Islamic Banking vs. Conventional Banking: An Analysis of Risk Management Processes

Inaugural-Dissertation
to obtain the degree of Doctor of Philosophy (Ph.D.) in Business Administration
submitted to the Faculty of Business Administration and Economics at the
Heinrich Heine University Düsseldorf

Presented by
Manal Jaber Shaki Osman

Supervisor: Prof. Dr. Christoph Börner

Chair of Business Administration, in particular Financial Services

Date: 12 May 2025

Acknowledgment

After all these years of hard work, I must express my gratitude to those people who contributed and extended their support and valuable help in the preparation and completion of this academic work in one way or another.

First, my deepest gratitude to the one above all of us, the omnipresent God for giving me the courage to plod on through my desires to give up, thank you so much my Allah, the One.

I would also like to express my sincere thanks to my supervisor, Prof. Christoph Börner, whose encouragement, supervision and support enabled me to develop an understanding of my thesis from the preliminary to the final level.

I am truly grateful for the hidden blessing of my father's soul (Jaber Shaki), my great mother (Kedija Alamin Ali), my supporting husband (Nebil Alamin), my caring uncle (Mohammed Alamin Ali) and not to forget my little angels Noor, Lamar, Yahya and Jaber, who were all my inspiration as I hindered all the obstacles in completing this work.

I am ultimately thankful to the Heinrich Heine University for providing me the opportunity to pursue this post-graduate study in Business Administration-Finance.

Manal Jaber Shaki Osman

Table of Contents

List of Tables

List of Figures

List of Abbreviations

A	Rating grade A
AA	Rating grade AA
AAOIFI	Accounting and Auditing Organization for Islamic Financial Institutions
A-IRB	Advanced Internal-rating approach
BCBS	Basel Committee on Banking Supervision
BIS	Banks for International Settlements
CAR	Capital Adequacy ratio
CBM	Central Bank of Malaysia
CDS	Credit Default Swap
CR	Credit Risk
DCR	Displaced Commercial Risk
DF	Default
EAD	Exposure at Default
EDF	Expected Default Frequency (according to the KMV Model)
EL	Expected loss
EUR	Euro
FICO	Credit score developed by Fair Isaac Corporation.
F-IRB	Foundation Internal rating based (approach)
GDP	Gross Domestic Product
IAS	International Accounting Standards
IB	Islamic Banking
IIFS	Institutions (other than Insurance Institutions) offering only Islamic Financial Services
IFRS	International Financial Reporting Standards
IFSB	Islamic Financial Services Board
IMF	International Monetary Fund
IIFM	International Islamic Financial Market
IILM	International Islamic Liquidity Management
IRB	Internal rating-based
IRR	Investment Risk Reserve
LGD	Loss-given-Default
LMC	Liquidity Management Center
M	Maturity
MR	Market Risk
NINJA	No income, no job, no assets. Term used to indicate a poor credit risk.
OR	Operational Risk
PD	Probability of Default
PER	Profit Equalization Reserve
PLS	Profit and Loss Sharing
PSIA	Profit-sharing investment account
RC	Regulatory Capital
RW	Risk Weights
RWA	Risk-weighted asset
SGF	Sharia Governance Framework
SNCR	Sharia non-compliance risk

SSB	Sharia Supervisory Board
STC	Standardized Approach for credit risk
SME	Small and Medium-sized Enterprises
VaR	Value-at-Risk

Preface

The Dot-Com Bubble 1997-2000, Energy Crisis 2003, the Subprime Mortgage Crisis 2007-2009, United States Housing Bubble 2006-2009, Iceland Financial Crisis 2008-2012, Irish Banking Crisis 2008-2012, Russian Financial Crisis 2008-2009 & 2015, Automotive Industry Crisis 2008-2010, European Sovereign Debt Crisis 2009-2012, Greek Government Debt Crisis 2007-2016, Ukrainian Crisis 2014, Chinese Stock Market Crash 2015 (Caproasia, 2016); the last two decades have showed that huge risks materialize more frequently and with bigger impact than institutions like to think. Therefore, more financial institutions are taking a hard look at an alternative financial system and different risk management models. These crises gave emphasis to the Islamic financial system and the differences to conventional system in terms of stability.

The basic principle of Islamic financial system is the prohibition of Riba (ususry) which means that all Islamic banking activities are at a zero-interest rate. According to Islamic Finance, money has no intrinsic value as it is only a mean and a measure of value, therefore there should be no charge for its use (Osman, 2013). The second basic principle is the profit and loss sharing (PLS) principle between the surplus spending units (SSU) i.e., providers of the funds and the spending deficit unit (SDU) i.e. users of funds. In addition, all transactions under Islamic finance must be backed by real tangible assets whereby an investment involves an exchange or ownership of assets, and money is simply the payment mechanism in exchange to the transaction. Excessive uncertainty (gharar) as in the use of derivatives is not allowed, therefore, contractual obligations must be based on clear terms and disclosure of all information needed. Business deals must not involve excessive risk taking (maysar) as in gambling. Finally, financing any business activity must not involve elements that are not Shariah complaint (halal) such as alcohol, pork related products, interests related financial services, casinos, gambling, pornography, and weapons. Amongst the common Islamic financial instruments used in Islamic banking are cost plus sale (Murabaha), trust financing (Mudharaba), equity participation (Musharaka), safekeeping (Wadiah), leasing (Ijarah), forward commissioned manufacture (Istisna'a) and forward sale agreement (Salam).

In 2008 financial crisis Islamic banks encountered the challenges faced by the conventional banks, yet they managed to achieve an average growth rate of 20% after 2009 (Islamic Financial

Services Board, 2014). The resilience capabilities of the Islamic banking model during the financial crisis and post crisis period in addition to its high growth rate "attracted the conventional financial sector participants to consider the use of Islamic finance characteristics as a means of financial stability. This has stimulated research, aimed at comparing Islamic and conventional banks in terms of performance" (Hashem & Giudici, 2016) risks, and risk management tools.

Risk management role in both Islamic and conventional banking starts once the risks have been identified and measured (risk identification and measurement), all techniques to manage each risk falls into one of the following strategies: avoid or eliminate the risk, transfer/share the risk, mitigate the risk, or finally accept and treat the risk. Its major goal is to maximise the value of the financial institution as determined by its level of profitability and risk.

Even though risk management and risk measurement are often used interchangeably, there is distinct difference between them. Risk measurement is a specialised task of quantification and communication of risk exposure, while risk management is a process of making strategic and tactical decisions to control those risks that are identified and measured and to exploit those opportunities that can be exploited. Risk management should be the responsibility of managers at all levels of a financial organization. Therefore, for effective risk management, a consistent risk measurement and reporting should be in place from the most aggregate level to the top level of management for risk management to be able to use the understanding provided by risk measurement to manage current and future risks (Lleo, 2009).

The success of financial institutions depends greatly on how efficiently and effectively they manage their risks. Islamic banks like conventional banks face some similar risks such as market, credit, reputation, liquidity and legal risks. However, due to compliance with Sharia standards, the assets and liabilities structures of Islamic banks differ from those of conventional banks. This introduces unique form of risks faced by Islamic banks such as Sharia Compliance risk, fiduciary risk, displaced commercial risk, rate on return risk, and equity investment risk. Moreover, some of the risk management tools such as credit and market derivatives, interest rate swaps and some forms of forwards and future which are used by the conventional banks are not relevant for Islamic financial institutions.

Many studies on risk management practices in conventional and Islamic banks in various emerging economies (UAE, Turkey, Bahrain, Indonesia, Pakistan, Malaysia) have been

conducted over the years, such as (Siraj Khan 2020, Kisman, 2020; ncekara and etinkaya, 2019; Akram and Khalil ur Rahman, 2018; Abu Hussain and AlAjmi, 2012; Shaikh and Jalbani, 2008).

The current research study analyses theoretically and empirically the practical application of the various risks and risk management processes employed by conventional and Islamic banks from the perspective of various risk managers and practitioners. It also provides an up-to-date overview and compares the risk management practices, issues, and trends in Islamic and conventional banks.

The study seeks to fill a gap in the empirical literature on risk management in conventional versus Islamic banking. This makes it an important and beneficial source for both the banking system, namely Islamic and conventional banking policymakers, investors, researchers, consultants, and academic professionals.

With primary data triangulation, quantitative research methodologies are employed. In order to assess whether aspects of the risk management process such as understanding risk and risk management, risk identification, risk assessment and analysis, and credit risk analysis, relate to the risk management practices. Primary data is collected using a structured questionnaire from risk managers, personnel of the risk management department, managers and senior management working in conventional and Islamic banks. Triangulation is regarded to be helpful in drawing meaningful conclusions from data analysis.

The research is conducted to answer the following questions:

Q1. What are the main risks faced by conventional and Islamic banks?

Q2. What are the risk measuring techniques and risk mitigation instruments employed by conventional and Islamic banks?

Q3. Is there a difference in risk management techniques between conventional and Islamic banks?

Q4. What is the difference in terms of credit risk analysis between conventional and Islamic banks?

Overview of the Research Study

The research paper is broken into five chapters: after this introduction chapter, the thesis moves on to the subsequent four chapters, which are all interconnected.

Chapter One (Literature review- Concept of Risk Management) provide a literature review of the risk management. It explains the concepts of risks and risk management, its processes and systems, including risk mitigation and measurement techniques, as well as the regulatory requirements of Basel I to Basel III.

Chapter Two (Literature review- Risk Management in Conventional Banks) discuss the risk management procedures conducted by conventional banks mainly in credit risk, operational risk, liquidity risk and market risk. They also highlight the main risk management tools that conventional banks employ to manage their risks such as VAR, GAP, EaR, RAROC, and derivatives.

Chapter Three (Literature review: Risk Management in Islamic Banks) introduce the Islamic banking and risk management concepts within Islamic banks. These chapters describe the features of Islamic banks, Islamic modes of financing, and the various risks associated with Islamic banks. In addition, Takaful (Islamic insurance) as a risk management tool and the risk mitigation techniques employed by Islamic Banks is explored. The chapters conclude with a comparison between Islamic and conventional banks in terms of risks they face.

Chapter Four (Empirical Study: Risk Management Survey for Conventional and Islamic Banks) is based on the examination of primary data analysis acquired via a structured questionnaire. It provides reliability analysis, the normality test, as well as the frequency analysis of demographic variables. It also includes a tabular representation of data relating to risk identification methodologies and bank exposure to risks. It describes the Mann-Whitney U test as well as the descriptive statistics. The findings of the analysis are thoroughly explored, understood, and supported. The goal is to answer the research questions by explaining the outcomes in as much detail as feasible based on the data. The study's findings are also linked to the literature covered in chapters 2–6.

Chapter Five (Conclusions and Recommendations) presents the primary findings, recommendations, study contribution, and practical implications for conventional and Islamic banks.

Chapter 1: Concept of Risk Management

1.1. What is Risk?

Risk arises when there is a possibility that one or more uncertain events will cause an outcome and the ultimate outcome is unknown. Risk has been defined in many ways. Stamatis (2012) defines financial risk as "the unexpected variability or volatility with a specific time horizon". Volatility refers to the standard deviation of the change in value of a financial instrument; it is expressed in either absolute number or a percentage of the initial value of returns (Stamatis, 2012). Tesfatsion (2011) explained financial risk as the possibility that a financial outcome for the firm adversely deviates from what the firm anticipated. There are different measures for risk exposure which give numeric value to a risk enabling different risks to be compared. These tools include but are not limited to Value at Risk, Beta, GAP analysis, leverage and direction, scenario analysis, and stress testing. These measures quantify the probability of risk occurring and total loss if risk occurs.

Risk is a central part of financial services. According to portfolio theory, risk and return are two essential inputs as organizations seek to maximize return at a given level of risk (Cochrane, 2007). Though all business face risk such as legal risk, market risk, financial risk, operational risk, human resource risk, public relation or relations risk, and environmental risk; financial institutions face some special kinds of risks given their nature of activities which includes credit risk, liquidity risk, interest rate risk special for conventional bank; rate of return risk, equity investment risk, and inventory risk special for Islamic Banks. The aim of financial institutions is to maximize profit and shareholder value-added by providing different financial services mainly by managing risks (Hasan et. al, 2014)

One way to classify risks is to categorise them into two major groups: Financial Risks and Business Risks. Financial risk refers to the firm's ability to manage its debt and financial leverage, it arises from possible losses on financial markets due to movements in financial variables (Jorion and Khoury, 1996, p.2). Business Risk on the other hand refers to the firm's ability to generate sufficient sales and revenues to cover its operational expenses and hence make profit.

The banking sector is a highly complex system that comes with vast arrays of risks associated with new technologies, changing regulatory environment as well as changing consumers' behaviour. Therefore, addressing the risks and managing them in a way that ensure a safe performance of banking and the continuity of their businesses is a must by chief risk and compliance officers.

1.2. What is Risk Management?

The contemporary study of risk management can be traced back to Markowitz´s work of Portfolio Selection in 1952. Markowitz (1952) was one of the economists who made the observation and modelled that expected or anticipated return varies with risk and he positioned the study of risk at the heart of financial economics. Since then, the science of risk management has grown and became a field of study in its own.

Risk management explained by Basel Committee on Banking Supervision (2011a) "encompasses the process of identifying risks to the bank, measuring exposures to those risks (where possible), ensuring that an effective capital planning and monitoring programme is in place, monitoring risk exposures and corresponding capital needs on an ongoing basis, taking steps to control or mitigate risk exposures and reporting to senior management and the board on the bank's risk exposures and capital positions".

Risk management thus entails taking risks within limitations rather than avoiding risk. As previously stated, the goal of financial risk management is to maximize the value of the financial organization by maximizing its profitability at a given level of risk. Since risk is unavoidable and inherent in financial institutions, the duty of the risk manager is to manage the different kinds of risk at adequate levels to achieve optimal profitability. To reach this objective, risk management needs to continually identify, quantify, and monitor risk exposures, which in turn demands adequate organisational culture, sound policies, efficient processes, effective information systems, and skilled analysts.

There are two dimensions of risk management: upside management of risk and downside management of risk. Upside risk is the favourable or positive effect of risk while downside risk is the unfavourable or negative impact of risk. For example, accepting a loan application by a bank exposes the bank with the risk of not paying back the loan, this is the downside of the risk.

Banks and investors seek always limited downside risks. Another example would be that a bank launches a new financial service or product and estimate a certain level of sales in the first six months. The normal benchmark level is the sales forecast made, but there is a risk of higher sales and a risk of lower sales. The risk of higher sales is the upside, while the risk of lower sales is the downside. Analysing risk management in this way is imperative to promote the positive effects of the risk i.e., upside risk and contain the negative effects of risk i.e., downside risk (Chisambara 2019)

Besides analyzing risk management from upside risk and downside risk perspective, there are generic factors that are essential for effective risk management. Ranong and Phuenngam (2009) have elaborated on the major critical success factors for effective risk management procedure in financial institution. According to Ranong and Phuenngam (2009) study there are six "factors for effective risk management procedures in financial industries:

1. Commitment and support from top management.
2. Communication
3. Culture
4. Organization structure
5. Trust
6. Training."

Commitment and support from top management

Commitment and support from financial institution top management "includes a broad range of activities in an organization, including developing project procedures that include the initiation stage, training programs, establishing a project management office, support quality management and so on". In addition, "top-level management responds to business processes and manages risk. Successful mitigation or bearing of risk is contingent upon commitment and support from top management" (Ranong and Phuenngam, 2009). Moreover, top management formulates and decides objectives and strategies for organizational risk management activities, mission and overall objectives (Henriksen and Uhlenfeldt, 2006).

The concept refers to the highly required support and commitment from top management for effective risk management. Financial institutions use risk management to predict the probability of a negative outcome and to anticipate changes that they should act upon to either profit from the changes or at least minimize losses that will certainly have a great impact on the

performance of the whole organization. It is essential that risk management receives the required support from top management for an effective performance and timely decision-making process which will in turn enable risk management to manage and control risks.

The support of top management, however, is not sufficient on its own. Involvement of the board of directors is an essential critical success factor for an effective risk management system. Boards of directors are by nature not expected to be engaged in the day-to-day risk management process. Board of directors should instead, through their risk supervision role, ensure that the risk management procedures and policies designed and implemented by the top management and risk managers are coherent with the company's strategy and risk appetite, that these procedures and policies are running as directed, and that necessary actions are taken to promote a risk-aware culture. Moreover, the Board of directors should communicate to the top management and employees that comprehensive risk management is an integral component of strategy, business operations and corporate environment (Henriksen and Uhlenfeldt, 2006).

The board in addition should work together with management to foster a corporate environment and culture that realizes and implements institution wide risk management. Comprehensive risk management should not be seen as a specialized corporate function of risk managers, but instead should be incorporated into all business decision-making.

On October 12, 2011, the Court of Chancery dismissed the plaintiffs' claims for failure to make demand on Goldman Sachs' board of directors on October 12, 2011, based on allegations that they failed to adequately manage the company's anticipated excessive risk taking in the subprime mortgage securities market. Plaintiffs claimed that Goldman Sachs' directors breached their fiduciary duties by failing to properly compensate Goldman Sachs employees, failing to sufficiently monitor Goldman Sachs' operations, and allowing Goldman Sachs to act unethically (Layton and Finger, 2011).

Communication

Communication is the second critical success factor suggested by Ranong and Phuenngam (2009) in their study for effective risk management. Communication, transparency, consistency, and the flow of information within the organization between directors, senior management, and risk management are the keys to effective risk management. The vision, risk appetite, ethics and intolerance of compliance failure of the institution should be communicated

clearly and effectively throughout the organization.

In addition, information concerning the internal and external risk environment, the precise material risk exposures facing the company, the assessment and prioritizing of risks, risk response strategies, implementation of risk management measures and procedures, and the strengths and weaknesses of the overall system should all be clearly communicated within the organization. Management should agree on the format, type, and frequency of risk information to be communicated. High-quality, timely and reliable information provides the foundation for effective responses and decision-making by the management.

Top management should incorporate the risk management procedures, policies, codes of conduct, and ethics into the company's strategy and business operations. They should hold regular meetings with key executives primarily responsible for risk management to get an update on the institution's current risk exposures and response measures.

Risk communication should not be one way communication from decision makers to stakeholders; it should however be a two-way open dialogue with all stakeholders with efforts focused on development of common understanding within the organization. "Stakeholders, like every human being, tend to make judgments about risk based on their perceptions. These can vary due to differences in values, needs, assumptions, concepts and concerns, as they relate to the risks or the issues under discussion. Since the views of stakeholders can have a significant impact on the decisions made, it is important that possible variations in their perceptions of risk be identified, recorded and addressed in the decision-making process". (ENISA, 2016).

Unlike many other types of communication, risk communication frequently comprises remarks concerning potentially dangerous and poorly understood risks, and as a result, the dialogue is frequently marred by arguments, apathy, misunderstanding, and distrust (Rowan, 1994) As a result, risk communication might elicit strong negative feelings toward the risk communicator. If the communicator cannot alleviate the wrath directed at him, trust and credibility will swiftly diminish. The communicator must recognize animosity, practice self-management, be prepared, show empathy and caring, and transform negative signals into positive ones. (By Ng and Namby)

Culture

The third factor that was discussed by Ranong and Phuenngam (2009) for effective risk

management in financial institution is Culture. Culture as defined by Hofstede (2005) "is the collective programming of the mind that distinguishing the members of a group or category of people from others". According to Hofstede's definition, the collective programming of mind consists of accumulated knowledge, beliefs, experience, values, meanings, attitudes, religion, symbols that are passed along from one generation to the next by communication and imitation. This definition can be traced to Organizational culture which is "the system of shared assumptions, values, and beliefs, which governs how people behave in organizations. These shared values have a strong influence on the people in the organization and dictate how they dress, act, and perform their jobs" (Study.com, 2016). Every organization develops and maintains a unique culture, which provides guidelines and boundaries for the behaviour of the members of the organization.

Girotra and Netessine (2011) stated "Smart companies design their innovations around managing risks". According to Girotra and Netessine, if organizations want to pioneer in the marketplace, they must develop a business strategy that focuses on identifying where the risks are and then determine whether to terminate, transfer, treat, or accept the risk.

Economist Robert Merton pointed out companies can create value by being better at managing risk than their competitors are (Metron cited in Girotra and Netessine, 2011). The idea here is that if companies want to increase market share it is worth to shift some of the focus on improving products and services to creating an organizational culture that thinks about how the company, suppliers, and customer can together manage the risks of the business conducted. Financial organizations are no exception. In fact, the global banking system is facing major liquidity and credit crisis. In 2008, many financial institutions wrote off $400 billion and the central banks around the world initiated emergency measures to restore liquidity (Beuhler et. al, 2008). Many important innovations in risk management originated in the financial industry mainly because banks are in effect risk-intermediation businesses and the ability to describe, price, and manage risk should be among their core competencies.

Organizational Structure

The fourth factor that was discussed by Ranong and Phuenngam (2009) for effective risk management in financial institution is organizational structure. Organizational structure defines how tasks are divided, grouped, and coordinated in organizations. Every organization has a structure that clarifies the roles that organizational members perform so that everyone understands their

responsibilities to the group. “It is used to define a hierarchy within an organization. It identifies each job, its function and where it reports to within the organization. Organizational structure is developed to establish how an organization operates and assists an organization in obtaining its goals to allow for future growth” (Friend, 2016)

The financial and business world fluctuates constantly, thus organizational structure must be evaluated on a regular basis so that risk management in return can respond quickly and in different ways to the resulting changing financial environment. Redundant organizational structures that provide operational slack and the lack of assurance of task performance in dynamic environments are linked to risk in organisation (La Porte & Consolini, 1991) Redundancy can cause difficulties when duplicate tasks are executed by organizational members who do not share each other’s values or understand each other’s roles and responsibilities (Grabowski and Roberts, 1999).

In conclusion, organizational structure that provides strong reciprocity and intensity of linkages among organizational members is a critical success factor for effective risk management because it leads to the development of, fine-grained information transfer, joint problem solving, trust that are important means for risk mitigation (Grabowski and Roberts, 1999).

Trust

The Fifth factor that was discussed by Ranong and Phuenngam (2009) for effective risk management in financial institution is Trust. Trust is defined by Hurly (2006) as a “confident reliance on someone when you are in a position of vulnerability”. Trust as stated by Kim and Mauborgne (1997) produces voluntary cooperation, and voluntary cooperation drives performance, leading people to go beyond the call of duty by sharing knowledge and applying their creativity. A distrustful environment leads to costly and sometimes incurable problems. Hurley (2006) researched how a working environment feels when it is characterized by low levels of trust. The survey result was “stressful, threatening, divisive, unproductive, and tense.” When researched how a high trust work environment feels, the results were “fun, supportive, motivating, productive and comfortable.” Clearly, organizations that cultivate a trusting environment will have a competitive advantage over their rivals. One of the multi reasons is that trust encourages employees to exchange ideas openly which leads in return to a higher level of innovation.

Kim and Mauborgne (1997) explained how trust encourages active cooperation among employees. They argued that each employee wants to be valued as human beings and not only as personnel or human assets. Employees, as they explained, want to be treated with respect to their intelligence, want their ideas to be taken seriously, and want to understand the rationale behind specific decisions. They are sensitive to the signals conveyed through a company´s willingness to trust people and to seek their ideas- or they can signal the opposite.

Trust leads to shared commitment, cooperation, and loyalty. Risk management members need the three elements to focus on their mission without doubt about other members' responsibilities, roles, and resources. Therefore, one of the factors driving effective risk management is trust.

Training

The definition of training has been described in many ways. Riley (2015) defines training as "The process of increasing the knowledge and skills of the workforce to enable them to perform their jobs effectively". Training is therefore given to employees so that they master their role and responsibilities and learn job-related skills and knowledge that will enable them to do their job efficiently, effectively and productively. "Training improves technical, personal or management skills and will increase staff efficiency" (BBC, 2014). Even though training costs can be tremendous to any organization, banks and other businesses are yet prepared to incur these costs because of the many benefits that it provides which give them a competitive edge within the industry. These benefits include but are not limited to higher quality, increased productivity, and better motivation through empowerment.

Training according to Frost (2015) allows employees to strengthen skills that need to improve, "it brings all employees to a higher level so they all have similar skills and knowledge and creates an overall knowledgeable staff with employees who can take over for one another as needed without constant help and supervision from others" Frost (2015). In addition, training provide improved employee performance and confidence because of the stronger acquired understanding of the industry and the responsibilities of their job which enable them in return to perform better and think of new ideas that help them excel. Training creates supportive workplace and employees who feel appreciated and challenged through training opportunities are more satisfied in their jobs (Frost, 2016)

Benefits of risk management training are significant as well. Including the above-mentioned benefits risk management training has the added value of a reduction of losses and associated downtime, improving the risk profile of the institution and providing improved options in terms of risk financing and treating. It improves efficiency and productivity because of the emphasis placed on best work methods and procedures and less time is spent on resolving mistakes (Marsch, 2014)

1.3. Risks faced by Financial Institutions

One of the common goals of financial institutions whether conventional or Islamic is to maximize shareholders value and return which is achieved by mobilizing funds between the surplus spending units (SSU) i.e., providers of the funds and the spending deficit unit (SDU) i.e., users of funds for investment projects. To pursuit the abovementioned goal, financial institutions are faced with several risks of which some include credit risks, liquidity risks, interest rate risks, foreign currency risks, operational risks, market risk, foreign exchange risk, technological risks, product innovation risks, competitive risks, legal risks, country or sovereign risk, etc. While Islamic banks share similar risks with conventional banks, there are unique risks that are associated with Islamic banks nature of business and operations.

