ISLAMIC FINANCIAL SERVICES BOARD

GUIDANCE NOTE IN CONNECTION WITH THE IFSB CAPITAL ADEQUACY STANDARD: THE DETERMINATION OF ALPHA IN THE CAPITAL ADEQUACY RATIO FOR INSTITUTIONS (OTHER THAN INSURANCE INSTITUTIONS) OFFERING ONLY ISLAMIC FINANCIAL SERVICES

March 2011

ISBN: 978-967-5687-11-2

ABOUT THE ISLAMIC FINANCIAL SERVICES BOARD (IFSB)

The IFSB is an international standard-setting organisation which was officially inaugurated on 3 November 2002 and started operations on 10 March 2003. The organisation promotes and enhances the soundness and stability of the Islamic financial services industry by issuing global prudential standards and guiding principles for the industry, broadly defined to include banking, capital markets and insurance sectors. The standards prepared by the IFSB follow a lengthy due process as outlined in its Guidelines and Procedures for the Preparation of Standards/Guidelines, which includes the issuance of exposure drafts and the holding of workshops and, where necessary, public hearings. The IFSB also conducts research and coordinates initiatives on industry-related issues, as well as organises roundtables, seminars and conferences for regulators and industry stakeholders. Towards this end, the IFSB works closely with relevant international, regional and national organisations, research/educational institutions and market players.

For more information about the IFSB, please visit **www.ifsb.org**

COUNCIL MEMBERS*

H.E. Rasheed Mohammed Al Maraj	Governor, Central Bank of Bahrain
H.E. Dr Atiur Rahman	Governor, Bangladesh Bank
H.E. Haji Mohd Rosli bin Haji Sabtu	Managing Director, Autoriti Monetari Brunei Darussalam
H.E. Djama Mahamoud Haid	Governor, Banque Centrale De Djibouti
H.E. Dr Farouk Abd El Baky El Okdah	Governor, Central Bank of Egypt
H.E. Dr Ahmad Mohamed Ali Al Madani	President, Islamic Development Bank
H.E. Dr Darmin Nasution	Governor, Bank Indonesia
H.E. Dr Mahmud Bahmani	Governor, Central Bank of the Islamic Republic of Iran
H.E. Faris A. Sharaf	Governor, Central Bank of Jordan
H.E. Sheikh Salem AbdulAziz Al-Sabah	Governor, Central Bank of Kuwait
H.E. Dr Zeti Akhtar Aziz	Governor, Bank Negara Malaysia
H.E. Fazeel Najeeb	Governor and Chairperson, Maldives Monetary Authority
H.E Rundheersing Bheenick	Governor, Bank of Mauritius
H.E. Sanusi Lamido Aminu Sanusi	Governor, Central Bank of Nigeria
H.E. Shahid Hafiz Kardar	Governor, State Bank of Pakistan
H.E. Sheikh Abdullah Saoud Al-Thani	Governor, Qatar Central Bank
H.E. Dr Muhammad Al-Jasser	Governor, Saudi Arabian Monetary Agency
H.E. Heng Swee Keat *(until 2 April 2011)*	Managing Director, Monetary Authority of Singapore
H.E. Ravi Menon (*from 2 April 2011)*	Managing Director, Monetary Authority of Singapore
H.E. Dr Sabir Mohamed Hassan **(***until 7 March 2011)*	Governor, Central Bank of Sudan
H.E. Dr Mohamed Khair Ahmed Elzubear (*from 8 March 2011)*	Governor, Central Bank of Sudan
H.E. Dr Adib Mayaleh	Governor, Central Bank of Syria
H.E. Sultan Bin Nasser Al Suwaidi	Governor, Central Bank of the United Arab Emirates

***In alphabetical order of the country the member represents**

TECHNICAL COMMITTEE*

Chairman
Dr Abdulrahman A. Al-Hamidy – Saudi Arabian Monetary Agency

Deputy Chairman
Mr Osman Hamad Mohamed Khair – Central Bank of Sudan *(until 15 August 2009)*
Dr Mohammad Yousef Al Hashel – Central Bank of Kuwait *(from 23 November 2009)*

Members*

Dr Sami Ibrahim Al-Suwailem *(until 13 December 2010)*	Islamic Development Bank
Dr Salman Syed Ali *(from 14 December 2010)*	Islamic Development Bank
Mr Khalid Hamad Abdulrahman Hamad	Central Bank of Bahrain
Mr Gamal Abdel Aziz Ezzat Negm *(until 13 December 2010)*	Central Bank of Egypt
Mr Farag Abdul Hameed Farag *(from 14 December 2010)*	Central Bank of Egypt
Mr Ramzi Ahmad Zuhdi *(until 5 April 2010)*	Bank Indonesia
Dr Mulya Effendi Siregar *(from 6 April 2010)*	Bank Indonesia
Mr Hamid Tehranfar *(until 31 March 2009)*	Central Bank of the Islamic Republic of Iran
Mr Abdolmahdi Arjmand Nehzad *(from 1 April 2009)*	Central Bank of the Islamic Republic of Iran
Mr Bakarudin Ishak *(until 31 March 2009)*	Bank Negara Malaysia
Mr Ahmad Hizzad Baharuddin *(from 1 April 2009)*	Bank Negara Malaysia
Dr Nik Ramlah Mahmood	Securities Commission of Malaysia
Dr Bashir Umar Aliyu *(from 6 April 2010)*	Central Bank of Nigeria
Mr Pervez Said *(until 31 March 2009)*	State Bank of Pakistan
Ms Lubna Farooq Malik *(until 5 April 2010)*	State Bank of Pakistan
Mr Saleemullah *(from 6 April 2010)*	State Bank of Pakistan
Mr Mu'jib Turki Al Turki	Qatar Central Bank
Professor Abdulaziz Abdullah Al Zoom	Capital Market Authority of Saudi Arabia
Mr Chia Der Jiun *(until 13 December 2010)*	Monetary Authority of Singapore
Mr Adrian Tsen Leong Chua *(from 14 December 2010)*	Monetary Authority of Singapore
Mr Mohammed Ali Elshiekh Terifi *(until 30 March 2011)*	Central Bank of Sudan
Mr Mohamed Hassan Alshaikh *(from 31 March 2011)*	Central Bank of Sudan
Mr Saeed Abdulla Al-Hamiz *(until 31 March 2009)*	Central Bank of the United Arab Emirates
Mr Khalid Omar Al-Kharji *(from 1 April 2009)*	Central Bank of the United Arab Emirates

*** In alphabetical order of the country the member's organisation represents**

TECHNICAL SUB-COMMITTEE*

Chairman
Professor Datuk Rifaat Ahmed Abdel Karim – Islamic Financial Services Board

Members*

Mr Sayed Abdel Mawla Faisal Hamad	Central Bank of Egypt
Mr Eko Adi Irianto	Bank Indonesia
Dr Hamim Syahrum Ahmad Mokhtar	Bank Negara Malaysia
Mr Muhammad Zaki Awan	State Bank of Pakistan
Mr Alaa Eldin Mohd Aly El-Ghazaly	Qatar Central Bank
Mr Salem Ali Alkuwari	Qatar Central Bank
Mr Jameel M. Hayat Ahmad	Saudi Arabian Monetary Agency
Mr Lim Zhi Jian	Monetary Authority of Singapore
Mr Abdelaziem Hassan Mohamed	Central Bank of Sudan

***In alphabetical order of the country the member's organisation represents**

ISLAMIC DEVELOPMENT BANK *SHARĪ`AH* COMMITTEE*

Chairman
Sheikh Mohamed Mokhtar Sellami

Deputy Chairman
Sheikh Saleh Bin Abdulrahman Bin Abdulaziz Al Husayn

Sheikh Dr Abdulsattar Abu Ghuddah	Member
Sheikh Dr Hussein Hamed Hassan	Member
Sheikh Mohammad Ali Taskhiri	Member
Sheikh Mohamed Hashim Bin Yahaya	Member

