of $\frac{1}{2}a^2\sigma^2 m^2 + aEm - \rho = 0$. The roots of the ordinary differential equation will be $\frac{1}{a}\left[\frac{-E \pm \sqrt{E^2 + 2\sigma^2\rho}}{\sigma^2}\right]$.

Let us assume the general solution for $N \le 0$ is given by:

$$V = \overline{A}\exp(\overline{m}_1 N) + \overline{B}\exp(\overline{m}_2 N) \quad \text{(i)}$$

The solution for $0 \le N \le N*$ is given by:

$$V = A\exp(m_1 N) + B\exp(m_2 N) \quad \text{(ii)}$$

There are six boundary conditions to estimate the unknown parameters $\overline{A}, \overline{B}, A, B$ and $N*$.

At $N*$

$$V_N = m_1 A\exp(m_1 N^*) + m_2 B\exp(m_2 N^*) = 1 \quad \text{(iii)}$$

$$V_{NN} = m_1^2 A\exp(m_1 N^*) + m_2^2 B\exp(m_2 N^*) = 0 \quad \text{(iv)}$$

At N^0

$$V^- = V^+: \quad \overline{A}\exp(\overline{m}_1 N^0) + \overline{B}\exp(\overline{m}_2 N^0) = A\exp(m_1 N^0) + B\exp(m_2 N^0) \quad \text{(v)}$$

$$V_N^- = V_N^+: \quad \overline{A}\overline{m}_1\exp(\overline{m}_1 N^0) + \overline{B}\overline{m}_2\exp(\overline{m}_2 N^0) = Am_1\exp(m_1 N^0) + Bm_2\exp(m_2 N^0) \quad \text{(vi)}$$

At $N^{-\infty}$

$$V = \overline{A}\exp(\overline{m}_1 N^{-\infty}) + \overline{B}\exp(\overline{m}_2 N^{-\infty}) = 0 \quad \text{(vii)}$$

Using the boundary conditions, we obtain the value of the unknown parameters of the general solutions.

Applying $N^0 = 0$ at the boundary condition, we find the pasting condition between two general solution.

$$\overline{A} + \overline{B} = A + B \quad \text{(viii)}$$

$$\overline{A}\overline{m}_1 + \overline{B}\overline{m}_2 = A\overline{m}_1 + B\overline{m}_2 \quad \text{(ix)}$$

$$\frac{A}{B} = -\frac{\overline{m}_1 - m_2}{\overline{m}_1 - m_1} \quad \text{(x)}$$

Combining two smoothing conditions between N^0 and $N*$ we find the magnitude of the model,

$$A = -\frac{m_2^2}{m_1^2}\exp((m_2 - m_1)N^*)B$$

$$-\frac{m_2^2}{m_1^2}\exp((m_2 - m_1)N^*)Bm_1\exp(m_1 N^*) + Bm_2\exp(m_2 N^*) = 1$$

$$B = \exp(-m_2 N^*)\frac{m_1}{m_2}(m_1 - m_2)^{-1} \quad \text{(xi)}$$

Similarly for another parameter, we find,

$$B = -\frac{m_1^2}{m_2^2}\exp((m_1 - m_2)N^*)A$$

$$-\frac{m_1^2}{m_2^2}\exp((m_1 - m_2)N^*)Am_2\exp(m_2 N^*) + Bm_1\exp(m_1 N^*) = 1$$

$$A = \exp(-m_1 N^*)\frac{m_2}{m_1}(m_2 - m_1)^{-1} \quad \text{(xii)}$$

The critical value for zero-dividend threshold is given by:

$$\frac{A}{B} = -\frac{m_2^2}{m_1^2}\exp(m_2 - m_1)N^* = -\frac{\overline{m}_1 - m_2}{\overline{m}_1 - m_1}$$

$$N^* = (m_2 - m_1)^{-1}\ln\left[\frac{m_1^2}{m_2^2}\left(\frac{\overline{m}_1 - m_2}{\overline{m}_1 - m_1}\right)\right] \quad \text{(xiii)}$$

Exhibit B.1
Simulation result

N	V	V_x	V_{xx}	$-(V_{xx}/V_x)$
-0.5	24.77	10.78	4.69	-0.44
-0.4	25.87	11.26	4.90	-0.44
-0.3	27.02	11.76	5.12	-0.44
-0.2	28.23	12.29	5.35	-0.44
-0.1	29.48	12.83	5.59	-0.44
0	30.79	13.40	-99.84	7.45
0.1	31.74	6.54	-44.71	6.84
0.2	32.22	3.47	-20.01	5.77
0.3	32.49	2.09	-8.95	4.27
0.4	32.67	1.48	-3.99	2.70
0.5	32.80	1.21	-1.77	1.47
0.6	32.91	1.08	-0.78	0.72
0.7	33.02	1.03	-0.33	0.32
0.8	33.12	1.01	-0.13	0.13
0.9	33.22	1.00	-0.04	0.04
1	33.32	1.00	0.00	0.00

$-(V_{xx}/V_x)$ expresses the portfolio decision impact on both expected returns and the variance of returns; thus, $-(V_{xx}/V_x)$ determines the mean-variance trade-off (Milne and Robertson, 1996).