The total risk associated with banking operations was broken down by CAPM (Capital Asset Pricing Model) into systematic risk and unsystematic risk. CAPM was first model that measures the relationship between risk and return and explained that s*ystematic risks* are all external forces that affect all businesses and households in the country or economic system and are considered as uncontrollable risks (Joseph, 2013). It emphasizes the possibility of a collapse of the whole financial system or the stock market causing a disastrous impact on the entire system in the country. For instance, if the economy is witnessing an economic crash and recession, bankruptcies will increase which in turn triggers credit losses and decline in stock markets due to lower corporate profits. Systematic risk includes political instability such as a military coup, new elected government discontinuing certain policies or making changes in the taxation laws, wars, terrorism, natural disasters, foreign investment policies having a sever and widespread impact on the quality of a credit asset that may lead to losses (Cuatero, 2019). Systematic risks are difficult to mitigate since these are inherent in nature, large scale; multiple factors are involved, and not necessarily controlled by an individual or a group.

Other sources of systematic risk in the financial market explained by Surbhi (2017) include interest risk, inflation risk, and market risk. Interest risk results from fluctuations in the rate or interest from time to time and affecting interest-bearing securities such as bonds and debentures. Inflation risk, also known as purchasing power risk, adversely affects an individual's buying power because of higher production costs, higher salaries, etc. And market risk is the risk that influences the prices of a share, i.e., the prices will consistently rise or fall over a period along with other market shares.

It is vital to distinguish between systematic and systemic risk. A systemic risk is the possibility that a single incident will cause the collapse of an industry or the entire economy. The event occurs at the company level and frequently results in a wider market decline. Lehman Brothers' 2008 bankruptcy is a classic illustration of systemic risk. When this worldwide financial services company went bankrupt, it triggered a chain reaction that resulted in a larger banking catastrophe.

While systemic risks are singular events with the potential for widespread influence, a systematic risk is one that is already present in the economy. Systematic risk affects the entire market rather than a specific sector or business. The Covid-19 pandemic serves as a good illustration of systematic risk. Pandemic risk is something that is always present yet difficult to forecast. When it occurred, it caused widespread company closures, lockdowns, and interruptions to worldwide travel. Another example is the 2008 financial crisis and Great Recession, which had a diverse influence on many asset classes.

Unsystematic risk, however, refers to the risks associated with the specific business or industry in which a company is engaged (Surbhi, 2017). They are controllable risks and do not affect the entire economy or all business enterprises/households. Such risks are caused due to internal factors which can be controlled or reduced in a relatively short span of time; they are largely industry specific and/or company specific (Cuatero 2019). Unsystematic risks “represent risks of a specific corporation, such as management, sales, market share, product recalls, labor disputes, and name recognition” (Institute of Business and Finance, 2016).

A bank can reduce its level of unsystematic risk through diversification by extending credit to a range of customers (Joseph, 2013) and good management decisions regarding costs, expenses, investments and marketing.

Examples of unsystematic risk amongst others includes change in regulations impacting specific industry, entry of a new competitor in the market, a firm recalling one of its defective products, an employee union tactic such as strikes to push the senior management to meet their demands.

A financial institution such as a bank may be exposed to different types of risks. Some of these are systematic risks and others are unsystematic risks. These risks include, but are not limited to:

Credit risk

Credit Risk is one of the most important and fundamental types of risk. It arises from the possibility that the borrower may default by failing to repay the principal and if applicable interest according to the conditions determined in the contract. "If the debtor fails to abide by his obligations, it leads to a loss for the creditor and, therefore, becomes a risk for the bank. The existence of credit risk is not dependant on direct financing by the bank, like bank loans. The bank also faces this type of risk in guarantees and acceptance paper when the originator of the financial instruments owned by the bank is unable to meet his obligations (as in the case of bonds)" (Elgari, 2003).

Market Risk

Market Risk defined by Hull (2012) is "risk relating to movements in market variables"; examples of market variables include exchange rates, stock prices, interest rates, commodity prices, equity prices etc.

Dowd (2005) also defined market risk as "the risk of loss (or gain) arising from unexpected changes in market prices such as security prices or market rates such as interest or exchange rate. Market risk in return can be classified into interest rate risk, equity risk, exchange rate risks, commodity prices risk, and so on, depending on whether the risk factor is an interest rate, a stock price or another random variable".

Market risk belongs to systematic risk which is as explained earlier is largely due to changes in macroeconomics such as changes in interest risk, purchasing power risk, market crashes or recession, currency exchanges, war etc... Systematic risk is an inherent business risk that firms usually have no control over, companies have the choice of either avoid systematic risk by

staying away from all risky investments or engage in investments and react to changing conditions due to systematic risks. Many assets or possibly all assets in the market are exposed to systematic risk which the banks have no control over.

Market risk is measured by various techniques such as value at risk, sensitivity analysis, Beta, Capital Asset Pricing Model. Value at risk is the maximum loss not exceeded at some specified confidence level over a given period (Hull, 2012). Sensitivity analysis or what-if analysis is how different values of an independent input will impact a particular the individual trade or ultimately portfolio (dependent variable) (Banwait, 2017). Beta measures the "tendency of a security's returns to respond to swings in the broad market" (Bodie et al, 2011). Capital asset pricing model calculates the expected return on a security based on its level of risk (financeformulas.com, 2017).

Interest Rate Risk

Another risk which is very important to mention for conventional banking and is part of market risk is Interest Rate Risk which is the exposure of banks income or capital to interest rates movements. Interest rate risk is inherent in conventional banking business and can be an important source of profitability. However, excessive interest rate risk can present a considerable threat to a bank's earnings and capital base. Changes in interest rates affect a bank's earnings by changing its net interest income and the level of other income (including changes in non-interest revenues/expenses). Changes in interest rates also affect the underlying value of the bank's assets, liabilities and off-balance sheet (OBS) financial instruments because the present value of future cash flows (and in some cases, the cash flows themselves) changes when interest rates change. Accordingly, an effective risk management process that maintains interest rate risk within prudent levels is essential to the safety and soundness of banks (Basel Committee of Banking Supervision, 2016)

As Islamic banks do not deal with interest rate, they are exposed to a risk known as the **Rate of Return Risk** as suggested by Islamic Financial Services Board (IFSB) (2005). Rate of Return Risk differs from Interest Rate Risk in that Islamic banks are concerned with the result of their investment activities at the end of the investment holding period (Zaino, Kassin, 2010).

Operational Risk

Operational Risk is inherent in all banking activities, processes, products and systems, and the effective management of operational risk should always be an essential element of a bank's risk management system (Bank of International Settlements, 2011)

Operational risk as defined by the Bank of International Settlements (2011) is the "risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk but excludes strategic and reputational risk". Losses from external events such as disruption of utilities, natural disasters, environmental hazards, or civil disruption are relatively easier to define than losses from internal events, such as employee thefts, fraud and product flaws. "Because the risks from internal problems are closely tied to a bank's specific products and business lines, they should be more firm-specific than the risks due to external events" '(Federal Reserve Bank of San Francisco, 2002)

In case of Islamic banks, given the different nature of business there is an increased risk in terms of personnel and technology as there are not yet enough qualified professionals both capacity and capability to conduct Islamic financial operations and the banking software that are available in the market for conventional banks are not fully appropriate for Islamic banks. This gives rise to system risks from developing and using informational technologies is Islamic banks (Ahmed, Khan)

To decrease the potential of damaging operational risk events, banks should develop a strong culture of risk management and ethical business practices framework which is integrated into the bank's overall risk management processes that can effectively deal with those unavoidable events once they occur.

Liquidity Risk

The notion of liquidity according to Kihanga (2020) refers to the "ability of an economic agent to exchange his or her existing wealth for goods and services or for other assets". In this definition liquidity is a "flow concept which refers to the unhindered flow among the agents of the financial system, with a particular focus on the flow among the central bank, commercial banks and markets" (Nikolau, 2009). Financial system liquidity can take many different aspects such as market liquidity (interbank and asset market), funding liquidity and central bank liquidity. For our literature purpose, we will focus on funding liquidity.

Funding Liquidity according to Basel Committee on banking supervision (2008) refers to banks' ability to fund increases in assets and meet obligations as they come due at reasonable cost. From this definition we can derive the meaning of liquidity risk as the danger that a bank will be unable to meet its present and future payment obligations completely or on time, which in return can lead to refinancing risk which is the danger that additional refinancing can be obtained only at higher costs (Deutsche Bundesbank, 2008)

In case of Islamic banks liquidity risk is very critical. As interest-based loans are prohibited by Sharia, Islamic banks cannot borrow funds to meet liquidity requirements in case of need. Furthermore, Sharia does not allow the sale of debt, other than its face value. Thus, to raise funds by selling debt-based assets is not an option for Islamic financial institutions. Moreover, because of slow development of financial instruments, Islamic banks are also unable to raise funds quickly from the markets. This problem becomes more serious because there is no inter-Islamic bank money market (Ahmed, Khan).

Withdrawal Risk

For Islamic banks variable rate of return on savings and investment deposits creates uncertainty with respect to the actual value of deposits. An important factor in the withdrawal decisions of the depositors may be the preservation of assets in terms of minimizing risk of loss due to a lower return rate. This introduces a "withdrawal risk" from the bank's perspective, which is linked to the lower rate of return relative to other financial institutions (Ahmed, Khan) and hence leads to liquidity risks.

Business Risk

Business risk as defined by Böcker (2008) is the "potential loss in the company's earnings due to adverse, unexpected changes in business volume, margins, or both". Causes of business risk can vary from changes in customers demand, change in government policies, changes in competitive positions, or even internally as mismanagement, theft, forgery, or lavish expenditure.

Banks' exposure to business risk such as sudden changes in the banks' activities, output volumes, margins, and costs leads to a decline in banks' profits. It is management role to be able to adapt its policies to unexpected changes and events.

Understanding business risk is essential; a major cause of the 2007 subprime crisis was lack of

attention to business risk in the banking industry. As mentioned in a 2007 economic capital survey, “management of business risk still lags behind core financial risks” CRO Forum (2008)

The 2007 subprime crisis proved that banks could suffer severely from business risk even more than non-financial companies. During the crisis, the termination of some bank activities can be considered to be the consequence of business risk. For example, activity in the markets for structured products, IPOs, and syndicated loans crashed due mainly to severe asset depreciations and strong financial market disruptions (Chafsfai & Dietsch, 2013)

In case of Islamic banking the potential loss to the bank come from positions taken in contracts where an Islamic bank is exposed to ownership and price risks. This can happen for example, when the bank takes up a true Murabaha sale involving purchase of assets, which it will later sell on a credit basis. By taking up business risks, the bank may charge a business risk premium on top of the credit risk premium, which may increase profit-rate on the Murabaha sale. In some jurisdictions, Islamic banks have applied the bay al-‘inah contract to avoid business risk so that profit rate on the Murabaha contract is competitive with interest rates on conventional loans (Global Islamic Finance Report, 2015)

Reputational Risk

Reputational Risk as defined by Deutsche Bank (2023) is the “risk of possible damage to the banks brand and reputation, and the associated risk to earnings, capital or liquidity arising from any association, action or inaction which could be perceived by stakeholders to be inappropriate, unethical or inconsistent with the Bank’s values and beliefs”.

The Basel Committee on Banking Supervision (2017) defined reputational risk as “risk arising from negative perception on the part of customers, counterparties, shareholders, investors, debtholders, market analysts, other relevant parties or regulators that can adversely affect a bank’s ability to maintain existing, or establish new, business relationships and continued access to sources of funding.”

Reputation is perhaps the core and the most valuable asset for a bank that needs to be protected and managed rigorously. The success of any bank is defined by the trust that the general public places in it. Reputation also plays a role in attracting trust and confidence from other stakeholders.

Reputational risk as shown in Figure 1 depends largely on the effects of other types of risks such as credit risk, liquidity risk, market risk, and operational risk and can also lead to chain reactions of other risks. Figure 1 depicts the inter-relationship of reputational risk with other various risks faced by a bank.

Therefore, in order to maintain market trust and avoid reputational damage, banks should measure as precisely as possible and manage the effect of reputational risk in terms of the other types of risks to which it may be exposed.

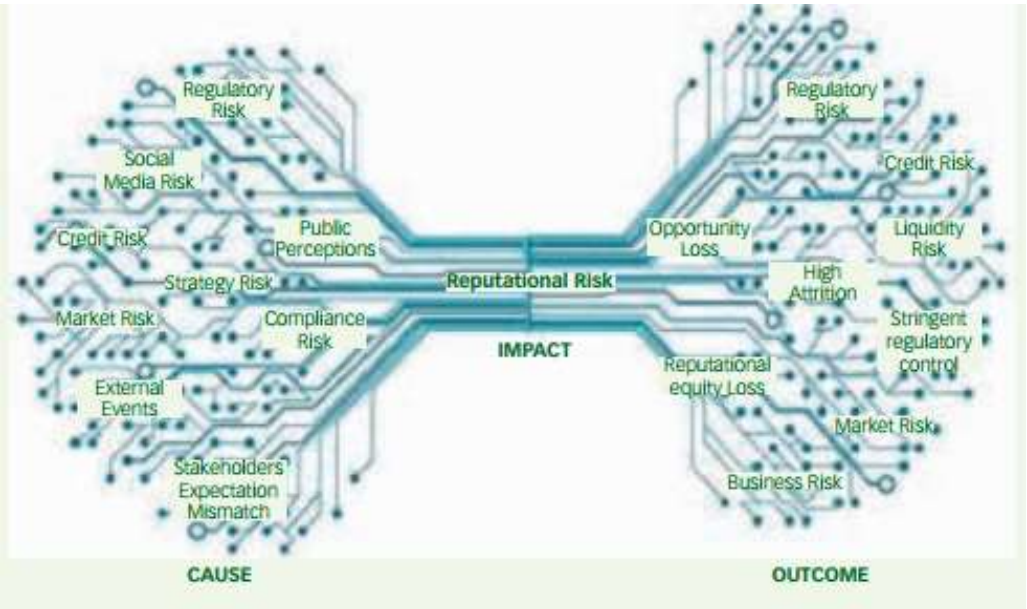


Figure 1: Interconnected Nature of Reputational Risk (Dey, 2017)

Moral hazards Risk

Hossain & Chowdhury (2015) defines moral hazard as a "situation in which one party decides to take risk knowing that someone else will bear the cost if things go wrong". It occurs when one party participates in a risky event knowing that it is protected from the risk while the other party bears the expense. It takes place when both parties have insufficient information about each other. One example in the financial world includes the selling of a financial product knowing that it is not in the buyer's interests to buy it, another example is when bankers take excessive risk knowing that they will not bear it.

Moral hazard also occurs when the borrower has incentives to engage in activities that are undesirable from the lender's point of view — that is, activities that make the loan less likely to be repaid leading to credit risk. To minimize the moral hazard in such cases, lenders must impose restrictions (restrictive covenants) and other contract terms on borrowers so that borrowers do not engage in behaviours that make it less likely that they can repay the loan; then lenders must monitor the activities of the borrowers and enforce the restrictive covenants if the borrower breaches them (Mishkin, 2001)

It is submitted that moral hazard leads to reputational risks and a renewed focus on reputational management will lead to better management of issues of moral hazard, conflict of interest, and adverse selection. Furthermore, banks should focus on transparency and disclosure in order to overcome the reputational risks associated with moral hazard problems (Scandizzo, 2011)

Another cause of moral hazards in the banking industry and the acceptance by banks of high risk is result of central banks supporting the banking system in order to prevent financial crisis. If the bank can take risks knowing that someone else will have to bear the burden of those risks, then they may take them. It is argued that these central banks support reinforces moral hazard, hence, laws and regulations should change, and banks should no longer enjoy the guaranteed support from central banks.

Dow (2010) highlighted that "structured products which incorporated securitised loans in an opaque way concealed the extent of risk attached to them; this concealment would appear to have been deliberate. Yet the products were traded despite their make-up, and therefore the lack of clarity as to the likely risk attached to their value. Market sentiment was such as to encourage optimism that downside risks were low and asset prices would continue their long rise.

However, because banks themselves trusted the central bank to provide support to prevent them from failing, they took on additional risk which brought about the prospect of failure".

Technological Risk

Technological Risks are "risks related to any adverse outcome, damage, loss, disruption, violation, irregularity or failure arising from the use of or reliance on computer hardware, software, electronic devices, online networks, and telecommunications systems" (Central Banks of Bahamas, 2016) in the day-to-day conduct of the bank's operations, settlement of books of accounts, and storage and retrieval of information and reports.

Amongst the causes of technological risk are systems failures, choice of faulty or unsuitable technology, processing errors, hardware breakdown, adoption of obsolete technology, software defects, hacking incidents, network vulnerabilities, security breach, fraudulent actions, etc.

In the past, information technology was used as a supporting tool for precise and rapid delivery of financial services. Over the years, Internet banking services, automated teller machine (ATM) service, mobile banking service, and other uses of information technology in financial services have widened considerably. Severe competition among banks induced them to expand their banking products and services and obliged them to offer online services that allow the customers to access the banking accounts from their end. Financial technological development has offered many opportunities and growth but has also posed many risks that can result in fines and expenses, reputational damage, preventing banks from reaching business objectives, or even lead to a lawsuit. Therefore, it is the bank's responsibility to measure, mitigate and control technology risk, and adopt a set of high-level IT security principles that establish the foundation of the IT security risk management framework (Central Banks of Bahamas, 2016).

Legal Risk

Legal Risk in financial markets arises from the failure to comply with relevant policies, laws, and regulations due to the lack of awareness or misunderstanding of the laws that apply to business, products or services which ultimately leads to financial, business, or reputational loss. Financial loss can "easily be absorbed by retained earnings and existing legal reserves." (Gaulard, 2014) whereas reputational impact "is much more difficult to quantify and potentially more threatening" (Gaulard, 2014).

In addition to the lack of awareness and misunderstanding of the laws, specific changes to the

law and uncertainties about proposed changes cause legal risk to arise and can have an adverse effect on the financial market. In financial market the linkage between legal risk and reputational risk is very close, a severe damage to reputation can cause the financial institution to lose key relationships and mandates (McCormick, 2010).

The risk profile of banks is also affected by the continuous development of anti-terrorism and anti-money laundering laws, an increasingly uncompromising attitude of regulators to frauds and other kinds of financial crime and apparently ever-growing need for additional consumer protection measures to combat perceived unfair practices. All this has an impact on how bank manage their business (McCormick, 2010).

Shariah Non-compliance Risk

Shariah Non-compliance Risk is unique to Islamic Banking. Given their different nature of financial contracts, Islamic banks face risks related to their documentation and enforcement. As there is lack of standard forms of contracts for various financial instruments, Islamic banks prepare these according to their understanding of the Sharia, the local laws, and their needs and concerns. The lack of standardized contracts and the challenges associated with developing proper legal systems influence the enforceability of contractual obligations between counterparties. This result in heightening the legal risks associated with Islamic contractual agreements. Legal risk is also known as Shariah noncompliance risk in Islamic Banks (Abozaid, Abdulazeem, 2015)

Fiduciary Risk

A rate of return that is lower than the market rate also introduces fiduciary risk, which is when depositors/investors interpret a low rate of return as a breach of investment contract or mismanagement of funds by the bank (Accounting and Auditing Organization of Islamic Financial Institutions (AAOIFI), 1999 cited in Ahmed, Khan). Fiduciary risk can be caused by a breach of contract by the Islamic bank. For example, the bank may not be able to fully comply with the Shariah requirements of various contracts. While the justification for the Islamic bank's business is compliant with the Shariah, an inability to do so or not doing so will fully cause a serious confidence problem and deposit withdrawal (Ahmed, Khan)

Displaced Commercial Risk

This risk is the transfer of the risk associated with deposits to equity holders. This arises when, under commercial pressure, banks forgo a part of its profit to pay the depositors to prevent withdrawals due to a lower return (AAOIFI, 1999 cited in Ahmed, Khan). Displaced commercial risk implies that although the Islamic bank may operate in full compliance with the Shariah requirements, it may not be able to pay competitive rates of return as compared to its peers of Islamic banks and other competitors. Depositors will again have the incentive to seek withdrawal. To prevent withdrawal, the owners of the bank will need to apportion part of their own share in profits to the investment depositors (Ahmed, Khan).

1.4. Risk Management Process and System

After comprehending the various risks that banks face. Banks need to focus on risk management in order to stay on top of and ahead of the myriad significant risks they confront daily via an efficient and effective risk management process and system.

The risk management process and system consist of a series of steps that, when undertaken in sequence, facilitate financial institutions to protect and add value to the business and its stakeholders. It considers both upside risk that constitute opportunities and benefits and downside risk which constitute threats to success. It provides framework for the bank that allow activities to take place in consistent and controlled manner which enables in return continual improved decision making, efficient allocation of resources and capital, volatility reduction in the non-essential areas of the business and enhance company image and assets (The Institute of Risk Management, 2002).

Every bank has its financial strength. Some big banks like CITI bank, Deutsche Bank, Maybank, Samba Financial Group have different capacity to absorb risk than smaller banks, therefore, banks must develop a comprehensive and reliable risk management process, integrated in all business activities that optimize risk and provide the bank risk profile which are in line with the established risk framework in order to avoid losses and accept only risks that can be absorbed by the bank.

Risk Management process comprises the following steps:

1. Goals and Objective Definition,
2. Risk Identification,
3. Risk Assessment and Prioritisation,
4. Risk Measurement,
5. Risk Control.

1.4.1. Goals and Objectives Definition

Financial institutions' goal is to generate profits, maintain growth, and increase market share. To achieve such goals banks faces certain kinds of risks and these risks must be taken to maintain profitability, liquidity, and solvency.

Profitability is simply the ability of the bank to earn profit. The most widely used measure of banks profitability is the return on assets and return on equity. The return on assets shows how effectively and efficiently a bank is managing its resources and assets worth it to generate income (Omar & Mugabe 2016). Return on equity measures bank performance and it "refers to how much profit a company earned compared to the total amount of shareholder equity invested or found on the balance sheet. ROE is what the shareholders look for in return for their investment. A business that has a high return on equity is more likely to be one that can generate cash internally. Thus, the higher the ROE the better the company is in terms of profit generation" (Omar & Mugabe 2016).

Liquidity and ***solvency*** refer to the bank's ability to meet its financial obligations. Liquidity refers to meeting short term obligations while solvency refers to meeting long term obligations and secure funding in the future. ***Solvency*** is the "overall capital structure of a firm, its degree of finance a leverage, and the risk associated with that structure. It is essential to stay in business" (Marin, 2016). Liquidity is the ability of the bank to convert its short-term financial obligations into cash assets without affecting the assets price. An inability to pay financial obligations would render the bank illiquid. The Basel Committee of Banking supervision refers to liquidity as the "ability of banks to meet their liabilities, unwind or settle their positions as they come due" (BIS, 2008). Banking system liquidity "comprises banks' current holdings of central bank money and their cash reserves" (Deutsche Bundesbank, 2017). Banks have different sources of Liquidity. In case of conventional banks, one source are depositors who entrust their

money to the bank, second source is the market where the bank can sell its asset or generate liquidity through securitization, loan syndication and the secondary market for loans, and third source is interbank market. Other tools to generate and manage liquidity are foreign exchange swaps, repo operations, treasury bills and commercial papers.

All the above-mentioned liquidity sources and tools are based on interest rate hence makes it inaccessible to Islamic banks. Therefore, the sources of liquidity for Islamic banks are of different nature. The model of Islamic banking is based on Profit and Loss Sharing – PLS. The basic principle of PLS modes of finance is based on partnership with the borrower. Instead of lending money at interest, the bank shares in the enterprise profits and losses. Hence, the income generated from profits is the source of liquidity to Islamic banks. However, unlike interest-based tools, in the case of Profit and Loss sharing modes of finance, there is no guaranteed rate of return on the investment since income depends on the profit earned by the partnership company and may possibly result in losses.

Whether the bank is Islamic or conventional each has a difference capacity to absorb risks, therefore every bank must understand its ***risk appetite*** and develop a comprehensive risk appetite framework that helps banks better understand and manage their risks by translating risk metrics and methods into strategic decisions, reporting, and day-to-day business decisions (Uddin, 2015b).

Risk Appetite defined by ISO Guide 73:2009 is “the amount and type of risk that an organization is willing to pursue or retain”. Risk appetite allows banks to decide how much they are willing to accept risks while pursuing its objectives, and before any action is decided to be necessary in order to reduce the risk (Manoukian, 2016). Risk appetite is decided by the board of management along with the risk management committee.

Unfortunately, risk appetite and risk tolerance are oft used interchangeably in the risk management field which can lead to errors in the risk appetite framework as they are different and specific concepts. Both risk appetite and risk tolerance set limits of how much risk an institution is ready to take. While risk appetite is the general level of risk a bank is willing to accept, risk tolerance is more specific and affects individual risks. ***Risk tolerance*** defined by ISO guide 73:2009 is “an organization or stakeholder’s readiness to bear the risk after risk treatment in order to achieve its objectives”.