*** In alphabetical order**

SECRETARIAT, ISLAMIC FINANCIAL SERVICES BOARD

Professor Datuk Rifaat Ahmed Abdel Karim	Secretary-General
Abdullah Haron	Assistant Secretary-General
Professor Simon Archer	Consultant
Dr Venkataraman Sundararajan	Consultant
Ms Mashair Mohamed Ibrahim Sabir	Member of the Secretariat, Technical and Research
Mr Ronald Rulindo	Member of the Secretariat, Technical and Research

TABLE OF CONTENTS

ACRONYMS

CAR	Capital adequacy ratio
DCR	Displaced commercial risk
IAH	Investment account holders
IFSB-2	Capital Adequacy Standard for Institutions offering Islamic Financial Services IIFS
IIFS	Institution(s) offering Islamic financial services
IRR	Investment risk reserves
PAR	Profit-at-risk
PER	Profit equalisation reserves
PSIA	Profit-sharing investment accounts
RPSIA	Restricted profit-sharing investment accounts
RWA	Risk-weighted assets
UIAH	Unrestricted investment account holders
UPSIA	Unrestricted profit-sharing investment accounts

Bismillahirrahmanirrahim

Allahumma salli wasallim 'ala Sayyidina Muhammad wa'ala a*lihi wasahbihi*

SECTION 1: BACKGROUND

1. In December 2005, the Islamic Financial Services Board (IFSB) issued the standard "Capital Adequacy Standard for Institutions offering Islamic Financial Services (IIFS)" (hereinafter, "IFSB-2"). The Standard proposes two methods of calculating capital adequacy ratios (CARs) of IIFS:

(a) The *standard formula*, in which IIFS are not required to hold regulatory capital in respect of risk arising from assets funded by profit-sharing investment accounts (PSIA), so that the risk-weighed assets (RWA) in respect of commercial risks (credit and market risks) funded by such accounts are excluded in calculating the denominator of the CAR,

(b) The *supervisory discretion formula*, in which IIFS are required to hold regulatory capital in respect of displaced commercial risk (DCR). In this approach, commercial risks of assets financed by *unrestricted* PSIA (UPSIA) are considered to be borne proportionately by both the unrestricted investment account holders (UIAH) and the IIFS. Hence, a proportion of the (risk-weighted) assets funded by UPSIA, denoted by the Greek letter "alpha", is required to be included in the denominator of the CAR, the permissible value of alpha being subject to supervisory discretion. A supervisory authority may also decide to extend this treatment to restricted investment accounts.

2. IFSB-2 recommends supervisors to assess the extent of risks borne by PSIA and to reflect these assessments in the computation of capital adequacy. The main challenge facing IIFS and their supervisors is to assess the risk-sharing level between IIFS' own capital (shareholders' funds) and that of the investment account holders (IAH); the supervisory assessment of how an IIFS manages the risk-return mix of PSIA would determine the alpha factor, with a value of alpha near zero reflecting an investment-like product with the investor bearing the commercial risk, while a value of alpha close to 1 would reflect a deposit-like product with the depositor effectively bearing virtually no commercial risk.

1.1. Objectives

3. The objectives of this Guidance Note (GN) are:

(a) to provide a methodology to estimate the value of alpha to be used in the supervisory discretion formula in calculating the CAR of IIFS; and

(b) to demonstrate how to measure the DCR – that is, the additional risk that IIFS shareholders may assume in order to cushion the returns payable to IAH against variations in asset returns.

The GN, drawing on accounting definitions and industry practices, also refers to a basic framework for the management of PSIA, particularly managing the risks and returns sharing between the IAH and IIFS' shareholders.

1.2. Scope of Application

4. This GN is applicable to IIFS that employ the practice of smoothing profit payouts to their IAH, and to which, therefore, the supervisory discretion formula set out in the IFSB-2 applies in calculating their CARs. This GN focuses mainly on estimating DCR and alpha for the UPSIA that are on a *Muḍārabah* basis. However, based on the smoothing practices that prevail in each jurisdiction, the approach derived in the GN could equally be applicable to restricted profit-sharing investment accounts (RPSIA) and other forms of investment contracts such as *Mushārakah* and *Wakālah*.

SECTION 2: MANAGEMENT OF PSIA

2.1. Characteristics and Types of PSIA

5. PSIA, commonly referred to as "investment accounts", are a pool of investment funds placed with an IIFS, usually on a *Muḍārabah* basis,[1] in which case the IAH (fund providers) act as *Rabb-ul-mal* and the IIFS (fund manager) acts as a *Muḍārib*. The IIFS invests such funds in income-producing assets or economic activities, and as a *Muḍārib* is entitled to a "*Muḍārib* share" – that is, a share of the profits (but not of losses) earned on the funds managed by it on behalf of the IAH according to a pre-agreed ratio specified in the *Muḍārabah* contract. In accordance with the *Muḍārabah* contract, IAH share in the profits of successful investments, but are exposed to the loss of part or all of their funds. However, if negligence, misconduct, fraud or breach of contract can be proven, the IIFS is liable for the entire capital of the IAH. Therefore, in the absence of negligence or misconduct, which are dealt with under operational risk, the IIFS is not liable for the risks arising from IAH funds since the commercial risks (market and credit risks) of assets funded by the IAH are borne by the IAH themselves, whereas operational risk is borne solely by the IIFS.

6. The PSIA are categorised as follows:

(a) *Restricted PSIA (RPSIA)*, in respect of which the usage of funds by IIFS is subject to investment criteria specified by the IIFS in the *Muḍārabah* contract, or agreed upon between the IAH and the IIFS at the time of contracting. The IAH share in the returns and bear the risks of a specific class of assets or a specified type of asset portfolio, as agreed with the restricted IAH, and there is typically no commingling of IIFS funds and IAH funds.

(b) *Unrestricted PSIA (UPSIA)*, in respect of which the IIFS has full discretion in making investment decisions, and the IAH funds may be used "commingled" in an asset pool in which shareholders' and current account holders' funds (which are guaranteed by IIFS) are also invested. UPSIA are expected to share in the overall risks of the jointly funded investments made by the IIFS, as reflected in the volatility of overall returns from investments made with a proportion of UPSIA funds and proportions of shareholders' and current account holders' funds that have been commingled. This is shown in Figure 1 of Appendix 1, where these commingled funds are invested in a specified pool of assets reflecting the general business and management strategy of the IIFS.[2]

7. From a *Sharī`ah* perspective, according to the contract of *Muḍārabah*, PSIA are profit-sharing and loss-bearing. An important implication of this is that UPSIA, while normally appearing on the IIFS's balance sheet, are not treated as liabilities of the IIFS; accordingly, in the case of liquidation, UIAH have no claim as creditors over the assets of the IIFS (as do conventional depositors). Instead, they have a claim to the assets financed by their funds (including their share of any undistributed profits and less any losses), including their share of assets financed by commingled funds, in respect of which they rank *pari passu* with the shareholders after taking account of the fact that the latter are liable for amounts deposited by current account holders and other creditors. From a competitive market perspective, UPSIA tend to be assimilated into conventional deposit accounts that are "capital guaranteed" and have a contractually determined rate of return. Thus, in practice, IIFS may find themselves virtually obliged to practise the smoothing of profit payouts to UIAH, for two reasons:

(a) Commercial pressure: such a situation would most likely occur as a result of rate of return risk (profit rate risk) when the IAH funds are invested in physical assets such as *Murābahah* with a relatively long maturity and at a rate of return which no longer meets the current market rate of return (market benchmark). Or

[1] PSIA could also be placed on a *Wakālah* basis, where the relationship between the IIFS and the investors is an agency relationship, with the IIFS earning a fee instead of sharing in profits.