Appendix C: Financial participation in a sharing contract

The analysis explores the effect of financial participation by the bank's shareholders on the quality of contracts. The analysis starts with the following assumptions:

i. The shareholders and the investment depositors share the monetary surplus in proportion to their financial shares $E: f(OC, a(OC))$.
ii. The investment depositors and the shareholders have strictly concave utility functions.
iii. The shareholders suffer from opportunity loss for any effort given to monitor the bank performance $V(e)$,and if they invest the money somewhere else $O_{OC}(OC)$.
iv. The investment depositors suffer from opportunity loss if they invest the money somewhere else $O_{PSIA^U}(EC - OC)$. [when EC equals total equity-based capital)

Hence, we have the shareholders' utility function $U_{OC}: f(OC, a(OC), e(OC, a(OC)))$ and the $PSIA^U$ holders' utility function $U_{PSIA^U}: f(OC, a(OC), e(OC, a(OC)))$. This analysis is inspired by Baldwin (2000). Let us assume that U_{OC} is determined by the shared monetary surplus $[\int_{\underline{E}}^{\overline{E}} a(OC)Ef(E,e)dE]$ minus agency cost $V(e)$ and the opportunity cost of funds $O_{OC}(OC)$, which is expressed in equation (C.1). $\int_{\underline{E}}^{\overline{E}} Ef(E,e)dE$ expresses the expected outcome as a function of e and the density function of production uncertainty $E \in [\underline{E}, \overline{E}]$.

$$U_{OC} = \int_{\underline{E}}^{\overline{E}} a(OC)Ef(E,e)dE - V(e) - O_{OC}(OC) \qquad \text{(C.1)}$$

Similarly, for the $PSIA^U$, U_{PSIA^U} is determined by the shared monetary surplus and the opportunity cost of funds $O_{PSIA^U}(PSIA^U)$, which is expressed in equation (C.2).

$$U_{PSIA^U} = \int_{\underline{E}}^{\overline{E}} (1 - a(OC))Ef(E,e)dE - O_{PSIA^U}(EC - OC) \qquad \text{(C.2)}$$

According to Harris and Raviv (1978), Pareto improvement can be achieved if the agent's expected utility can be increased without decreasing the expected utility of the other party. Assuming that the investment depositors are invariant to compensating changes in $a(OC)$ and OC, the total differentiation gives:

$$\frac{\partial U_{PSIA^U}}{\partial OC} dOC + \frac{\partial U_{PSIA^U}}{\partial a} \frac{\partial a}{\partial OC} dOC = 0 \qquad \text{(C.3)}$$

Differentiating U_{OC} and U_{PSIA^U} with respect to $a(OC)$ we have:

$$\frac{\partial U_{OC}}{\partial a(OC)} = a'(OC)Ef(E,e)de \text{, and}$$

$$\frac{\partial U_{PSIA^U}}{\partial a(OC)} = -a'(OC)Ef(E,e)de$$

Hence,

$$\frac{\partial U_{OC}}{\partial a(OC)} = -\frac{\partial U_{PSIA^U}}{\partial a(OC)} \tag{C.4}$$

Differentiating totally the shareholders utility function gives:

$$dU_{OC} = \frac{\partial U_{OC}}{\partial OC}dOC + \frac{\partial U_{OC}}{\partial a}\frac{\partial a}{\partial OC}dOC + \frac{\partial U_{OC}}{\partial e}\left[\frac{\partial e}{\partial a}\frac{\partial a}{\partial OC} + \frac{\partial e}{\partial OC}\right]dOC \tag{C.5}$$

Combining the agent compensating conditions (C.3) and (C.4) into the shareholders'/depositors' utility for compensating changes in $a(OC)$ and OC gives:

$$dU_{OC} = \left[\frac{\partial U_{OC}}{\partial OC} + \frac{\partial U_{PSIA^U}}{\partial OC} + \frac{\partial U_{OC}}{\partial e}\left[\frac{\partial e}{\partial a}\frac{\partial a}{\partial OC} + \frac{\partial e}{\partial OC}\right]\right]dOC \tag{C.6}$$

The quality of the contract will be improved if $dU_{OC} > 0$ (i.e. if the U_{PSIA^U} utility level is at least the same while the OC improves (the change is higher than 0), the contract is said to be improved). Substituting equations (C.3) and (C.4) into (C.6), we have:

$$\frac{\partial U_{PSIA^U}}{\partial OC} + \frac{\partial U_{OC}}{\partial OC} = (O'_{PSIA^U}(OC) - O'_{OC}(OC)) \tag{C.7}$$

Therefore,

$$[O'_{OC}(OC) - O'_{PSIA^U}(OC)] \leq \frac{\partial U_{OC}}{\partial e}\left[\frac{\partial e}{\partial a}\frac{\partial a}{\partial OC} + \frac{\partial e}{\partial OC}\right] \tag{C.8}$$

This means that the necessary conditions for a higher quality of contracts are:

[1] the utility must be positively correlated with effort,

[2] effort is positively correlated with profit share,

[3] profit share is positively correlated with financial participation, and

[4] marginal opportunity cost should be lower than the monetary surplus.