Scholars like Dean and Giffin (2009) distinguished risk appetite from risk tolerance by defining risk appetite as “the amount of total risk exposure that an organization is willing to accept or retain on the basis of risk-reward trade-offs; reflective of strategy, risk strategies and stakeholder expectations; set and endorsed by board of directors through discussions with management” while they defined risk tolerance as “the amount of risk an organization is willing to accept in the aggregate (or occasionally within a certain business unit or for a specific risk category); expressed in quantitative terms that can be monitored; often expressed in acceptable/ unacceptable outcomes or levels of risk”

Ingram (2014) on the other hand defines risk appetite as “the level of risk associated with the balance between risk and reward that is comfortable for the company, the level of risk that aligns with the firm´s business strategy and capitalization” whereas he described risk tolerance as the boundary on risk taking, “ it can be quantitative or qualitative; qualitative risk tolerances may set out the company’s aversion to particular types of risk, while quantitative risk tolerances establish constraints on the amount of risk the firm is willing to take”. Example he gave:
“Risk Appetite on capital: less than 20% chance that more than 10% of capital will be lost next year.
Risk Tolerance on Capital: less than 5% chance of capital falling below 150% of regulatory requirement in the coming year”.

Figure 2 shows a comprehensive risk appetite frame where risk tolerance for each specific risk is included. Figure 3 shows the difference between risk appetite and risk tolerance.

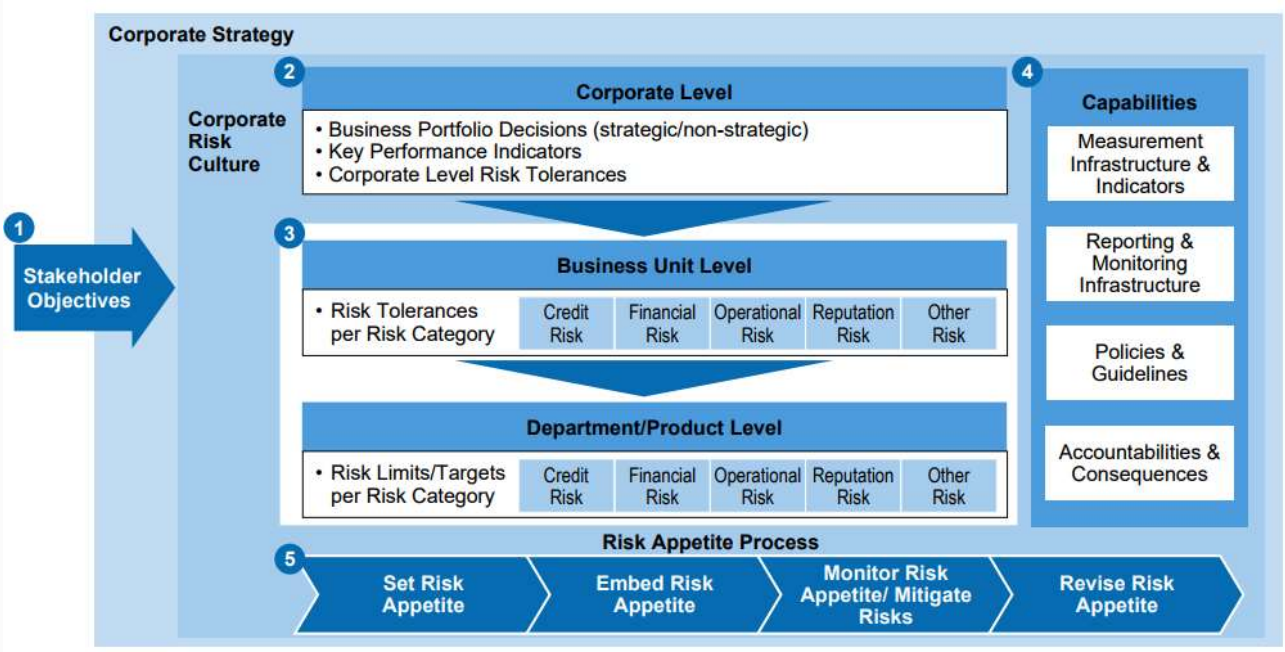


Figure 2: Risk Appetite Framework (Hyde et al, 2009)

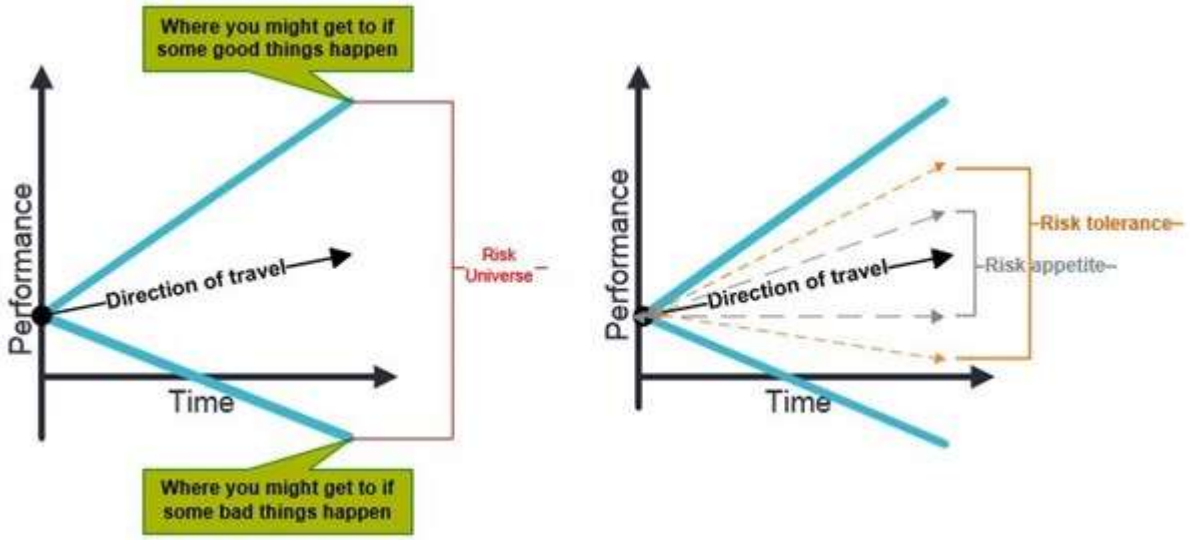


Figure 3: Difference between Risk Appetite and Risk Tolerance (IIA, 2017)

In figure 3 risk appetite is the bandwidth the bank aims to work within to achieve its objectives and risk tolerance has a wider scope than risk appetite as it represents the outer boundaries beyond which the entity could not cope in terms of risk capacity i.e., "the resources, including financial, intangible and human, which an organization is able to deploy in managing risk" (IIA, 2017).

1.4.2. Risk Identification

Risk identification defined by Eaton et al (2015), “is the process of taking stock of an organization’s risks and vulnerabilities and raising awareness of these risks in the organization”. All risks related to achieving the specified goal must be identified. Although identifying emerging risks may require banks to perform intensive stress tests and scenario planning, most understand that gaining broader perspectives on probable risks that could have a significant systemic impact would be highly beneficial.

Risk identification is the starting point for understanding and managing risks. Identifying risk and the factors that may contribute to the risk drives downstream processes of the risk management system including risk measurement, assessment & prioritizations and control.

Risk identification begins with identifying crucial activities of the financial institution. Crucial activities are those activities that are substantial to business strategies and operations. Crucial activities are identified from various sources including the institution's strategic business plans, organizational charts, capital allocations, and internal and external financial reporting. Generally, the followings are some of the crucial activities identified as prevailing in banks: cash management, liquidity & investment management, lending services, strategic management, wealth management, technology, and service delivery (DICO, 2005)

Risk identification should involve defining a probable but severe forward-looking scenario, by developing comprehensive stress scenarios that are explicitly designed to target organization-level risks as well as key systemic vulnerabilities. This should include risks outside of the common risk types owned by the risk department i.e., credit, liquidity, market, and operational to include expense drivers and revenue drivers as well in order to better assess the extent of the risk. An example would be considering the risk of financial technology (FinTech) usage to enhance products and services or if a bank has a significant concentration of credit exposure to a specific industry, it may need to include an additional stress test on factors which drive that industry’s credit losses such as sharp decline in their product prices.

Full capture of risks helps to ensure the bank has adequate capital and liquidity, can properly tailor scenarios to its own risk profile, and can manage its risk appropriately. However, in order to receive full benefit from risk identification exercise, engagement of senior management is

crucial so that risk identification task receives focused attention and resources on the vulnerabilities that could most significantly threaten the bank. Nonetheless risk identification cannot be limited to the risk management department and senior management; the whole institution must be involved to ensure comprehensive and deep collection of all possible risks. "The use of parallel top-down and bottom-up processes provides a higher likelihood of identifying all the organization's key risks than either process in isolation. A top-down process is led by senior management and should focus on the organization's most important risks, while a bottom-up process is conducted by management across the entire organization, harnessing information already gathered through processes" (Eaton et al, 2015). "Owners of the risk identification process should recognize that the process must encompass the broader organization to achieve comprehensiveness" (Eaton et al, 2015). Continuous participation from the entire institution and face-to-face interaction are required to boost trust and open communication which is crucial to effective risk identification. Such extensive involvement of the institution will raise understanding of the accurate sources of risk, define how risks link to specific business functions, and provide the best opportunity to identify newly emerging risks. Risk identification hence should occur regularly throughout the institution and a precise periodical process is needed as sources of information change and new information becomes available to provide periodical updates and make sure that the full list of risks is current and up to date.

1.4.3. Risk Assessment and Prioritisation

Following the initial risk identification phase, the risk management department should have a working list of risks that have been identified as potentially affecting the bank. An example of such list could include the following variables: real interest rate (RIR), inflation (INFL), money supply (M2), foreign exchange reserves (M2RES), liquidity ratio (LIQ), unweighted capital adequacy ratio (LEV), real property price growth (RHPG), etc. In case of Islamic financial institution, the risk of Loss based on Profit & Loss Sharing principles and the risk of commodity or leased asset can be included. From this list, using qualitative and quantitative methods, the risk manager should categorize and prioritize those that seem minor and do not require further attention from those that require follow-up, qualitative analysis, quantitative analysis, and active mitigation and management. The risk assessment and prioritization process provide an assessment of the magnitude and seriousness of each identified risk (National Research Council, 2005).

1.4.4. Risk Measurement

The banking business is the business of managing risk. The task of the risk manager is to measure risk and know how much risk the organization is taking. Risk measurement is "in particular the measurement of financial asset return volatilities and correlations" (Andersen et al, 2012). The different types of financial risks that a bank faces in the loans or financing it provides such as credit, market, liquidity and operational risks are measured by different models. Credit risk, for example, is measured by the exposure at default, probability of default and loss given at default. Operational risk is measured by the Beta and alpha factors. Market risk, i.e., interest rate and Forex rates is measured by the Value at risk. Value-a Risk (VaR) is defined "as the maximum potential loss in value of a portfolio of financial instruments with a given probability over a certain horizon" (Manganelli & Engle, 2001). In simpler words, it calculates the worst loss over a given horizon at a given confidence level under normal market conditions. VaR can help prevent portfolio managers from taking extremely high risk more than what is allowed in the bank portfolio risk policy. The main issue lies in the amount of capital needed to back the exposures that can bring about capital destruction and subsequently bank insolvencies. Risk measurement must also be complemented by other measures such as stress tests that take into account extreme events not captured by VaR statistics (as it only captures situations under normal economic conditions). Stress tests can help identify extreme events that could trigger catastrophic losses which VaR has not been able to assume in its estimation of loss (Steven, 2013)

1.4.5. Risk Control

Risk is pervasive in banking operations; a bank cannot run without taking risks. There are different risk treatment options that banks can choose from when faced with a transaction involving risk (Sheehan, 2010):

1. Avoid the risk.
2. Transfer the risk.
3. Reduce the risk.
4. Accept the risk.

Risk Avoidance or elimination is avoiding any exposure to the risk whatsoever. It is however not limited to not performing an activity that carry risk at all, but it can also mean redesigning a process or work so that the risky step no longer must be taken. It can include the

standardisation of all business-related activities and process, construction of diversified portfolio, and implementation of an incentive compatible scheme with the accountability of actions (Santomero, 1997). It is the best risk management strategy that banks should invest the most effort into investigation wherever possible. However, banks should keep in mind that "avoiding risks also means losing out on the potential gain that accepting the risk may have allowed" (Elderson, 2024). Not entering a business to avoid the risk of loss also shuns the possibility of earning profits.

Risk Transfer as defined by (CNA, 2016) "is a risk management and control strategy that involves the contractual shifting of a pure risk from one party to another". This means causing another party to accept the risk by contract or hedging. An example of risk transfer is the purchase of an insurance policy, by which a specified risk of loss is passed from the policyholder to the insurer against insurance premium charged by the insurance company for accepting the risk**.** Other examples would be buying or selling of financial claims, changing borrowing terms, or taking offsetting positions in derivative securities. This is typically how brokerage firms or fund managers use hedging for financial risk management.

Risk transfer can also be accomplished through contracts which often include indemnification provisions. An indemnity clause is "a provision in a contract under which one party, the indemnitor, (or both parties) commit to compensate the other, the indemnitee, (or each other) for any harm, liability, or loss arising out of the contract" (Thomson Reuters, 2023). In addition to direct financial losses, some contracts may also transfer legal defence or product recall costs.

Risk Reduction is essentially concerned with minimizing the severity of particular risk consequences. In this strategy risk is not eliminated or transferred to a third party; it is however accepted for the sake of doing the business and is therefore now trying to reduce the level of expected loss, the probability of the risk materializing, or the organizations exposure to risk. Risk reduction is chosen when a risk elimination strategy is considered to be excessive in terms of cost or time.

Risk Acceptance/tolerance as explained by Thune (2015) is the amount and type of risk an institution can accept in order to achieve its business objectives. Every organization and every individual have a different level of risk tolerance and risk appetite. They are often shaped by the organization's corporate culture and values and are categorized as aggressive, moderate, or conservative. Risk culture must be widely understood throughout the organization, open to

changes particularly to new events that can have extremely negative consequences (Dean and Giffin, 2009).

Risk tolerance is a matter of choice for the institution, and it is the only good choice when all other strategies explained above are analyzed and found to be not feasible. Risk tolerance should always be made wisely and based on the circumstances faced at a given point in time.

In selecting the most appropriate risk treatment option, financial institutions should balance the costs of implementing each activity against the benefits derived. In general, the cost of managing the risks needs to be commensurate with the benefits obtained. The general practice of financial institutions is to avoid certain activities that impose risk upon them, shifts risks that can be transferred, or accept risks that can be efficiently managed. Some risks, however, must be in any case accepted by financial institutions due to the complexity of the risk and the difficulty in separating it from assets whereas some are central to their business.

1.5. The Basel Accords

Academics, practitioners, and regulators agree that effective risk management is essential for managing the business of banks. This reality has given rise to a comprehensive approach to dealing with bank risk exposures. As a result, the Basel Committee on Banking Supervision has developed various accords (Basel I, Basel II, and now Basel III) to support banks' risk management practices. Therefore, it is very vital when managing risk to take into consideration the Basel Accord established by the Bank of International Settlement (BIS) in Switzerland. Basel Accord is a set of agreements which mainly focuses on risk to banks and the financial system. It helps to foster financial stability and common standards of banking regulations. The purpose of the accord is to ensure that financial institutions have enough capital on account to absorb unexpected losses arising from credit, market, and operational risk while at the same time fulfilling their obligations to pay back creditors.

The first Basel Accord, issued in 1988, focused on credit risk. This was followed by Basel II in 2004 which concentrated on both credit-risk weight of assets and operational risk. In 2011, Basel III was introduced to revise capital standard by tightening the definition of capital and increasing the capital adequacy ratio to 12.5% in contrast to 8% under Basel II.

1.5.1. Basel I

For several years, Basel I (1988 Basel Capital Accord) set the international standard for bank capital. While the original Basel Committee was composed of representatives from just the G-10 countries (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States), Basel I was ultimately endorsed by over 100 countries. Nevertheless, as international financial markets developed, the business of banking, supervisory approaches, risk management practices, and financial markets each have experienced critical transformation since then (BIS, 2001). Basel I accord became less and less consistent with the leading international banks. More and more banks were faced with risks that Basel I had not been designed to capture. Over the counter (OTC) derivatives and the use of securitization techniques which grew hugely in the 1990s have changed the risk profile of banks. Therefore, in response to these developments, in 2004, the Basel Committee announced a New Capital Framework with an implementation date of 2007. The New Capital Framework is often referred to as Basel II (Schooner & Taylor, 2010).

In 1988, the Basel Committee endorsed the first Basel Accord (Basel I) and it became the internationally recognized risk assessment framework for bank capital in use throughout much of the world. The focus of Basel I was to provide an adequate capital cushion for credit risks i.e., the risk that the bank's customer will default. The reason behind Basel I was to create minimum capital standards for internationally active banks. Hence, banks from different countries competing for the same loans would have to put aside approximately the same amount of capital on the loans. In this way international banks were restrained from building business volume without sufficient capital backing.

To measure credit risk, Basel I is derived from equity/assets ratio the so-called risk assets ratio or solvency ratio. "The risk assets ratio or solvency ratio is similar to an equity/assets ratio in that it expresses the bank's capital base as a percentage of its total risk assets. However, unlike the simple assets/equity ratio, the total value of a bank's assets is derived only after discounting its assets for their relative degree of risk" (Schooner & Taylor, 2010).
The formula for risk assets ratio is:

Risk Assets Ratio = Capital / Total Risk Weighted Assets ≥ 0.08 or (8%). (Schooner & Taylor, 2010)

Capital in the numerator was defined as comprising two components: core capital (Tier 1) and supplementary capital (Tier 2) (see figure 5). Tier 1 (core capital) included the book value of common stock and reserves. Common stock is the paid-up share capital and reserves are equity as determined by the difference between assets and liabilities. Tier 2 (supplementary capital) was deemed of lower quality. It included general loan loss reserves, subordinated debt both term and perpetual, and cumulative and/or redeemable preferred stock. A maximum of 50% of a bank's capital could comprise tier 2 capital.

Tier 1 Capital	Common Stock*
	Disclosed Reserves (or retained earnings)
Tier 2 Capital**	Undisclosed Reserves
	General Loan-loss provisions
	Hybrid debt capital instruments***
	Subordinated term debt
	Subordinated term debt with minimum maturity of 5 years ****

*Issued and fully paid common stock and non-cumulative perpetual preferred stock

**total Tier 2 cannot exceed total Tier 1

***e.g., cumulative perpetual preferred stock

****may be included only up to 50% of Tier 1

Figure 5: Key Component of Tier 1 and Tier 2 Capital (Schooner & Taylor, 2010)

Whilst the numerator comprises the capital in the equation, the denominator comprises the total of a bank's assets. The assets of a bank are assigned to one of a number of risk weighting categories, effectively discount factors that adjust the value of an asset according to its degree of credit risk Capital (Schooner & Taylor, 2010)

The Credit risk degree was divided into 5 categories: 0%, 10%, 20%, 50%, and 100% (Figure 6). To calculate required capital, a bank would multiply the assets in each risk category by the category's risk weight and then multiply the result by 8%. Commercial loans, for example, were assigned to the 100% risk weight category. Thus a $100 commercial loan would be multiplied by 100% and then by 8%, resulting in a capital requirement of $8.

Weight %	**Asset Type**

0	• Cash. • Claims on central governments and central banks are denominated in national currency and funded in that currency. • Claims on OECD countries, central governments and central banks. • Claims on non-OECD central government in national currency.
20	• Cash items in collection • Claims on banks incorporated in the OECD. • Claims on banks incorporated in countries outside the OECD with residual maturity less than 1 year. • Claims on OECD public-sector entities, excluding central government, and claims on guaranteed securities issued by such entities.
50	• Residential mortgage loan that is or will be occupied by the borrower or that is rented.
100	• Claims on the private sector. • Claims on non- OECD banks with residual maturity of over 1 year. • Claims on non-OECD governments unless denominated and funded in national currency. • Claims on commercial companies owned by the public sector. • Plant and equipment, premises, and other fixed assets. • Real estate owned

Figure 4: Basel I Risk Capital Weights Categories (Schooner & Taylor, 2010)

Selected Islamic Assets Weight risk.

Assets	Risk Weights
Murabaha	50%
Ijara	50%
Equity (non-listed companies)	150%
Equity (listed companies)	100%
Sukuk	50%
Musharaka	150%

Figure 5: Selected Islamic assets risk weights (Bank Negara Malaysia, 2019)

Although Basel I was simple, straightforward, and easy for the banks to calculate, it has received major criticism due to its difficulty to measure the true riskiness of banks assets and the broad categories of risk weighting that do not adequately differentiate between assets with different risk characteristics. This difficulty in measuring the riskiness of the assets is basically due to information asymmetries. This means that banks regulators who do not possess the same information as the banks themselves, are at a disadvantage in measuring accurately the degree of risk in banks assets. Currently, there is little science and more intuition used in determining, for example, that residential mortgage loans should receive a 50% risk weighting. Moreover, Basel I give the same huge category the same risk weights. For example, commercial loans risk weight is 100% which covers lending from large international companies to fresh startups. The probabilities of these two borrowers defaulting is however very different and will "be reflected in the interest rate that the bank can charge them, with lending to a start-up being potentially far more profitable than lending to a large corporation. Under the Basel approach, the amount of capital a bank must set aside against both loans will be the same—$8 for each $100 it lends. As a result, when faced with the choice of lending $100 to a large corporation, on which it is likely to earn a fraction of a percentage point, or to an Internet start-up, on which it can earn a much higher interest margin, the bank will be tempted to lend to the latter, despite the comparatively higher default risk of the start-up" (Schooner & Taylor, 2010). Another criticism faced by Basel I is that it focused only on credit risk and ignored all other types of risks that are important. As a result, the Basel Committee started a review of Basel I in 1991 and was completed in 2004 which resulted in what became known as Basel II.

1.5.2. Basel II

The Basel II capital adequacy framework is designed with the intention of correcting some of the most obvious shortcomings of Basel I. Basel I concentrated on credit risk while banks are exposed to a variety of other risks that Basel I ignored. Basel II goal was for the banking system to maintain enough capital to guard against the damage of financial shocks and unlike Basel I; it covers three risks, namely credit, market, and operational risk.

The Basel II consists of three pillars (Basel Committee, 2003)

1. ***Pillar 1: Minimum Capital Requirement***

This pillar prescribes the determination of regulatory capital for credit, market and operational risk which reflects banks' actual risk of economic loss.

A bank business must ensure that it has enough capital to absorb potential losses or risk arising from failure of the counterparty in fulfilling their debt obligation (i.e., credit risk), market volatilities (i.e. market risk) and problems associated with the bank's internal activities (i.e. associated risk). In this manner, the capital ratio given by Basel II has incorporated the three main risks in the formula below:

Risk Assets Ratio = Capital / [Total Risk Weighted Assets (credit risk + Market Risk + Operational risk)]

Credit risk = Risk weight assets = Financing exposure x risk weight

Market risk = Gross earnings x 12.5%

Operational risk = Gross earnings x 12.5%

2. ***Pillar 2: Supervisory Review***

While Pillar I sets the rules of capital adequacy, Pillar 2 focuses on how these rules are being followed by banks. It will review the banks' internal assessments of their overall risks and capital needs. Activities and risk profiles of individual banks are evaluated by regulators to ascertain whether banks should hold higher levels of capital than the minimum requirements specified by Pillar 1.

3. ***Pillar 3: Market Discipline***

Pillar 3 dealt with introducing and strengthening disclosure requirements for banks operating within the framework of the Accord. It strengthens market discipline by requiring banks to

publicly provide information on their capital management, risk management and other control-related activities. It also enhances the degree of transparency in the bank's public reporting to shareholders and customers. The main aim is to make the market more transparent and efficient.

1.5.3. Basel III

Some commentators have blamed Basel II for the 2008 crisis. According to them, from one side Basel II gave too much freedom to banks, in computing quantities such as the Probability of Default (PD) and Loss given default (LGD), an indicator of the severity of loss, thus increasing risk; while, from the other side, it introduced too much rigidity in the way banks had to hedge risk, not allowing them to react quickly enough (Hull, 2012)

The main flaws of the Basel II construction can be summarized as follows. First, it became clear that the capital reserves required by Basel II were insufficient in bad market conditions, as those of a world crisis. Surprisingly, Basel II contained no uniform definition of capital for banks, thus increasing the uncertainty on the markets. Inadequate risk management approaches were another flaw of Basel II. It became evident that Basel II underestimated liquidity risk and excessive leverage as possible causes of financial distress for banks (Finance and development, 2008)

In fact, Basel II required banks to increase their capital ratios when facing greater risks. Naturally this could require them to lend less during a recession or a credit crunch, thus possibly aggravating the downturn (Finance and development, 2008)

The Basel Committee began discussing a new version of the Basel Accords in 2009, paving the way for Basel III. The first version of Basel III was released in 2011, along with Basel 2.5, a set of more stringent market risk rules. Basel III, which is more concerned with credit risk, went into effect in 2013. Basel III is not a major revision of Basel II, but rather an attempt to address Basel II's flaws. Basel III's main points are new capital definitions and requirements, the introduction of so-called capital buffers, a greater emphasis on leverage ratio and liquidity risk, and a stricter definition and treatment of counterparty credit risk.