[2] Other funds, including any uninvested portion of UIAH funds and other deposits, may be held in the remaining assets of the IIFS.

it may rise as a result of other market (price) risk or credit risk associated with poor performance of the assets under the management of the IIFS.

(b) Supervisory pressure: supervisors at their discretion may require a profit payout mechanism to UIAH that provides some protection to the IAH in order to avoid UPSIA withdrawals that may cause systemic risk.[3]

8. In practice, there is considerable ambiguity in the nature and characteristics of UPSIA, which vary among IIFS and jurisdictions. At one extreme, IAH are highly protected so that UPSIA tend to be deposit-like products where the returns are "stabilised" by the use of mechanisms such as the following:

(a) the IIFS forgoing all or part of its *Muḍārib* share of profits on investing UIAH funds, or donating to the UIAH part or all of the profit on investments financed by shareholders' funds, so as to enhance the profit payout to the UIAH;

(b) the profit equalisation reserve (PER), formed out of profits before their allocation between shareholders and UIAH, and therefore having two components, one that is part of the shareholders' funds and another that is attributable to IAH funds; and

(c) the cushioning of losses attributable to UIAH by mechanisms such as the investment risk reserve (IRR), formed by retaining part of the profit attributable to the UIAH.

9. Thus, UPSIA are used as a *Sharī`ah*-compliant substitute for conventional (interest-bearing) deposit accounts; for this reason, the IIFS tend to avoid exposing such accounts to impairment of capital and even to fluctuations in profit payout. At the other extreme, UPSIA are investment-like products that fully bear the risk of fluctuations in returns and even losses on the underlying investments (i.e. typical *Muḍārabah* investments). UPSIA could also be positioned anywhere along a continuum between these two cases, depending upon the extent of investment risks actually borne by the UIAH.

10. The resulting challenge to IIFS and their supervisory authorities is to determine the level of risk sharing between the IIFS and the IAH (i.e. where along the continuum the UPSIA in a specific IIFS in a specific jurisdiction lie). It should be noted that only the mechanisms mentioned under paragraph 8(a) and (b) above transfer risk from UIAH to shareholders which constitutes DCR. The mechanisms mentioned in paragraph 8(a) transfer a significant amount of risk, while that mentioned under paragraph 8(b) mitigates DCR to some extent and thus may have a relatively low impact on IIFS' shareholders. Finally, the mechanism mentioned under paragraph 8(c) has no impact on IIFS' shareholders. The PER serves to smooth the payouts of IAH and shareholders, thus mitigating DCR to a greater or lesser extent, while the IRR allows payouts to be made to IAH even when the actual return on their investments is negative (a loss).[4]

2.2. Supervisory Implications and Capital Adequacy

2.2.1. Formal Definition of DCR

11. Displaced commercial risk refers to the extent of additional risk (volatility of returns) borne by an IIFS's shareholders compared to the situation where PSIA assume all commercial risks as specified in the *Muḍārabah* contract. As per the *Muḍārabah* contract, an IIFS in its capacity as *Muḍārib* does not bear losses if they are not due to negligence and/or misconduct. Hence, the definition of DCR does not include covering of losses of IAH, which in principle are covered by IRR.[5]

[3] In some jurisdictions where IAH tend to be highly protected, supervisory authorities have specific regulations to control profit distributions and the passing on of losses to IAH.

[4] For further details on the smoothing of payouts to IAH, please refer to GN-3: *Guidance Note on the Practice of Smoothing the Profits Payout to Investment Account Holders.*

[5] However, in certain cases where the IIFS opts to cover losses, the effect of this will be picked up by the measurement process described in the GN and reflected in the calculation of alpha.

12. As explained above, in the absence of misconduct and negligence on the part of the IIFS as *Muḍārib*, the IAH contractually bear all of the investment risks arising from assets financed by their funds. Contractually, therefore, there is no transfer of such risks from the IAH to the shareholders of the IIFS, and hence no implications for the shareholders and thereby for the capital adequacy of the IIFS. Notwithstanding this contractual position, in situations where UPSIA are treated as a more or less close substitute for conventional deposits as explained above, there will be some displacement of risk from UIAH to IIFS' shareholders – that is, DCR. This DCR has implications for the CAR of the IIFS, which need to be considered by the IIFS and its supervisory authority. The proportion of risk-weighted assets that needs to be included in the CAR to cater for this DCR is denoted by "alpha".

13. IFSB-2 proposes two different formulas for calculating the CAR of an IIFS:

(a) *The standard formula:* This approach is applicable when UPSIA are treated as pure investment products; under this approach, the RWA funded by IAH are excluded from the denominator of CAR. The rationale behind this treatment is that, according to the *Muḍārabah* contract, returns on funds invested by *Rab-al-Mal* (IAH) depend on the profits earned on the investments and are not contractually guaranteed by the IIFS; hence, the IIFS is not required to allocate capital for risks arising from the assets financed by UIAH funds.

(b) *The supervisory discretion formula:* This approach is applicable to situations where UPSIA are treated as more or less close substitutes for conventional deposits. According to this approach, a specified proportion (denoted by "alpha") of the RWA funded by UIAH is included in the denominator of the CAR. The rationale behind this is to reflect the amount of DCR arising out of the IIFS' management of PSIA, as explained in paragraph 11. The proportion "alpha" is dependent on the supervisory authority's directive in the jurisdiction in which the IIFS operates. In the case where the practice of smoothing profit payouts to IAH by the IIFS is not confined to UPSIA but extends to the restricted PSIA, alpha will have two components, one for UPSIA and the other for restricted PSIA, so that each component reflects the DCR for each category of PSIA.

2.3. Investment Account Management

2.3.1. Definition

14. Investment account management can be defined as a tool of risk management in Islamic finance whereby the sharing of risks and returns between shareholders and IAH is measured and managed. The extent of risk sharing between IAH and shareholders is influenced by the following:

(a) Competitive pressures to pay IAH a market-related return that might deviate from the asset returns to which they are contractually entitled in order to prevent withdrawal of funds by IAH.

(b) Regulators applying moral suasion, or exercising authority, to approve IIFS' payouts to IAH, leading IIFS to pay returns to IAH that take into account prevailing market rates in order to mitigate systemic risk that may arise from customers making withdrawals in response to poor returns.

(c) Management strategy: IIFS management may manage investment risks as well as expectations of IAH so that the extent of risk (i.e. the volatility of returns) that is retained by shareholders, and the amount of risk that is borne by IAH, is managed through a set of tools, thereby controlling the capital requirements of IIFS.

15. In order to safeguard the interests of the IAH, and at the same time to mitigate any DCR to which shareholders may be exposed, it is essential for IIFS to manage the risk-sharing properties of UPSIA and, where relevant, RPSIA. Thus, the management of the risk-return profile of the investment of IAH funds is one of the key aspects of risk management. This may be achieved by using the available smoothing mechanisms mentioned under paragraphs 16–21 below.

2.3.2. Smoothing Mechanisms[6]

(a) Usage of Prudential Reserves

16. In order to minimise the impact of smoothing IAH returns on shareholders' income – in other words, to mitigate DCR – IIFS can take precautionary steps by setting up special reserves, such as a PER. It should be noted that the purpose of a PER is to stabilise the profit payouts to IAH, not the actual profits earned. In addition, a reserve such as an IRR may be used to cushion losses attributable to IAH.

17. The components of the accumulated PER that form part of the equities of IAH and shareholders, respectively, can be drawn down to smooth the profit payouts to both IAH and shareholders when investment returns decline. The accumulated IRR, which belongs entirely to IAH, can be used to cushion any losses (negative asset returns) attributable to IAH that might arise from time to time.

