An Analytical Study Between Banking Risks and Islamic Financing Formulas

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Abstract

Through this research, we sought to analyze a portion of the study conducted by researchers Tariqullah Khan and Habib Ahmed (in their 2001 publication "Risk Management: Analysis of Issues in the Islamic Financial Industry" by the Islamic Development Bank's Islamic Research and Training Institute) using Principal Component Analysis (PCA) and Agglomerative Hierarchical Clustering (AHC) methodologies.

Our analysis concluded that the *murabaha* formula represents the least risky financing structure among all examined instruments, followed by *ijarah* as the second least risk-intensive arrangement. Conversely, the *musharakah* formula emerged as the most risk-prone financing mechanism, followed by the diminishing *musharakah* formula as the second most risk-intensive structure.

Regarding risk typology, liquidity risk was identified as the least significant risk factor across various financing formulas, followed by credit risk in terms of relative severity. Operational risk constituted the most critical risk dimension across different financing structures, followed by profit margin risk as the second most consequential vulnerability.

Keywords

Banking Risks;
Islamic Financing Formulas ;
Principal Component Analysis (PCA) ;
Agglomerative Hierarchical Clustering (AHC) ;
Islamic Banking.

دراسة تحليلية للعلاقة بين المخاطر المصرفية وصيغ التمويل الإسلامي

ملخص

نهدف من هذه الدراسة إلى تحليل جزء من البحث الذي أجراه الباحثان طارق الله خان وحبيب أحمد (في بحثهم لعام 2001 بعنوان "إدارة المخاطر: تحليل قضايا في الصناعة المالية الإسلامية" الصادر عن المعهد الإسلامي للبحوث والتدريب التابع للبنك الإسلامي للتنمية) باستخدام منهجيات التحليل المكوّن الرئيسي (PCA) والتجميع الهرمي التكتلي.(AHC) خلصت دراستنا التحليلية إلى أن صيغة المرابحة تمثل الهيكل التمويلي الأقل مخاطرة من بين جميع الأدوات المدروسة، تليها الإجارة كثاني ترتيب من حيث انخفاض كثافة المخاطر. وعلى النقيض من ذلك، برزت صيغة المشاركة كآلية تمويلية تتسم بأعلى مستويات المخاطر، تليها صيغة المشاركة المتناقصة كثاني هيكل من حيث كثافة المخاطر.أما فيما يتعلق بتصنيف المخاطر، فقد تم تحديد مخاطر السيولة كأقل عوامل المخاطر أهمية عبر صيغ التمويل المختلفة، تليها مخاطر الائتمان من حيث شدة المخاطر النسبية. شكّلت المخاطر التشغيلية البُعد الأكثر أهمية للمخاطر عبر هياكل التمويل المختلفة، تليها مخاطر هامش الربح كثاني أكثر المخاطر تأثيراً.

الكلمات المفتاحية

مخاطر مصرفية ؛
صيغ تمويل إسلامية؛
طريقة PCA؛
طريقة AHC؛
مصرفية إسلامية.

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I- Introduction :

Islamic banking offers a substantial replacement for traditional banking with its foundation of Shariah principles which forbid riba interest alongside gharar uncertainty and maysir gambling yet encourage ethical risk-sharing investments. The primary characteristic of Islamic banking involves focusing on distinct financing methods to meet Shariah legal requirements. However, these unique structures present particular risk profiles that require specialized management approaches. Although the Islamic Banking industry has witnessed a rapid growth, it continues to face various challenges concerned with the inherent risks associated with its financing formula or operations. It (Islamic banking industry) is growing but it suffers of many problems and challenges in cyclic risks involved in financing forms and the Islamic banking activities, as determined in the analytical study paper ' The Problems and Challenges of the Risks in the Context of Forms of Financing and Islamic Banking Operations'. Therefore, for the sustainable development of Islamic banking, it is important to understand the relationship between Islamic financing formulas and risks associated to them.
The importance of this subject has risen drastically with the growth of Islamic finance across the world.
According to (Hassan 2017, 15) , Islamic banking assets "have grown at double-digit rates over the past two decades," highlighting the increasing importance of appropriate risk management frameworks for these institutions. However, as the analytical study document observes, "The lack of serious studies in modern analytical ways on banking risks in the Islamic banking sector is a major shortage in this field". This literature review addresses this gap by examining the relationship between banking risks and Islamic financing formulas, with particular focus on the empirical findings from (Khan, Tariqullah & Ahmed, Habib 2001)seminal study as analyzed in the provided document. The review synthesizes current research on how different Islamic contracts interact with various categories of financial risk, identifying patterns, gaps, and directions for future research. The primary research questions guiding this review are:
1. What are the distinctive risk profiles of different Islamic financing formulas?
2. How do various risk categories (credit, operational, liquidity, and profit margin) interact with specific Islamic financing structures?
3. What implications do these risk-formula relationships have for Islamic banking practice and regulation?

