

# Integration of Islamic bank specific risks and their impact on the portfolios of Islamic Banks

Syed Alamdar Ali Shah, Raditya Sukmana and Bayu Arie Fianto  
*Islamic Economics Department, Faculty of Economics and Business,  
Universitas Airlangga, Surabaya, Indonesia*

Impact on the  
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## Abstract

**Purpose** – This study aims to propose a risk management framework for Islamic banks to address specific risks that are unique to Islamic bank settings.

**Design/methodology/approach** – A unique methodology has been developed first by exploring the dynamics and behaviors of various risks unique to Islamic banks. Second, it integrates them through a series of diagrams that show how they behave, integrate and impact risk, returns and portfolios.

**Findings** – This study proposes a unique risk-return relationship framework encompassing specific risks faced by Islamic banks under the ambit of portfolio theory showing how Islamic banks establish a steeper risk-return path under Shariah compliance. By doing so, this study identifies a unique “Islamic risk-return” nexus in Islamic settings as an explanation for the concern of contemporary researchers that Islamic banks are more risky than conventional banks.

**Originality/value** – The originality of this study is that it extends the scope of risk management in Islamic banks from individual contract-based to an integrated whole, identifying a unique transmission path of how risks affect portfolio diversification in Islamic banks.

**Keywords** Islamic banks, Risk management, Islamic banks' specific risks, Integration of risks, Portfolio diversification

**Paper type** Technical paper

## 1. Introduction

The Islamic banking system has become very fragile requiring rigorous integrated risk management (Admati, 2014). Integrated risk management is necessary to avoid systemic risk that results from various types of bank failure (Deli and Hasan, 2016; Avci and Yucel, 2017). It is actually a subset of a comprehensive appreciation of banking systems by regulators based on a trade-off between risk-taking, regulations and return margins (Louhichi *et al.*, 2020). Lee and Hsieh (2013) indicate the following two types of hypothesis for banking regulations: regulatory and moral hazard. Regulatory suggests a positive relationship between risk and capital, whereas moral hazard is negative.

Banks' capital is also a function of risk-taking that emanates from competition (Louhichi *et al.*, 2020). The competition, risk and capital nexus is also the subject of two hypotheses,

**JEL classification** – G11, G21, G28, G32, G38

For this manuscript the first author acknowledges his MBA students who put challenging questions while he was teaching the course of “Investment Analysis and Portfolio Management” to explain the portfolio theory in the context of Islamic banking. Using literature and student questions a basic framework was developed that has been used in this manuscript. We also acknowledge the contributions from unknown reviewers of International Journal of Islamic and Middle Eastern Finance and Management who helped a lot to fine-tune the manuscript in its present form.



competition-fragility and competition-stability. The first suggests a negative relationship between risk and capital leading to lower profitability as competition increases by increasing risky assets (Keeley, 1990). The second concerns increased competition that reduces interest rates, increases profitability and decreases the risk in risky assets, particularly the credit risk (Boyd and De Nicolo, 2005).

Keeley (1990) first explored the risk-return integration with regulations identifying the damage of non prudent risk behavior and default risk because of deregulation of the US economy. Rupello (2004) affirms the results that the risk-return nexus requires integration with all important risks under regulatory supervision to control the risk-taking behavior of banks in an environment of imperfect competition. Hakenes and Schnabel (2011) propose a more capitalistic view stating that capital regulations reduce the strength of banks by reducing demand for loans. Agoraki *et al.* (2011) confirm the impact of the integration of the risk-return relationship with regulations with the reservation that banking market power has a violating effect.

Islamic banking has recently received significant attention from researchers because of its distinct nature (Adebayo and Hassan, 2013; Lopez-Mejia *et al.*, 2014). Its role in an economy is similar to conventional banks, however, the difference is Shariah compliance (Hanafi and Santi, 2013; Doumpos *et al.*, 2017; Ibrahim and Rizvi, 2017). Hassan and Aliyu (2018) explain that Islamic banking has financial characteristics of avoidance of riba and gharar and nonfinancial characteristics of ensuring the principles of equity, ownership and participation. Furthermore, underlying contracts in Islamic banking have some Islamic guidelines from various specific needs-based contracts such as Mudharabah, Musharakah, Murabahah, Ijarah and Istisna (Doumpos *et al.*, 2017; Ibrahim and Rizvi, 2017).

Islamic institutions are subject to a misconception that they are free from risk (Louhichi *et al.*, 2020). Rather, it is the measurement and management of risks in the Islamic environment that makes them look risk free (Louhichi *et al.*, 2020). Yunus *et al.* (2018) indicate that, over and above the risks faced by conventional banks, Islamic banks are subject to displaced commercial risk, equity investment risk, withdrawal risk, rate of return risk and Shariah risk that impact their behavior in risk taking.

Various studies have examined risk-taking behavior by Islamic banks. For instance, Beck *et al.* (2013), Rosman *et al.* (2014) and Sakti and Zulkhibri (2018) indicate better management of insolvency risks in Islamic banks. Ito (2013) finds co-movements between Islamic rates of return and conventional interest rates with Islamic rates of return propelling conventional rates of interest in less than one-year maturity brackets. Abedifar *et al.* (2013) find lower credit risk in small Islamic banks. Despite all the studies addressing various risks for Islamic banks, risk from increased competition is showing an increasing trend requiring more integrated risk management procedures. For instance, studies toward the end of the previous decade, such as Turk-Ariss (2010), indicate less competition. Studies in the middle of this decade, such as Weill (2011), find no difference and others, such as Nurul-Kabir and Worthington (2017) and Inci (2018), indicate higher competition.

Research over the last two decades reveals that Islamic banks suffer higher levels of settlement, country, operational, residual and liquidity risks over and above certain unique risks of Shariah non-compliance, rate of return, equity investment, withdrawal and displaced commercial risk (Archer and Karim, 2019). These higher levels of risks when integrate with the unique risks of Islamic banks create unexplained effects on the risk-return relationship. These unexplained effects have been identified by various contemporary researchers, for example, Abedifar *et al.* (2013), Chattha and Alhabshi (2018); Grira *et al.* (2018), Noor *et al.* (2018); Anwer *et al.* (2019), Archer and Karim (2019); Noor *et al.* (2019b); Chattha *et al.* (2020), Grassa *et al.* (2020); and Ibrahim (2020).

The management of risks is a vast topic that comes from the identification of risks. However, risk management is much more than risk identification since analyzing how they integrate is equally important (Archer and Karim, 2006, 2019). Addressing the research gap of integration this study explores the nexus among various risks and returns highlighting how various risks integrate with each other. Specifically, it focuses on how various risks and returns integrate and behave under portfolio theory. Although many studies have explored the issue of risk, risk and return and risk-return and regulations in conventional and Islamic environments, to the best of our knowledge, no study has been undertaken to explain how these risks integrate and form a spectrum of risk and return in Islamic banking.

### 1.1 Methodology

This study has its roots in the landmark study by Abedifar *et al.* (2013), who explain the “kinked impact” of displaced commercial risk on the risk-return relationship in Islamic banks. It develops on Islamic bank-specific risks by taking a step by step approach to a risk-return environment under portfolio theory. This explains how the “kinked impact” affects the portfolio risk-return relationship in the Islamic banking environment by identifying a unique area on the efficient portion of the portfolio risk-return curve. This study is the first known study to fill the gap of risk-return relationship in Islamic banks by adopting a step-by-step mechanism. It analyzes the relationships between various risks and returns faced by Islamic banks developing a three-step methodology.

First, it explores the dynamics of five specific risks faced by Islamic banks through an extensive literature review of equity investment risk, displaced commercial risk, withdrawal risk, rate of return risk and Shariah risk contributed by leading researchers in Islamic banking and finance. Second, these five risks are systematically mapped against each other in a series of diagrams labeled as Islamic banking risk boxes. This is followed by mapping and analysis under portfolio risk and return theory showing how various risks and returns behave thereby establishing minimum and maximum limits for an Islamic bank and for the Islamic banking industry.