According to Basel III, a bank's total capital consists of three components. The first is known as Tier 1, or core capital. It consists of share capital and retained earnings but excludes goodwill

and deferred tax assets. Tier 1 capital must always be at least 6 percent of risk-weighted assets. Tier 1 capital is then supplemented with a component known as Additional Tier 1. Extra items, such as non-cumulative preferred stocks, are included in this component. Preferred stocks are a type of stock that has advantages that common stocks do not. Typically, they have dividend preferences, which means that if dividends are paid, they must first be paid to preferred stock owners. Dividends do not accumulate in non-cumulative preferred stocks if they are not paid. (Basel Committee, 2023a).

Tier 2 capital is the third component, and it includes supplementary capital, such as debt subordinated to depositors with a 5-year original maturity. Tiers 1 and 2 must account for at least 8% of RWA (Basel Committee, 2013). There is no longer a Tier 3 capital in Basel III, as there was in Basel II.

Capital buffers are additional amounts of capital required by Basel III for banks to maintain. They are the conservation buffer and the countercyclical buffer. Both buffers must be met with Tier 1 capital. The conservation buffer corresponds to 2.5% of the RWA. It is meant to ensure that banks build up capital during good times, so that they are more able to cover losses during periods of financial difficulty. The countercyclical buffer goes from 0 to 2.5%. The conservation buffer is compulsory for all banks, while the countercyclical buffer is left to the discretion of national authorities, hence it can vary from country to country. Because of the conservation buffer, the total capital requirements of a bank increase to 10.5% of RWA at all times. During crises, banks can decrease up to 8%, but then they are obliged to bring capital back as soon as possible. In addition to capital requirements based on risk-weighted assets, banks are required by Basel III to maintain a minimum leverage ratio of 3%. The leverage ratio is the ratio of capital to total exposure, and it can be seen as a measure of the riskiness of a bank (Basel Committee, 2015).

National regulators can impose stricter rules under the Basel III framework. In the US, for example, for some Systemically Important Financial Institutions (SIFI) the leverage ratio is at least 6% (Congressional Research Service, 2018) A Systemically Important Financial Institution is any financial institution whose failure may trigger a financial crisis. They are also known as Too Big to Fail, and Too Interconnected to Fail. Liquidity risk is the risk that manifests itself in situations in which a party that is interested in trading an asset cannot do it because nobody in the market wants to trade for that asset. For banks this generally happens because banks have

the tendency to finance their long-term needs with short-term funding. In good times, this is generally not a problem. If a bank is perceived as safe and healthy, it will have no problem in getting funding. But, in bad times, liquidity risk can lead a bank to the impossibility of rolling over and financing itself. This is essentially what happened to Northern Rock in the UK, and Lehman Brothers in the US (Congressional Research Service, 2018)

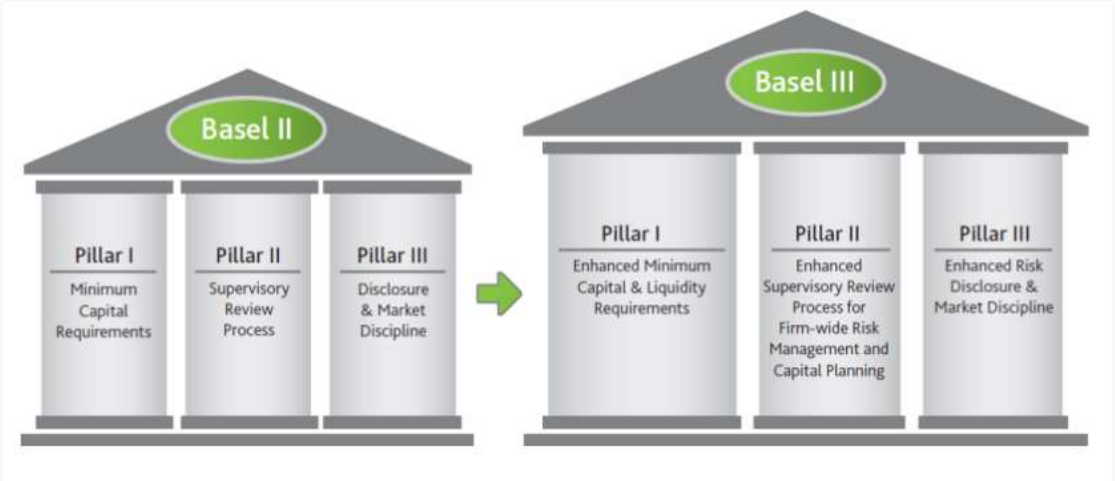


Figure 6 Basel II & III Guidelines (Altarik, 2015)

In summary, Basel II and Basel III allow banks to mobilize deposits based on the amount of capital they are holding and prescribe an 8% and 12.5% capital ratio respectively. The capital serves to support the risk profile of the portfolios, thus deserving it to receive rewards from the risk-taking position.

Chapter 2: Risk Management in Conventional Banks

In theory, banks are seen as financial institutions primarily concerned with the collection of deposits and the provision of loans to their customers. Although the goal of each economic activity is embodied in the profit-making function, the flip side of this reality should not be overlooked: every profit-oriented purpose is inextricably linked to a certain level of risk. Legal entities are exclusively responsible for risk quantification using concrete methodologies and techniques, and risk control and monitoring units provide guidance to top management for decision-making in order to ensure future economic success.

From the perspective of the bank and its business, as well as the stability of the financial sector, the risk management process should include developed methodologies and procedures that would take effect in efficient and comprehensive observation of potential risks and reaction options before it was too late. The notion of risk management has its roots in the corporate governance of insurance firms, with a focus on the potential of accident cases occurring, which have an impact on the companies' assets and income. Risk managers are individuals who oversee risk management in organizations.

The term risk management is a relatively recent expression, yet risk management as a profession is as old as civilization itself. Risk management, in its broadest sense, is a process of personal and organizational asset and revenue protection. Risk management is a business activity that provides an adequate way of dealing with risks that are inherent in corporate operations.

In 1956, Harvard Business Review published one of the first studies in this field. The idea of personnel accountable for risk management within a specific business (risk managers) was offered as a proposition in author Russell Gallagher's work. The emphasis was on the proclamation of core principles for risk management sector operations, which enable organizations to function effectively in a variety of market scenarios. (Gallagher, 1956)

The current accepted concept of risk management dates back to the early 1950s in the twentieth century. Harry Markowitz was the first economist to include risk in portfolio theory and discussions about diversification. With the idea of risk, Markowitz explained the relationship between return and utility. In this approach, he laid the groundwork for further financial study,

which led to the development of contemporary portfolio theory in the first instance and Black-Scholes theory of options later.

Risk management can also be defined as a function in a bank created for the purpose of risk hedging that includes activities such as defining bank exposure and evaluating potential losses; risk assessment based on measurement and analysis of losses in the past as well as assessment of variables that will have an impact in the future; decreasing and neutralizing losses through the use of various types of collaterals; financing through reserves provision; development of specific techniques; and implementation of expert opinions.

2.1. Credit Risk Management

Credit risk is one of the essential risks for banks and other financial institutions along with market risk and liquidity risk. Since credit business is the core business of banks, credit risk is the highest risk exposures of a bank. Therefore, it is fundamental for a bank to have effective management and a concrete measurement of credit risk in order to maintain solvency and profitability.

Joseph (2013) defined credit risk as "the probability of the loss (due to the non-recovery of) emanating from the credit extended as a result of the non-fulfillment of contractual obligations arising from unwillingness or inability of the counterparty or for any other reason" If the probability of the loss is high, the credit risk involved is also high and vice versa. These losses include both losses due to defaults and losses caused by variations in the credit quality of counterparty (Joseph, 2013).

Credit risk consist of the following credit risk components: (Bessis, 2015, p.28)

I. **Default risk**: is "uncertainty surrounding a firm's ability to service its debts and obligations." (Crosbie & Bohn, 2019) resulting in total or partial loss of credit. There are several default situations such as delay in loan payment, insolvency of the borrower, reorganizing the debt structure due to decline in the credit standing of the borrower etc.
II. **Migration risk:** refers to the loss due to the deterioration of the credit standing of a borrower, such deterioration does not imply defaults, but it does imply that the probability of default increases due to the credit migration event and the borrower value decline.

III. **Exposure at Default** refers to the loss of future exposures (the loan amount plus the interest accrued) in the event of default. Exposure risk arises from the fact that future exposures, the size of amount due are subject to uncertainty. Since future exposure is uncertain, there is exposure risk.

IV. **Correlation and Concentration risk:** Correlation risk refers to credit losses due to loss correlation, which implies whether losses tend to occur independently from each other or whether they tend to appear jointly. The higher the loss correlation, the higher is the credit risk. Similarly applies to risk concentration, which refers to the fact that a large amount is lent to a small number of borrowers. If these many small borrowers tend to default jointly, the resulting loss is very large.

V. **Loss given default** refers to a part of the loan amount which is not paid back by borrower. The partial payment might be due to recoveries from collateral.

VI. **Counterparty risk**: this risk arises due to the non-performance of the trading partner rather than the borrower. It designates the form of credit risk that is specific to some derivatives and comes in three separate versions, depending on the type of deal: default risk, replacement risk and settlement risk. *Default risk* is the risk that counterparty defaults which leads to failure to pay transactions. *Replacement risk* is the risk that in case of default, it is not possible to replace the deal on the same terms and conditions. Settlement risk involves the risk that the counterparty fails before the transaction has been fully settled (Du et al, 2023)

The method used to assess the quality of the counterparty is Credit rating. Credit ratings can be external or internal, in other words, banks can rely on the ratings computed by third parties, namely rating agencies, or they can compute their own ratings. Any change in the credit quality of the counterparty may have a direct and an indirect influence on credit risk. If for example, an AAA bond is downgraded to BBB, this implies that the bond is becoming much riskier.

To assess and hedge credit risks, Basel III offers a set of approaches for measuring risk that provides higher risk sensitivity through differentiation between different borrowers (Lastra, 2004):

1. Standardized Approach
2. Internal Rating Based Approach (IRB)
    a. Foundation Internal Rating Based Approach (Foundation IRB)
    b. Advanced Internal Rating Based Approach (Advanced IRB)

According to the regulator, all three approaches are intended to determine the capital requirements for credit risk, or the minimum amount of capital that a bank or other financial institution must maintain to hedge credit risk.
The calculation of capital requirements is always based on a metric known as Risk-Weighted Assets (RWA).

According to the Basel Committee on Banking Supervision (2004), in the *standardized approach* once the RWA is computed - by multiplying the risk weights assigned by regulators to the asset's value - capital requirements for credit risk are only 8% of it. Banks that lack the sophistication to use the other approaches use the standardized approach.

In the *Foundation IRB approach* the RWA is computed after the Probability of Default is introduced (PD). Credit ratings (internal or external) and other models can be used to calculate PD. Once calculated, the PD can be entered into some formulas provided by the regulator to calculate the RWA. Because the Standardized approach is more conservative, the capital requirements under the Foundation approach are typically lower.

Banks using the *Advanced IRB approach* are free to compute a wide range of quantities, from the probability of default to the loss given default (LGD). All of these quantities are then used to calculate the RWA using internal formulas that are not imposed by the regulator, as is the case with the Foundation approach (Lastra, 2004). As a result, complex probabilistic models are created. Before approving its official use, the regulator examines each individual model. Because the Advanced approach necessitates a financial investment in research, it is typically used by large banks with quantitative research departments. The advantage of the advanced approach is that it frequently allows large banks to reduce their capital requirements.

2.1.1. Standardized Approach for Credit Risk (STC)

Under the Basel framework, the standardized approach is the simplest approach that banks can use to assess and hedge credit risk. Banks that use a standardized approach must compute the Risk Weighted Assets (RWA) to determine the minimum level of regulatory capital a bank must maintain to deal with unexpected losses (Basel Committee on Banking Supervision, 2017a). Risk-weighted assets are the weighted sum of on-balance-sheet and off-balance-sheet

items that have been weighted based on risk weights. Cash, securities, and loans made to individuals, businesses, other banks, and governments are common assets of a bank. Each asset type has unique risk characteristics. Each type of asset is assigned a risk weight to indicate how risky it is for the bank to hold the asset. The value of the asset (i.e., the exposure) is multiplied by the relevant risk weight to determine how much capital banks should keep on hand to protect against unexpected losses. Banks require less capital to cover exposures to safer assets and more capital to cover exposures to riskier assets. (Basel Committee on Banking Supervision, 2017a).

These risk weights are defined using credit ratings and hence they are all provided by the regulator. According to the Basel Committee on Banking Supervision (2017a), the minimum regulatory capital that banks must maintain consists of:

- "Common Equity Tier 1 – common shares, retained earnings and other reserves.
- Additional Tier 1 – capital instruments with no fixed maturity.
- Tier 2 – subordinated debt and general loan-loss reserves".

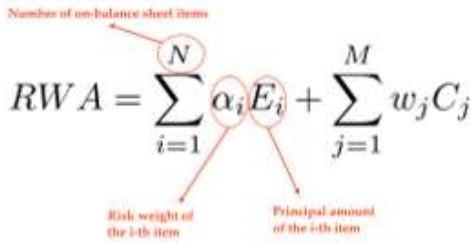
In the case of off-balance-sheet items, a quantity known as credit equivalent amount is considered. The credit equivalent amount is a metric for calculating credit risk for off-balance-sheet instruments. An off-balance-sheet item is simply an asset or debt that does not appear on the balance sheet of a company. Typically, it is an item over which the company has no legal claim. A loan is clearly an item on the books in the case of banks. If, on the other hand, this loan is securitized and sold as an investment, the securitized debt is no longer kept on the bank's books and thus becomes off-balance. Other off-balance-sheet items include guarantees, commitments, derivatives, and similar contractual arrangements, the full notional principal amount of which may or may not be reflected on the balance sheet Whether or not such instruments are recorded on the balance sheet at market value, they are subject to a capital charge" (office of the Superintendent of Financial Institutions Canada, 2017). As such, they are considered direct credit substitutes, and the credit risk is equivalent to that of a loan to the ultimate borrower or, in the case of an acceptance, to the drawer of the instrument (bis, 1986).

Calculation of Risk-Weighted Assets (RWA) under Standardized Approach

The Risk-Weighted Assets (RWA) under Standardized Approach can be computed using the following formula (Crillo, 2018):

$$RWA = \sum_{i=1}^{N} \alpha_i E_i + \sum_{j=1}^{M} w_j C_j$$

There are two summations in the formula: A summation in i, and a summation in j.
The summation in i is related to the on-balance items where their principal amounts are multiplied by their specified risk weights.

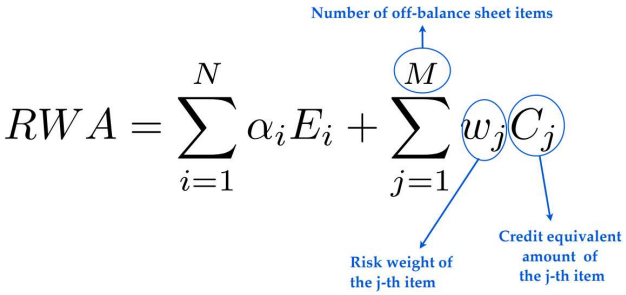


$$RWA \times 0.08 = RC$$

Where:

α_i	= risk-weight attached to assets "i"
E_i	= assets
RWA	= risk weighted assets
RC	= regulatory capital

The second part is the summation in j, which involves off-balance sheet items. In the case of off-balance sheet items, the sum is the products of credit equivalent amounts and their risk weights.



All risk weights are set by the regulator in the Standardized Approach, and banks are simply required to compute their RWA using the previous formula. Risk weights are assigned to different types of items based on their credit ratings. The capital required for credit risk is then equal to 8% of RWA.

The following table shows the risk weighting scheme put forward by the Basel Committee. These weights are regularly updated by the regulator; therefore, they can vary over time.

Residential real estate exposure						
	*LTV ≤ 50%	50% < LTV ≤ 60%	60% < LTV ≤ 80%	80% < LTV ≤ 90%	90% < LTV ≤ 100%	LTV > 100%
Risk Weight	20%	25%	30%	40%	50%	70%
*The LTV (loan to value) ratio is the amount of the loan divided by the value of the property.						
Exposure to bonds						
External Rating	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	
Risk Weight	10%	20%	20%	50%	100%	
Exposure to general corporate						
External Ratings	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	Below BB-	Unrated
Risk Weight	20%	50%	75%	100%	150%	100%

Table 1: Basel Committee Risk Weighting Scheme (Basel Committee On Banking Supervision, 2017)

Looking at the table, we notice that a BBB-rated government bond has a risk weight of 20% or 0.2. This is the percentage that must be multiplied by the principal amount. A loan to an AAA-rated corporation has a risk weight of 20%, and so on.

Assume a bank asset are made up of:

- 120 million Euros of loans to A-rated corporations,
- 10 million of AA-rated government bonds,
- 60 million Euros of residential mortgages with LTV 75%.

What is the value of RWA?

What is the capital requirement for credit risk?

Using the following formula (Cirillo, 2018):

For A-rated corporations, the E is 120 million Euros. And the Risk weight (RW) attached to the A-rated corporations as shown in the table is 50%, or 0.5 in decimals. Therefore, 120 multiplied by 0.5 equals 60 million Euros.
An A- rated corporations RWA is 120 x 0.5 = 60

For government bonds the RW for AA bonds according to the above table is 0%.
Hence 10 multiplied by 0 is 0.
An AA-rated government bonds RWA is 10 x 0 = 0

Finally, the residential mortgages principal amount is 60 million Euros and the risk weight according to the table is 0.30, Hence the result of their multiplication is 18 million Euros.
A residential mortgages RWA is 18 million Euros

The value of the total risk-weighted assets (RWA) is the sum of 60, 0 and 18 which are 78.

The Regulatory capital requirements (RC) for credit risk is 8% of RWA = RWA x 0.08 which results in 78 x 0.08 or 8% = 6.24 million Euros.

In this example that bank should have a minimum Regulatory Capital of 6.34 million Euros to deal with unexpected losses resulting from this portfolio.

2.1.2. The Internal Rating Based Approach

Banks that have received approval from their national supervisors can use the Internal Rating Based Approach. These banks must demonstrate to their national regulators that they meet certain minimum conditions both at the outset and on an ongoing basis." The emphasis is on banks' ability to rank order and quantify risk in a consistent, reliable, and valid manner (Basel Committee on Banking Supervision, 2023)

The **minimum requirements** are set by the national regulator, typically the Central Bank. Therefore, they can vary from country to country, even if they all share some common elements, described in the Basel II and III documents.

In general, the Banking Committee on Banking and Supervision (2023) lists the minimum requirements for entry and on-going use of the internal ratings-based (IRB) approach that banks should respect; amongst them are:

Composition

A bank which uses IRB methods must guarantee that its estimates of the risk parameters reflect the distinct characteristics of each counterparty. In other words, the risk parameters must differentiate between the different types of clients. The risk related to a retail customer cannot be assessed as the risk of a corporate client. Moreover, risk parameters should encourage risk diversification, and they should be consistent with their use in risk management decisions.

Compliance

When adopting the IRB approach, banks must demonstrate ongoing compliance with all the listed minimum requirements. If at a certain time the bank was not able to satisfy one or more of the minimum requirements for any reason, it is obliged to inform the national regulator and propose a plan about the strategies the bank intends to implement in order to return to compliance. If compliance is not respected, the regulator can impose penalties.

Risk Rating Design

The requirement of rating design is related to a set of statistical and technological rules, meant to guarantee the quality of the estimation of the risk parameters. Banks have the possibility to use many different models and ratings systems for distinct exposures, but the methodology according to which an exposure is assigned to a particular rating system must be logical and documented. A bank should not make use of a given rating system, only because it minimizes regulatory capital requirements. In other words, a bank always has to justify its choice with sound modeling arguments.

Corporate Governance

Any bank that uses IRB methods, the rating system has to be approved by the board of directors, who need to regularly check all the management reports that are written as part of the implemented rating systems. In order to ameliorate the risk management performance of a bank, its senior management should often review the used rating system and identify the areas that need improvement.

Disclosure

In order to be authorized to the use of IRB approaches, a bank must necessarily comply with the disclosure requirements of the third pillar (market discipline) of Basel II. These requirements include transparency, due diligence, etc.

The Internal-Rating Based (IRB) approaches are more sophisticated than the standardized approach, and they require more work and attention. However, on average, capital requirements obtained from IRB methods are smaller than those given by the standardized approach which is something desired by banks so they can use the excessive money for other profit generating activities.

Generally, IRB banks must produce their own estimates of risk parameters which are the Probability of default (PD), the Exposure at Default (AED), the Loss Given Default (LGD), and the Maturity (M) which are then used to compute the Risk Weighted Average (RWA) and the capital requirement.

In the **Foundation approach (F-IRB)** banks can compute the probabilities of default (PD) of their counterparties, using the methods they prefer. However, the formulas to compute all other risk parameters such as the Exposure at Default (AED), the Loss Given Default (LGD), and Maturity (M) are provided by the national regulator in accordance with Basel II and III rules.

In the **Advanced approach (A-IRB)** banks are allowed to compute all their risk parameters using their own empirical models. Therefore, banks develop the PD, LGD, EAD models on their own. These are then used in computing the RWA and 8% of RWA is the capital requirement for credit risk. The only condition is that computations should meet the minimum guidelines, which are set by the regulator. The regulators also check the statistical soundness and the reliability of the proposed models.

Risk parameters are the most important quantities in the IRB approaches. Each of them defines a fundamental aspect of credit risk.

Probability of Default (PD) as described by Bandyopadhyay, A. (2016), quantifies a borrower's likelihood of failing to meet contractual obligations and defaulting. Default does not always result in immediate losses, but it does increase the likelihood of bankruptcy and, thus,

subsequent losses. The possibility of default exists. Banks must first estimate the likelihood of a borrower defaulting over a given time horizon in order to properly estimate credit risk. Under the Basel II IRB approach, PD is the first dimension of measuring credit risk. The new Basel II accord's internal ratings based (IRB) allows banks to use their own internal credit ratings.

Banks must estimate rating-based PD in order to calculate regulatory capital. The primary goal of default risk modelling is to measure credit risk in terms of default probabilities rather than ordinal rankings. By providing a PD for a loan obligor, one is forecasting the likelihood of default over the specified time period (e.g., one year). This is true even when the previous default experience is used. PD can be calculated for each individual borrower or for the entire portfolio. Borrower-specific factors such as the source of finance, financials, firm size, competitive factors, management factors, and so on, as well as market-specific factors such as business environment, unemployment rate, interest rate movements, and so on, influence the probability of default (PD).

When a borrower's credit quality deteriorates, the likelihood of future default rises. Default can be defined in a variety of ways, including failure to meet a payment obligation, filing for bankruptcy, participating in a distressed exchange, breaching a covenant, and so on. The Basel II definition of default is based on two sets of conditions (at least one of which must be met): first, the bank considers that the obligor is unlikely to pay [in full], and second, the obligor's past due on any material credit obligation is more than 90 days.

The **Exposure at Default (EAD)** is the "amount of loss that a bank may face due to default. Since default occurs at an unknown future date, this loss is contingent upon the amount to which the bank was exposed to the borrower at the time of default" (Bandyopadhyay, A. 2016).

Loss Given Default (LGD) is another estimate for the expected and unexpected credit losses. The LGD is the percentage (%) of loss over the total exposure, in case of counterparty default. Therefore, LGD is a percentage of Exposure as Default (EAD) (Bandyopadhyay, A. 2016).

Let's assume that one of a bank's X client defaults and his outstanding debt is 100 million Euros. This 100 million Euros is nothing but the bank's Exposure at default (EAD). Usually when counterparty defaults, the bank is very unlikely to lose all the credit. Typically banks uses procedures such as foreclosure to be able to recover part of the credit.

Let us assume that this bank was able to recover 60 million by selling some collateral. In this case the banks actual loss was 40 million. This corresponds to 40% of the EAD which is the Loss Given Default. Therefore, the Loss Given Default (LGD) in this banks case is 40%.

Maturity (M) is the final payment date of a loan or another financial instrument/security. For example, a 2-year bond has a maturity of 2 years. A 20-year mortgage has simply a maturity of 5. And so on.

2.2. Operational Risk Management

Basel committee on Banking Supervision (2011b) stated that banks should develop, implement, and maintain a fully integrated framework in the overall risk management processes of the bank. Ghosh (2012) on the other hand suggested that the bank should treat its operational risk management as a totally independent risk management function to identify, evaluate, monitor, control and mitigate banks ' operational risk.

Generally, the operational risk management framework selected by the bank depends on a variety of factors such as banking business nature, size, complexity, and risk profile. Basel Committee on Banking Supervision (2011b) explained that Operational Risk Management Framework should also be consistent to the work environment, risk appetite, and targeted level of capital. It should provide the design of reporting and communication lines to help support understanding of operational risk in the workforce and to facilitate risk awareness and control culture in the institution.

It should also describe the role of various business lines, responsibilities and accountabilities guidelines. Therefore, when describing the structure, the bank risk system must present operational risk management policies, processes and procedures in a document and should clearly communicate it to staff involved in day-to-day activities. In addition, the document on operational risk management should identify policy implementation strategies and define risk tolerance limits and reporting levels in the event of infringement of these limits.

Moreover, based on the potential and historical record of events, the bank should decide on the process related to identifying and assessing operational risk. They should monitor and categorize operational risk loss data based on frequency and intensity and map them based on remedial

action priorities.