I-1 Conceptual Framework of Risk in Islamic Banking

Risk in Islamic banking, as in conventional finance, is defined as "uncertainty in the investment or financing decision, in the recovery of the lent capital or in the collection of prospective future earnings". However, the conceptualization of risk in Islamic finance incorporates distinctive religious and ethical dimensions. According to (Aqeeq 2015, 30), Islamic finance allows ‘risk (measurable and can price) but not uncertainty (unmeasurable and cannot price)’. Financial risk management is the identification, analysis and economic control of risk to the financial assets of an enterprise or investor, or alternatively, the identification, measurement, follow-up and control of various exposures to risk. This definition aligns with conventional approaches to risk management but must be adapted to the unique characteristics of Islamic financial contracts. (Azmat 2020, 25)highlights that Islamic banking’s understanding of risk is based on transmitting risk rather than on mitigating risk, which contrasts with conventional banking approach. This is rooted in the Islamic principle of 'profit is justified by risk-taking (al-ghunm bil ghrurm). Consequently, Islamic financing formulas are designed to distribute risk among transaction participants rather than concentrating it on borrowers as in interest-based systems.

I-1-1 Types of Banking Risks in Islamic Finance

Islamic banks face most of the same categories of risk as conventional banks, although with different characteristics and intensities, there are several primary categories of risk in Islamic banking:
Financial Risks:

1. **Credit Risk:** Defined as "risks are the result of a bank not redeeming interest, the principal of the lent, or both, or the result of an investment in securities that is not specified". In the Islamic context, this refers to the risk that a counterparty will fail to meet its obligations according to agreed terms (M. R. Danlami 2023, 15).
2. **Liquidity Risk:** Described as "risks arising from the Bank's inability to pay its short-term liabilities on maturity dates". (Demirtaş 2024, 67) notes that Islamic banks face unique liquidity management challenges due to the limited availability of Shariah-compliant money market instruments and the restrictions on interest-based borrowing.
3. **Market Risk:** Defined as "potential losses due to fluctuations in commodity prices, interest rates and exchange rates". According to (Maouloud 2017, 156), Islamic banks face distinctive market risks due to their involvement in commodity transactions and profit-rate exposures rather than interest rate exposures.

Non-Financial Risks:

1. **Operational Risk:** encompasses the risks that "result from insufficient or ineffective internal processes, persons, or systems, or from external events" Islamic banks encounter distinct operational risks because of their Shariah compliance requirements and complicated Islamic financial contracts. (Syaifuddin 2024, 122).
2. **Legal Risk:** risks that emerge when bank operations fail to follow laws that supervisory authorities enforce. (Aqeeq 2015, 788) suggest Islamic banking institutions must contend with amplified legal hazards because of divergent contract validity challenges alongside inconsistent regulatory standards throughout various jurisdictions. Islamic banks navigate multiple set risks alongside unique risks such as Shariah compliance risk and displaced commercial risk that complicates their risk management processes (Alotaibi 2023, 213).

I-2 Islamic Financing Formulas and Their Theoretical Risk Characteristics

Islamic banks employ several distinctive financing formulas, each with its own theoretical risk profile based on its structure and underlying principles.

I-2-1 Murabaha (Cost-Plus Financing)

The banking system uses Murabaha to buy assets then sell them with a higher price to their clients with postponed payment options. According to (Azmat 2020, 37),Murabaha involves "the sale of goods at a price comprising the purchase price plus a margin of profit agreed upon by both parties concerned."