## 2. Literature review

### 2.1 Risk management in Islamic banks

Research on risk management in Islamic banks has become popular in this decade (Chattha and Alhabshi, 2018; Grira *et al.*, 2018; Maharani and Setiyono, 2018; Noor *et al.*, 2018, 2019b; Wiranatakusuma, 2018; Anwer *et al.*, 2019; Archer and Karim, 2019; Chattha *et al.*, 2020; Grassa *et al.*, 2020). Although identifying and measuring risks is a crucial and critical activity, confronting and managing them is even more sensitive and critical (Riaz *et al.*, 2019). Risk management’s role in managing investments is important because investments are sources of risk and return for financial institutions and Islamic banks are no exception. Islamic banks lack risk disclosure compared with conventional banks (Grassa *et al.*, 2020). Present day investment managers always try to find the optimum, unique combination of risk and return (Nazir *et al.*, 2012).

Risk always requires management before its occurrence by following a proper identification and handling mechanism. This leads to higher level of risk management for Islamic banks because of their unique nature (Riaz *et al.*, 2019). Studies, so far, suggest that displaced commercial risk is a defining risk in the context of Islamic banking because it affects conventional risk-return relationships by incorporating “kink (s)” in the relevant risk-return curves. Hence, this study first explores its dynamics and moves on to incorporate other Islamic bank-specific risks in it.

2.1.1 *Displaced commercial risk.* The Islamic Financial Services Board (IFSB) documents IFSB-2 (2005) and IFSB-GN4 (2011) deal with the occurrence of displaced commercial risk and measure it with a function labeled alpha. Alpha represents that portion of risk weighted assets that is funded by funds that will be displaced to shareholders to smooth out the payouts to investment account holders (Toumi *et al.*, 2019; Touri *et al.*, 2020). In this way, displaced commercial risk affects the capital of Islamic banks requiring an additional charge to capital (Toumi *et al.*, 2019).

IFSB recommends alpha's measurement by a quotient representing the actual displaced commercial risk exposure to total displaced commercial risk exposure (IFSB-GN4, 2011). Studies suggest that the relationship between alpha and actual displaced commercial risk is positive. Toumi *et al.* (2019) narrate that it simply means higher profit smoothing leads to higher risk transfer to shareholders. The maximum value of alpha is "1," but it varies according to the perception of the regulators in different countries (Daher *et al.*, 2015).

Toumi *et al.* (2019) identify certain weaknesses in current displaced commercial risk measurements. According to them, first, a simple formula based on the standard deviation of the returns to shareholders may be biased because of averages not representing true means and the choice of period of return being arbitrary. Second, current measurements assume that investment account holders are protected by regulatory authorities and their accounts cannot be negative. This leads to capital adequacy ratios that might produce inaccurate results making the banks undercapitalized (Daher *et al.*, 2015; Noor *et al.*, 2019a).

Recent studies on the displaced commercial risk provide alternative measurements and modeling of the displaced commercial risk. For instance, Toumi *et al.* (2019) provide a value-at-risk and generalized Pareto distribution based model to address different scenarios of displaced commercial risk and their relationship with profit and loss distribution to shareholders. Another explanation and handling of displaced commercial risk is given by Touri *et al.* (2020) based on machine learning algorithms and proxied variables, the actual effects of which require thorough verification. This is because proxied variables merely introduce uncertainty i.e. "excessive gharar" that is prohibited in the Islamic context (Nehad and Khanfar, 2016).

All research on displaced commercial risk has a consensus that it creates a "kink" in the risk-return relationship. This was first shown graphically by Abedifar *et al.* (2013), who indicate the impact of displacement commercial risk on the relationship between various risks and returns for an Islamic bank investment account holder as in Figure 1.

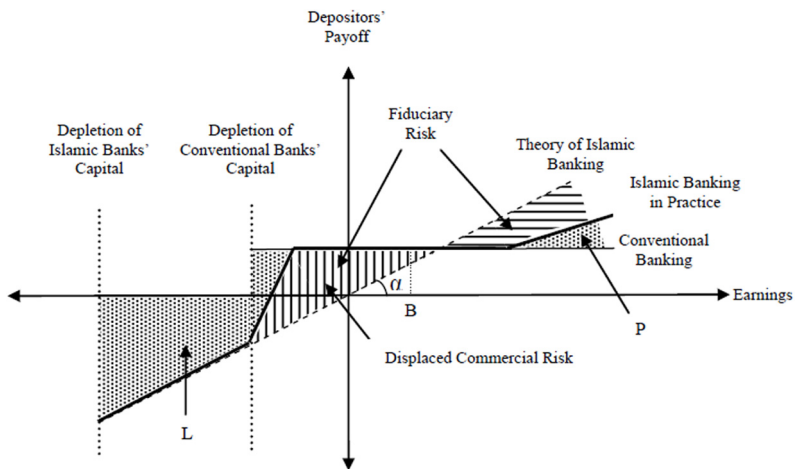


Figure 1.  
Relationship between  
depositor off and  
displaced commercial  
risk

Figure 1 explains how various risks unique to Islamic banks affect the returns to investment account holders. The figure shows how displaced commercial risk creates a kink in the payoff to investment account holders represented by Region B. Such a kinked curve actually exists for all investment account holders of an Islamic bank. This is because Islamic banks pay competitive returns to their investment account holders even in case of losses that are depicted by the dotted line at less than 45 degrees ( $\alpha$ ) getting P excess return and L excess losses, as the case may be (Abedifar *et al.*, 2013). The deposits of investment account holders are always at their respective discretion; therefore this study analyzes the dynamics of the displaced commercial risk with withdrawal risk, rate of return risk and equity investment risk to construct a framework.

## 2.2 The spectrum of displaced commercial risk with withdrawal risk, rate of return risk and equity investment risk

2.2.1 *The displaced commercial and withdrawal risk spectrum.* Displaced commercial risk occurs when the profit expectations of Islamic bank investment account holders are higher than actual returns (Toumi *et al.*, 2019). This makes Islamic banks subject to withdrawal risk (Archer *et al.*, 2010; Aysan *et al.*, 2014; Alhammadi, 2016; Aysan *et al.*, 2016; Alhammadi *et al.*, 2018; Noor *et al.*, 2019a) that may hamper their financial standing and subject them to systemic risk (Toumi *et al.*, 2019). To ensure their competitiveness, Islamic banks bear losses when their expected pay off to investment account holders is lower than the market and retain a higher share of profits when their expected pay off to investment account holders is higher than the market (Alhammadi, 2016; Alhammadi *et al.*, 2018; Noor *et al.*, 2019a; Toumi *et al.*, 2019).

In summary: “In effect, Unrestricted Profit Sharing Investment Accounts (UPSIA) are typically used by Islamic banks as a form of very low-risk leverage. This is because Islamic banks do not have any obligation to pay returns to Unrestricted Investment Account Holders (UIAH) in the absence of profits, and in any case, may use reserves taken from prior-year UIAH profits to pay returns in years when profits are lacking. In the absence of governance rights, the only safeguard UIAH’s might have would be effective competition between Islamic banks for their funds together with transparency and market discipline, but the evidence suggests that these are insufficient.” (Alhammadi *et al.*, 2018; p 16).

2.2.2 *The effect of displaced commercial and withdrawal risk spectrum on equity investment risk.* Displaced commercial risk and withdrawal risk are ultimately passed on to equity investment risk. Equity investment risk actually arises from entering into a partnership to undertake or participate in a financing or general business activity as described in the contract (Rhanoui and Belkhouout, 2019). Equity investment risk is obvious in Mudharaba and Musharaka contracts (Anwer *et al.*, 2019; Rhanoui and Belkhouout, 2019). IFSB (2018) identifies various precautions against equity investment risk:

- The record of partners under Mudharbah or Musharakah contracts should be taken into account regarding similar projects.
- All statutory requirements should be carefully studied because the impact of nonadherence to statutory requirements is irreparable.
- Information regarding the functioning of the project should always be complete.
- Valuation of the project should be complete and contemporary to ensure transparency and to avoid misunderstandings.