Appendix D
Simulation of the proposed capital regulation

In the simulation, we use a minimum CAR of 8% [equation 7] and a $\left[\frac{OC}{PSIA^U}\right]$ ratio of 6% to find the overall capital ratio requirement (i.e. the higher of the two). In the simulation, we keep the total value of $PSIA^U$ and SA equal to 1.

Exhibit D.1
Simulation of proposed capital regulation

SA	$PSIA^U$	CAR'			FP	The higher of the CAR and FP req.			OC/TA			$OC/PSIA^U$			Rel.Agency Cost		
		Sc1	Sc2	Sc3	Sc1												
		100%	50%	150%	0.06	100%	50%	150%	100%	50%	150%	100%	50%	150%	100%	50%	150%
0.99	0.01	0.079	0.040	0.119	0.001	0.079	0.040	0.119	0.073	0.038	0.106	7.92	3.96	11.88	1.1	1.2	1.1
0.95	0.05	0.076	0.038	0.114	0.003	0.076	0.038	0.114	0.071	0.037	0.102	1.52	0.76	2.28	1.6	2.3	1.4
0.90	0.10	0.072	0.036	0.108	0.006	0.072	0.036	0.108	0.067	0.035	0.097	0.72	0.36	1.08	2.3	3.6	1.9
0.85	0.15	0.068	0.034	0.102	0.009	0.068	0.034	0.102	0.064	0.033	0.093	0.45	0.23	0.68	3.1	5.1	2.4
0.80	0.20	0.064	0.032	0.096	0.012	0.064	0.032	0.096	0.060	0.031	0.088	0.32	0.16	0.48	4.0	6.8	3.0
0.75	0.25	0.060	0.030	0.090	0.015	0.060	0.030	0.090	0.057	0.029	0.083	0.24	0.12	0.36	4.9	8.5	3.6
0.70	0.30	0.056	0.028	0.084	0.018	0.056	0.028	0.084	0.053	0.027	0.077	0.19	0.09	0.28	6.0	10.5	4.4
0.65	0.35	0.052	0.026	0.078	0.021	0.052	0.026	0.078	0.049	0.025	0.072	0.15	0.07	0.22	7.2	12.6	5.2
0.60	0.40	0.048	0.024	0.072	0.024	0.048	0.024	0.072	0.046	0.023	0.067	0.12	0.06	0.18	8.5	15.0	6.2
0.55	0.45	0.044	0.022	0.066	0.027	0.044	0.027	0.066	0.042	0.026	0.062	0.10	0.06	0.15	10.1	15.0	7.3
0.50	0.50	0.040	0.020	0.060	0.030	0.040	0.030	0.060	0.038	0.029	0.057	0.08	0.06	0.12	11.9	15.0	8.5
0.45	0.55	0.036	0.018	0.054	0.033	0.036	0.033	0.054	0.035	0.032	0.051	0.07	0.06	0.10	14.0	15.0	10.1
0.40	0.60	0.032	0.016	0.048	0.036	0.036	0.036	0.048	0.035	0.035	0.046	0.06	0.06	0.08	15.0	15.0	11.9
0.35	0.65	0.028	0.014	0.042	0.039	0.039	0.039	0.042	0.038	0.038	0.040	0.06	0.06	0.06	15.0	15.0	14.1
0.30	0.70	0.024	0.012	0.036	0.042	0.042	0.042	0.042	0.040	0.040	0.040	0.06	0.06	0.06	15.0	15.0	15.0
0.25	0.75	0.020	0.010	0.030	0.045	0.045	0.045	0.045	0.043	0.043	0.043	0.06	0.06	0.06	15.0	15.0	15.0
0.20	0.80	0.016	0.008	0.024	0.048	0.048	0.048	0.048	0.046	0.046	0.046	0.06	0.06	0.06	15.0	15.0	15.0
0.15	0.85	0.012	0.006	0.018	0.051	0.051	0.051	0.051	0.049	0.049	0.049	0.06	0.06	0.06	15.0	15.0	15.0
0.10	0.90	0.008	0.004	0.012	0.054	0.054	0.054	0.054	0.051	0.051	0.051	0.06	0.06	0.06	15.0	15.0	15.0
0.05	0.95	0.004	0.002	0.006	0.057	0.057	0.057	0.057	0.054	0.054	0.054	0.06	0.06	0.06	15.0	15.0	15.0
0.00	1.00	0.000	0.000	0.000	0.060	0.060	0.060	0.060	0.057	0.057	0.057	0.06	0.06	0.06	15.0	15.0	15.0

Sc1: Scenario 1 for average risk weight of 100%
Sc2: Scenario 1 for average risk weight of 50%
Sc3: Scenario 1 for average risk weight of 150%

The higher of the CAR and FP req.:
If the requirement set by the CAR is higher than the minimum requirement for financial participation, then the CAR is binding and vice versa.

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