18. By the use of the PER, IIFS may maintain the profit payouts to IAH at market- related levels when the actual asset returns are higher, by making appropriations to the PER. These appropriations may be reversed when actual asset returns are lower than market-related levels. In addition, appropriations to IRR can be made from the IAH share of profit, to be reversed when asset returns are negative. In case IIFS are able to manage the distribution of returns on PSIA entirely though adjustments in PER without any recourse to income transfer from shareholders and/or adjusting the *Muḍārib* share of profits, there will be no DCR at the point of assessing the requirement for additional capital charges. Furthermore, accumulation of sufficient PER and IRR may permit the payment of targeted levels of return to IAH even when actual asset returns are negative.

19. The formulation of prudential reserves may not, however, entirely mitigate DCR. This is because of the limitations of PER and IRR themselves. Apart from corporate governance restraints on the setting up of these reserves, on account, for example, of the intergenerational problem,[7] excess accumulation of PER and IRR may be constrained by supervisory authorities.[8]

(b) Adjusting the *Muḍārib* Share

20. An IIFS can smooth returns paid to IAH by temporarily reducing its *Muḍārib* share below the contractual share (which tends, in practice, to be set at a maximum level) and/or by otherwise assigning a lower profit share to shareholders, even if the IIFS is not contractually obliged to do so. However, this mechanism can only be used for income smoothing in the absence of losses, as investment losses on PSIA funds are to be borne by IAH themselves, while the IIFS merely receives no share of profit as *Muḍārib*.

(c) Transfers from Shareholders' Funds

21. As an alternative or additional mechanism to smooth the returns of IAH (but not to cover losses), IIFS management may (with the shareholders' approval) donate some portion

[6] For further details, please refer to GN-3: *Guidance Note on the Practice of Smoothing the Profits Payout to Investment Account Holders.*

[7] For further details, please refer to IFSB-3: *Guiding Principles on Corporate Governance for Institutions offering Only Islamic Financial Services (Excluding Islamic Insurance (Takāful) Institutions and Islamic Mutual Funds)*. In this context, it should be noted that PER and IRR operate for the benefit of the shareholders of an IIFS, and do not create any value for the IAH.

[8] The principle of *Mubāra`at* will be applicable in this case, whereby the IIFS and IAH agree that the latter will allow the former to appropriate amounts out of the IAH share of profit, up to specified maximum percentages, to PER and IRR, made during the investment period.

of the shareholders' income to IAH, so as to offer the latter a level of return close to the market benchmark level, when the investment returns of the IIFS are lower than the benchmark. The size of the donation from shareholders required to achieve a desired rate of return to IAH depends upon the available level of PER, the market benchmark return, and the actual investment return of the IIFS. The relationship between the IIFS's investment returns and the income transfers to IAH is expected to be negative, since the larger the investment return, the less is the need for income transfer from shareholders. The larger the negative correlation between these two, the greater is the DCR to which shareholders are exposed, and hence the larger is the capital requirement.

22. It should be noted that a loss may be covered only out of the IRR, and if the IRR balance is insufficient to cover the loss entirely, no further amounts may be transferred from the PER in order to make a profit payout to the IAH.

23. Our research findings suggest that, in practice, there is significant absorption of risks by IIFS, since many IIFS with sharply divergent risk profiles and rates of return on assets seem to be offering almost identical rates of return to IAH, and these rates are generally in line with the general rate of return on deposits in conventional institutions. Although the mechanism of transfer of income from shareholders to IAH entails an exposure to DCR for IIFS shareholders, such an exposure seems to be considered preferable to facing liquidity and withdrawal risks that may result from IAH being dissatisfied by the returns they receive. IIFS and their supervisors, therefore, make a trade-off between DCR and withdrawal risk, with its systemic characteristics. In situations where DCR is unavoidable, appropriate policies for allocating capital charges and/or building up prudential reserves (PER and IRR), together with a systematic approach to the transfer of income to IAH when necessary, can help to match the rates of return paid to IAH with their expectations.

SECTION 3: MEASUREMENT OF RISK IN PSIA AND RISK SHARING

24. In light of the smoothing mechanisms that are outlined in Section 2, this section describes an approach for estimating and modelling risks to both IAH and shareholders under various scenarios of payouts and PSIA charters. This approach provides a basic step in estimating DCR and thereby alpha.

3.1. Data Inputs and Definition of Variables

25. In order to assess the returns on PSIA, and the associated risks measured by the variability of these returns, a basic framework and definitions are required for measuring the risk-return mix of PSIA. Since there is no single industry model for measuring *Muḍārabah* profits (and because of pending application of the IFSB standard on transparency and market discipline that is the equivalent for the IIFS of Pillar 3 of Basel II), and no specific supervisory disclosure requirements on PER/IRR other than those in applicable accounting standards, the GN, based on available accounting standards, proposes the use of the variables specified below:

(a) *Muḍārabah* Profits

The existing applicable accounting standards state that when an IIFS commingles its own funds and the *Muḍārabah* funds of unrestricted IAH (UIAH), profits are first allocated between *Muḍārib*'s own funds (shareholders' funds) and UIAH funds according to the capital contribution of each of the two parties. The share of the IIFS as a *Muḍārib* for its role as fund manager is then deducted from the share of profits allocated to UIAH. Based on this, *Muḍārabah* profits (before allocating *Muḍārib* share) attributable (i.e. after appropriations to or releases from PER) between UIAH (*Rab-al-Mal*) and the IIFS as a *Muḍārib* can be defined as investment income from balance sheet assets (the latter may include other assets in the investment pool, based on other sources of funds, including current accounts) plus trading income minus provisions, minus appropriations to PER, minus income attributable to sources not included in the investment pool.

(b) Rate of Return to IAH

The IAH get their returns only from the specified profit-sharing ratio applied to *Muḍārabah* profits. The amount of profit *distributed* to IAH is, therefore, the agreed share of *Muḍārabah* profit *net of appropriations to (or plus releases from) PER and, where applicable, IRR* plus any income transfer from shareholders' funds. This is not the same as the income *attributable* to PSIA – that is, the amount of the agreed *Muḍārabah* profit share of PSIA *before any transfers in or out of the PER and/or IRR*.

(c) Rate of Return to Shareholders' Equity

The returns to shareholders are derived from both their share of returns in the pool of investment assets acquired using the commingled IAH/shareholders' funds, plus their share of *Muḍārabah* profits for the services as a *Muḍārib*, and the net earnings from other funds – for example, income from other banking services and other non-PSIA assets that are funded from other sources.[9]

[9] In practice, there are two methods of determining the rate of return on shareholders' equity. In the first method, the rate of return on capital is endogenous, determined internally by management. If the IIFS' management chooses a transfer of income to IAH, this will be reflected in the return to shareholders' equity, given that the IAH receive a targeted return commensurate with their risk-bearing capacity (or consistent with their risk appetite). An alternative approach is to assume that the return to a component of capital in the commingled pool is proportional to its contribution to the pool, and hence the investment return on capital is the same as the return obtained from assets funded by the commingled funds. In this case, there is no transfer of profit from shareholders to UIAH.

(d) Net Profits, and Return on Assets

As a measure of profitability, the GN defines return on assets as the sum of net profits to shareholders plus income attributable to PSIA (i.e. total net[10] profits of the year before distribution to IAH) expressed as a percentage of total assets. (Total assets, for the purposes of this GN, are defined as the sum of shareholders' and UPSIA funds.) The gross rate of return on assets is equal to the rate of return on assets after adding back provisions expressed as a percentage of assets. The conventional measure of the rate of return on assets defined as total net profits before any distribution to IAH as a percentage of average total assets can also be used for estimation purposes.

(e) Other Data

Estimation of DCR and alpha also requires another set of historical data.[11] These data include the amounts of transfers made from and/or to PER and IRR, *Muḍārib* share as a percentage, amounts of transfers made from shareholders' funds, total assets, average UPSIA, a market benchmark for the rate of return to be paid to IAH, the amount of provisions appropriated from the gross income, gross income for the financial year, gross income to shareholders, and gross income available for IAH.