Higher *ex ante* Islamic equity cost of capital implies a higher equity risk perception of Islamic banks (Ghira *et al.*, 2018). Equity investment risk in the Islamic bank risk-return

literature remains under-addressed despite important ramifications (Daher *et al.*, 2015; Grira *et al.*, 2018). However, its significance in Islamic risk management has been increased because of a less effective market structure, competition, unique financial structure and Shariah based contracts. Keeping in view its importance, its inclusion in the total risk spectrum is important to make a holistic risk-return analysis. Equity investment risk has a positive relationship with displaced commercial and withdrawal risks. This is because higher withdrawals lead to a higher risk perception of Islamic banks that raises the cost of capital for Islamic banks to raise funds.

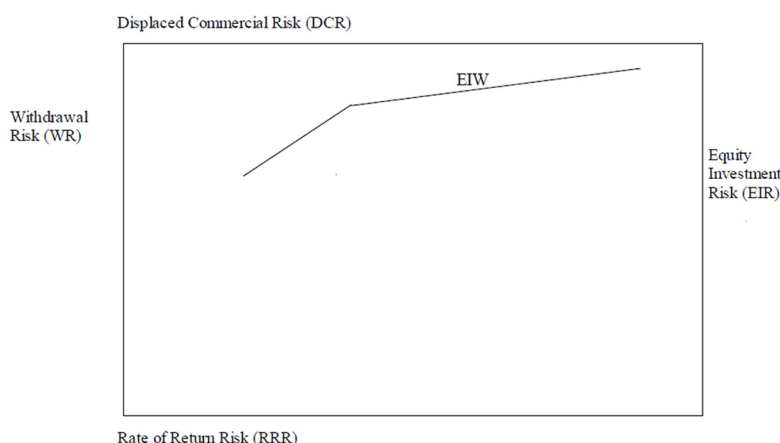
*2.2.3 The displaced commercial and withdrawal risk spectrum effect on equity investment risk affects the rate of return risk.* The higher cost of equity caused by higher equity investment risks ultimately squeezes the rates of return increasing the rate of return risk. Handling the rate of return risk is critical and problematic for Islamic banks because they are less flexible in benchmark rate movements (Zainol and Kassim, 2010; Archer and Karim, 2019). In financing activities, it suffers from withdrawal risk because the maturities of liabilities in Islamic banks are generally shorter than their assets (Korkut and Özgür, 2017). In such a scenario, withdrawal risk also has a profound impact on rate of return risk. This gives rise to the issue of systemic risk because failure to integrate withdrawal risk with rate of return risk can put Islamic banks into severe consequences (Archer and Karim, 2019).

Benchmark rates play a vital role in setting rates of return in Islamic banks. Ito (2013) shows that Islamic rates of return have become significant parts of short term money markets in Malaysia. Benchmark rates' role has such significance that it is the most keenly observed phenomenon by regulatory bodies (Archer and Karim, 2019). The terms rate of return risk and benchmark rate risk are often used interchangeably in Islamic banking literature (Chattha and Alhabshi, 2018).

Islamic banks suffer in managing their assets and liabilities on the grounds that they cannot reflect movements in benchmark rates on their existing assets and liabilities. This adds a further dimension of withdrawal risk because failure to pay market rates of return might force investors/depositors to switch (Chattha and Alhabshi, 2018). Further, changes in interest rates that may impact the benchmark rate may also affect prudent valuation of assets and liabilities of Islamic banks further exposing them to systemic risk (Chattha and Alhabshi, 2018).

Ito (2017) reveals strong evidence of monetary policy expectations of short term Islamic rates of return. However, regulatory authorities cannot dictate to Islamic banks to adopt specific measures for management of the rate of return risks, rather they encourage them to assess rate of return risk and withdrawal risk management procedures (Archer and Karim, 2019). Presently, certain contracts, such as Ijarah, Murabahah and Bay-bi-tsamam-ajil, may be imperfectly used to handle rate of return risk. However, these procedures are not holistic because they do not take into account the balance sheet that is the source of the rate of return risk through a mismatch of assets and liabilities (Archer and Karim, 2019). The result of this practice is the transfer of all displaced commercial risk to Islamic banks making it difficult for them and respective regulators to gauge the actual risk exposure to shareholders (Toumi *et al.*, 2019). This results in a kink in risk-return curve as demonstrated by Abedifar *et al.* (2013) and shown in Figure 2.

Figure 2 has been developed by exploring the literature concerning the relationship behaviors between four types of risk faced by Islamic banks: displaced commercial risk (DCR); rate of return risk (RRR); withdrawal risk (WR); and equity investment risk (EIR). All these behaviors have been plotted in the Islamic bank risk box, measuring them along the boundaries. The curve developed in the box is EIW, which shows the relationship between EIR and WR.



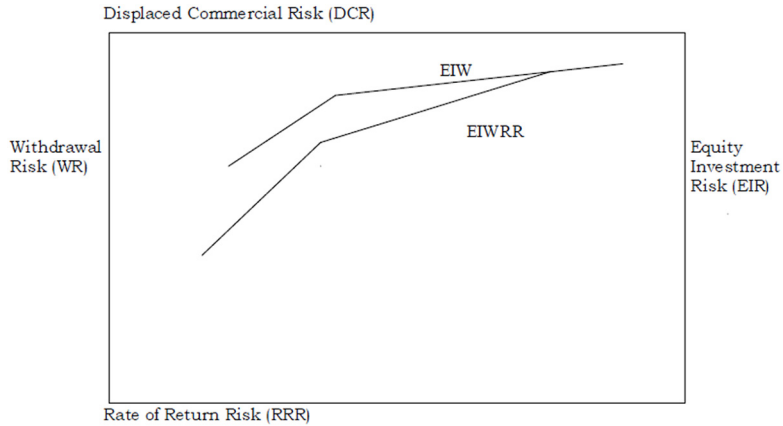
**Figure 2.**  
Relationship of withdrawal risk and displaced commercial risk with equity investment risk

As we have established that equity investment risk is positively related to other risks in Islamic banks, the curve in Figure 2 slopes downward from right to left, which means WR decreases with the decrease in EIR. The curve, however, has a kink that shows the impact of DCR on EIR and WR. This is because risks for Islamic banks increase with increase in their operations and competition. Furthermore, Islamic banks are maturing in decision making about the selection of business ventures for financing and investment. Also, with the passage of time, deposit account customers get to know the return pattern of Islamic banks and they respond better to the risk policy changes of Islamic banks with changes in their withdrawal attitude more quickly with respect to small changes in the announced Islamic EIR practices. This implies that the relationship of displaced commercial risk with other risks and return is not linear. Islamic banks face a unique risk-return relationship for all account holders separately that ultimately yields different rates of return for every product. Given different rates of return, the respective risk-return curves for various products are different, hence, the “kinked impact” of displaced commercial risk. For simplicity, however, we produce two scenarios of the “kinked impact” of displaced commercial risk that are shown in Figure 3 with an additional curve.

Figure 3 is an augmentation and explanation of Figure 2 with another curve named EIWRR introduced to show the relationship between EIR, WR and RRR with the “kinked impact” of DCR. Figure 2 shows the spectrum of all four risks, i.e. EIR, WR, RRR and DCR. However, it depicts only the theoretical relationship between EIR and WR. Figure 3 shows how changes in EIR practices impact RRR through an impact on WR. A decrease in EIR improves the performance of Islamic banks by increasing liquidity available through lower deposit withdrawals, which ultimately leads to high-quality investment in terms of earning capability. Better earning potential leads to lower RRR.