From a theoretical perspective, murabaha presents moderate credit risk as it creates a debt obligation similar to conventional loans, but with the asset serving as implicit collateral (Laib 2018, 89). Liquidity risk is moderate since payments are typically scheduled over fixed periods. Operational risk stems primarily from the requirement for the bank to take actual ownership of the asset before selling it to the client, creating potential for valuation and delivery issues (Raza 2023, 51).

I-2-2 Mudarabah (Profit-Sharing)

Under Mudarabah terms one party acts as investor by giving capital to the bank while the other partner provides entrepreneurial expertise through management functions. Under this structure profits get distributed based on prior agreements except the capital provider must absorb all financial losses.

Theoretically, mudarabah presents high credit risk due to the potential for moral hazard and adverse selection, as the entrepreneur manages the business while the bank bears all financial losses (Hussien 2017, 146). Operational risk is significant due to the monitoring challenges and information asymmetry between the bank and the entrepreneur (Syaifuddin 2024, 76).

I-2-3 Musharakah (Partnership)

In Musharakah each party supplies capital while sharing authority over management responsibilities.Both profits and losses are shared according to capital contribution ratios or as mutually agreed. From a theoretical perspective, musharakah presents high credit risk due to the potential for partner default or underperformance (Al Badarin 2024, 143). Operational risk is significant due to the challenges in monitoring business operations and potential governance conflicts between partners (Ibrahim 2023, 54).

I-2-4 Ijarah (Leasing)

In ijarah the bank buys the asset and lease it to the client for a certain period on a rental basis. During the lease term, the asset remains the bank property.

Theoretically, ijarah presents moderate credit risk as the bank retains ownership of the asset, providing natural collateral in case of default (Maouloud 2017, 167). Operational risk stems from the bank's responsibility for major maintenance and insurance of the asset (Febianto 2012, 56).

I-2-5 Istisna' (Manufacturing Contract)

Istisna' is a contract where the bank finances the production or construction of an asset according to specifications, with payment and delivery occurring at future dates.

From a theoretical standpoint, istisna’ has high credit risk due to the chance of product non delivery and product quality issues with the manufactured asset (Demirtaş 2024, 263). Because manufacturing and construction projects are, for the most part, very long term, liquidity risk is very important (Seho 2020, 178).

I-2-6 Salam (Forward Financing)

Salam involves the bank making full advance payment for future delivery of a specified commodity, typically used in agricultural financing. Theoretically, salam presents high credit risk due to the advance payment structure and potential for non-delivery or quality issues with the commodity (Junaini 2023, 179).Market risk is of paramount importance because of the change in price between the contract's initiation and delivery (Parlakkaya 2022, 57).

I-2-7 Diminishing Musharakah (Declining Partnership)

Musharakah is a partnership that involves diminishing musharakah, wherein one partner (the bank) gradually transfers ownership to the other partner with periodic payments, which is commonly applied in home financing.

From the theoretical side, diminishing musharakah implies moderate credit risk (the bank's ownership stake diminishes over time, which puts less capital at risk, result in less collateral position, Meera, (Sakouili 2019, 12). Operational risk stems from the complex structure involving both partnership and leasing elements (Parlakkaya 2022, 59).

II– Methods and Materials:

In this study we employ two primary statistical techniques to analyze the relationship between Islamic financing formulas and banking risks:

II-1 Principal Component Analysis (PCA)

Principal Component Analysis is used "to understand the structure of the data and the relationship between them" when dealing with multiple variables. PCA is particularly valuable for reducing dimensionality while preserving maximum information, allowing for the visualization of complex relationships in a lower-dimensional space.

PCA "can be considered as a projection medium that allows observations to be dropped through a p-dimension space (i.e., a variable p) into a k-dimensional space (where k<p), so that we maintain maximum information (the information is measured here by the total variation of the dot cloud) on the first dimensions".