Also, banks should develop an effective process to screen and detect deficiencies in the system and procedures of operational risk management. In order to identify probable costly operational risk, they should also identify early warning indicators.

Finally, in order to manage operational risks, banks should map financial products and activities within the business units. they should establish policies, processes, and procedures to monitor and mitigate the key operational risks. The effectiveness of operational risk strategies should be reviewed on a periodic basis and amendments should be made in the event of deficiencies.

2.3. Liquidity Risk Management

The problem of the 2007-2009 global financial crisis have raised a liquidity risk issue for all financial institutions and have created anxiousness among regulators worldwide. The Basel Committee concluded that the crisis was caused by excessive leverage, poor capital bases, weak financing policies and inadequate buffers of liquidity. As a result, the market lost confidence in banks, which had a significant impact on many countries ' real economy (Basel Committee on Banking Supervision, 2010)

The theory of financial intermediation states that the provision of liquidity and financial services are the two most important reasons for financial institutions, particularly banks, to be present. Regarding the provision of liquidity, banks receive deposits from people with excess money and extend them as funds to the people who need money while maintaining the liquidity for any withdrawal of deposit. On the other hand, banks conduct the function of converting short-term deposits into long-term loans, making them inherently vulnerable to liquidity risk (Basel Committee on Banking Supervision, 2008b).

Liquidity risk management deals with the ability to meet cash needs as they arise. In order to ensure that they can be met with almost complete certainty, it is important for a bank to forecast its cash needs in both normal market conditions and stressed market conditions Cash needs depend on the withdrawal of depositors, draw on credit lines, guarantees made, counterparty defaults and so on. Cash sources are instruments that can be easily converted into cash, wholesale borrowing, securitisation of assets, new depositors, cash itself and central bank borrowing

(Hull, 2012)

It is important to differentiate liquidity from solvency. Solvency refers to a company which has more assets than liabilities, so that its equity value is positive. Liquidity refers to a company's ability to make payments in cash as they become due. Banks, which are solvent, may fail due to liquidity problems (Hull, 2012)

Banks need to maintain depositor liquidity demand on a regular and irregular basis. Regular depositor demand is the natural consequence of the depositor's daily business activities, while irregular demand is the outcome of the depositor's predictable and unpredictable liquidity demand. This is due to irregular depositor business activities, such a withdrawal from government tax operations and the execution of immature time deposits (Basel Committee on Banking Supervision, 2008).

Liquidity regular demands can be managed or mitigated using the following strategies: Firstly, the bank can invest the money in more liquid assets that can be easily converted into cash. Secondly, the bank should maintain increased sources of funds from various depositors for diversification. Thirdly, the bank should use the central bank as a lender in the last effort to meet the liquidity regular demand (Greenbaum and Thakor, 2019)

The banking regulations provided by Basel II, III, and countries ' central banks require banks to maintain a separate standby account to fulfil the depositors' regular demand. The bank can hold these funds in the following ways: currencies held with the central bank, certificates from the central bank, and deposits with commercial banks and cash items, such as outstanding Cheques that are not yet cleared through the clearing house (Hempel et al., 1994).

The Senior Supervisors Group (2009) advised that banks develop a thorough liquidity risk management approach to assure that it is compliant with the risk appetite of the bank. In addition, by identifying, measuring, monitoring and controlling, Basel Committee on Banking Supervision (2008b) suggested banks to categorize the liquidity risk management process. The liquidity risk management process contains the following elements: the Board of Directors' (BOD) policies for liquidity management, the role and responsibility of the Asset and Liability Management Committee (ALCO), the effective management information system, and the roles of the liquidity management internal control systems.

A survey of 62 large banks was conducted by Institute of International Finance and Ernst and Young (2012) showed that 92 percent of the largest banks changed their approach to liquidity risk management: raising buffers of liquid assets; increasing liquidity stress testing; bringing more rigorous internal and external pricing structures; raising the discussion and approval of liquidity risk appetite and contingency planning to the board level; and giving the CRO greater responsibility and involvement in liquidity management. For banks, systems, regulatory uncertainty and data quality, liquidity risk has been a significant area. Its consistency is also one of the main challenges for managing liquidity.

Following the global financial crisis, liquidity management has become a focused area for regulatory authorities. Basel III hence proposed two standard liquidity ratios, i.e., liquidity coverage ratio and net stable funding ratio. The liquidity coverage ratio allows he banks to measure that it has sufficient liquid resource to cover the net cash outflow for 30 days (Basel Committee on Banking Supervision, 2019b), while the net stable funding ratio is used to promote medium to long-term liquidity funding (Basel Committee on Banking Supervision, 2019c)

Jasiene et al. (2012) have suggested a liquidity risk management model for commercial banks on a time-limit basis, i.e., short term liquidity for the period of one month and long-term liquidity for the period of one year. Banks' short-term liquidity is measured through bank liquidity ratios, obligatory reserves, and short-term realisation of liquidity. While banks' long-term liquidity is measured by liquidity gap, deposit forecasting, liquidity and loan needs, and realisation of long-term liquidity limits.

In nutshell, a bank is said to have sufficient liquidity potential if it can obtain the necessary funds (through increased liability, securitization and sale of assets) promptly at a reasonable price. This is because the liquidity of a bank is a function of the situation and market perception of existing risks for credit institutions (Van Greuning et al, 2009).

The Basel Committee on Banking Supervision (2019), has completed a review of its 2008 Principles for sound liquidity risk management and supervision which set out a clear definition of liquidity in banking institutions, namely.

i. Liquidity is the ability of a bank to fund increases in assets and to meet obligations as they arise, without incurring unacceptable losses.
ii. The fundamental role of banks in converting short-term deposits into long-term loans

makes banks inherently vulnerable to liquidity risk, both of an institution-specific nature and that which affects markets.

iii. Almost every financial transaction or commitment has implications for the liquidity of the bank. Effective liquidity risk management helps ensure the ability of the bank to meet cash flow obligations that are uncertain as they are affected by external events and the behaviour of other agents. Liquidity risk management is of paramount importance because a liquidity shortfall in a single institution can have a system-wide impact.

2.4. Market Risk Management

Market risk includes the risk of financial loss as a result of price movements in the market. According to the Board of Governors of the Federal Reserve System (2021), market risk is assessed using, but not limited to, the following evaluation factors:

- The financial institution's earnings or the economic value of its capital are sensitive to changes in interest rates, foreign exchange rates, commodity prices, or equity prices.
- Given the institution's size, complexity, and risk profile, management's ability to identify, measure, monitor, and control exposure to market risk.
- The nature and complexities of interest rate risk exposure in nontrading positions.
- The nature and complexity of market risk exposure resulting from trading and foreign operations, as appropriate.

Market risk, according to the Basel Accord, is the "risk of loss in balance and off-balance-sheet items due to changes in market prices" (Basel Committee on Banking Supervision, 2005). Equity prices, interest rates, foreign exchange rates, and commodity risk are the most important factors that can lead to the emergence of market risk.

Equity risk refers to the risk of changes in equity prices having an impact on a bank's balance and off-balance-sheet items. Equity risk consists of two components: general market risk and specific market risk. More specifically, for an equity portfolio, general market risk denotes the portfolio's risk exposure to the equity market. Specific market risk, on the other hand, refers to the risk of holding an individual security within an equity portfolio that is not covered by general market risk (Platen and Stahl). Total exposure is expressed as net open position, and all positions balance and off-balance items that include securities are put through stress tested. If the bank has a high level of exposure to multiple securities, scenario analysis is much more

appropriate due to the high concentration of trading securities portfolio.

Commodity risk refers to the possibility of incurring losses because of market price movements of a bank's balance and off-balanced items, which have an impact on commodity prices. Commodity prices have an indirect impact on a bank's credit portfolio when the client's repayment capacity is threatened by price movement. Due to the significant volatility of commodity prices in the past, net positions in certain commodities are usually tested using historical scenarios. This makes assessing the price movement range in the future period easier.

Interest rate risk is the risk that a bank's capital and current or future earnings will bear because of unfavorable fluctuations in market rates brought on by the central bank's monetary policy actions. Over time, market demand and supply of the instrument must be adjusted to achieve parity in the yields given on securities across all markets. Excessive interest rate risk, however, can jeopardize banks' earnings, capital, liquidity, and solvency. This risk is a regular aspect of banking and can be a significant source of income and shareholder value.

Foreign currency risk, often known as exchange rate risk, refers to the financial impact of exchange rate variations. To put it simply, foreign exchange risk is the risk that changes in currency exchange rates will have an influence on a bank's financial performance or position. Depreciation/appreciation of the foreign currency, depreciation/appreciation of the base currency, or a mix of the two can all lead to foreign exchange risk.
Total market risk is the sum of the above-mentioned risk factors as well as other, so-called residual risks which are the remaining amount of loss exposure to which a business is exposed after all other risks have been eliminated or offset using risk management technique (AccountingTools, 2024). Examples of residual risks are:

- Spread risk, which occurs as a result of a spread in two different financial instruments. For example, credit spread risk is associated with government bonds and corporate bonds.
- Basis risk is associated with price differences between equivalent instruments such as futures, bonds, and swaps.
- Specific risk is associated with the issuer.
- and volatility risk is associated with the potential risk caused by price fluctuations in financial instruments.

To define global price risk of financial instruments, market risk and residual risk should be treated collectively.

Market risk can have an impact on a company's operations in a variety of ways. The direct impact of market risk can be seen in operational spread declines as a result of rising raw material prices or currency depreciation in countries designated as target markets for the observed company. Changes in the market environment may force companies to adjust their product and service prices while also changing sales volumes or competitiveness, depending on the positioning and market exposure of the main competitors. In that sense, most companies intend to manage market risk on their financial results, particularly non-financial institutions.

There is an overlapping of business and market risk with financial institutions. Their "raw materials" are currencies, interest rates, and so on, and financial institutions attempt to operate independently of market risk in order to achieve success based on the application of business strategies and decisions, as well as the return-risk trade-off that lies at the heart of decisions. Regular scenario analysis and stress tests should be part of the market risk management process. Financial institutions could select a scenario based on either historical data or empirical models of market risk factor movements. The goal is to assess the effects of significant changes in market risk factors on financial conditions. As a result, the chosen scenario may include unfavourable scenarios of low profitability, resulting in extraordinary losses. Scenario analysis and stress testing could be both qualitative and quantitative in terms of the effects of unpredictability in the market as well as non-market risk factors. Prices, volatility, market liquidity, historical correlations and assumptions in the condition of stress testing, vulnerability of institutions in "the worst-case scenario," default of large clients, and assumptions on maximum amount of cash flow inflow and outflow in new circumstances are examples of non-market risk factors.

Adequate scenario analysis and stress testing should provide significant assistance to the bank's top management in making better assessments of market movements on the bank's net profit and equity. The bank's executive board monitors and controls the results of prepared scenarios and stress tests on a regular basis, as well as reviewing the assumptions used in the analysis. If the achieved results indicate a high level of probability of future losses, the bank's top management takes additional risk management measures or decides to implement plans in the event of the occurrence of extraordinary events known as contingency plans.

2.5. Risk Measurements and Management Techniques

Risk management and measurement is very important in banks for effective mitigation and capital allocation. Risk measurements deals with financial institutions quantifying the risks they face whereas risk management is defined as a method for developing a business strategy for recognizing, quantifying, understanding and managing the nature of financial institutions' risks (Cumming and Hirtle, 2001).

There are different methods for assessing and quantifying the risks that financial institutions are facing. Two essential methods are Value at Risk (VaR) and Gap Analysis. Value at Risk assesses a confidence interval of the possibility of a result as well as a potential monetary impact, whereas GAP Analysis is used to quantify interest rate risk.

2.5.1.VaR

Value at Risk (VaR) is one of the recent risk measurements instruments used to calculate losses from investment portfolio, commodity portfolio, and foreign exchange portfolio due to uncertain market conditions. Banks are required to calculate VaR at regular time slots on different portfolios to quantify losses on asset values and to determine the capital adequacy required to cover market risk. VaR is a tool used to quantify potential losses on an asset or portfolio as a result of adverse market conditions fluctuations and is calculated by time slots and a certain level of confidence.

VaR as defined by Amin et. al (2018) is the “maximum potential loss in a value of a portfolio over a defined period for a given confidence interval in normal market condition”. The volatility in asset values, the chosen time period for risk assessment and the expected level of confidence are the inputs for VaR calculation. The chosen time period for VaR may be a day, a week, a month or a year, but the current Basel regulation allows banks to approximate the VaR model based on at least 10 working days. In addition, the holding time slot is determined by the bank's risk appetite, regulatory requirement, or standard accounting practices.

The volatility in the asset value can be measured by how quickly the prices of securities commodities, options are moving, or how much in each period the profit variance on investment in bonds is. VaR's value can change depending on the chosen time, i.e., holding period. The longer

the holding time, the greater the VaR showing a significant portion of potential loss (Ghosh, 2012)

Selection of the confidence level is based on the bank`s risk bearing approach and capacity. Banks with a liberal approach will select a 95% confidence level, while banks with conservative approach will choose 99.9% as a confidence level for VaR calculation (Ghosh, 2012).
Various experiments with the VaR model must be used to ensure the results are accurate. To ensure whether VaR forecasts matched the observed market volatility, back testing must be performed.

2.5.2. GAP Analysis

This instrument is a risk measurement instrument used to calculate and monitor the effect of on-balance sheet interest rates. This tool targets the risk of net interest income volatility over the periods specified. A maturity/re-pricing system is designed for this technique that distributes liabilities, interest-sensitive assets, and contingent liabilities positions in the time slots according to their maturity (if fixed) or remaining time to their next reassessment (if floating). Such timings are then used to produce indices of income-and economic-value-sensitivity to floating interest rates (Basel Committee on Banking Supervision, 2016). Upon choosing the time intervals, the organizations' assets and liabilities are divided into these time slots depending on their maturity based on fixed rates or the first time of re-pricing for flexible rates. The re-priced assets and liabilities are called as rate sensitive assets and rate sensitive liabilities.

The formula for calculating the interest sensitivity GAP between assets and liabilities is as follows (Khan and Ahmad, 2001; Makkar and Singh, 2013):

Gap = Risk Sensitive Assets – Risk Sensitive Liabilities

This formula gives the banks' management information about the effect of the interest rate change on the bank's net income. Positive balance would show that a potential interest rate increase would lead to an increase in net interest income and vice versa (Gomez et al 2016, 2001; Alam and Masukujjaman, 2011)

2.5.3. Duration GAP Analysis

Duration gap analysis is another instrument of measuring the sensitivity of banks to interest rate risk. Duration Gap analysis compares the economic value percentage change to the interest rate percentage change (Ghosh, 2012, p.356). Duration gap is a powerful tool for managing interest rate risk, used to minimize the effect of fluctuating interest rate on a bank's financial position. A bank's net financial position is equal to its assets ' market value minus its liabilities' market value. A bank will be more sensitive to the risk of interest rates if there is a difference between the maturity duration of assets and liabilities.

Duration analysis measures how well the timing of the asset cash inflows and the liabilities cash outflows are matched in response to the interest rate change. It is the average amount of time needed to recover the funds invested.

The formula to calculate the **duration gap** follows: (Cumming and Hirtle, 2001)

Duration Gap = DA – DL × (PL/EA)

Where, DA is the duration of the earning assets, DL is the duration of the paying liabilities, PL is paying liabilities, and EA is earning assets (Gomez et al, 2016).

If the duration of an earned asset is greater than the duration of the paying debt, the duration gap will be positive. If the interest rate increases, the asset loses more value than the liabilities, leading to a reduction in the bank's equity and vice versa. On the other hand, if an earned asset's duration is less than the paying liability's duration, then the duration gap will be negative. Often, as interest rates rise, liabilities lose more value than assets, resulting in an increase in bank equity value and vice versa (Gomez et al, 2016).

If the interest rate has an evolving and unpredictable situation, but stays within the defined level of tolerance, then it is prudent to target all assets and liabilities for a short maturity period. Based on the market valuation of their equity, banks are required to carry out sensitivity analysis under different interest rate scenarios. Because the length of financial instruments changes over time, there is a need to reset the period of assets and liabilities seldom to offset interest rate shocks (Ghosh, 2012).

2.5.4. Earning at Risk (EaR)

There are various sources of bank earnings, one of which is related to interest rate earnings. Earnings at Risk refer is a risk measurement instrument which refers to earnings loss (interest income) as a result of adverse interest rate movements (Basel Committee on Banking Supervision, 2019a). It is calculated for a specified period of time, i.e., monthly, quarterly, semi-annually, and annually. The banks measure the difference between the risk-sensitive assets and liabilities based on time slots and then multiply the positive or negative gap with the reported interest rate changes for the EaR calculation. Based on the size of assets and liabilities, the time slot for the EaR analysis is selected. If a bank has large, short-term assets and liabilities, the EaR should be evaluated on a weekly or daily basis. On the other hand, if a bank has long-term assets and liabilities, they will measure EaR monthly, quarterly, or semi-annually.

The EaR estimation formula as per Ghosh (2012) is as follows:

EaR= (Rate-sensitive Assets – Rate-sensitive Liabilities up to selected time slot) × change in interest rat

The EaR is determined by selecting the reprising period for assessing the interest rate sensitivity of assets and liabilities, distributing the risk sensitive assets and liabilities in different time slots depending on the reprising duration, measuring the net exposure within the chosen time slots and multiplying the net exposure with the interest rate shifts (Ghosh, 2012).

2.5.5. Sensitivity Analysis

Sensitivity Analysis is an effective risk measurement instrument for estimating a bank's balance sheet sensitivity under various interest rate scenarios. It evaluates the effect of market value on the bank's net income and the equity price. This methodology is conducted in terms of differences in the potential path of interest rates, the shape of yield curves, changes in business strategies related to financing hedging, product pricing, etc. Sensitivity analysis is complex in contrast with gap analysis and duration gap analysis, and the reliability of sensitivity analysis results depends on the validity of the study and reliability of the data**.** But unless these two conditions are met, the findings will be treated as undefined. The sensitivity analysis is mostly used by the larger financial institutions exposed to interest risk (Ghosh, 2012)

2.5.6. Risk Adjusted Rate of Return on Capital (RAROC)

RAROC is a risk measurement instruments that quantifies the risk by considering the bank managers' trade-off between risk and reward in the various assets. This technique was considered in late 1990 to measure the effectiveness of financial institutions' performance and best practices. Economic capital's purpose is to protect the financial institution against unexpected losses. Economic capital refers to methods and practices for attributing capital to financial institutions and banks to cover the economic effects of risk-taking activities (Hull, 2012). It is therefore important to allocate capital to protect against losses for different risk exposures.

The RAROC analysis provides the total capital required to cover unexpected losses and total return on a bank's capital. This technique is a comprehensive risk management tool used to measure credit, operational, and market risk capital requirements (Crouhy and Robert, 2001). RAROC is a great tool for risk measurement that allows banks and financial institutions measure solvency and assess the performance of various business activities.

RAROC = Expected profit/ Economic Capital

Where, expected profit = Return – Expected Loss – Expenses

2.5.7. Simulation Technique

Simulation analysis is a useful method for estimating the sensitivity of a bank's balance sheet to various interest rate scenarios. It assesses the impact on the bank's net income and equity price based on market value. This technique is used to analyse variances in the prospective path of interest rates, the shape of yield curves, and changes in business strategies such as finance, hedging, and product pricing, among other things. Simulation analysis is more difficult than gap analysis and duration gap analysis, and the outcomes of simulation analysis are dependent on the validity of their assumptions and the data's dependability. However, if these two conditions are not met, the findings will be ambiguous. Larger financial firms that are exposed to interest rate risk are the most likely to use simulation analysis (Ghosh, 2012)

2.5.8. Stress Testing

The Basel Committee on Banking Supervision (2009) stated that stress testing is a great tool used by bankers to manage risk. It is a component of internal risk management with the capital adequacy framework defined by Basel II. Stress testing notifies about the bank's risk exposure-related adverse unexpected consequences. It also shows how much capital is needed to absorb the losses caused by major shocks. Stress testing shows an alert about the adequate level of capital needed to tolerate the worst economic conditions. This tool will help other approaches to risk management and measurement. Stress testing gives information on forward-looking risk analysis, overcomes models and historical data limitations, maintains internal and external communication, provides capital and liquidity planning procedures, instructs the bank on setting the level of risk tolerance, assists developments in risk mitigation and contingency plans in different stressed situations.

Stress test can be applied using different methods. The test's complexity ranges from simple sensitivity tests to sophisticated stress tests used to assess the impact of macroeconomic stress conditions such as earnings and economic capital (European Banking Authority, 2018). The stress test is carried out with regard to risks such as credit, liquidity, market, and operational risks.

A stress test is used to produce information to summarize a company's risk exposure to the conditions that are possible and extreme. Risk managers are responsible for collecting and summarizing information related to the strategic relationship between risk-taking and risk appetite to the senior management. The stress test should be regularly calculated and monitored over a specified period. It is used to tackle the enormous movement of major market variables over and above day-to-day risk monitoring activities. The stress testing process involves finding potential movements, the market variables that need to be stressed, how much to stress them, and the required time duration for running the test. Once the assumptions and market conditions have been decided, shocks will be applied to the company's portfolio to assess the impact of individual market movements on the company's portfolio value and overall profits and losses (European Banking Authority, 2018).

2.5.9. Securitisation

Securitisation is a risk management instrument where certain assets are pooled to be reissued in the form of securities bearing interest. Buyers of these securities are given the interest amount and the principal amount. This method is used to transfer credit risk to other institutions such as banks, insurance companies, and hedge funds by many financial institutions. Securitisation of an asset is aimed at raising funds at a lower cost (Jobst, 2008). Securitisation is, in simple words, transforming the illiquid asset into a security.

Securitization defined by Bessis (2015) as special transaction in which assets are sold to investors. For example, a bank decides to sell the loan to a special purpose vehicle (SPV, which is an independent company)

In return, the SPV issues a series of bonds and notes based on different periods of maturity. These notes are also given ranks based on the risks that rating agencies associate with them. These notes are being sold to various investors. The pool of assets financed by a series of notes rather than a single loan-backed note is known as "tranching," while a single note is known as the "tranche" of total investor funding.

Each tranche is associated with a different level of risk and sold separately. Each of these tranches will be assigned the loan amount (i.e., principal and interest rate payment) and the likelihood of loss based on the maturity period. The more secured tranche has the first income call generated by the corresponding assets, whereas the riskier tranche has less income claim. One of the advantages of securitization is that the asset is not evaluated based on the company's ranking, instead the asset's credit value is evaluated, and ranks are given to specified assets. It is an alternative source of funding other than borrowing from the bank and provides the banks with an off-balance sheet funding source.

2.5.10. Derivatives

Derivatives are risk management instruments which have played an important role in recent years not only as a tool for mitigating risk, but also for generating income. Derivatives are financial instruments whose value or prices depend on or are determined by the value of one or more underlying assets. Futures, Forwards, options and swaps, are the main types of derivatives

(Hull, 2018). Derivatives are often utilized as a risk-hedging instrument; they allow risk transfer between different parties in the form of futures (through financial exchange) or swaps between investors (over the counter). Hedging risk is based on derivatives (future or options) (Hull, 2018).

2.5.11. Credit Derivatives

For the sale of credit risk, credit derivatives are used. First, the actual credit risk is separated from the credit itself and then it is sold based on its risk profile to a potential investor who is interested in buying these risky products. This sale is made through exposures to credit risk packaging, securitisation, and marketing with a variety of credit risk characteristics.

Credit derivatives are the tools used to reduce exposures to credit risk. Credit derivatives can take many forms including swaps, options and linked credit notes (Crouhy et al., 2001).

2.5.12. Forwards and Futures

Forward contracts are cash market derivatives in which the delivery of the asset being traded is deferred to a future date. The parties agree on the price at the moment of contract entry, which is the forward price, rather than the future date of delivery. This is why a forward contract is often viewed as a contract in which the parties lock in the price when entering the contract in order to avoid future market volatility. Forward contracts can be used as derivative instruments to hedge risks, particularly those linked with currency or exchange rate risks, and to speculate on future market value fluctuations. Forward contracts are non-standardized contracts between counterparties (Glantz & Kissell, 2014)

Future contracts are similar to forward contracts, although they differ in some ways. While forward contracts are non-standardized, futures contracts are based on standardization. Forward contracts are not exchange traded, whereas futures contracts are. A future contract is described as a standardised contractual agreement between two parties to exchange a specified asset with a known standardised amount and quality at a price agreed upon by the parties on the sport while delivery is made at a predetermined future date.

This future contract between the two parties is available in future markets for purchase or sale.

That is, rather than tangible commodities, it is the contract instrument that can be sold or purchased. As a result, future contracts are standardised contracts that can be exchanged on the future exchange's floor (Glantz & Kissell, 2014)

2.5.13. Options

An option is a type of financial derivative that is sold by an option writer to an option holder. That is, it is a contract in which the buyer is granted the right to buy (call) or sell (put) a security at an agreed-upon price within a set time frame.

In the **call option t**he right remains with the buyers. When they exercise their right to purchase the underlying asset, the seller is compelled to sell it at the agreed-upon price and within the stipulated time frame. However, for the buyer to exercise their entitlement, they must pay a fee known as a premium. The buyer's risk is limited to the premium paid.