Figure 3 shows that EIWRR curves start later than the EIW curve because EIR practices have a lagged effect on RRR; customer response to changes in Islamic bank practices always comes with some delay. Ultimately, the EIWRR curve appears in the diagram with some delay from the EIW curve and has more slope than EIW. The reason for the greater slope of the EIWRR curve is the fact that higher expertise in risk management enables Islamic banks to take advantage of the leverage of additional funds that leaves its multiplier effect on earnings potential at relatively higher risks. Figure 4 takes another step by showing the path of an Islamic bank along the EIW and EIWRR curves:

**Figure 3.**  
Relationship of withdrawal risk and displaced commercial risk with equity investment risk rate of return risk



**Figure 4.**  
Integrating effect of relationship between EIR, WR, RRR and DCR

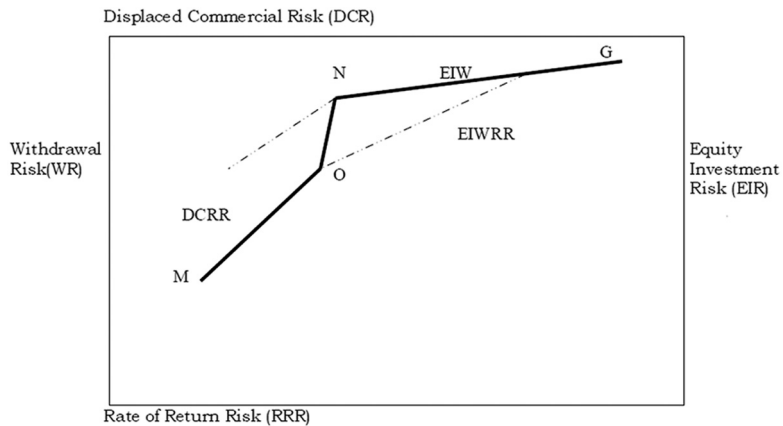


Figure 4 shows the impact of EIW and EIWRR on DCR. Better earnings potential ultimately raises the earnings potential of Islamic banks in accordance with the market, which enables them to reduce their DCR. The impact, however, is again not straightforward. This is because of the lagged effect of risk management practices and the effect of better risk management decisions. Accordingly, the change in DCR first follows the path of the EIW curve and then follows the EIWRR one making the path between the points N on EIW curve and O on EIWRR curve that is steeper than both those curves. It is in this area that Islamic banks operate with their WR and EIR without having much impact on RRR and DCR. The steeper curve makes Islamic banks face higher WR and EIR for every unit of RRR and DCR in case they opt to change their scale of operations. Accordingly, risk management practices enable Islamic banks develop a new curve, DCRR, that depicts the relationship between EIR, WR, RRR and DCR. This curve gives the maximum and minimum risk-taking points for an Islamic bank between the area of G and N and the risk operating area for Islamic banks between points N and O on the DCRR curve.



### 2.3 Mapping risk-return portfolios of Islamic banks against Shariah risks

Shariah risk arises when the Shariah principles and rules determined by a bank or the relevant regulatory body are violated (Archer and Haron, 2007; Laldin, 2013; Lahsasna, 2014). That ultimately results in losses through Sharī'ah non-compliant income (Noor *et al.*, 2019b). An Islamic bank needs more capital to absorb Sharī'ah non-compliant loss of income and the resultant cost (Abdullah *et al.*, 2011). As the current form of Shariah risk is operational, therefore it is dealt with under operational risk (Noor *et al.*, 2019b).

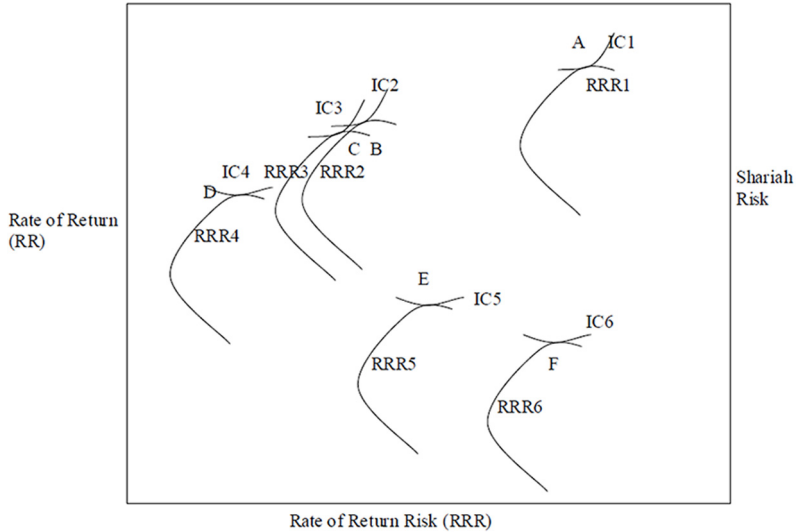
Loss sharing arrangements because of Shariah vary according to jurisdictions (Greuning and Iqbal, 2008). However, it happens mostly during the final profit allocation stages (Noor *et al.*, 2018). Shariah risk cannot include nonfinancial losses because Muslims believe that nonfinancial matters are matters of divine judgment (IFSB, 2007; Noor *et al.*, 2018). According to Balz (2008), violation of Shariah laws actually makes the enforceability of a transaction doubtful. This may spread the cost of Shariah risk from the institution to the industry as a whole (Balz, 2008; Noor *et al.*, 2018). Shariah risk is primarily analyzed from the perspective of validity of contract. Most Islamic scholars agree that contracts are of two types, "(sahih) contracts or invalid (ghayr sahih/batil) contracts." A valid contract is a contract that meets all Shariah and statutory requirements (Mansuri, 2006; Ayub, 2007; Dusuki *et al.*, 2012, 2013; Najeeb, 2014) and is free from gharar and riba (Noor *et al.*, 2019b). An invalid contract is one that is not valid (Noor *et al.*, 2019b). The Hanafi school of thought, however, has two further kinds of invalid contracts: "batil," which are irreparable contracts and "fasid," which are subsequently repairable (Rayner, 1991). According to Hanafis, a contract that is legal in "asl" but improper in "wasf" is not an invalid contract rather it is a repairable one (Najeeb, 2014; Noor *et al.*, 2018).

Shariah risks need to be examined only when it is certain that the contract would become invalid because of its existence (Keskitalo, 2006). However, there are levels of gravity of such circumstances such as high, medium and low (Lahsasna, 2014). In terms of the Hanafi school of thought, the first level makes a contract batil, whereas the second and third levels make a contract fasid (Laldin, 2013; Noor *et al.*, 2019b). The third level is actually a Sharī'ah-compliant contract with human errors or lack of information (Noor *et al.*, 2019b).

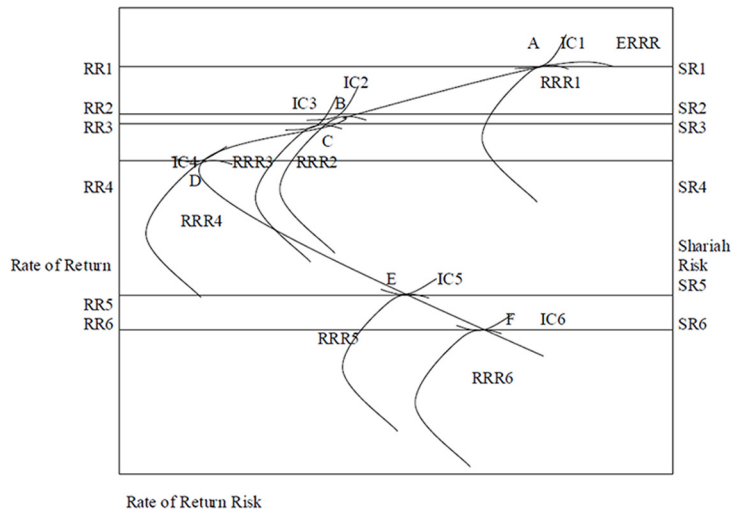
Shariah risk affects individual contracts and a portfolio of assets differently. For individual contracts, the occurrence of Shariah risk makes the respective incomes nonrecognizable for the respective institutions. For a portfolio, however, which consists of a group of assets, the 5,33,49 rule applies (Shah *et al.*, 2020a). This rule states that for every company where funds have been invested the debt to equity ratio should not exceed 33%, the accounts receivable to total assets ratio should not exceed 49%, and, if the organization is complying with these parameters, the mixture of Sharī'ah non-compliant income in Sharī'ah-compliant income is permissible only up to 5% (Ho *et al.*, 2011, 2012, 2014). For Islamic banks, however, all individual contracts should comply with Shariah in letter and spirit. This means that although an Islamic bank maintains a portfolio of assets with its customers, it cannot avail itself of the privilege of the 5,33,49 rule because it has entered into all its contracts individually with its customers. Following this explanation, mapping the portfolio of an Islamic bank against Shariah risk means that Sharī'ah non-compliant income cannot be accounted for in the financial results.