In the context of the study, PCA was used to identify the relationships between different Islamic financing formulas and specific risk categories, revealing patterns that might not be apparent from the raw data alone. The results are presented in Table 2, showing correlation coefficients between financing formulas and risk types, with coefficients below 0.5 excluded as insignificant. (Filzmoser 2018)

II-2 Agglomerative Hierarchical Clustering (AHC)

Agglomerative Hierarchical Clustering is described as "an iterative classification method" that groups similar elements based on selected criteria. the AHC process as follows:

1. "Begin by calculating the difference between N element (note, variable...)."
2. "It then combines two elements into a category, and creates a category comprising those two elements, through a grouping criterion."
3. "The difference between this category and the rest of the elements (N-2) is then calculated using the grouping criterion."
4. "Then continue on these steps until all items are collected".

one of the advantages of AHC is to work from the difference of elements that we want to combine. We can choose a kind of variation and adapt it to the topic and the nature of the data".

AHC was used to group similar financing formulas based on their risk profiles Table 3 and to group similar risk types based on their severity across financing formulas Table 5. These groupings provide a useful framework for understanding the overall risk landscape in Islamic banking. (Oti 2024)

III- Results and discussion :

III-1. Results

III-1-1 Risk Ratings Across Islamic Financing Formulas

Table 1 provides average risk assessments of Islamic financing methods under four categories (credit risk and profit margin risk and liquidity risk and operational risk) through data based on (Khan, Tariqullah & Ahmed, Habib 2001) survey:

1. Murabaha (Cost-Plus Financing): Moderate credit risk (2.93), relatively low profit margin risk (2.67), moderate liquidity risk (2.87), and the lowest operational risk (2.56) among all formulas.
2. Mudarabah (Speculation/Profit-Sharing): Moderate credit risk (3.08), the lowest profit margin risk (2.46), moderate liquidity risk (3.00), and relatively high operational risk (3.25).
3. Musharakah (Partnership/Sharing): The highest credit risk (3.80), moderate profit margin risk (2.92), high liquidity risk (3.40), and the highest operational risk (3.69) among all formulas.
4. Ijarah (Leasing/Rent): Relatively low credit risk (2.90), high profit margin risk (3.10), moderate liquidity risk (2.92), and low operational risk (2.64).
5. Istisna' (Manufacturing): High credit risk (3.29), moderate profit margin risk (3.00), very high liquidity risk (3.57), and moderate operational risk (3.13).
6. Salam (Peace/Forward Sale): High credit risk (3.25), high profit margin risk (3.20), high liquidity risk (3.50), and moderate operational risk (3.20).
7. Diminishing Musharakah (Diminishing Participation): High credit risk (3.40), high profit margin risk (3.33), high liquidity risk (3.40), and high operational risk (3.33).

These ratings serve as a valuable baseline that can be used to understand the perceived risks that various Islamic financing formulae entail from industry practitioner’s point of view.

III-1-2 Principal Component Analysis (PCA) Results

The PCA analysis reveals important relationships between financing formulas and specific risk categories:

III-1-2-1 Credit Risk Relationships

1. **Murabaha:** Inverse relationship with credit risk (correlation coefficient of 0.67), suggesting that increased use of murabaha tends to reduce credit risk exposure.
2. **Ijarah:** Strong inverse relationship with credit risk (correlation coefficient of 0.89), indicating that greater utilization of ijarah significantly reduces credit risk, likely because "in this formula the lease contract gives the bank a fixed amount, with the rented eye remaining with the bank".
3. **Musharakah:** Strong direct relationship with credit risk (correlation coefficient of 0.91), meaning that increased use of musharakah tends to increase credit risk exposure, which "arises when the other party in the contracts does not pay the banks' share of the profits".

III-1-2-2 Liquidity Risk Relationships

1. **Mudarabah:** Strong inverse relationship with liquidity risk (correlation coefficient of 0.93), suggesting that greater use of mudarabah significantly reduces liquidity risk exposure, "because speculation is used in short-term finance".
2. **Salam:** Strong direct relationship with liquidity risk (correlation coefficient of 0.92), indicating that increased use of salam tends to increase liquidity risk exposure.
3. **Istisna':** Direct relationship with liquidity risk (correlation coefficient of 0.71), suggesting that greater use of istisna' increases liquidity risk.
4. **Diminishing Musharakah:** Strong direct relationship with liquidity risk (correlation coefficient of 0.83), indicating that increased use of this formula tends to increase liquidity risk exposure.