In the **put option**, the seller retains the right to sell at a predetermined time and price. In terms of risk mitigation, puts can be utilized to limit the risk of the seller's (writer's) portfolio (Hull, 1993).

2.5.14. SWAP

A SWAP is a risk management instrument where two parties exchange financial instruments such as interest rates, cash flows, derivatives, and securities such as stocks and bonds for the mutual gain of the parties. The different types of Swaps include interest rate swaps, commodity swaps, currency swaps, equity swaps, and credit default swaps.

The most common financial SWAP is interest rate swap which is used to mitigate interest rate risks and reduce borrowing cost for businesses by allowing them to swap interest rates. For instance, let assume counterparty A is a new company with unsure finances and a subsequently lower credit rating than what it would like to have thus lender will only offer variable rate loans, whereas counterparty B is a more established company with an excellent credit rating. Both companies receive a loan for a 5M Euro however counterparty A has a variable rate of 6% whereas counterparty B has a fixed rate of 5%. The company A with the variable rate is exposed to interest rate risk and want to eliminate it.

The counterparties exchanges interest rate through a swap bank for a predetermined period but do not exchange the principal amount. SWAP turns the interest on a variable rate loan into a fixed cost. Bessis (2015) stated that "a swap receiving a variable rate and paying fixed rate might reduce the interest exposure and simultaneously generate variable rate revenues". Company A with variable rate benefit from having a more stable interest rate than its original loan and that potentially boost its credit rating. Company B benefits because the recent interest rate on variables has dropped and they now are paying a lower interest rate on the 5M Euro than they would have on their original loan. In case of variations in the interest rate, at the end of the contract period, only the difference of the interest payments occurs between the counterparties as principal involved on both side of the swap is usually the same amount. Thus, both parties enjoy interest rates which are more in line with their financial objectives.

With SWAP, we have concluded our discussion of risk management in conventional banks. The chapter gave a detailed theoretical examination of the ideas of risks and risk management. In light of prior empirical research, the risk management process in banks is discussed, the gaps are recognized, and a conceptual framework for the current research topic is constructed as a result.

The following chapter, Risk Management in Islamic Banks, includes a literature overview on Islamic banking. Because Islamic banking is unique in nature, it has been treated in a distinct chapter in relation to risk management for a better understanding.

Chapter 3: Risk Management in Islamic banking

The purpose of this chapter is to evaluate existing research studies on the risk management strategies of Islamic banks. Because this study contrasts Islamic and conventional banks in terms of risk management methods, it is critical to analyse and review the terminologies and philosophy of Islamic banks, as well as how they differ from those of conventional banks. It is also critical to comprehend Islamic banking products that are Shariah complaint and to investigate the potential risks associated with these products. And how these risks are managed, quantified, and minimized in Islamic banks.

This chapter provides a comprehensive review of Islamic banking law, rules, and features. It also delves into Islamic financial instruments, unique risk to Islamic banks, risk associated with each mode of Islamic Finance, a risk matrix comparing Islamic and conventional banks, and risk mitigation instruments in Islamic banks.

3.1. Islamic Banking

Islamic banks can be defined as a financial institution that abide Sharia principles in all its activities by acting as a financial intermediary between savers and investors; provides banking services within the framework of legitimate contracts and obtain a balance between economic and social returns (Alharbi, 2015). Esposito (2014), illustrated Sharia refers to the Gods' divine laws constructed from Islamic jurisprudence "Fiqh." Masud (2010) defined Sharia as a set of rules based on Quran (Islam's holy book) and Sunnah (action and sayings of Prophet Muhammad Peace be upon Him). The interpretation of Islamic law is known as "Fiqh." There are four prominent schools of thought representing Fiqh includes Hanafi, Maliki, Shafai, and Hanbali. The Islamic law has been developed for 1,400 years back but still, it never uniforms in terms of application and interpretation of governing principles. The last element in Islamic jurisprudence is "Ijma" the scholarly consensus over law formation.

Many may think that Islamic banking is only for the Muslims. In fact, Islamic Banking is for all people of all faiths and backgrounds. It must make sure that the financing facility makes prudent economic sense to the society and does not involve any act that causes imbalances in the society such as interest, gambling, dealing in unlawful goods and services, speculative transaction which tends to concentrate wealth in the hands of few hence making the rich get richer

and the poor become poorer. Islamic banking is centered about two important elements. First important characteristic of Islamic banking is Riba/Ribit free financing. Riba is the act of renting money at a price called interest rate (the Old Testament uses the sister word ribit for the same concept). Islamic banking is a system that is not built on renting money but on renting a tangible asset, such as real estates, tools and equipment, and businesses (Abdul-Rahman, 2014).

The second important characteristic of Islamic banking is that it is an asset-backed financing whether this asset is tangible -commodity or intangible asset –service-based financing. It commits itself to being involved in real activities, not simply renting money in order to make money on money. The conventional concept of banking as explained by Taqi Usmani (1998) is that banks and financial institutions only deal with money and monetary papers. That is why, in most countries, they are prohibited from trading in goods and keeping inventories. Money, on the other hand, is not recognized as a trade item in Islam. Money has no intrinsic utility; it is only a medium of exchange. Because each unit of money is 100 percent equal to another unit of the same denomination, there is no room for profit in the inter se exchange of these units. Profit is made when an item with intrinsic utility is sold for money or when different currencies are exchanged one for the other. Profit earned from dealing in money (of the same currency) or the papers representing it is considered interest and is thus prohibited. As a result, unlike conventional financial institutions, Islamic financing is always based on illiquid assets that generate real assets and inventories.

From the above main characteristics, it is concluded that Islamic finance does not consider debt provider and borrower as two separate factors of production. In conventional finance, the borrower is the only party that faces all risks and uncertainties involved in the business and is rewarded in the form of profit which is naturally uncertain (Rochon & Rossi, 2003). Debt provider on the other hand is the party who finances the business, and his income is certain which are the interest receivable by the investment regardless of whether the business made profits or losses until the point where the business reaches bankruptcy.

In Islamic finance every individual or institution that contributes capital to a business assumes the risk of loss and thus is entitled to a proportionate share of the actual profit in Islam. As a result, instead of a fixed return such as interest, it generates profit. The higher the business's profit, the greater the return on capital. Profits generated by commercial activities in society are thus equitably distributed to all those who have contributed capital to the business, no matter

how small.

Since banks and financial institutions provide capital to commercial activities in the context of modern practice, the flow of actual profits earned by society may be directed towards depositors in equitable proportions, which may distribute wealth in a wider circle and may hinder concentration of wealth in the hands of the few (Usmani, 1998).

3.2. Salient Features of Islamic Banking

Islamic banking, as mentioned above, enjoys certain unique features that are not found in conventional banking. These features are derived mainly from 4 different sources: Quran (the Holy Book of Islam), Sunnah (Words and action of Prophet Mohammed peace be upon him), Ijtimah (Jurist Consesus), and Ijtihad & Qiyas (Analogy). The features are as follows:

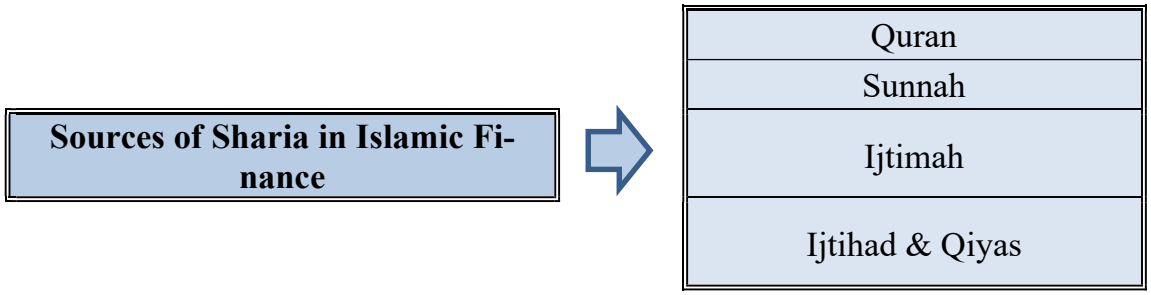


Figure 7: Sources of Sharia in Islamic Finance

3.2.1. Riba Free

In Sharia “Riba technically refers to the premium that must be paid on a financial transaction without any consideration” (Islamicity, 2019). Borhan (2009) defines Riba as “an increase of capital (fadl) whether in loans or in an exchange of a commodity, accrues to the owner (lender) without giving in return any equivalent counter value or recompense (‘iwad) to the other party”. Tahir (cited by Arif et al) describes riba as the discrepancy which results from the contractual obligations of a party in the context of a direct exchange of items of the same general kind (such as loan transaction) between two parties.

Riba is widely regarded as unjust enrichment. It is commonly regarded as the equivalent of interest, though the term is also translated as "usury" at times. The concept extends beyond pure interest to include any form of profit or enrichment that is considered unjust in Islamic law because it is received without any risk-sharing or contribution of labor or other activity for

which a payment or reward has been earned. A man lends his capital to another on the condition that he receive a specific amount more than the capital after a certain period of time. This excess amount is known as Riba, and it represents the cost of the loan for the time period specified. Arif et al (2012) stats that Riba is "when a condition is imposed that a stipulated sum will be charged on loaned capital against a period of time, it is an interest-based transaction and the sum charged in excess of the capital as the price of the period of time is called interest".

Arif et al (2012) also explained that there are three elements found in an interest-based transaction:

- Capital addition.
- The additional amount is fixed according to the loan period.
- The transaction is subject to interest payment.

Muslim jurists have classified Riba into two types:

1. **Riba Al-Nasiah**
2. **Riba Al-Fadl**

Riba Al-Nasiah is the "the kind of loan where specified repayment period and an amount in excess of capital is predetermined" (Islamic Markets, 2019). Indrianto et al (2022) defines Riba Al-Nasiah as the "as the extension of time, with the addition of the debt level, both on items that are measured or weighed when they are of different types". As a result, it is the stipulated interest that the lender collects from the borrower in consideration of the time allotted to the borrower to repay the capital. Riba Al-Nasiah is identified as interest in accordance with the consensus of all fuqaha' (jurists) without exception, and it is prohibited by the Quran, the Sunnah (the words and actions of the Prophet Mohammed peace be upon him), and the consensus of Muslim scholars.

One of the verses in the Quran which prohibits Riba is.
"Those who charge usury are in the same position as those controlled by the devil's influence. This is because they claim that usury is the same as commerce. However, God permits commerce and prohibits usury. Thus, whoever heeds this commandment from his Lord, and refrains from usury, he may keep his past earnings, and his judgment rests with Allah. As for those who persist in usury, they incur Hell, wherein they abide forever". (Quran 2:275)

In business, an entrepreneur makes a profit while also running the risk of losing money. Whereas riba is predetermined to be positive regardless of the ultimate outcome of the business, which may be positive or negative depending on factors beyond the entrepreneur's control. Owners of capital who do not want to take the risk are only entitled to the principal.

Riba Al-Fadl as defined by Uddin (2015a) is "the excess over and above the loan paid in *kind*. It lies in the payment of an addition by the debtor to the creditor in exchange of *commodities* of the same kind". In other words, it is exchanging one commodity for another, where commodities of the same type are exchanged in unequal amounts, especially the exchange of precious metals and foodstuffs, it is forbidden, by the Sunnah and the consensus of scholars as it paves the way for Riba Al-Nasiah. The ban on Riba Al-Fadl shows that the element of time may be absent.

The hadith related to the prohibition of Riba Al-Fadl is from Abu Sa'id al-Khudri (r.a.): The prophet peace be upon him said: *"Gold for gold, silver for silver, wheat for wheat, barley for barley, dates for dates, and salt for salt – like for like, and from hand to hand. Whoever pays more or takes more has indulged in riba. The taker and giver are alike (in guilt)".*

The purpose of the prohibition of Riba Al-Fadl is to ensure fairness and remove all forms of exploitation in economic transactions through unjust exchanges. Borhan (2009) explains the reason why exactly the same reciprocal transactions is required i.e. like for like, it must be exchanged in spot, and hand to hand is because what is essentially being required is justice and fair play in spot transactions; the price and the counter value should be just in all transactions where cash payment (irrespective of what constitutes money) is made by one party and the commodity or service is delivered reciprocally by the other.

To conclude the concept of Riba does not only cover money loans but also the exchange of goods. It refers to a surplus gain, whether in form of money or in kind.

3.2.2. The need for underlying assets

One of Islamic finance's most important features is that it is an asset-backed financing. Islamic finance requires that every sale or lease-based banking business must have an underlying asset. The asset or service is of primary importance since the Islamic bank either acts as a seller or a

service or usufruct vendor, or lessor. The absence of an underlying asset will cause the contract to become void ab initio. This is unlike conventional banking where the aspect of the asset is not a necessary requirement. Its significance lies solely in terms of collateral security in the sense that the assets acquired using the loan money can be charged or assigned to the bank as security (Islamic Bankers Resource Centre, 2014).

3.2.3. The avoidance of uncertainty or gambling

All Islamic Financial Institutions (IFIs) transactions must be free of elements of extreme uncertainty (Gharar) and gambling (Maisir). This is because Gharar may lead to conflicts that arise from misrepresentation and fraud due to an unjustified word in the contract. Gambling is seen as an activity which, at the expense of the other, always enriches one party: a zero-sum game.

Gharar involves ambiguity/ uncertainty about the end of a contract and the essence and or content and conditions of the contract subject matter or the parties' rights and obligations. A contract involving Gharar item is prohibited.

Examples of Gharar are ignorance of the object being sold, of the quantity and price of the product, of the specification of the product being sold, and of the time of payment of the deferred sales. Contracting a non-existent object and/or not being able to deliver the items, implying more than one price or choice in a contract unless expressly specified (Akther, 2015)

Maysir on the other hand is derived from 'Yusr' which means wishing something useful with ease and without paying an equal fee for it or without working for it or taking any responsibility against it, by chance game (Akther, 2015). Qimar also means receiving money, profit, or usufruct at others ' expense by resorting to chance, having the right to that money or benefit. A person puts his money at stake in which the amount to be risked could bring an enormous sum of money or be lost or damaged. Lotteries of the present day are also a form of gambling.

3.2.4. Profit and loss sharing

In Islamic banking operations, profit and loss sharing is possible through partnership. The bank would share either on a proportionate basis or on a negotiated profit-sharing arrangement with its customers. In the case of a loss, the loss will be covered proportionately by the bank under Musharkah agreement and will be borne by the bank under Mudaraba agreement (Islamic

Bankers Resource Centre, 2014).

Traditionally, partnership refers to two or more people (who are usually acquainted) making a contract to manage profit-oriented operations. All contribute capital, and everyone or one of them manages the activities. Profit is distributed in accordance with the contract, while loss is distributed in accordance with the equity stake. This is known as a capital partnership or Musharaka. Another type of partnership is known as Mudaraba, in which at least one person has no capital and is responsible for business management. The modern Islamic financing industry participates in the following types of partnerships based on these partnership concepts:

- Mudaraba and/or a combination of Musharaka and Mudaraba are used to collect deposits.
- Islamic Financial Institutions are permitted to invest in equity shares of Sharia-compliant companies listed on various stock exchanges around the world.
- Asset management firms manage multibillion-dollar Sharia-compliant equity funds.
- Another example of Musharaka and Mudaraba application in modern business framework is Sukuk or Islamic bonds.
- House financing is provided by IFIs globally based upon a combination of Musharaka and Ijarah contracts.
- Islamic Financial Institutions around the world provide housing financing through a combination of Musharaka and Ijarah contracts.

3.2.5. Sharia compliance

Islamic finance's central focus is compliance with Sharia. The establishment of a Sharia advisory or supervisory board to advise IFIs, Islamic insurance companies, Islamic funds and any other providers that sell Islamic financial products is a distinctive feature of Islamic finance to ensure compliance. Establishing a board, whose views are binding on all IFIs, is required to direct institutions towards compliance with Sharia. An institution cannot claim to do Islamic financial business until and unless it creates a Sharia board (scholars) or committee of highly esteemed and professional scholars (Islamic Bankers Resource Centre, 2014).

Since there are four Sunni Law Schools: Hanafi, Shafi'i, Hanbali, and Maliki, it is impossible to uniformly interpret Sharia-compliant banking transactions among the Sharia Boards. Therefore, there are two NGOs that mainly contribute to Islamic Finance standardization. The

Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) based in Bahrain, and the Islamic Financial Services Board (IFSB) based in Malaysia. Nevertheless, Islamic banks across countries are not obliged to follow the rules and regulations of either of two organizations, except for a few countries.

The Sharia Board's main functions are certification, supervision, and advisory. The function of ensuring that financial products comply with Sharia law is referred to as certification. The Sharia Board typically consists of three Sharia scholars who examine the financial product and issue a Fatwa (legal opinion) in which the board confirms or denies Sharia compliance. The certification function is accompanied by a supervisory function, and the board will monitor the entire business organization to ensure it adheres to Islamic law principles. The third function of Sharia Boards is commonly referred to as the advisory function. This term is correct in the sense that management frequently seeks Sharia Board advice before marketing a new product, developing a new financial product, establishing new funds, or developing a new investment policy. The Sharia Board does indeed exercise a certain advisory function to this extent (Suprayitno, 2023)

The Shariah Board must meet three requirements in order to fulfill its certification, supervisory, and advisory functions: (1) the board's independence from corporate management: Shariah boards should be independent of the financial institution and should not be subject to company instructions, (2) the members' expertise, and (3) the avoidance of conflicts of interest due to multiple mandates, such as serving on Shariah boards of multiple banks Casper (2012).

The Shariah Board meets twice to four times per year on average. As a result, it is effectively unavailable for regular consultation and involvement. As a result, in addition to the Shariah Board, the IFSB recommends the establishment of an internal compliance department. This department is then in charge of the day-to-day implementation of Shariah Compliance principles (Casper, 2012).

3.2.6. Unlawful goods or services under Sharia Law

Another equally important aspect is that Islamic finance should not be involved in any unlawful goods and services activities prescribed by Sharia. Such banned goods and services include, but are not limited to, non-halal foods such as pork or meat from non-slaughtered animals or

animals that have not been slaughtered according to Islamic standards, intoxicating beverages, pornography, weapons, and tobacco related products. Not only does it include the purchase or sale of these illegal goods and services, but it also covers all production and distribution chains, such as packaging, shipping, warehousing, and marketing (Islamic Bankers Resource Centre, 2014).

3.3. Islamic Modes of Finance

Islamic Banking employs a variety of Islamic finance products. Islamic financial tools and products are built on equity and various forms of profit and loss sharing. As partners, Islamic banks and their clients share risks and gains: the transfer of funds from clients to the bank (depositing) is based on revenue-sharing, while the transfer of funds from the bank to the clients (lending, financing) is based on profit-sharing.

Islamic financial products are currently categorised into three modes of Islamic financing: partnership-based modes, trade-based modes, and rental-based modes (Table 2). Islam does not prescribe a specific mode of financing. It has instead established some broad principles that can be applied to a variety of forms and procedures. A new form or procedure cannot be rejected simply because there is no precedent or because it is not explicitly mentioned in the Quran and Sunnah. In fact, any financial innovation can be Sharia-compliant if it does not violate any fundamental principle established by the Holy Quran, Sunnah, or Muslim jurists' consensus.

Islamic Modes of Finance			
Partnership Based	**Trade Based**	**Rental Based**	**Other Modes**
Musharak	Murabaha	Ijarah	Waqf
Mudaraba	Musawamah	Deminishing Musharaka	Zakat
	Salam		Qard Hasan
	Istisna		

Table 2: Islamic Modes of Finance

Partnership Based Modes of Islamic Finance

The two forms of partnership-based finance are referred to as Musharaka and Mudaraba. In **Musharaka**, a contract is established by the parties' mutual agreement to the division of profits and losses in the joint venture. It can be applied to the establishment of microenterprises, small productive ventures, working capital finance, etc. In **Mudaraba**, a trustee-type financing arrangement is created, whereby the financier contributes money to a project and the entrepreneur contributes management, labour, and expertise. Profit is divided according to pre-determined ratios, and losses, if any, are paid by the financier unless they are the result of the borrower's negligence or violation of the conditions of the arrangement. This form is ideal for professionals, artisans, and business owners who have ideas or plans but are unable to put them into action due to a lack of financing.

3.3.1. Musharaka (Equity Participation)

In the context of business and trade, the Arabic word "**Musharaka**," which means "sharing," refers to a joint venture in which all partners share in the joint venture's profit or loss. It has substantial effects on the real economy and serves as an Islamic replacement for interest-based financing. In conventional financing, the only tool utilized for all forms of funding is interest (Riba). Islam forbids the payment of interest, hence interest-based financing cannot be used to provide any sort of funding. Therefore, Musharaka has a significant place in an Islamic-based economy.

Conventional financing stipulates a fixed interest rate on a loan initiated by financiers regardless of the borrower's realized profit or loss, whereas, in musharaka, the return is dependent on the joint venture's actual profit. An interest-bearing loan's financier is not at risk if the joint venture fails, but the financier in Musharaka is.

Before proceeding with the application of Musharaka as a mode of financing, it is necessary to address some issues concerning the concept of Musharka. As explained by Mad & Ismail (2010) the following are some of the elements that distinguish the Musharaka contract.

Musharaka Capital

In Musharaka the capital must be provided by each partner. All partners in Musharaka may

contribute in cash or in kind such as labour, management, skill, goodwill, and commodities. Their capital mus be merged and if the partners wish to participate by contributing in kind, their share in the Musharaka capital shall be determined on the basis of the current market value prevailing at the time the Musharaka commences. Afterwards, each partner's share of Musharaka's assets is divided according to their respective contributions (Marifa, 2014).

Musharaka Management

Although every partner has the option to take part in Musharaka's management, some partners may choose to behave only as sleeping partners instead. In this situation, the sleeping partner will only be entitled to the benefit to the extent of his investment, and the profit ratio allotted to him should not be greater than his investment ratio. If all partners however agree to work for the Musharaka, each one will be regarded as the other's agent in all business dealings, and any work done by one of them in the regular course of business will be considered to have been approved by all partners. The power of appropriation in the property and management in Musharaka's affairs may not be proportionate to the capital invested by the partners (Rammal, 2004).

Musharaka Profit Sharing

In Musharaka agreement the proportion of profit to be divided among the partners must be agreed upon when the contract is signed. If no such proportion has been calculated, the contract is void in Shariah. According to different Muslim jurists' perspectives, the profit ratio can either be consistent with the capital ratio invested by each partner, i.e., if a partner has invested 20% of the total capital, he must receive 20% of the profit, or the profit ratio can differ from the investment ratio agreed between the parties with their free consent. However, if a partner expressly states in the agreement that he would stay a sleeping partner during the Musharaka term, his share of profit cannot be greater than the ratio of his investment.

The profit ratio can be fixed or variable. For example, one partner can say that his share of profit will be 50% if earnings are as high as 30% and 40% if the business profit exceeds 30%. The partners may later agree to adjust the profit-sharing ratio, and a partner may surrender a portion of its earnings to another partner on the distribution date. Partners may also elect not to distribute a portion of their profits and instead set aside funds. (Arshad & Ismail, 2010)

Musharaka Loss Sharing

All Muslim jurists agree that in the event of a loss, each partner will incur a loss proportionate to the ratio of his investment. As a result, if a partner has invested 40% of the capital, he must bear 40% of the loss, no more, no less, any provision to the contrary renders the contract null and void.

Partners' liability in Musharaka is often unlimited. As a result, if the joint venture's liabilities exceed its assets and the firm is liquidated, all excess liabilities must be carried pro rata by all partners. As a partnership is not a legal person like a limited liability company, the partner's responsibility in a partnership firm is unlimited. In the event of a business collapse and Musharaka's loss, all liabilities more than the remaining assets must be divided proportionally by the partners (Madni & Khadam, 2023).

Musharaka Termination

If one of the partners wishes to end the Musharaka while the other partner or partners wishes to continue with the business, this can be achieved through mutual agreement. The partners who want to keep the firm may buy the share of the partner who wants to end it, because terminating Musharaka with one partner does not imply termination with the other partners.

If there is a disagreement about the worth of the share and partners cannot agree on a precise price, the leaving partner may oblige the partners to liquidate or divide the assets themselves. (Marifa, 2014).

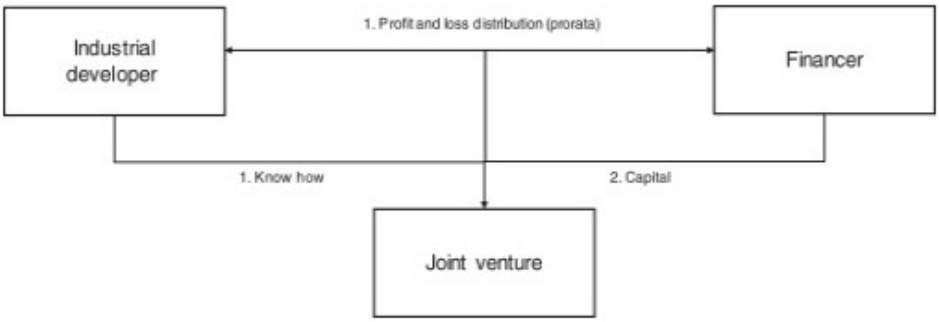


Figure 8: Structure of Musharaka Contract (Gatti, 2018)

Musharaka as a financing Model

Keeping the above Musharaka principles in view, we can proceed now to see how Musharaka can be used as a mode of financing. There are basically two forms of Musharaka that are used by Islamic banks:

1. Diminishing Musharaka
2. Permanent Musharkah.

Diminishing Musharaka is a type of partnership that culminates with a partner acquiring complete ownership of a project through a redeeming process agreed upon between them. It is used when a client wants to purchase an asset or a commercial business but does not have the finances to pay the whole amount, he or she seeks financial assistance from a bank.