Figures 5 and 6 show different portfolios of Islamic banks against different levels of Shariah risk. Maximum Shariah risk for an Islamic bank is that all its Sharī'ah-compliant income can be declared Sharī'ah non-compliant, which means the Shariah risk always equals rate of return risk. This is mapped in Figure 5.

An Islamic bank develops many risk-return combinations that should all comply with Shariah. Accordingly, the Islamic bank theoretically has many EIW and EIRR curves.



**Figure 5.**  
Various risk return  
combination curves  
faced by Islamic  
banks



**Figure 6.**  
Envelope risk return  
curve derived from  
various risk return  
curves

Having assessed the risk spectrum of Islamic banks between the points G and M, we can simply assume that an Islamic bank faces many portfolios of risk and return combinations between the points depicted in Figure 5. For the purpose of our analysis, we use risk-return combinations only from RRR1 to RRR6. These combinations range from the highest to lowest EIR, the highest to lowest WR, and highest DCR and RRR to their lowest levels. The choice of the combination depends on the Shariah risk performance and risk-return appetite of the Islamic bank. Among all these combinations, RRR curves show the risk-return combinations of which the relevant portions are only the upper portion because we know

from portfolio theory that each lower combination has a corresponding efficient point on the upper portion on the respective RRR curve that gives a higher return at the same risk level. The indifference curves ranging from IC1 to IC6 show the levels of satisfaction of Islamic banks on each RRR are also placed on the top of every respective curve because, given a level of risk, a prudent risk manager always prefers the highest return. The figure shows the rate of return risk on the left boundary of the figure and the Shariah risk on the right on an equal scale. This agrees with our earlier observation that, theoretically, Shariah risk equals the rate of return risk. This is further shown in [Figure 6](#).

In [Figure 6](#), we develop an envelope risk-return curve for an Islamic bank titled ERRR. This curve has been developed using all efficient points from points A to F on the respective RRR curves ranging from RRR1 to RRR6. In the figure, we map portfolios of Islamic banks against Shariah risk. For Islamic banks, Shariah risk exists for every transaction separately because each transaction of an Islamic bank is examined individually on the basis of the existence of “Riba” and “Fiqh al Muamlat.” Accordingly, we have six levels of Shariah risk for the six risk-return combinations depicted in the diagrams ranging from SR1 to SR6.

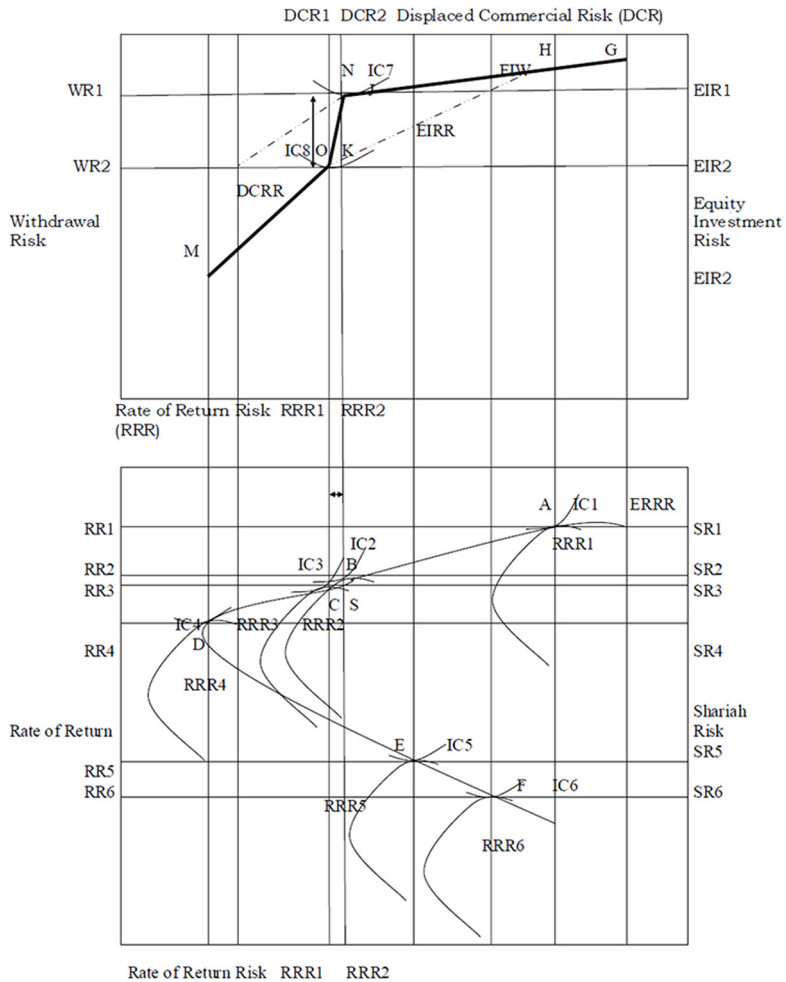
### 3. Conclusion

The study’s conclusion is based on [Figure 7](#) that combines all figures developed in this paper.

[Figures 4](#) and [5](#) establish the risk operating spectrum and risk-return combinations available to Islamic banks, respectively. [Figures 4](#) and [6](#) show the impact of various risks of Islamic banks on their respective rates of return by showing their interrelationships. We already know from portfolio theory that, on a given risk-return curve, the efficient portion is the upper portion because of higher returns available to investors at a given level of risk. This also applies to the ERRR, hence the efficient portion of the ERRR curve is only the upper portion from point D to A and the efficient risk-return combinations available to Islamic banks are only RRR1 to RRR4, rendering curves RRR5 and RRR6 completely inefficient.

Taking [Figure 7](#) and the explanation of [Figure 4](#) into consideration, we know that Islamic banks will not operate between the risk spectrum points G to N nor between points O to M. The preferable risk spectrum is between N and O of the DCRR curve because it is in this area Islamic banks operate with their EIR and WR. This is an area where small changes in DCR and RRR accompany large changes in EIR and WR. Accordingly, following the same area in [Figure 7](#), we find that the relevant rate of return risk acceptable range for Islamic banks is between points RRR1 and RRR2; the applicable rate of return lies between RR2 and RR3. This area is represented by points B and C on the ERRR curve. Therefore, Islamic banks will be prepared to take risk only between points B and C measured along the axis by RRR1 and RRR2 in [Figure 7](#) at a rate of return ranging only between RR1 and RR2.

The relevant DCR acceptable to an Islamic bank lies between the points DCR1 and DCR2, which is the representative area of the RRR in [Figure 7](#). The relevant acceptable range of EIR and WR to an Islamic bank is represented by the area between the indifference curves IC7 and IC8 depicted between the points N and K in [Figure 6](#) measured along the axis as EIR1 and EIR2 and WR1 and WR2, respectively. [Figure 7](#) also shows the ability of Islamic banks to manoeuvre their quantum of EIR and WR by effecting small changes in the rate of return. The figures also help us establish the quantum of SR in terms of rate of return available to Islamic banks. In [Figure 7](#), the SR is represented between points B and S which is measured along the axis as SR1 and SR2.