III-1-2-3 Operational Risk Relationships

1. **Ijarah:** Strong inverse relationship with operational risk (correlation coefficient of 0.80), suggesting that greater use of ijarah significantly reduces operational risk exposure, "because leasing is a fixed-income asset".
2. **Murabaha:** moderate inverse relationship with operational risk (correlation coefficient – 0.61); higher use of murabaha tends to decrease operational risk but to a less degree than Ijarah.
3. **Musharakah:** Strong direct relationship with operational risk (correlation coefficient of 0.80), meaning that greater use of musharakah tends to increase operational risk exposure.

III-1-2-4 Profit Margin Risk

The PCA analysis found "no significant risk of this type of risk for different financing formulas except with an effect less than (0.5)", suggesting that profit margin risk has less clear relationships with specific financing formulas compared to other risk categories.

III-1-3 Hierarchical Clustering Analysis Results

III-1-3-1 Clustering of Financing Formulas

The AHC analysis grouped the Islamic financing formulas into four clusters based on their risk profiles:

1. **Group 1 (Lowest Risk):** The lowest risk formula (Group 1: Murabaha): this has a combined risk score of 11.03 and is representing the safest formula among Islamic financing formulas.
2. **Group 2 (Moderate-Low Risk):** Mudarabah (Speculation) and Musharakah (Participation), with a combined risk score of 12.80. This group is "less risky at liquidity risk level (2.69), more risky at credit risk (3.47)'.
3. **Group 3 (Moderate-High Risk):** Ijarah (Leasing) and Diminishing Musharakah, with a combined risk score of 12.51. The analyzed combination of Ijarah (Leasing) and Diminishing Musharakah shows "less credit risk exposure (2.98) and higher liquidity risk (3.21)".
4. **Group 4 (Highest Risk):** Istisna' and Salam, with a combined risk score of 13.07. At the level of liquidity risk, this group is 'less risky' (3.1.0), more risky at the level of profit margin risk (3.5.3).

III-1-3-2 Clustering of Risk Types

The AHC analysis also grouped the risk categories into two clusters based on their severity across financing formulas:

1. **Group 1 (Higher Severity):** Operational risks and credit risks both rated 22.22 points collectively throughout all financing formula.
2. **Group 2 (Lower Severity):** Liquidity risks and profit margin risks, amounted to 21.67 points across all financing formulas.

III-1-3-4 Aggregate Risk Rankings

Table 6 provides a clear ranking of Islamic financing formulas based on their overall risk profiles:

1. **Lowest Risk:** Murabaha (5.51)
2. **Low-Moderate Risk:** Ijarah (5.78)
3. **Moderate Risk:** Mudarabah (5.89)
4. **Moderate-High Risk:** Istisna' (6.49), Salam (6.57)
5. **High Risk:** Diminishing Musharakah (6.73)
6. **Highest Risk:** Musharakah (6.90)

Similarly, the ranks risk types based on their overall severity across all financing formulas:

1. **Lowest Severity:** Liquidity Risk (11.67)
2. **Moderate Severity:** Credit Risk (12.18)
3. **High Severity:** Profit Margin Risk (12.76)
4. **Highest Severity:** Operational Risk (12.79)

III-2. Discussion

III-2-1 Interpretation of Murabaha's Lower Risk Profile

Analysis of the formula indicates that Murabaha is the lowest risk financing formula with a total risk score of 5.51 on all of the risk categories. This finding helps explain why murabaha is the most widely used Islamic financing formula in practice, as noted by (Ahmed 2011, 223) and others.

we suggest several reasons for murabaha's lower risk profile:

- It provides a predetermined return for the bank, reducing profit margin uncertainty.
- Natural collateral is given by the bank's ownership of the asset during the transaction, reducing credit risk.
- A relatively straightforward structure means that it is less complicated than other participatory modes.