3.2. Measurement of Risk Sharing

3.2.1. Definition of Risk

26. Risk is generally defined in finance as volatility measured by the variance of a value about its mean, and the risk of an asset portfolio is the variance of its returns about their mean. Downside risk is the probability that returns will be lower than the mean, and in particular the probability of losses. Expected losses are covered by provisions, increases in which reduce profits and vice versa. Unexpected losses fall to be covered by capital. Thus, risks to which an IIFS's shareholders will be exposed, under various scenarios relating to how the payouts to the IAH are determined, can be measured by a model using variability of asset returns, according to which there is a specified probability level for returns that fall below a threshold value and are hence unexpected, or (in other words) losses that are unexpected by virtue of exceeding a threshold level. Under different scenarios of payouts to IAH, the extent of risk sharing is measured by the covariance of the net income of shareholders and the net income of IAH, taking account of the fact that the shareholders' *Muḍārib* share has a lower bound of zero.

3.2.2. Measurement of Investment Risk to Shareholders

27. The true risk facing shareholders which is the main determinant of capital requirement is the difference between the variance of the actual rate of return on equity, and the variance of the underlying rate of return on equity that the shareholders would have received in the absence of income transfer to IAH (by means of *Muḍārib* share forgone and/or profit donated). The risk to shareholders can be measured by calculating the variance of return on equity (R_E) and its components as given in Appendix 2.

3.2.3. Measurement of Investment Risk to IAH

28. Similarly, investment risk to IAH is the difference between the variance of the actual rate of return to IAH, and the variance of the rate of return that the IAH would have received in the absence of smoothing their payouts. The mechanism for measuring investment risk to IAH and its components is given in Appendix 2.

[10] Net of provisions.
[11] The supervisory authority has discretion to determine the adequacy of data. For further details, please refer to paragraph 41.

3.3. Modelling Risk Sharing

29. An IFSB survey on DCR conducted in 2009[12] showed that, overall, unrestricted PSIA are being treated as semi-deposits owing to market considerations and/or regulatory requirements. As such, there exists DCR at different levels in all surveyed countries. The rationale for the treatment of PSIA varies from one country to another, in part due to the prevailing regulatory requirements in each country. While regulations in all countries tend to protect the principal capital of PSIA (not the returns), for market considerations IIFS are inclined to pay smoothed rates of return that are competitive with those paid by their peers and conventional counterparts. Following from this, the prevailing perception was that smoothing of returns would only exist in countries where dual banking systems prevail. However, this may not be the case in all circumstances, as the survey findings showed that smoothing of returns could exist in an environment where conventional banks do not exist at all, this being due to competition among peers and other public sector institutions.

30. The survey results also revealed that IIFS determine rate of return to be paid to IAH based on two factors, actual rates of return and market benchmarks. This being the case, IIFS management decisions on the rate of return to be paid to IAH (R_i) can be modelled as a function of two variables: the rate of return on assets (R_A), which represents the income available for distribution between IAH and IIFS shareholders; and the market benchmark rate (Rm), which represents alternative returns available to depositors generally, including IAH, in the market. For simplicity, the actual payout to IAH can be modelled as a weighted average of the market benchmark rate (Rm) and the rate of return attributable to IAH as a derivation from the rate of return on assets (R_A) given in Appendix 2.

$$R_i = w.(Rm) + (1 - w).R_A + C^{13}$$

Where "w" is a summary measure of investment account management; it is the weight attached to market benchmarks in the decision on payouts to IAH.

31. Empirical estimates of "w" based on the data for the above three variables would yield an approximation of management decisions over time, and can form the basis for the estimation of DCR and alpha. The relationships among DCR, smoothing mechanisms and alpha are explained in the following paragraphs.

3.3.1. Correlation between the Variables

<u>The Relationship between DCR and the Smoothing Mechanisms</u>

32. As explained in Section 2, paragraphs 11 and 12, the situation of DCR arises when IIFS employ the practice of smoothing returns to IAH. Whereas some of the smoothing mechanisms are mainly to mitigate DCR, the use of other mechanisms will give rise to DCR. For instance, in managing the PSIA of IAH, IIFS may either: (a) manage the payouts to IAH without affecting the returns to shareholders by using prudential reserves PER (and IRR, although the latter does not affect shareholders' profits); (b) manage the payouts to IAH by using shareholders' funds through making direct transfers in the form of a donation or forgoing part or all of the *Muḍārib* share; or (c) a combination of both. In the former case, there will be no risk transfer to shareholders as long as the reserves are sufficient to cover any lack of IAH profits, and then to top up returns to the targeted payouts.[14] More precisely, there will be no *net* DCR, since the IIFS is able to mitigate its exposure to DCR completely by using prudential reserves. In the latter two cases, assuming all losses are being covered by IRR, but PER is not sufficient to smooth the returns of IAH or there is no PER at all, IIFS have to resort to shareholders' funds resulting in DCR.

[12] The survey covered 52 institutions operating in seven IFSB member countries.
[13] "C" is a constant factor that may take a negative value to cater for the variation between the rate of return on assets and the rate of return to IAH.
[14] In some scenarios, the IRR may be used to cover a loss to IAH and then the PER may be used to make a balance available for distribution to IAH as a "profit" payout.

The Relationship between DCR and Alpha

33. When UPSIA, at one extreme, fully bear their own risks as specified in the *Muḍārabah* contracts and receive returns equal to the returns on the investments made with their funds, IAH are treated as investors. Hence, there will be no DCR. In this case, alpha will be zero, and therefore no additional capital requirements are called for. At the other extreme, when PSIA are paid the market return regardless of the return on assets, and there is no mitigation of DCR by the use of PER, then DCR will be very large. In this case, alpha will be close to 1, and therefore there will be additional capital requirements to provide a buffer against the "capital strain" resulting from the diversion of profits from the shareholders and the resultant increase in the riskiness of their returns. Between these two extreme cases, there could exist situations where there are different levels of DCR between zero and a maximum amount. In such cases, alpha will be between zero and 1, depending on the level of DCR and risk mitigants (PER) available to reduce DCR. The task then is to measure the actual DCR and, hence, the actual level of alpha that is required by the IFSB supervisory discretion formula.

3.4. Estimation of DCR and Alpha

34. DCR represents the extent of additional risk borne by IIFS' shareholders compared to the situation where PSIA assume all commercial risks (as in the standard interpretation of the *Muḍārabah* contract).

35. To be more precise, from Figure 2 in Appendix 1, let us use the following definitions:

(a) Let UL_0 denote unexpected losses borne by IIFS' shareholders when PSIA bear all commercial risks (i.e. DCR and alpha are zero in the supervisory discretion formula).

(b) Let UL_1 denote the unexpected losses that would be borne by IIFS' shareholders if PSIA were treated as if they are ordinary depositors who receive a market return and do not bear any commercial risks. (DCR is at its highest, and hence alpha is 1 in the supervisory discretion formula).

In practice, alpha is between zero and 1, because IIFS do not always make a payout to the UIAH according to market rates or strictly follow the rate of profit on investment made with the *Muḍārabah* funds. IIFS use various techniques of setting aside or drawing from reserves, or making donations from shareholders' funds, in order to smooth the returns with a view to setting aside some reserves in good times and avoiding paying low returns in times of low profits.

36. If the IIFS pays a return to PSIA that closely follows the actual rate of profit, then DCR is low, and alpha is also low; if the IIFS pays a rate of return to PSIA that closely follows an average market benchmark rate, regardless of fluctuations in profits, then DCR by implication is high, and alpha is closer to 1. This intuitive explanation provides a framework for estimating DCR and the alpha associated with the particular level of DCR. For simplicity, the extent of co-movement between return to PSIA (R_I) and market return (Rm) can be estimated by the equation given in paragraph 31.

37. As "w" moves from zero to 1, the character of PSIA changes from being a pure investment-like product to more of a pure deposit-like product, requiring increasing amounts of shareholder capital. Additional capital requirements – that is, the increase as "w" shifts from zero (pure *Muḍārabah* outcome) to its actual level "w" – given by ($UL_2 - UL_0$) – is the measure of DCR. The maximum possible value of DCR is given by ($UL_1 - UL_0$).