The bank's part is divided into several units, and it leases its portion of the asset (units) to the customer on a regular basis in exchange for rental payments, growing his own share until the customer buys all of the financier's units, making him the sole owner of the asset. In this type of partnership, all partners are co-owners of all parts of the joint property or asset, and one partner cannot claim a specific part of the property or asset while leaving the remaining parts to other partners (Financial Islam, 2018). Diminishing Musharaka will be explained more in detail under Rental Based Mode of Finance section.

In *permanent Musharaka* the Islamic bank participates in project´s equity and receives a proportion of the profit on a pro rata basis. The duration of the contract is unspecified, making it suitable for long-term financing of projects where funds are committed (IFN, 2020). Permanent Musharaka can be used in financing long term investment projects, funding entrepreneurs the working capital to purchase raw materials or goods as well as for financing imports and exports (e-Marefa, 2017).

Long Term Investment Projects

In the case of long-term investment projects, if the investment comes from both sides the Musharaka mode of financing can be adopted. If the bank on later stage desires to withdraw from the Musharaka while the other party wants to continue the business, the latter may buy the former share at an agreed price. In this way, if the business has earned, the bank could recover the amount it invested along with a profit.

If the one-time sale of the share is not feasible due to the lack of liquidity in the project, the bank's share can be divided into smaller units, and each unit can be sold after an appropriate interval. When a unit is sold, the bank's share in the project is reduced to that extent and when all the units are sold, the bank comes out of the project altogether. On the other hand, the entrepreneur can continue his project either on his own or by selling a share of the bank to some other person who can replace the bank (Usmani, 1999)

Working Capital

Where funds are required for a running business' working capital, Musharaka's instrument may be used in the following manner: the running business ' capital may be assessed with mutual consent. The value of the enterprise can be treated as the investment of the person seeking finance, while the amount given by the bank can be treated as its investment share. For a given period, such as one year or six months or less, the Musharaka may be affected. Both parties agree on a certain percentage of the profit to be given to the bank which should not exceed the percentage of its investment as it will not be working for the business. On the expiry of the term, all liquid and non-liquid assets of the business are again evaluated, and the profit may be distributed based on this evaluation. On the expiry of the term, all the company's liquid and non-liquid assets are again assessed, and the profit can be distributed based on this assessment (Akram, 2020).

Import/Export

An exporter or importer may arrange for a single transaction based on Musharaka. After the imported goods have been cleared from the port, the importer and the bank may share their sales proceeds according to a pre-agreed ratio. In this case, to the extent of the ratio of its investment, ownership of the imported goods shall remain with the bank. This Musharaka may be limited to an agreed term, and if the imported goods are not sold on the market until the expiry of the term, the importer may buy the share of the bank himself, making himself the sole proprietor of the goods.

Similarly, in the case of export finance, Musharaka will be even easier. The exporter has a special order coming from abroad. The price at which the goods are to be exported is well known ahead of time, and the bank can calculate the expected profit easily. The bank may finance it based on Musharaka and may share the amount of the export bill by a percentage agreed in advance. To secure itself from any negligence on the part of the exporter, the bank

may provide for a condition that the exporter will be responsible for exporting the goods in full compliance with the L / C conditions (Usmani, 1999).

3.3.2. Mudaraba (Trust Financing)

Mudaraba which is based on profit sharing and loss bearing principle is “a special kind of partnership in which one partner provides the capital needed to another who provides the human capital needed to invest it in a business enterprise. The investment comes from the first partner called "rabb-ul-mal," whereas know-how, management and work are the sole responsibility of the other partner, called "mudarib" (Kumar, 2014)

Mudaraba's contract is traditionally applied to trade alone, but it provides the basis for the relationship between banks, depositors, and entrepreneurs. Mudaraba can be applied to all sectors of the economy, such as trade, industry, agriculture, etc.

Mudarib's different capacities include the followings (Usmani, 2015):

- Ameen (Trustee): Rabb-ul-maal's money and the assets required to do so are held in trust by him.
- Wakeel (agent): He is an agent of Rabb-ul-maal in the purchase of goods for trade.
- Shareek (Partner): if the company earns a profit, it is Rabb-ul-maal's partner who shares the profit in the agreed ratio.
- Zamin (Liability): if the company suffers a loss due to his negligence or misconduct, he is liable to compensate for the loss.
- Ajeer (Employee): if the Mudaraba becomes void for any reason, the Mudarib is entitled to receive a fee for his service.

According to State Bank of Pakistan (2005), there are some aspects to consider when working under Mudarabah agreement. First, the mudarib who runs the business can be a natural person, a group of individuals or a legal entity and a corporate body. Mudaraba shall include banks, trusts of units, mutual funds, or any other institution or individual by whatever name it is called. Second, Rabbulmal shall make his investment in money or kind other than receivables at a mutually agreed valuation which is placed under the absolute control of the Mudarib. Third, the conduct of Mudaraba's business shall be carried out exclusively by the Mudarib under the mandate provided for in the Mudaraba Agreement. Fourth, the profit shall be divided in a strict proportion agreed upon at the time of contract and no party shall be entitled to a predetermined

amount of return or remuneration. Fifth, Rabb-ul-mal's liability is limited to his investment unless he has authorized the Mudarib to incur debts on his behalf. Sixth, all goods purchased by the mudarib shall be the sole property of the rabb-ul-mal, and the mudarib may only earn his share of the profit if he sells the goods profitably. Therefore, even if the assets value has increased, Mudarib is not entitled to claim his share in the assets themselves. Seventh, the loss, if any, is only suffered by the rabb-ul-mal, because the mudarib makes no investment. His loss is limited to the fact that his labor went in vain, and that his work brought him no fruit. Finally, with Rabbulmal's permission the Mudarib can invest its funds in the Mudaraba business. The condition is that, in such a situation, the Rabbulmal is not entitled to a proportion of profit beyond the ratio that his investment bears to the enterprise's total investment. The loss is to be shared, if any, in proportion to the parties' capital.

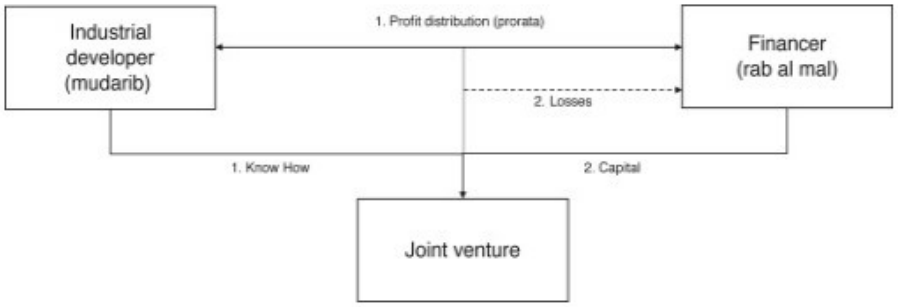


Figure 9: Structure of Mudaraba Contract (Gatti, 2018)

Mudaraba Investment

There are two types of Mudaraba investment: restrictive and unrestrictive.

In **Restrictive Mudaraba** or **Al-Mudaraba Al-Muqayyada** the Rabb-ul-maal i.e., the capital provider may specify investment details for the mudarib, in which case he will invest the money within the scope of the contract specifications (Siddiqui, 2018).
In Unrestricted Mudaraba or **Al-Mudaraba Al-Mutlaqah** the Rabb-ul-maal grants the Mudarib the freedom to undertake any business that is reasonably expected to yield profits (Siddiqui, 2018).

Rabbu-ul-maal gives the investment and Mudarib provides the management and know-how in both sorts of Mudaraba investments. As a result, the Rabbu-al-maal should hand over the agreed-upon investment to Mudarib and leave everything up to him. However, Rabul-al-maal

has the right to supervise the Mudarib's actions and collaborate with the Mudarib if the Mudarib approves.

Mudaraba Capital

Unlike in Musharaka, where all partners contribute capital, only Rabbu-ul-maal contributes to the investment in Mudaraba. The capital form can be liquid or nonliquid assets such as construction machinery or land. Non-liquid assets, on the other hand, must be subject to an exact amount determination before being used for Mudaraba. If the assets are not accurately evaluated, the Mudaraba is invalid.

Mudaraba Profit and Loss sharing.

For the validity of Mudaraba it is necessary that the parties agree, right at the beginning, on a definite proportion of the actual profit to which each of them is entitled. The Shariah had not prescribed any particular proportion; rather, it was left to their mutual consent. They can share the profit equally, and they can also allocate different proportions for the rabb-ul-mal and the mudarib. However, they cannot allocate a lump sum of profit to any party, nor can they determine any party's share at a specified rate tied to the capital. For example, if the capital is Eur 100000 they cannot agree on a condition that Eur 10000 out of profit is the mudarib's share, nor can they say that rabb-ul-maal is given 20 per cent of the capital. They can agree, however, that for example 40% of the actual profit should go to the mudarib and 60% to the rabb-ul-mal, or vice versa (Usmani, 2015).

It is also permitted that in different situations different proportions are agreed. The rabbul-maal can say to mudarib for instance. "If you do business in your city, you will be entitled to 30% of the profit, and if you do business in another city, your share will be 50% of the profit." In addition, the mudarib cannot claim any periodic wages or fees or remuneration for the work he does for the Mudaraba (Usmani, 2015).

If the business incurred a loss in certain transactions and gained profit in some other transactions, the profit shall be used to compensate the loss at first instance and the remainder, if any, shall be distributed among the parties according to the agreed ratio (Usmani, 2015)

Mudaraba Termination

When entering into the Mudaraba, the contract of Mudaraba may be terminated at any time by the two parties or the parties agree that no party shall terminate it for a specified period, except in specified conditions. In either case the only condition is that the other party be notified. If at the time of termination all of the Mudaraba's assets are in cash form, and some profit on the principal amount has been earned, it shall be distributed among the parties according to the agreed ratio (Usmani, 2015).

Mudaraba as a financing Model

Mudarbah, like Musharaka financing, can be used in a variety of financing sectors, including project financing, small and medium firm start-up financing, and import and export financing. The only distinction, as previously said, is that the entire capital is provided to the investment by financiers (Rabbul-al-maal), i.e., Islamic banks.

In Mudaraba financing the bank should not reduce risk by demanding collateral for this purpose, the banks bear the financial risk entirely and exclusively. Collateral may be demanded to help reduce moral hazard, such as to prevent the entrepreneur from running away (Zaher & Hassan, 2002).

The bank is entitled to receive from the entrepreneur, if and only if there is a surplus, the principal of the loan at the end of the period provided for in the contract. If the books of the company show a loss, this will not constitute a default on the entrepreneur's part, except for negligence or mismanagement (Zaher & Hassan, 2002).

Trade Based Modes of Islamic Finance

In Shari'ah, trade or “Bai” is defined as the exchange of a value thing by another value thing with the mutual consent (Usmani, 2015)

Kettell (2011) illustrated the different types of sales used in trade. Amongst them is *Bai Musawamah* which is a general type of sale in which the seller and the buyer negotiate the price of the commodity to be traded without any reference to the seller's price paid or costs.
Another type is *Bai Murabaha* which literally means a sale on mutually agreed profit. Technically, it's a sales contract where the seller declares the cost and profit. Islamic banks have

adopted this as a mode of financing. It may involve a client's request to the bank to purchase a certain item for him as a financing technique. The bank does so for a definite profit over the cost specified in advance.

There is also *Bai Salam*, Salam means a contract in which advance payment for later delivery of the goods is made. The seller undertakes to supply the buyer with certain specific goods at a future date in exchange for a full payable advance price at the time of contract. According to the Shariah's normal rules, no sale may be affected unless the goods exist at the time of the deal, but Salam sale constitutes an exception given by the Holy Prophet (SAW) himself to the general rule provided that the goods are defined, and the date of delivery is fixed. The quality of the commodity intended to be purchased must be fully specified, leaving no ambiguity which leads to dispute.

Bai Istisna on the other hand is a contractual agreement for the manufacture of goods and commodities, which allows advance cash payment and future delivery or future payment and delivery. A manufacturer or constructor agrees to produce or build a well-described good or building at a given price on a given date in the future. Price may be paid in instalments, as agreed between the parties. Istisna may be used to provide financing facilities for the manufacture or construction of houses, plants, projects, and bridge, road and highway construction. It is basically an order to manufacture.

Bai Muqayada refers to barter sale excluding currency sale. *Bai Surf* refers to the sale of gold, silver, and currency. *Bai Muajjal* refers to such sale in which delivery is spot while payment is deferred but cost is not known. Finally, *Bai Urboon* is a down payment made to a seller by a purchaser after both parties have concluded a valid contract. The down payment represents the undertaking to buy the goods. If the buyer chooses to pay the remaining outstanding payment during a prescribed period, the amount payable as a down payment will be counted as part of the purchase price. Otherwise, the purchaser will lose the down payment.

3.3.3. Murabaha (Cost Plus or Mark-up)

Murabaha is a term which refers to a particular kind of sale that has nothing to do with financing in its original sense. If a seller agrees with his buyer to provide him with a specific commodity on a certain profit added to his cost, that transaction is called Murabaha. Murabaha's basic

ingredient is that the seller discloses the actual cost he has incurred in purchasing the commodity, and then adds some profit to it. This profit may be in lump sum or on a percentage basis (Alam et al, 2017). Therefore, Murabaha is not an interest-bearing loan; it is a sale of a commodity at cash or on deferred payment basis called *Murabaha Muajjal.*

An argument that comes up in Murabaha is that both profit and interest are the same, and that Murabaha financing is the same as conventional banking. However, Islamic scholars argue that a Murabaha financing structure is quite different in several aspects from an overdraft organized along conventional lines and the former offers several advantages for the bank and its customers. As a result of that financing, depositors are made to share the bank's profits. However, the fundamental difference is the contract which covers the Islamic conditions. If the element of interest is available in the contract, then it will be void (Jonsson, 2005).

Furthermore, a Murabaha transaction is not created simply by swapping the term "interest" for the words "profit" or "mark-up." Indeed, Shari'ah scholars permitted Murabaha as a means of finance, subject to the essential principles and conditions outlined above. Murabaha is thus prohibited unless those regulations are strictly followed. If these rules are not followed, the Shari'ah transaction is null and void.

Nonetheless, the ideal form of Shari'ah financing is the Mudaraba or Musharaka that was discussed in the first chapter. However, there are certain practical difficulties in using Mudaraba and Musharaka instruments in some financing areas from the perspective of the economic set. The contemporary Shari'ah experts have thus allowed, subject to the rules and conditions, the use of the Murabaha as a mode of financing on a deferred payment basis. Moreover, it should never be overlooked that Murabaha is not originally a mode of financing. It is only a device to escape "interest" and not an ideal instrument to accomplish Islam's true economic goals. This instrument should therefore only be restricted to those cases where Mudaraba or Musharaka cannot be practiced.

Murbahah as a Mode of Financing

Murabaha involves buying a commodity from a bank on behalf of a client and reselling it on a cost-plus-profit basis to the latter. Under this arrangement the bank discloses its cost and profit margin to the customer. In other words, the bank will purchase the goods from a third party and

sell them to the customer at a pre-agreed price instead of advancing money to a borrower which is how the system would work in a conventional banking agreement (Jonsson, 2005).

According to Shari'ah, the best way for Murabaha is that the bank buys the commodity himself and keeps it in his own possession or buys the commodity through a third person appointed by him as an agent, before selling it to the customer. In exceptional cases, however, where direct buying from the supplier is not practicable for some reason, it is also permissible for him to make the customer himself his agent to buy the commodity in his name which can also ensure the conformity of the goods to the customer prior to acceptance (Zaher & Hassan, 2002). In this situation, the client first purchases the commodity on behalf of its bank and then takes control of it. He then purchases the product from the bank at a postponed price.

The agent is just a trustee in the first stage, while the ownership belongs to the bank, therefore the risk of the commodity is also shared by the bank as a natural consequence of the property. However, when the client acquires the commodity from his bank, ownership and risk are passed to the client.

Murabaha validity depends on certain rules that should be duly observed in Shari'ah to make them acceptable. These Shari'ah rules as explained by Kettell (2011) include that the subject of sale shall be present at the time of sale. According to Shariah a subject which has not yet come into existence cannot be sold even with parties' mutual consent. In addition, at the time of sale, the subject of sale must be in the seller's possession: Thus, it is not possible to sell what the seller does not own. If he sells something before, he becomes a proprietor, the sale is void. Also, the subject of sale must be in the physical or constructive possession of the seller when he sells it to someone else. Constructive possession as stated by Kettel (2011) is "a situation in which the possessor has not taken over the physical delivery of the commodity, yet the commodity has come into his control and all the rights and obligations of the commodity are passed on to him, including the risk of its destruction".

Other Murabaha validity rules concerning the subject of sales include that it must be a value property, it is therefore impossible to sell or purchase a thing that has no value according to the use of trade. The subject of sale should not be used for Shariah forbidden purposes i.e., Haram purposes: such as pork, wine, pornography etc. Finally, the subject of the sale or a commodity must be explicitly known to the buyer and identified: The buyer must be made aware of all the

specifications.

Additional Murabaha validity rules include that the sale must be immediate and absolute. A sale allocated to a future date or a sale contingent on a future event is therefore void. The parties may affect a valid sale when the future date comes, or the contingency occurs. For example, A says to B on January 1st: "On February 1st, I sell my car to you." The sale is void, as it is attributable to a future date. Or A tells B, "If Party X wins the elections, my car will be sold to you" The sale is void, because it depends on a future event. Other rules include that the sale must be unconditional. A conditional sale is invalid unless the condition is recognized as part of the transaction based on commercial use. For example, A purchases a car from B on condition that B employs his son in his firm. The sale is conditional and is therefore invalid. However, if A purchase a car from B, on condition that B undertakes its free service for 2 years. The condition is valid, and the sale is lawful, being recognized as a part of the transaction.

Further Murabaha validity rules include that the delivery of the sold subject to the buyer must be definite and should not depend on contingency or chance. The Subject price must be certain. If the price is uncertain then the sale will be void. Finally, Murabaha cannot be used as a financing mode except where the customer needs funds to buy some commodities. For example, if he wants funds to buy flour for his bakery as a raw material, the Bank can sell him the flour based on Murabaha. But where the funds are required for other purposes, such as paying the price of commodities already purchased by him, paying electricity bills or other utilities, or paying his staff's salaries, Murabaha cannot be made, because Murabaha requires a real sale of certain commodities, and not just a loan.

Figure 10: Structure of Murabaha Contract (Gatti, 2018)

In the light of the abovementioned rules and principles, a bank can use the Murabaha as a mode of finance by adopting the following process (Shaikh, 2012):

Step 1: The client and the bank sign an overall agreement by which the bank promises to sell,

and the client promises to buy the commodities from time to time on an agreed profit ratio added to the cost. This Agreement may specify the limit to which the facility could be used.
Step 2: When the client requires a specific commodity, the bank appoints the client as its agent for the purchase of the commodity on his behalf, and both parties sign an agency agreement.
Step 3: The client buys the commodity on behalf of the bank and takes possession of it as the bank's agent.
Step 4: the client informs the bank that he has bought the commodity on his behalf and, at the same time, offers the bank to purchase it.
Step 5: The bank accepts the offer, and the sale is concluded by transferring the ownership and the risk of the commodity to the client.

The most important aspect of the transaction is that the commodity must stay at the risk of the bank between the third and fifth stages. This is Murabaha's only feature that distinguishes it from a transaction based on interest. As a result, it must be followed at all costs with due diligence, or else the Murabaha transaction becomes void under Shari'ah.

A third party selling the commodity is also a requirement for Murabaha's validity. In Shari'ah, it is not permissible to purchase a product from the consumer on a "buy back" agreement. Murabaha in this context would be nothing more than an interest-based transaction based on a "buy back" agreement.

Issues in Murabaha Application

Murabaha rules and procedures introduce some issues in the Murabaha financing as explained by Meezan Bank (2002). Amongst these issues are the followings:

- **Securities against Murabaha:** Payments from the sale are receivables, and a security may be requested from the client for this. It may be a mortgage or some sort of lien or charge.
- **Guaranteeing the Murabaha:** The seller may request that the customer provide a third-party guarantee. The seller may have recourse to the guarantor in case of default on payment, who will be liable to pay the amount guaranteed to him. There are two issues that relate to this:
    a. The guarantor cannot charge the original customer a fee. The reason is that a person charging a loan advance fee comes under the riba definition.
    b. The guarantor may however charge any documentation expenses.

- **Default penalty**: Another issue with Murabaha is that if the customer fails to pay the price at the due date, the price cannot be changed, nor the penalty fees can be charged. To deal with dishonest customers who deliberately default in payment, they should be made liable to pay compensation to the Islamic Bank for the loss suffered as a result of default. These should however be made subject to the following conditions:
    a. A grace period of at-least one month may be given to the defaulting party.
    b. If there is no doubt that the customer is in default without a valid excuse, compensation may be requested.
- **Rollover in Murabaha:** The Murabaha transaction cannot be rolled over as the old contract expires for a further period. Murabaha is not a loan, but rather the sale of a commodity, deferred to a particular date. Once this commodity is sold, it transfers its ownership from the bank to the customer and is therefore no longer the seller's property. Now what the seller can claim is only the agreed price and so there is no question of making another sale between the same parties on the same commodity.

Applications of Murabaha

Murabaha can be utilized for the different purposes such as the purchase of raw material for meeting working capital needs of trade and industry. It can be used to finance medium to long term requirements for purchase of land, building and equipment. It can also be used in trade finance products including imports, exports and bill purchase.

3.3.4. Salam (Forward Sale Agreement)

One of the basic conditions for the validity of a sale in Shariah is that the commodity intended to be sold must be in the seller's physical or constructive possession. This condition has three ingredients: First, the commodity must exist; therefore, it is not possible to sell a commodity which does not exist at the time of sale. Second, that commodity should have been owned by the seller. So, if the commodity exists but the seller doesn't own it, he can't sell it to anyone else. Third, mere ownership doesn't suffice. It should have come either physically or constructively into the seller's possession. If the seller owns a commodity but has not taken delivery himself or through an agent, he is not allowed to sell (Kettell, 2011). In Sharia, however, there are but two exceptions to this general principle. One of them is salam, the other is istisna.

Salam (forward sale agreement) is “a sale contract to purchase an underlying asset at a

predetermined future date but at a price paid on spot" (al-Bashir and al-Amine, 2009). The price here is cash but the delivery of the purchased goods is deferred. The seller and buyer can agree at their own freewill on any price. At the time the sale is finalized the buyer should pay the price in full to the seller. Although at the time the Salam contract is finalized, the buyer must pay the price in full, payment of hard cash is not necessary; banks may credit the seller's account or issue a payment order to the seller, which can be cashed on demand. A Salam borrower can deposit the amount or the price he receives with the same bank he had entered into a Salam deal with. The contract is beneficial for both parties as the seller receives the money in advance while the buyer normally pays the price at lower rates (Kaleem & Wajid, 2009)

Salam was permitted by the Holy Prophet based on certain conditions. The fundamental purpose of this sale was to meet the needs of the small farmers who needed money to grow their crops and feed their families until harvest time. They couldn't take usurious loans after riba (interest) ban. Thus, they were allowed to sell the agricultural products in advance.

The Messenger of Allah (peace be upon him) came to Madinah and found its inhabitants entering salam contracts (with the price paid in advance) in fruits for one, two, and three years. He (peace be upon him) said: "whoever enters into a salam contract, let him specify a known volume or weight, and a known term of deferment".

Similarly, Arabia's traders used to export goods to other places and import certain other goods into their homeland. They needed money to get this type of business undertaken. After the prohibition of riba they could not borrow from the usurers. Therefore, it was allowed for them to sell the goods in advance. They could easily undertake the aforementioned business after they received their cash price.

Salam's permissibility was an exception to the general rule prohibiting forward sales, and it was therefore subject to certain strict conditions to eliminate the elements of Gharar (ambiguity). These terms of use as explained by Kaleem & Wajid (2009) requires the buyer to pay the price in full to the seller at the time the sale is affected, "which is not the case in forward or futures contracts" stated by Al-Amine (2008). In the absence of full payment, it will mean selling a debt against a debt that the Holy Prophet expressly forbids. In addition, the basic wisdom for allowing Salam is to satisfy the seller's instant need. Hence, the basic purpose of Salam will not be achieved if it is not paid in full. Salam can only be affected in those commodities whose

quality and quantity can be precisely specified. Those things whose quality or quantity is not determined by specification cannot be sold under the Salam contract (LawTeacher, 2013)

In addition, all details concerning the quality of the goods sold must be expressly specified, without leaving any ambiguity which could lead to a dispute. The quantity of the commodity needs to be agreed in absolute terms. It should only be measured or weighed in its usual measure. In the contract the exact date and place of delivery must be specified and cannot be made for things to be delivered on the spot.