However, this finding raises important questions about the relationship between risk and Shariah authenticity in Islamic banking. (El-Gamal 2007, 142) posits that "the practical dominance of murabaha in Islamic banking portfolios is a reflection of its relative simplicity and lower risk as compared to more equity like alternatives" but might relate to a departure from the risk sharing principles that should underpin Islamic finance.

A basic challenge of Islamic banking is between the risk management practicalities and theoretical ideals. As (Farooq 2007, 72), "the causes of the gap between theory and practice in Islamic finance are to a large extent a reflection of the obstacles to implementing high risk sharing contracts in competitive financial markets."

III-2-2 Partnership Modes and Higher Risk

Musharakah emerges as the highest-risk financing formula in the analysis, with a combined risk score of 6.90. This finding is particularly significant given that musharakah is often considered the most authentic form of Islamic financing from a theoretical perspective.

The analysis shows a strong direct relationship between musharakah and both credit risk (0.91) and operational risk (0.83), indicating that "the more the sharing formula is used, the higher the credit risk, which arises when the other party in the contracts does not pay the banks' share of the profits".

The finding matches with (Al Badarin 2024, 143) explanation that musharakah's high risk profile attributed to 'the inherent uncertainty in profit generation, challenges in partner selection and difficulty in monitoring business operations'. Iqbal and (Iqbal 2011, 126) contend that musharakah most nearly fits with Islam Finance's fundamental principles of profit—loss distribution and risk sharing, despite these risks.

Just like musharakah, the high-risk profile (Rank 6.73) for diminishing musharakah is second highest in the list. This is useful because the popularity of diminishing musharakah in Islamic home financing as an alternative to conventional mortgages is growing.The findings suggest a fundamental tension in Islamic banking: the formula, supported most closely by Islamic economic principles (musharakah and diminishing musharakah) contain the highest risk profiles while less Islamic economic practices (murabaha and ijarah) may be regarded as less compatible with the dictate of risk-sharing.

III-2-3 Operational and Credit Risks as Primary Challenges

Hierarchical clustering analysis shows that operational and credit risks compose the highest severity risk cluster (22.22) while liquidity and profit margin risks are the lowest (21.67). According to this finding, operational and credit risks should be emphasized in the risk management of Islamic financial institutions.

More importantly, the high severity of operational risk (12.79) is consistent with (Archer 2007, 122) complexity of Islamic financial contracts. Credit risk to high severity (12.18) also resembles the difficultly of counterpart assessment and monitoring, in particular in profit-sharing arrangements.

These findings have important implications for the risk management of Islamic banking and go beyond just risk limitation, suggesting that operational, as well as credit risk mitigation, should be given priority and the higher risk financing formulas such as musharaka (pledged loans) and diminishing musharaka (interest) specifically.

IV- Conclusion:

This study has examined the relationship between banking risks and Islamic financing formulas, Several key conclusions emerge from this analysis:

First, the risk profiles of different Islamic financing formulas vary from one to another. Murabaha and ijarah generally have lower risk overall whereas musharakah and diminishing musharakah have higher risk. This pattern can explain why Islamic banks have tended to resort to profit sharing even though there are theoretical reasons to prefer profit sharing under Shariah.

Second, considering Islamic financing formulas, second, operational and credit risks, then profit margin and liquidity risk-based crises appeared to be most significant. This ranks operations and credit risk mitigation ahead of most other risk management activities, and suggests that the higher risk finance formulations should be of particular focus.
Thirdly, the analysis uncovers extensive relationships between certain kinds of risk and financing formulas. Several formulas (murabaha, ijarah, mudarabah) have inverse relations with some risk categories and may indicate that use of these formulas is associated with lower overall risk exposure.Other formulas (musharakah, salam, istisna', diminishing musharakah) have direct relationships with specific risk types, indicating that their increased use tends to increase risk exposure.
Fourth, there is a fundamental tension in Islamic banking between theory and practice. Among the financing formulas most authentically reflecting Islamic economic principles (musharakah and diminishing musharakah) the highest risk profiles are presented, whereas less risk-aligned formulas (murabaha and ijarah) may appear to be discounting the principle of risk sharing. This tension lends itself to explaining such observed banking patterns in Islamic banking practice and the difficulties of a radicalising distinctive model of the Islamic banking.
Finally, some implications for future Islamic banking practice, a regulatory framework, and research are also made from the findings. Therefore, Islamic banks should adopt formula specific risk management approach and balanced portfolio strategy considering Shariah authenticity and risk profiles.