**Figure 7.**  
Islamic banks risks  
and rate of return  
relationship diagram

### 3.1 Implications and future research directions

This study has operational implications for Islamic banks and supervisory implications for the respective regulatory bodies. Islamic banks are at the receiving end of changes in benchmark rates. This inability leads them to manage their returns earned and paid so that their financial position remains least affected. They need to quantify their risks by integrating them in a holistic manner moving a step ahead from merely entering into specific contracts, a practice that ignores the diversification effect and is also less responsive to changing market rates.

The risk framework in this study forms various testable observations. For instance, withdrawal risk equals equity investment risk because lost funds lose opportunity to be invested. Shariah risk equals the rate of return risk because if a transaction is rendered non-compliant with Shariah an Islamic bank suffers in its rate of return. Shariah risk also has a potential impact on displaced commercial risk because it equals the rate of return risk that

ultimately causes variations in displaced commercial risk. Portfolio theory is equally applicable to Islamic banks but they suffer from the limitations of Shariah compliance and displaced commercial risk. In that way, all combinations of financial assets and liabilities of an Islamic bank are not the efficient combinations in their portfolios, rather the efficient portion of the risk-return curve also has a Shari'ah-compliant portion to be considered. That portion may be a continuous line or may be some short portions on an optimal risk-return portfolio line. The relationship between equity investment risk and rate of return risk is not stable in the long run because of the existence of displaced commercial risk. In the short run, the relationship is steeper, i.e. every one unit increase in the rate of return risk causes more than 1 unit increase in equity investment risk and vice versa. For the rate of return and Shariah risks, however, it has a smaller effect.

This study addresses the calls of leading researchers [Abedifar \*et al.\* \(2013\)](#), [Chattha and Alhabshi \(2018\)](#); [Grira \*et al.\* \(2018\)](#), [Noor \*et al.\* \(2018\)](#); [Anwer \*et al.\* \(2019\)](#), [Archer and Karim \(2019\)](#); [Chattha \*et al.\* \(2020\)](#); [Noor \*et al.\* \(2019b\)](#); and [Shah \*et al.\* \(2020b\)](#) that Islamic banks are required to adopt Shari'ah-compliant techniques for holistic risk management. The mechanism manages risks based on a framework that extends Islamic risk management from merely entering into contracts to finding an optimum combination of risk and return in a given environment. Having established a holistic framework, this study presents a potential solution regarding the positioning of Shariah risk against various returns that extend the scope of work of [Noor \*et al.\* \(2018\)](#) and [Noor \*et al.\* \(2019b\)](#) in modeling Shariah risk.

The framework also provides possible explanations regarding the concerns of various leading researchers about risk management in Islamic banks. First, it addresses the findings of [Chattha and Alhabshi \(2018\)](#) and [Chattha \*et al.\* \(2020\)](#) that Islamic banks have significantly longer durations, i.e. they are more risky than conventional banks. Addressing this issue, the proposed framework in this study suggests that Islamic banks have to adopt a significantly steeper risk-return path while managing their portfolios. This occurs because, for every unit of rate of return risk and displaced commercial risk an Islamic bank takes, it has to bear significantly higher levels of withdrawal risk and equity investment risk ([Figure 7](#), upper diagram). This steeper path, when translated into portfolio risk-return figure ([Figure 7](#) lower diagram) translates into Islamic banks taking a higher rate of return risk for every unit of rate of return, i.e. approximately double the risk for every unit of return.

Second, it addresses [Saeed \*et al.\* \(2020\)](#)'s concerns that risk management in Islamic banks is more the subject of cost efficiency than capitalization. This is because risks in Islamic banks increase primarily because of the steeper effect of the nexus between displaced commercial risk, rate of return risk, withdrawal risk and equity investment risk; a nexus that, for the purpose of our study, has been labeled as the "Islamic risk-return-nexus". Third, this study addresses [Grassa \*et al.\* \(2020\)](#)'s concern that the risk ratings of Islamic banks require more robust, relevant inputs than conventional banks. This is because it provides an explanation of the unique nexus that affects Islamic banks' risk-return relationship in an unconventional manner.

Finally, this study addresses [Archer and Karim \(2019\)](#)'s concern that entering into new contracts to manage risks and returns in Islamic banks is an impediment to the implementation of monetary policies, which also affects the efforts of the regulatory authorities for financial stability. This is because a holistic risk-return framework can better address the management of risks more than by merely entering into contracts.

**References**

- Abedifar, P., Molyneux, P. and Tarazi, A. (2013), "Risk in Islamic banking", *Review of Finance*, Vol. 17 No. 6, pp. 2035-2096.
- Abdullah, M., Shahimi, S. and Ismail, A.G. (2011), "Operational risk in Islamic banks: examination of issues", *Qualitative Research in Financial Markets*, Vol. 3 No. 2, pp. 131-151, available at: <http://doi.org/10.1108/17554171111155366>
- Adebayo, R.I. and Hassan, M.K. (2013), "Ethical principles of Islamic financial institutions", *Journal of Economic Cooperation and Development*, Vol. 34 No. 1, pp. 63-90.
- Admati, A.R. (2014), "The compelling case for stronger and more effective leverage regulation in banking", *Journal of Legal Studies*, Vol. 43 No. 2, pp. 35-61.
- Agoraki, M.E.K., Delis, M.D. and Pasiouras, F. (2011), "Regulations, competition, and bank risk-taking in transition countries", *Journal of Financial Stability*, Vol. 7 No. 1, pp. 38-48.
- Alhammadi, S. (2016), "Corporate governance dilemma with unrestricted profit sharing investment accounts in Islamic banks", PhD thesis, ICMA Centre, Henley Business School, University of Reading.
- Alhammadi, S., Archer, S., Padgett, C. and Karim, R.A.A. (2018), "Perspective of corporate governance and ethical issues with profit sharing investment accounts in Islamic banks", *Journal of Financial Regulation and Compliance*, Vol. 26 No. 3, pp. 406-424, available at: <https://doi.org/10.1108/JFRC-01-2017-0014>
- Anwer, Z., Asadov, A., Kamil, N.K.M., Musaev, M. and Refede, M. (2019), "Islamic venture capital – issues in practice", *ISRA International Journal of Islamic Finance*, Vol. 11 No. 1, pp. 147-158.
- Archer, S. and Haron, A. (2007), "Operational risk exposures of Islamic banks", in Archer, S. and Karim, R.A. (Eds), *Islamic Finance: The Regulatory Challenge*, 1st Edition, John Wiley and Sons, Singapore, pp. 121-131.
- Archer, S. and Karim, R.A.A. (2006), "On capital structure, risk sharing and capital adequacy in Islamic banks", *International Journal of Theoretical and Applied Finance*, Vol. 09 No. 3, pp. 269-280.
- Archer, S. and Karim, R.A.A. (2019), "When benchmark rates change: the case of Islamic banks", *Journal of Financial Regulation and Compliance*, Vol. 27 No. 2, pp. 197-214.
- Archer, S., Karim, R.A.A. and Sundararajan, V. (2010), "Supervisory, regulatory, and capital adequacy implications of profit-sharing investment accounts in Islamic finance", *Journal of Islamic Accounting and Business Research*, Vol. 1 No. 1, pp. 10-31.
- Avcı, S.B. and Yucel, E. (2017), "Effectiveness of monetary policy: evidence from Turkey", *Eurasian Economic Review*, Vol. 7 No. 2, pp. 179-213, available at: <https://10.1007/s4-0822-017-0068-y>
- Aysan, A.F., Fendoglu, S. and Kilinc, M. (2014), "Managing short-term capital flows in new central banking: unconventional monetary policy framework in Turkey", *Eurasian Economic Review*, Vol. 4 No. 1, pp. 45-69.
- Aysan, A.F., Disli, M., Duygun, M. and Ozturk, H. (2016), "Islamic banks, deposit insurance reform, and market discipline: evidence from a natural framework", *Journal of Financial Services Research*, Vol. 51 No. 2, pp. 257-282.
- Ayub, M. (2007), "*Understanding Islamic Finance*", John Wiley and Sons, New York, NY.
- Balz, K. (2008), *Islamic Legal Studies Program*, "Shari'ah risk? How Islamic finance has transformed Islamic contract law", Harvard Law School Occasional Publications, Cambridge, MA.
- Beck, T., Demirgüç-Kunt, A. and Merrouche, O. (2013), "Islamic vs conventional banking: business model, efficiency, and stability", *Journal of Banking and Finance*, Vol. 37 No. 2, pp. 433-477.
- Boyd, J.H. and De Nicola, G. (2005), "The theory of bank risk-taking and competition revisited", *The Journal of Finance*, Vol. 60 No. 3, pp. 1329-1343.