3.4.1. The Formal Definition of Alpha

38. Alpha is the ratio of actual risk transferred to shareholders – that is, the DCR in the situation of "full" risk transfer to shareholders (i.e. the full risk of the actual profit being below the benchmark, but not the risk of IAH losses) implying the maximum value of DCR. An algebraic approach to the estimation of DCR and alpha is explained in detail in Appendix 2.

SECTION 4: THE ROLE OF SUPERVISORY AUTHORITIES

4.1. Estimation Methodology

39. Supervisory and regulatory authorities may need to assess the risk profile of IIFS at both institutional (micro) and national (macro) levels. In order to estimate reasonable values of alpha that are commensurate with the actual risk profile of the IIFS operating in their jurisdictions, regulators and supervisors may use either of the following approaches:

(a) IIFS-specific Data Approach

In this approach, supervisory and regulatory authorities at their discretion can impose on IIFS individual alpha factors based on independent assessment of each IIFS's exposure to DCR. Such IIFS-specific alpha factors should reflect each IIFS's payout policy, the extent of payouts and the impact on shareholders. This approach relies on a sufficiently long time-series of relevant data being available for an IIFS, and may be applicable in the case of a long-established IIFS, but not for more recently established institutions as these do not have long enough time-series data for statistical modelling purposes.

(b) Panel Data Approach

This approach estimates a country-specific alpha factor using panel data for the population of IIFS in a jurisdiction. However, a limitation of this approach is that it may not be feasible if there are too few IIFS in the jurisdiction.

40. The estimation of alpha is likely to require additional data collection. It is essential to acquire the required set of data in order to estimate the level of exposure to DCR and thereby arrive at reasonably accurate estimates of alpha. In this context, supervisory and regulatory authorities will need, in the first place, to determine data requirements for the calculation of DCR and alpha. This, in turn, may require assessing the existing accounting frameworks, and requirements in their jurisdictions for reporting and disclosure to the supervisor.

4.2. Supervisory Discretion Issues

41. A number of studies conducted by the IFSB have indicated that CARs of IIFS are highly sensitive to changes in the value of alpha. The implication of this finding is that if the CAR of an IIFS is calculated without estimating a reasonably realistic value of alpha, the CAR will not provide an adequately accurate measure of the IIFS's capital adequacy. For example, setting values of alpha too high would entail excessive capital requirements for the IIFS. This, in turn, would negatively affect the economic efficiency of the IIFS in question. For a similar reason, setting values of alpha too low would entail insufficient capital requirements for an IIFS, with resultant prudential risks. Therefore, supervisory and regulatory authorities should satisfy themselves that the estimated value of alpha and their corresponding capital requirements reflect as accurately as possible the true risk profile of IIFS at both institutional and national levels.

Stressed Alpha

42. It is important for supervisors to take into account stress conditions when determining alpha. DCR is likely to be higher during stressed conditions as investment returns tend to be lower, increasing the need for an IIFS to draw upon its reserves/shareholder funds in order to maintain the same level of payout to IAH. To account for the potentially higher DCR during stressed conditions, supervisors should aim to incorporate historical data from meaningful and significant stressed periods, where available, to reflect the "stressed" alpha.

43. It should be noted that the estimation of alpha as just outlined is concerned with displaced *commercial* risk and does not take into account potential exposures to operational risk in the form of a *Muḍārib's* potential liability for "misconduct and negligence". In

accordance with the *Muḍārabah* contract, if negligence, misconduct and/or breach of the contract could be proven, an IIFS would be liable to compensate IAH for their *Muḍārabah* capital. This GN does not propose that this issue of operational risk (which might call in particular cases for a supervisor to require an IIFS to hold additional capital) should be dealt with by incorporating it into a methodology designed to address the issue of DCR. On the other hand, higher values of alpha may be applicable in jurisdictions where IAH tend to be highly protected by the governments and central banks for strategic reasons. In this context, it is recommended that supervisors and regulators base their judgments on the actual legal status of PSIA in their jurisdictions (i.e. whether PSIA are explicitly/implicitly protected by the central bank and/or deposit insurance).

DEFINITIONS

The following definitions are intended to assist readers in their general understanding of the terms used in the Guidance Note. The list is by no means exhaustive.

Investment Risk Reserve (IRR)	The amount appropriated by the institution offering Islamic financial services out of the income of investment account holders (IAH), after allocating the *Muḍārib's* share, in order to cushion against future investment losses for the IAH.
Mubāra`at	An agreement between the institution offering Islamic financial services and its customer whereby the customer will waive a certain portion of his profits earned during the investment period.
Muḍārabah	A contract between the capital provider (*Rabb-ul-mal)* and a skilled entrepreneur (*Muḍārib)* whereby the capital provider would contribute capital to an enterprise or activity that is to be managed by the entrepreneur as the *Muḍārib* (or labour provider). Profits generated by that enterprise or activity are shared in accordance with the terms of the *Muḍārabah* agreement, while losses are to be borne solely by the *Rabb-ul-mal* unless the losses are due to the *Muḍārib*'s misconduct, negligence or breach of contracted terms.
Mushārakah	A *Mushārakah* is a contract between the institution offering Islamic financial services and a customer to contribute capital to an enterprise, whether existing or new, or to ownership of a real estate or moveable asset, either on a temporary or permanent basis. Profits generated by that enterprise or real estate/asset are shared in accordance with the terms of the *Mushāraka*h agreement, while losses are shared in proportion to each partner's share of capital.
Profit Equalisation Reserve (PER)	The amount appropriated by the institution offering Islamic financial services out of the *Muḍārabah* income, before allocating the *Muḍārib*'s share, in order to maintain a certain level of return on investment for investment account holders and to increase owners' equity.
Restricted Investment Accounts	The account holders authorise the institution offering Islamic financial services to invest their funds based on *Muḍārabah* or agency contracts with certain restrictions as to where, how and for what purpose these funds are to be invested.
Unrestricted Investment Accounts	The account holders authorise the institution offering Islamic financial services (IIFS) to invest their funds based on *Muḍārabah* or *Wakālah* (agency) contracts without imposing any restrictions. The IIFS can commingle these funds with their own funds and invest them in a pooled portfolio.
Wakālah investment	*Wakālah* is an agency contract, where the investment account holder (principal) appoints the institution offering Islamic financial services (agent) to carry out on behalf of the principal the investment for a fee or for no fee, as the case may be.