Regulatory authorities need to build specialized rules that properly describe Islamic finance systems. Research teams should work to create better profit-sharing risk management tools to make Islamic banking practice match its theoretical models. The global growth of Islamic finance depends on our continuing study of banking risks in relation to Islamic financing tools. This survey outlines the basis for future work by showing both the difficulties and possibilities for managing risks through different Islamic financing setups.

- Appendices:

Table No. 01 /OpinionsOn the risks of Islamic financing formulas

Risks / Islamic Financing Formulas	Credit risk	Market Risk	Liquidity risk	Operational Risk
Murabaha (Cost-Plus Financing)	2.93	2.67	2.87	2.56
Mudarabah (Profit-Sharing)	3.08	2.46	3	3.25
Musharakah (Partnership)	3.8	2.92	3.4	3.69
Ijarah (Leasing)	2.9	3.1	2.92	2.64
Istisna' (Manufacturing Contract)	3.29	3	3.57	3,13
Salam (Forward Financing)	3.25	3,2	3.5	3,2
Diminishing Musharakah (Declining Partnership)	3.4	3.33	3.4	3.33

Source:TareqAllah Khan and Habib Ahmed, Risk Management: An Analysis of Issues in

Table No. 02 /Results of analysis of study variables by method PCA:

Risks / Islamic Financing Formulas	Credit risk	Market Risk	Liquidity risk	Operational Risk
Murabaha (Cost-Plus Financing)	0.67	/	/	0.61
Mudarabah (Profit-Sharing)	/	/	0.93	/
Musharakah (Partnership)	0.91	/	/	0.83
Ijarah (Leasing)	0.89	/	/	0.80
Istisna' (Manufacturing Contract)	/	/	0.71	/
Salam (Forward Financing)	/	/	0.92	/
Diminishing Musharakah (Declining Partnership)	/	/	0.83	/

Source: Prepared by the researcher (/impact less than 0.5)

Table No. 03/ Financing formula groups

Group 1	Group 2	Group 3	Group 4
Mudarabah (Profit-Sharing)	Mudarabah (Profit-Sharing)	Ijarah (Leasing)	Istisna' (Manufacturing Contract)
	Musharakah (Partnership)	Diminishing Musharakah (Declining Partnership)	Salam (Forward Financing)

Source: Prepared by the researcher (/impact less than 0.5)

Table No. 04/ The impact of financing formula groups on risks:

Risks / Groups	Operational Risk	Liquidity risk	Market Risk	Credit risk	Total risk
Group 1	2.93	2.67	2.87	2.56	11.03
Group 2	3.44	2.69	3.20	3.47	12.80
Group 3	3.15	3.21	3.16	2.98	12.51
Group 4	3.27	3.10	3.53	3.16	13.07
Total risk	12.79	11.67	12.76	12.18	

Source: Prepared by the researcher (/impact less than 0.5)

Table No. 05/ Risk groups:

Group 1	Group 2
Operational Risk	Liquidity risk
Credit risk	Market Risk

Source: Prepared by the researcher (/impact less than 0.5)

Table No. 06/The impact of risk groups on financing formulas:

Groups / Islamic Financing Formulas	Group 1	Group 2	Total risk of financing formulas
Mudarabah (Profit-Sharing)	2.74	2.77	5.51
Mudarabah (Profit-Sharing)	3.16	2.73	5.89
Musharakah (Partnership)	3.74	3.16	6.90
Ijarah (Leasing)	2.77	3.01	5.78
Istisna' (Manufacturing Contract)	3.21	3.28	6.49

Salam (Forward Financing)	3.22	3.35	6.57
Diminishing Musharakah (Declining Partnership)	3.36	3.36	6.73
Total Risks	22,22	21.67	

Source: Prepared by the researcher (/impact less than 0.5)

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