- Chattha, J.A. and Alhabshi, S.M.S.J. (2018), "Benchmark rate risk, duration gap and stress testing in dual banking systems", *Pacific-Basin Finance Journal*, Vol. 62, pp. 1-20, available at: <https://doi.org/10.1016/j.pacfin.2018.08.017>
- Chattha, J.A., Alhabshi, S.M.S.J. and Meera, A. (2020), "Risk management with a duration gap approach: empirical evidence from a cross-country study of dual banking system", *Journal of Islamic Accounting and Business Research*, Vol. 11 No. 6, available at: <https://doi.org/10.1108/JIABR-10-2017-0152>
- Daher, H., Masih, M. and Ibrahim, M. (2015), "The unique risk exposures of Islamic banks' capital buffers: a dynamic panel data analysis", *Journal of International Financial Markets, Institutions and Money*, Vol. 36, pp. 36-52.
- Deli, Y.D. and Hasan, I. (2016), "Real effects of bank capital regulations: global evidence", *Journal of Banking and Finance*, Vol. 82, pp. 217-228.
- Doumpos, M., Hasan, I. and Pasiouras, F. (2017), "Bank overall financial strength: Islamic versus conventional banks", *Economic Modelling*, Vol. 64, pp. 513-523.
- Dusuki, A.W., Ali, M.M. and Hussain, L. (2012), "A framework for Islamic financial institutions to deal with shariah non-compliant transactions", ISRA Research Paper, 42/2012, pp. 1-37, available at: <http://ifikr.isra.my/documents/10180/16168/42.pdf>
- Dusuki, A.W., Ali, M.M. and Hussain, L. (2013), "Hanafi's approach to deal with shari'ah noncompliance transactions in Islamic finance", *Australian Journal of Basic and Applied Sciences*, Vol. 7 No. 6, pp. 589-595.
- Grassa, R., Moumen, N. and Hussainey, K. (2020), "Is bank creditworthiness associated with risk disclosure behavior? Evidence from Islamic and conventional banks in emerging countries", *Pacific-Basin Finance Journal*, Vol. 61, doi: [10.1016/j.pacfin.2020.101327](https://doi.org/10.1016/j.pacfin.2020.101327).
- Greuning, H.V. and Iqbal, Z. (2008), "Operational and Islamic banking risks", *Risk Analysis for Islamic Banks, the International Bank for Reconstruction and Development*, The World Bank, New York, NY, pp. 174-182.
- Grira, J., Hassan, M.K., Labidi, C. and Soumaré, I. (2018), "Equity pricing in Islamic banks: international evidence", *Emerging Markets Finance and Trade*, Vol. 55 No. 3, available at: <https://doi.org/10.1080/1540496X.2018.0.1451323>
- Hakenes, H. and Schnabel, I. (2011), "Capital regulation, bank competition, and financial stability", *Economics Letters*, Vol. 113 No. 3, pp. 256-258.
- Hanafi, M.M. and Santi, F. (2013), "The impact of ownership concentration, commissioners on bank risk and profitability: evidence from Indonesia", *Eurasian Economic Review*, Vol. 3 No. 2, pp. 183-202, doi: [10.14208/eer.2013.03.02.005](https://doi.org/10.14208/eer.2013.03.02.005).
- Hassan, M.K. and Aliyu, S. (2018), "A contemporary survey of Islamic banking literature", *Journal of Financial Stability*, Vol. 34, pp. 12-43, available at: <https://doi.org/10.1016/j.jfs.2017.11.006>
- Ho, C.S.F., Abd-Rahman, N.A., Yusuf, N.H.M. and Zamzamin, Z. (2011), "Comparison of quantitative shariah-compliant screening methods", *International Journal of Islamic Finance*, Vol. 3 No. 2, pp. 91-109. No
- Ho, C.S.F., Masood, O., Abdul-Rehman, A. and Bellalah, M. (2012), "Syariah accounting and compliant practices", *Qualitative Research in Financial Markets*, Vol. 4 No. 2, pp. 24-254.
- Ho, C.S.F., Rahman, N.A.A., Yusuf, N.H.M. and Zamzamin, Z. (2014), "Performance of global Islamic versus conventional share indices: international evidence", *Pacific-Basin Finance Journal*, Vol. 28, pp. 110-121, available at: <https://doi.org/10.1016/j.pac-fin.2013.09.002>
- Ibrahim, M. (2020), "Islamic banking and bank performance in Malaysia: an empirical analysis", *Journal of Islamic Monetary Economics and Finance*, Vol. 6 No. 3, available at: <https://doi.org/10.21098/jimf.v6i3.1197>
- Ibrahim, M.H. and Rizvi, S.A.R. (2017), "Do we need bigger Islamic banks? An assessment of bank stability", *Journal of Multinational Financial Management*, Vol. 40, pp. 77-91.

- IFSB (2007), *Disclosures to Promote Transparency and Market Discipline for Institutions Offering Islamic Financial Services*, IFSB, Kuala Lumpur.
- IFSB (2018), *Guiding Principles of Risk Management for Institutions (Other than Insurance Institutions) Offering Only Islamic Financial Services*, IFSB, Kuala Lumpur.
- IFSB-2 (2005), *Capital Adequacy Standard for Institutions (Other than Insurance Institutions) Offering Only Islamic Financial Services*, IFSB, Kuala Lumpur.
- IFSB-GN4 (2011), *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*, IFSB, Kuala Lumpur.
- Inci, A.C. (2018), "Financials sector intraday volatility characteristics in the emerging Turkish economy", *Eurasian Economic Review*, Vol. 8 No. 2, pp. 215-229, available at: <https://doi.org/10.1007/s40822-017-0085-x>
- Ito, T. (2013), "Islamic rates of return and conventional interest rates in the Malaysian deposit market", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 6 No. 4, pp. 290-303, available at: <https://doi.org/10.1108/IMEFM-11-2012-0113>
- Ito, T. (2017), "Monetary policy expectations and the Malaysian deposit market: analysis of Islamic rates of return and conventional interest rates", *International Journal of Bonds and Derivatives*, Vol. 3 No. 4, pp. 275-289.
- Keeley, M. (1990), "Deposit insurance, risk, and market power in banking", *American Economic Review*, Vol. 80 No. 5, pp. 1183-1200.
- Keskitalo, P. (2006), "Contracts + risks + management = contractual risk management?", PhD dissertation, University of Tromsø, Norway.
- Korkut, C. and Özgür, Ö. (2017), "Is there a link between profit share rate of participation banks and interest rate?: the case of Turkey", *Journal of Economic Cooperation and Development*, Vol. 38 No. 2, pp. 135-138.
- Lahsasna, A. (2014), *Shari'ah Non-Compliance Risk Management and Legal Documentation in Islamic Finance*, John Wiley and Sons Singapore, New York, NY.
- Laldin, M.A. (2013), "Shari'ah non-compliance risk", in Archer, S. and Karim, R.A. (Eds), *Islamic Finance: The New Regulatory Challenge*, 2nd ed., John Wiley and Sons Singapore, New York, NY. pp. 237-260.
- Lee, C.C. and Hsieh, M.F. (2013), "The impact of bank capital on profitability and risk in Asian banking", *Journal of International Money and Finance*, Vol. 32, pp. 251-281, available at: <https://doi.org/10.1016/j.jimonfin.2012.04.013>
- Lopez-Mejia, A. Aljabrin, S. Awad, R. Norat, M. and Song, I. (2014), "Regulation and supervision of Islamic banks", International Monetary Fund WP/14/219.
- Louhichi, A., Louati, S. and Boujelbene, Y. (2020), "The regulations–risk taking nexus under competitive pressure: what about the Islamic banking system?", *Research in International Business and Finance*, Vol. 51, pp. 1-17, available at: <https://doi.org/10.1016/j.rib-f.2019.101074>
- Maharani, N. and Setiyono, B. (2018), "Do risk, business cycle, and competition affect capital buffer? an empirical study on Islamic banking in ASEAN and MENA", *Journal of Islamic Monetary Economics and Finance*, Vol. 3 No. 2, pp. 181-200, available at: <https://doi.org/10.21098/jimf.v3i2.888>
- Mansuri, M.T. (2006), *Islamic Law of Contract and Business Transactions*, Adam Publishers and Distributors, New Delhi.
- Najeeb, S.F. (2014), "Trading in islam: Shari'ah rules and contemporary applications in Islamic financial transactions", *Journal of Emerging Economies and Islamic Research*, Vol. 2 No. 2, pp. 1-26.
- Nazir, M.S., Daniel, A. and Nawaz, M.M. (2012), "Risk management practices: a comparison of conventional and Islamic banks in Pakistan", *American Journal of Scientific Research*, Vol. 68 No. 1, pp. 14-22.