APPENDICES

Appendix 1: Illustrative Figures

Figure 1: A Framework to Compute *Muḍārabah* Income and Returns to IAH

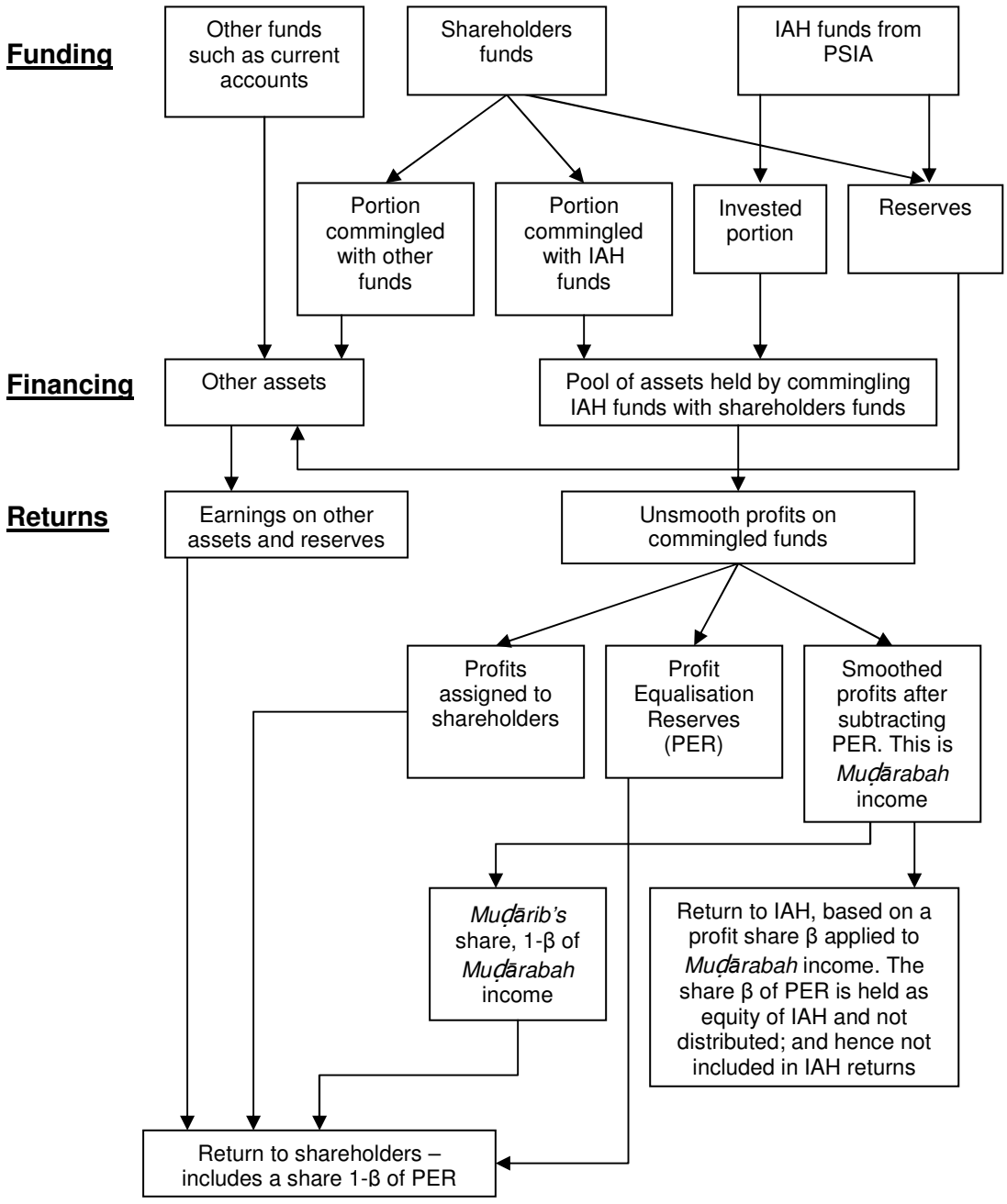
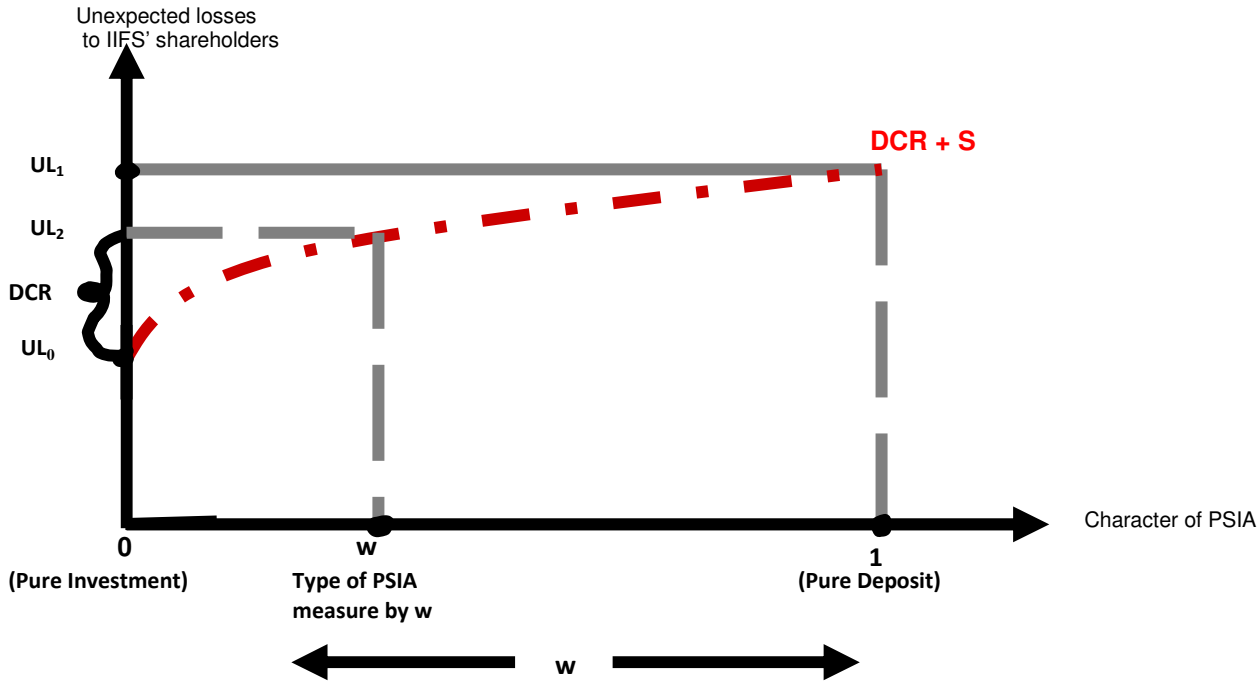


Figure 2: **The Relationship between Unexpected Losses to IIFS' Shareholders and the Character of PSIA**



This figure shows the relationship between the character of PSIA expressed in "w" and unexpected losses to IIFS' shareholders. As "w" moves from zero to 1, the character of PSIA changes from being a pure investment-like product to a pure deposit-like product. (Since DCR exists only in cases of smoothing returns, the "S" factor, given above, is by assumption to cater for the guaranteed principal of *Muḍārabah* capital so that PSIA assimilate pure deposits.) In such a case, it is required to increase the amount of shareholders' funds. The additional capital requirement – that is, the increase in unexpected losses as "w" shifts from zero (a pure *Muḍārabah* outcome) to its actual level "w" – is given by ($UL_2 - UL_0$), which is the measure of displaced commercial risk (DCR). The maximum possible value of DCR is given by ($UL_1 - UL_0$). The value of alpha in the capital adequacy formula is given by the ratio of actual size of DCR to its maximum value, as explained in paragraph 10 of Appendix 2.

Appendix 2: An Algebraic Approach for Measuring DCR and Alpha

1. This appendix provides an algebraic presentation for the DCR and alpha estimation approach that is detailed in Section 3.

(a) Definition of the Data

2. Estimation of DCR and alpha requires specific time-series data. The set of historical (or panel) data required for the regression is listed below. The definitions of data provided in Section 2, paragraph 25, are re-presented here to stimulate an algebraic presentation for the variables.

(i) *Muḍārabah* Income

3. *Muḍārabah* income attributable (i.e. after appropriations to or releases from PER) between UIAH (*Rabb-ul-mal*) and the IIFS as a *Muḍārib,* as illustrated in Figure 1 in Appendix 1, can be defined as investment income from balance sheet assets plus trading income, net of provisions, income attributable to capital, specific investments, and income due from other institutions. *Muḍārabah* income before allocating the *Muḍārib* share can therefore be written as follows:

$$RM = A.(R_A - S_P) - A.R_P - KR_K \quad (1)$$

Where:
RM : *Muḍārabah* income
A : Total assets, equal to the sum of shareholders' funds (K), and UPSIA funds (DI) and other funds (OF)
R_A : The gross rate of return on assets
S_P : Provisions made out of current income as a percentage of assets
R_p : Appropriation to PER as a percentage of total assets
KR_K : Income attributable to the shareholders outside of the *Muḍārabah,* such as income from assets funded by current accounts, and before the attribution of the *Muḍārib share*, expressed in terms of a rate of return on shareholders' funds, R_K

:
RK, may thus be written as follows:

$$R_K = A/K \,.\, (R_A - S_P - R_P - D_K)$$

Where D_K is any transfer of income from IIFS' shareholders to UIAH expressed as a percentage of total assets. D_K may take the form of a donation from the shareholders to the UIAH out of the shareholders' share of profits.