- Nehad, A. and Khanfar, N.A. (2016), "A critical analysis of the concept of gharar in Islamic financial contracts: different perspective", *Journal of Economic Cooperation and Development*, Vol. 37 No. 1, pp. 1-24.
- Noor, M., Fadhzana, N. and Mohamed, J. (2019a), "Profit equalisation reserve and income smoothing practices in Malaysian Islamic banks: Robust statistical analysis", *Asian Academy of Management Journal*, Vol. 24 No. Supp.1, pp. 79-92.
- Noor, N.S.M., Shafiai, M.H.M. and Ismail, A.G. (2018), "Modelling shariah risk in Islamic finance: a probability approach", *International Journal of Business and Society*, Vol. 19 No. 3, pp. 870-885.
- Noor, N.S.M., Shafiai, M.H.M. and Ismail, A.G. (2019b), "The derivation of shariah risk in Islamic finance: a theoretical approach", *Journal of Islamic Accounting and Business Research*, Vol. 10 No. 5, pp. 663-678.
- Nurul-Kabir, M. and Worthington, A.C. (2017), "The 'competition-stability/fragility' nexus: a comparative analysis of Islamic and conventional banks", *International Review of Financial Analysis*, Vol. 50, pp. 111-128, available at: <https://doi.org/10.1016/j.irfa-0.2017.02.006>
- Riaz, S., Khan, M.I. and Iqbal, A. (2019), "Risk management practices and Islamic bankers' perception about potential risk in Islamic countries", *Journal of Managerial Sciences*, Vol. 12 No. 3, pp. 159-177.
- Rayner, S.E. (1991), "*The Theory of Contracts in Islamic Law: A Comparative Analysis with Particular Reference to the Modern Legislation in Kuwait, Bahrain and United Arab Emirates*", Graham and Trotman, London.
- Rhanoui, S. and Belkhouout, K. (2019), "Risks faced by Islamic banks: a study on the compliance between theory and practice", *International Journal of Financial Research*, Vol. 10 No. 2, pp. 137-146.
- Rupello, R. (2004), "Capital requirements, market power, and risk-taking in banking", *Journal of Financial Intermediation*, Vol. 13 No. 2, pp. 156-182.
- Rosman, R., Wahab, N.A. and Zainol, Z. (2014), "Efficiency of Islamic banks during the financial crisis: an analysis of Middle Eastern and Asian countries", *Pacific-Basin Finance Journal*, Vol. 28, pp. 76-90.
- Saeed, M., Izzeldin, M., Hassan, M.K. and Pappas, V. (2020), "The inter-temporal relationship between risk, capital and efficiency: the case of Islamic and conventional banks", *Pacific-Basin Finance Journal*, Vol. 62, available at: <https://doi.org/10.1016/j.pacfin-0.2020.101328>
- Sakti, M.R.P. and Zulkhibri, M. (2018), "Pro-cyclicality and bank lending behavior in Indonesia: the case of dual banking system", *Journal of Islamic Monetary Economics and Finance*, Vol. 4 No. 1, pp. 23-38, available at: <https://doi.org/10.21098/ji-mf.v4i1.921>
- Shah, S.A.A., Sukmana, R. and Fianto, B.A. (2020a), "Duration model for maturity gap risk management in Islamic banks", *Journal of Modelling in Management*, Vol. 15 No. 3, pp. 1167-1186, available at: <https://doi.org/10.1108/JM2-08-2019-0184>
- Shah, S.A.A., Sukmana, R. and Fianto, B.A. (2020b), "Macaulay's theory of duration: 80-year thematic bibliometric review of the literature", *Journal of Economic Studies*, Vol. ahead-of-print No. ahead-of-print, available at: <https://doi.org/10.1108/JES-11-2019-0540>
- Toumi, K., Viviani, J.L. and Chayeh, Z. (2019), "Measurement of the displaced commercial risk in Islamic banks", *The Quarterly Review of Economics and Finance*, Vol. 74, pp. 18-31.
- Touri, O., Ahroum, R. and Achchab, B. (2020), "Management and monitoring of the displaced commercial risk: a prescriptive approach", *International Journal of Emerging Markets*, Vol. ahead-of-print No. ahead-of-print, available at: <https://doi.org/10.1108/IJOEM-07-2018-0407>
- Turk-Ariss, R. (2010), "Competitive conditions in Islamic and conventional banking: a global perspective", *Review of Financial Economics*, Vol. 19 No. 3, pp. 101-108.
- Weill, L. (2011), "Do Islamic banks have greater market power?", *Comparative Economic Studies*, Vol. 53 No. 2, pp. 291-306.

- Wiranatakusuma, D. (2018), "Constructing Islamic banking resilience index in Indonesia", *Journal of Islamic Monetary Economics and Finance*, Vol. 3, pp. 45-62, available at: <https://doi.org/10.21098/jimf.v3i0.760>
- Yunus, S.M., Kamaruddin, Z. and Embong, R. (2018), "The concept of Islamic banking from the Islamic worldview", *International Journal of Academic Research in Business and Social Sciences*, Vol. 8 No. 11, pp. 539-550.
- Zainol, Z. and Kassim, S.H. (2010), "An analysis of Islamic banks' exposure to rate of return risk", *Journal of Economic Cooperation and Development*, Vol. 31 No. 1, pp. 59-84.

#### Further reading

- Toumi, K. (2019), "Islamic ethics, Capital structure and profitability of banks; what makes islamic banks different?", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 13 No. 1, available at: <https://10.1108/IMEFM-05-2016-0061>

#### About the authors

Syed Alamdar Ali Shah did his M.Phil in Commerce and Finance from The Superior College Lahore Pakistan. He has over 15 years of professional experience of working in conventional and Islamic banks and an experience of over 5 years of teaching various business and finance courses at undergraduate and Masters level. Currently he is enrolled for PhD at Universitas Airlangga under Airlangga Development Scholarship Indonesia.

Raditya Sukmana did his Masters from USA and PhD from International Islamic University Malaysia. He has more than 25 publications in the area of Islamic Finance. Currently he is serving as professor at Islamic Economics Department, Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia.

Bayu Arie Fianto, did his MBA in Islamic banking and Finance from International Islamic University Malaysia and PhD in Finance from Lincoln University, New Zealand. Currently he is an Assistant Professor at Islamic Economics Department, Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia. Bayu Arie Fianto is the corresponding author and can be contacted at: [bayu.fianto@feb.unair.ac.id](mailto:bayu.fianto@feb.unair.ac.id)