(ii) Rate of Return on Shareholders' Equity

4. The returns to shareholders are derived from both their share of returns in the pool of investment assets acquired using the commingled IAH/shareholders' funds, plus their share of *Muḍārabah* profits for the services as a *Muḍārib* and the net earnings from other funds.[15] Other sources of shareholders' funds – for example, income from other banking services and other non-PSIA assets that are derived from other assets.[16] Accordingly, the rate of return on shareholders' equity[17] (R_E) can be written as follows:

$$R_E = (1 - \beta).\{RM/K + A.\, R_P/K\} + R_K \quad (2)$$

[15] For example, income from other funds includes that from banking services and other income not related to PSIA.
[16] Other funds, including any uninvested portion of IAH funds and other deposits, are held in remaining assets of the IIFS, as shown in Figure 1 in Appendix 1.
[17] It is worth noting that equation (2) does not include IRR for simplicity, and because in principle IRR does not affect shareholders' profit.

Where:
(1 – β): *Muḍārib*'s share
RM : *Muḍārabah* income
K : Shareholders' funds
A : Total assets, equal to the sum of shareholders' funds (K), and UPSIA funds (DI) and other funds (OF)
R_p : Appropriation to PER as a percentage of total assets
R_K : The rate of return on shareholders' funds that is invested in other assets

(iii) Rate of Return Attributable to IAH

5. The IAH get their returns only from the specified profit-sharing ratio applied to *Muḍārabah* profits. Rate of return attributable to IAH is, therefore, the agreed share of *Muḍārabah* profit net of investment risk reserves. Based on the definition of *Muḍārabah* income given in paragraph 3 above, rate of return to IAH is expressed by the following formula:

$$R_I = \beta.\ RM/DI - R_{IR}$$

Substituting RM from equation (1) into this equation reveals:

$$R_I = \beta.\ [A.\ (R_A - S_p - R_P) - KR_K] / DI - R_{IR} \quad (3)$$

Where:
R_I: Rate of return attributable to IAH
β: IAH's share of *Muḍārabah*'s profit
DI: PSIA funds
R_{IR}: Investment risk reserves
K: Shareholders' funds
R_A: The gross rate of return on assets
S_P: The provision as a percentage of assets
KR_K : Income attributable to the shareholders outside of the *Muḍārabah,* such as income from assets funded by current accounts, and before the attribution of the *Muḍārib share*, expressed in terms of a rate of return on shareholders' funds, R_K

6. Combining equations (1), (2) and (3), R_I and R_E can be rewritten as follows:

$$R_E = (1 + (1 - \beta)\ DI/K)).\ (R_A - S_P) - \beta.D_K \quad (4)$$

$$R_I = \beta.\ (R_A - S_P) - \beta.\ A/DI.\ R_P + K/DI.\ \beta.D_K - R_{IR} \quad (5)$$

(b) Estimation of DCR and Alpha

7. The key to estimating DCR and alpha is to estimate the degree of co-movements of R_i with R_A and Rm. Accordingly, DCR and alpha can be estimated based on the following steps:

- **Step 1: Estimate "w".**
- **Step 2: Estimate return to shareholders under alternative scenarios.**
- **Step 3: Compute unexpected losses to shareholders under alternative scenarios.**
- **Step 4: Estimate DCR and alpha.**

The procedures required for each step are further detailed in the following paragraphs.

Step 1: Estimation of "w"

8. The relationship between the co-movement of rate of return on assets and market benchmark, and rate of return to IAH, is explained in paragraph 30 and expressed as follows:

$$R_i = w.\ (Rm) + (1 - w).\ R_A + C^{18}$$

Therefore, "w", which is the weight attached to Rm in the determination of Ri by the IIFS, can be obtained by getting the regression of Ri on Rm and Ra, using time-series or panel data.

Step 2: Estimation of return to shareholders under alternative scenarios

Scenario 1: PSIA are treated as pure investment products

9. Under this scenario, all commercial risks arising from assets funded by IAH are borne by the IAH themselves. In other words, there is no "smoothing" of payouts to IAH. Therefore, there will not be DCR and, accordingly, values of "alpha" and "w" will be zero. Other risk determinants – PER and IRR, transfer of income from shareholders to IAH will also be zero, and *Muḍārib*'s share will be fixed (i.e. under this scenario, alpha = 0, w = 0, $R_I = R_A - S_P$, IRR/PER = 0). Therefore, the rate of return to shareholders will depend strictly on investment return (i.e. return on assets and *Muḍārib*'s share):

$$R_{E0} = R_A - S_P$$

The standard deviation (σ_0) of R_{E0} is to be obtained to compute unexpected losses in step 3.

Scenario 2: PSIA are treated as pure deposit-like products

10. Under this hypothetical scenario, IAH bear no losses and all commercial risks arising from assets funded by IAH are borne by shareholders. Therefore, DCR will be at its maximum and, accordingly, values of "alpha" and "w" will also be at their maximum – that is, 1. Other risk determinants – PER and IRR, *Muḍārib*'s share and income transfer from shareholders to IAH will vary according to the payout policy adopted by the IIFS (i.e. under this scenario, alpha = 1, w = 1, R_I = Rm). The rate of return to equity will be as follows:

$$R_{E1} = (R_A - S_P) + DI/K.(R_A - S_P - Rm)$$

The standard deviation (σ_1) of R_{E1} is to be obtained to compute unexpected losses in step 3.

Scenario 3: PSIA are treated as being in-between pure investment and deposit-like products

11. Under this scenario, which represents an intermediate situation between the two extreme cases (scenarios 1 and 2), the payout to IAH is a weighted average of market return and investment return. Accordingly, there is risk-return sharing between IAH and shareholders of the IIFS resulting in some DCR. The values of "alpha" and "w" will, therefore, fall between zero and 1. Other risk determinants: PER and IRR, *Muḍārib*'s share, and transfer of income from shareholders to IAH will depend on the IIFS' payout policy and sufficiency of reserves held by IAH. The rate of return to equity is expressed as follows:

$$R_{E2} = (R_A - S_P) + DI/K.w.(R_A - S_P - Rm)$$

The standard deviation (σ_2) of R_{E2} is to be obtained to compute unexpected loss in step 3.

Step 3: Computation of unexpected losses to shareholders under alternative scenarios

12. Assuming a normal probability distribution, and using the standard deviations of rate of return on equity (R_E) that are obtained in step 2, the corresponding unexpected loss to

[18] The symbol "C" is a constant factor being used as a dummy variable. It can take a negative value to cater for the variation between the rate of return on assets and the rate of return to IAH.

shareholders under the three above-mentioned scenarios of PSIA can be calculated as follows:

- Scenario 1: Unexpected loss to shareholders when PSIA are treated as pure investment products:

  UL_0 = a multiple of the standard deviation of R_{E0}

- Scenario 2: Unexpected loss to shareholders when PSIA are treated as pure deposit-like products:

  UL_1 = a multiple of the standard deviation of R_{E1}

- Scenario 3: Unexpected loss to shareholders when PSIA are treated as being in-between pure investment and deposit-like products:

  UL_2 = a multiple of the standard deviation of R_{E2}

Step 4: Estimation of DCR and alpha

13. From the unexpected losses to shareholders that were obtained in step 3, DCR and alpha can be obtained using the following equations:

DCR = $UL_2 - UL_0$

Maximum DCR = $UL_1 - UL_0$

"Alpha" = $(UL_2 - UL_0) / (UL_1 - UL_0)$