Salam as a Mode of Financing

Salam as a forward agreement contract was legalized by the prophet Mohammed (Peace be upon him) to assist mainly the poor people such as farmers and craftsmen. For instance, a farmer may approach the bank, the bank would analyze the farmer's credibility, and agree to buy the agricultural products he would produce at a specified future date. A price with the quantity would be fixed, and a delivery date would be set, and the bank would pay the full price in cash on the spot upon signing the Salam contract. On the agreed date the farmer would deliver the products, and the contract would be over. The bank could then sell the goods to a third party and the difference between the purchase price and the selling price would be the bank's profit. The price in Salam is lower than the price of the commodities delivered on the spot. The difference between the two prices is therefore a valid profit for the banks (Muneeza et al, 2011).

To ensure that the seller delivers the goods on the agreed date, the bank may also ask him to provide security in the form of a guarantee or a mortgage. In the case of default in delivery, the guarantor may be asked to deliver the same commodity, and if a mortgage exists, the buyer / financier may sell the mortgaged property, and the sale proceeds may either be used to realize the commodity required by buying it from the market, or to recover the price advanced by him. In the case of default in delivery, the guarantor may be asked to deliver the same commodity, and if a mortgage exists, the bank may sell the mortgaged property, and the sale proceeds may be used either to realize the commodity required by buying it from the market, or to recover the price advanced by the guarantee (Usman, 2002).

The only issue with Salam contract is that the seller (borrower) delivers commodities at the time of delivery and not money to the bank which would have to establish a special cell for

commodities dealing. This is, however, not the case in conventional futures contracts where the commodity in the first contract could be sold prior to taking possession (Al-Amine, 2008). One way to tackle this issue is by signing up with the seller (borrower) an independent contract agency to appoint him as an agent for selling the goods. The seller delivers the goods to the bank constructively and as the bank's appointed agent he will sell the products to consumers immediately. The seller then gives the bank the sales money, and the bank pays the seller a wage for his work.

Another way to benefit from Salam is by establishing parallel Salam contracts. The bank concludes two separate contracts in a parallel Salam arrangement: one, where the bank is the buyer and the other, where the bank is the seller. Each such contract must be independent of each other (Kaleem & Wajid, 2009). They cannot be bound in such a way that the rights and obligations of one contract depend on the rights and duties of the parallel contract. Each contract should have its own strength, and it should not be contingent on the other.

In our farmer example, the bank in parallel Salam would first enter into a Salam contract with the farmer and subsequently the bank would enter into a promise with a third party to buy the goods immediately upon delivery to the bank. This would ensure that the goods are sold immediately upon delivery, without any loss to the bank. This type mitigates the bank's operational risk in the sense that the bank doesn't need to find a place to store. It should be noted here, however, that in this case the farmer may not be able to deliver the goods at the time specified, and that the third party may sue the bank for the loss due to late delivery.

Figure 11: Structure of Salam Contract (Gatti, 2018)

3.3.5. Istisna (Forward commissioned Manufacture)

Istisna like salam contract is the second type of sale where a “commodity is transacted before it comes into existence” (Iqbal, 2009) and is another exception to the general rule of the existence of the subject matter of sale and the allowance of sale of future goods.

Istisna as defined by Abdul-Khaliq (2014) it is a "contract whereby a party undertakes to produce a specific thing which is possible to be made according to certain agreed-upon specifications at a determined price and for a fixed date of delivery. And this undertaking of production includes any process of manufacturing, construction, assembling or packaging".

In other words, Istisna is a commission to a manufacturer to produce a specific good for the buyer to be delivered in the future. It can be used to provide financing facilities for the construction or manufacture of houses, plants, projects, bridge construction, roads and highways, etc. (Bellalah, 2013). In Istisna, with the consent of all parties involved, the price must be fixed and known in advance to the extent that ignorance or lack of knowledge is removed. In Istisna it is not necessary to pay the price in advance (unlike Salam where spot price payment is required). Price can be paid in installments within a fixed period of time (Ahmed, 2009). Against the general rule laid down for Salam, it has been legalized by the contemporary scholars because the construction of huge plants may require a long development period and payment can be made through installments depending on the pace of implementation of such projects.

Conditions of Istisna Contract

The validity of an Istisna contract is subject to the fulfillment of specific requirements. First, it is necessary to know and fully understand the specifications of the of the subject of Istisna (items to be manufactured or constructed) to eliminate any ignorance or lack of understanding of the commodity kind, type, quality, and quantity (Ahmed, 2009). Second, the prices must be fixed in advance and once prices are settled, they cannot be raised or decreased. However, due to material modification in the commodity, or due to unforeseen contingencies or changes in input prices, it can be adjusted by the mutual consent of the contracting parties (Zaharuddin, 2008). Third, the manufacturer uses his own material to produce the required goods, if the buyer supplies the material and the manufacturer is only required to use his labor and skills, it will be the contract of Ujrah (wage) and not of Istisna. Finally, before commencing work, any party may cancel the contract after notifying the other party. However, after commencement of work by the manufacturer, the contract cannot be unilaterally cancelled (Muhammad & Chong, 2007)

Difference between Istisna' and Salam

The subject on which Istisna's transaction is based on is always something that needs to be produced, whereas Salam's contract subject may be anything that needs to be produced or not.

In Istisna's price is not necessarily payable in full in advance. Paying the full price at delivery isn't even necessary. According to the parties 'agreement it can be deferred to any time. The payment can also be made in installments, whereas Salam's price must be paid in full in advance.

The delivery time shall not be fixed in Istisna whereas the delivery time is an essential part of the sale of Salam.

The Istisna contract can be cancelled before the manufacturer starts the work, whereas Salam contract cannot be cancelled unilaterally.

The contract with Istisna may be cancelled before the manufacturer begins the work, whereas the contract with Salam cannot be unilaterally canceled (Elasrag 2014).

Istisna as a Mode of Finance

The main aim of the financing mode in Istisna is to promote manufacturing capacity in the industrial, agricultural, or infrastructure sectors. It can be utilized in financing infrastructure projects such as buildings, apartments, hospitals, schools, universities, canals, etc.
For instance, if a customer wants to build a house, the bank may undertake to build the house based on an Istisna. The bank needn't build the house himself. He can enter a parallel Istisna with a third party to hire the construction service. The bank will have to calculate his cost and fix with his customer the price of Istisna that allows him to make a reasonable profit over his cost. Payment of installments by the customer may commence from the day the parties sign the Istisna contract. To secure the payment of installments, the bank may keep the house or land title deeds, or any other property of the customer, as a security until the customer pays the final installment.

Step by Step Istisna Financing **(Ibrahim, Kamarudin 2014):**

1. Customer identifies the subject to be manufactured or constructed.
2. The seller provides the price quotation and other relevant details requested by the customer.
3. Customer approach the bank for financing and both parties agree on financing using al-istisna (principal financing plus bank profit)
4. The bank enters into a parallel istisna agreement with the constructor/manufacturer: The bank will purchase (parallel al-istisna') the istisna subject from the developer at a principal price and now bank will have ownership of the subject matter.
5. Developer delivers the istisna subject in consideration for istisna purchase price.
6. Customers pay monthly installments to the bank.

Figure 12: Structure of Istisna Contract (Gatti, 2018)

Rental Based Modes of Islamic Finance

3.3.6. Ijarah (Leasing)

Ijarah is an Islamic jurisprudence term that means giving something on rent. It is the transfer of the usufruct of a particular property or asset s to another person in exchange for a rent claimed from him (Kettle, 2011). The term 'ijarah' is identical to the term 'leasing' in English. The lessor is called 'mu'jir' here, the lessee is called 'musta'jir' and the lessor's rent is called 'ujrah.'

In the sense of leasing, the ijarah rules are very similar to the sales rules, because in both cases something is transferred to another person for a valuable consideration. The only difference between ijarah and sale is that the corpus of the property is transferred to the purchaser in the latter case, whereas in the case of ijarah the corpus of the property remains in the transferor's ownership, but only its usufruct, i.e., the right to use it, is transferred to the lessee (Ayub, 2016)

Masood & Ghauri (2015) explained that ijarah in its origin is not a mode of financing. It is like sale, a normal business activity. However, this transaction is also being used in the Western

countries for financing purposes for certain reasons. Some financial institutions started leasing some equipment to their customers instead of giving a simple interest-bearing loan. They calculate the total cost incurred in the purchase of these assets while fixing the rent of these equipment and add the stipulated interest that they might have claimed on such an amount during the lease period. The aggregate amount thus calculated is split over the total months of the lease period, and on that basis the monthly rent is fixed (Chhapra et al, 2018).

Under Shariah rules however, there are basic terms and conditions that must be adhered to in the Ijarah contract so that it can be used as a mode of financing (Masood & Ghauri, 2015)

Transferring of usufruct not ownership: Leasing is a contract by which the owner of an asset or property transfers its usufruct to another person at an agreed consideration for a period of time.

Subject of lessee: The lease subject must have a valuable use to it. Thus, things that have no usufruct cannot be leased at all.

All consumable things cannot be leased out: For a valid lease contract, it is necessary that the corpus of the leased property remains in the seller's ownership and is transferred to the lessee only by its usufruct. So, anything that can't be used without consuming can't be leased out. The lease cannot therefore be affected in terms of money, edibles, fuel, etc., because their use is not possible unless consumed. If anything of this nature is leased out, it shall be deemed to be a loan and all rules relating to the loan transaction shall apply accordingly. Any rent charged in respect of this invalid lease is an interest charged on a loan.

All liabilities of ownership are borne by lessor: As the corpus of the leased property remains in the lessor's ownership, the lessor shall bear all the obligations arising from the ownership, but the lessee shall bear the liabilities relating to the use of the property. Example: A rented out his house to B. The property taxes shall be borne by A while B, the lessee, shall bear the water tax, electricity bills and all expenses incurred in the use of the house.

Lease period and purpose: The lease period must be set in clear terms. In addition, the lessee may not use the leased asset for any other purpose than the purpose set out in the lease agreement. If no such purpose is specified in the Agreement, the lessee may use it in the normal

course for whatever purpose it is used. If he wants to use it for an abnormal purpose, however, he cannot do so unless the lessor expressly allows him.

Lessee as Trustee: The lessee shall be liable to compensate the lessor for any damage caused to the leased asset by any misuse or negligence on the part of the lessee. In addition, the leased asset shall remain in the lessor's risk throughout the lease period, in the sense that the lessor shall bear any damage or loss caused by the factors beyond the lessee's control.

Lease of jointly owned property: A property owned jointly by two or more persons can be leased out and the rent is distributed among all joint owners according to the proportion of their respective shares in the property.

Rental Determination: The rent must be fixed for the entire lease period at the time of the contract. It is permissible for different amounts of rent to be fixed during the lease period for different phases, provided the amount of rent for each phase is specifically agreed upon at the time a lease is made. If the rent for a subsequent phase of the lease period was not fixed or left to the lessor's option, the lease is not valid. Second, the lessor cannot unilaterally increase the rent, and any agreement to that effect is void. Third, the rent or any part thereof may be payable in advance before the asset is delivered to the lessee, but the amount thus collected by the lessor shall remain with him as payment 'on account' and shall be adjusted to the rent after it is due. Fourth, the lease period starts from the date the leased asset was delivered to the lessee, regardless of whether the lessee has started to use it or not. Fifth, if the leased asset has completely lost the function for which it was leased, and no repair is possible, the lease ends on the day such loss was caused. However, if the loss is caused by misuse or the lessee's negligence, he will be responsible for compensating the lessor for the asset's depreciated value as it was immediately prior to the loss.

Figure 13: Structure of Ijarah Contract (Gatti, 2018)

Difference between conventional leasing and Ijarah (Chhapra et al, 2018)

The starting of Lease

In most financial lease cases, the lessor, i.e., the bank, buys the asset itself through the lessee. The lessee purchases the asset, either directly or through the lessee, on behalf of the lessor who pays the supplier its price. In some lease agreements, the lease starts on the very day the lessor pays the price regardless of whether the lessee has made payment to the supplier and has taken delivery of the asset or not. This can mean that the liability of the lessee for the rent begins before the lessee takes delivery of the asset. In Shariah, this is not permitted, because it amounts to charging rent on the money given to the customer, which is pure and simple interest only (Usmani, 2015)

Rent should be charged after the leased asset has been delivered.

The correct way, according to Shariah, is for the rent to be charged once the asset has been delivered by the lessee and not from the day the price has been paid. If after receiving the full price the supplier has delayed the delivery, the lessee should not be liable for the rent of the delay period.

Different relationships between the parties

It should be clearly understood that when the lessee himself is entrusted with the purchase of the asset to be leased, there are two separate relationships between the institution and the customer, which come into operation one after the other. In the first instance, the client is the institution's agent for buying the assets on behalf of the latter. The relationship between the parties at this stage is nothing more than the relation between a principal and his agent. The lessor and lessee relationship still has not taken place.

The second stage starts from the date the customer takes delivery from the supplier. At this stage the lessor and lessee relationship come to play its part. The parties should not mix or confuse these two capacities with each other. The client can't be held liable for a lessee's obligations during the first stage. He is responsible for carrying out the functions of an agent only during this period. But he is liable to discharge his obligations as a lessee when the asset is delivered to him.

Liability of the parties in case of loss to the assets

As mentioned in the basic principles of leasing, the lessee is liable for any loss that his misuse or negligence causes to the asset. He may also be held liable for the wear and tear that normally occurs during usage. But he cannot be held liable for a loss resulting from factors beyond his control. The conventional 'financial lease' agreements generally don't distinguish between the two situations. Both the situations should be dealt with separately in a lease based on the Islamic principles.

Penalty for late payment of rent

A penalty is imposed on the lessee in certain financial lease agreements if he delays payment of the rent after the due date. The Shariah does not justify this penalty if it is meant to add to the lessor's income. The reason is that the rent is a debt payable by the lessee after it becomes due and is subject to all of the rules prescribed for a debt. A debtor's monetary charge for his late payment is precisely the riba which the Holy Quran prohibits. Therefore, in case the lessee delays payment of the rent the lessor cannot charge an additional amount.

The penalty of late payment is given to charity.

An alternative may be resorted to avoid the adverse consequences. The lessee may be asked to undertake that he will pay a certain amount to a charity if he fails to pay rent on its due date. The bank / lessor may maintain a charity fund for this purpose in which such amounts may be credited and disbursed for charitable purposes, including advancing interest-free loans to the needy. The amount payable by the lessee for charitable purposes may vary depending on the default period and may be calculated on a percentage basis per year.

Termination of Lease

If the lessee violates any term of the agreement, the lessor shall have the right to unilaterally terminate the lease contract. However, if the lessee fails to violate, the lease cannot be terminated without mutual consent. In some 'financial lease' agreements it was noticed that, according to his sole judgment, the lessor was given unrestricted power to terminate the lease unilaterally whenever he so desires. That again contrary to Shariah principles

Usads kHKdsDH

Comparison between Conventional Lease and Ijarah

In a conventional lease, the bank retains ownership of the asset for the duration of the lease agreement. Similarly, in an Ijarah contract, the lessor (usually the Islamic financial institution) remains the owner of the leased asset. However, the risk and responsibility distribution differs between the two.

Risk Bearing

In a conventional lease, the lessor generally assumes the risk associated with the asset. In an Ijarah arrangement, all rights and liabilities related to ownership remain with the lessor. However, the lessee is responsible for liabilities arising from the use of the asset. Should the asset be harmed or lost due to circumstances beyond the lessee's control, the loss is borne by the lessor.

Commencement of Lease

A conventional lease typically begins when the lessee makes payment for the asset. In contrast, an Ijarah lease starts from the moment the asset is physically handed over to the lessee, enabling its productive use.

Profit Realization

Under a conventional lease, profit is earned through the interest charged on the money invested in acquiring the asset, and lease pricing is often influenced by prevailing market interest rates. In an Ijarah contract, profit is generated through the rental income from the use of the asset, not through interest.

Penalty for Delayed Payment

Conventional banks impose penalties for delayed rent payments. However, under Islamic finance principles, an Ijarah agreement does not permit charging any additional amount for late payment, as this would constitute Riba (interest), which is prohibited.

In Case of Theft

If the leased asset is stolen under a conventional lease, the lessee is typically still liable to continue paying the rent until the insurance claim is settled. In contrast, under Ijarah, the Islamic bank does not charge rent during the period in which the asset is no longer usable (such as after theft), as rent in Islamic finance is tied strictly to the actual use of the asset.

Compensation for Damage

In a conventional lease, the lessee is responsible for any damage or loss to the leased asset. In Ijarah, if the asset is completely destroyed and cannot be repaired, the lease ends on the date of such loss. However, if the loss or damage results from the lessee's negligence or misuse, the lessee must compensate the lessor for the depreciated value of the asset as of immediately before the loss.

Insurance

Conventional leases rely on traditional insurance mechanisms. In Ijarah contracts, the asset must be insured using a Shariah-compliant alternative, namely Takaful.

Contractual Conditions

Conventional leasing does not require adherence to religious or ethical conditions. In contrast, Ijarah stipulates that the asset must be used in a manner that complies with Islamic law (Shariah), and must be for lawful and productive purposes.

Securitization of Assets

Under a conventional lease, the leased asset cannot typically be sold to another party by the lessor until the lease term is fulfilled, although the lessee may have an option to purchase. Under Ijarah, the lessor may sell the leased asset to a third party even during the lease term. Upon transfer, all rights and obligations are passed to the new owner.

Rental Adjustment

In a conventional lease, any increase in market interest rates may be passed on to the lessee in the form of higher rent. In contrast, in an Ijarah contract, the rent cannot be increased unless it is due to specific, externally imposed factors such as new taxes or inflation.

3.3.7. Diminishing Musharaka (Declining Balance Partnership)

Diminishing Musharaka called in Arabic Musharaka Mutanaqisah allows profit sharing and pro-rate equity participation either in the joint ownership of a property/equipment or in a joint venture and provides a method whereby the Islamic bank continues to reduce its equity, ultimately transferring asset ownership to the client. This is done by dividing the banks share into a number of units and the client purchases the units of the banks share one by one periodically,

thus increasing gradually his own share until all the banks' units are purchased making the client the sole proprietor of the property or the joint venture (IFN, 2020). In other words, Diminishing Musharaka is a form of' Musharaka' in which the asset's ownership is split into units. The bank then leases its portion of assets (units) against rental payments to the customer. In parallel, the customer purchases the units periodically under bank ownership. When all the units are purchased, the customer becomes the sole proprietor of the asset.

Diminishing Musharaka is used in all purchases of fixed assets such as home financing, plant & factory financing, car / transport financing, project financing of fixed assets. As well as in financing of business of services and or in trade.

Diminishing Musharaka arrangement consists of the following transactions:
1. Establishing joint ownership of real estate.
2. Giving the customer the bank's share on rent.
3. Customer promise to purchase the Bank's share units.
4. Real purchase of the units at various stages.
5. Rental adjustment according to the bank's remaining share in the property.

Let's take an example to explain the above steps in house financing. Let's assume that a customer wants to buy a house and doesn't have sufficient funds. He approaches the bank which agrees to join him in buying the required house. The customer pays 20 per cent of the price and the bank pays 80 per cent of the price. The banks own 80% of the house, while the customer owns 20% (Transaction 1). The client uses the house for his residential requirement after jointly purchasing the property and pays rent to the bank for using his share in the property (Transaction 2). Simultaneously, the bank's share is further divided into eight equal units, each representing 10 per cent house ownership.

The customer promises the bank that he will buy one unit after three months (Transaction 3). Accordingly, he buys one unit of the bank's share after the first three-term by paying 1/10th of the house's price. This reduces the bank's share from 80 to 70 per cent (Transaction 4). Thus, the rent payable to the bank is reduced to this extent as well (Transaction 5). The customer then purchases another unit at the end of the second term, raising his share of the property to 40 per cent and reducing the bank's share to 60 per cent (Transaction 4), thus reducing the rent to that proportion (Transaction 5). This process continues in the same way until the customer

purchases the entire bank share, which reduces the bank's share to' zero' and increases the customer share to 100 percent.

One very important condition for diminishing Musharaka mode of financing is that “at the time of the purchase of each unit, sales must be effected by the exchange of offer and acceptance at that particular date” (Usmani, 1999b) based on the market value. If the value of the business or property has increased, the price will be higher and if it has decreased the price will be less. In this case, the price of the financier's units cannot be fixed in the promise to purchase because if the price is fixed before entering into Musharaka, it effectively means that the client has guaranteed the principal invested by the financier with or without profit, which is strictly prohibited in the case of Musharaka.

In this case, the price of the financier's units cannot be fixed in the promise to purchase because if the price is fixed before entering into Musharaka, it effectively means that the client has guaranteed the principal invested by the financier with or without profit, which is strictly prohibited in the case of Musharaka (Usmani, 1999b)

3.4. Risk Management in Islamic Banking Institution

Islamic Banking institutions, like all financial institutions, are subject to various risk types-financial and non-financial. Unlike conventional banks, Islamic Bank risk management systems often take steps into consideration to comply with Shariah rules and principles and to ensure adequacy of relevant risk reporting. Islamic Banks should have a robust risk management and reporting mechanism in place to implement all risk management elements including risk identification, measurement, mitigation, monitoring, reporting, and control including adequate board and senior management oversight. A risk management framework is a collection of guidelines and best practices that offer practical effect to manage and mitigate the risks underlying the business goals which Islamic Banks can adopt. This framework includes the introduction of acceptable policies, guidelines, processes, and effective management of information systems (MIS) for internal risk reporting and decision-making in accordance with the scope, complexity, and purpose of the activities of Islamic Banks.

The broad perspective on risk and its management is embodied in Islamic law. From the Islamic perspective, economic activities are judged not by inherent risks but by the added values and/or wealth they create. Yet due to their inherent excessive uncertainty (Gharar), many sales contracts are banned. Ghara refers basically to risk in contract where it deals with the uncertainties or ambiguity in relation to the pillars of contract. In a contractual agreement*, gharar* must be avoided because, where it exists, there is a possibility that one of the parties of the contract may lose out. What this means is that market participants must not allow ambiguity to exist when the contract is in effect.

Some of aspects in contracts in which excessive gharar may occur include:

- Risk or uncertainty associated with the time of payment, e.g., unconfirmed date of payment in the event of a delayed sale (Al-Kasani, 2003 cited in Agha, 2015).
- Risk or uncertainty associated with the existence of a commodity, e.g., trading in an item that does not exist (Al-Kasani, 2003 cited in Agha, 2015)
- The risk or uncertainty associated with the quality of the commodity. For example, ambiguity arises in the specifications and features of the goods (Al-Sarakhsi, 1993 cited in Agha, 2015).
- Risk or uncertainty associated with the quantity of the goods, for example, selling something without specifying the price or quantity of the goods (Ibn Abidin, 1992 cited in

Agha, 2015).

- Uncertainty associated with the possession of a commodity, for example, birds in the sky or fish in the sea (Ibn Muflih, 1997 cited in Agha, 2015).

By not allowing such contracts, the Shariah attempts to mitigate the high level of risk that is involved in the contract (Hassanain, 2016). While Sharia forbids uncertainties and risks in contracts, it enjoins investors and corporations to take risks in their business ventures as they do so in anticipation of profits. This is in line with the Islamic principle of risk-taking, namely:

1. "Al-ghonm bil ghurm" meaning that with risk comes profit

This principle maintains that profit can only be made by taking risks. Agha (2015) stated "the profit is only legitimate if it assumes a proportionate risk and should not be created from risk free contract". The behavior is in direct contrast to the riba (interest) where the taking of risk is absent from the receipt of the surplus from the loan. Riba practice allows capital to increase without the possibility of a decrease, while trade allows capital to increase or decrease based on market conditions and systemic events. The former is therefore unfair from an Islamic point of view, while the latter is just and equitable. In order to enjoy gains, this principle requires one to risk his capital. If an individual earns profit without risking his capital, the counterparty is likely to be treated unfavorably in the contract. The principle is usually used to propose a preference for profit-and-loss-sharing (PLS) financing instruments such as Musharaka and Mudarabah.

2. "*Al-kharaj bil daman*" meaning profit is dependent on responsibility

This Islamic principle maintains that the party benefiting from the full benefit of the asset should bear the risk of ownership of the asset. However, linking returns to ownership risks does not necessarily relate to profit-and-loss-sharing (PLS) contracts. The principle refers to the risks associated with ownership of sales and leasing transactions. For example, the effect of a sale-based transaction is that the seller must bear all the risks associated with the object of sale and in the lease contract, the lessor should be responsible for the asset leased during the contract period (Agha, 2015).

3.4.1. Risk Profile of Islamic Banks

While Islamic banks' risk profiles are generally similar to conventional banks especially with regards credit risk, Islamic banks however faces some unique risks because the nature of the contracts used by Islamic banks expose them to a variety of risks in ways not applicable to conventional banking operations. Their key unique risks include:

3.4.1.1. Credit Risk

As payment of Islamic banking facilities is made on an instalment basis, credit risk is a major risk facing Islamic banks. The concept of al-bay (sale) as an alternative to riba (interest) has been modelled as a sale with an instalment or a deferred payment. As a customer of an Islamic bank pays on an instalment basis, the bank charges additional money as a profit margin. As a result, the credit risk premium has probably become synonymous with charging a certain "margin" of profit from Islamic credit financing.

Islamic banking products dealing with deferred payments can be called asset-based credit products. The difference between Islamic credit financing and interest-bearing credit lending is that the former is generated from asset-based credit financing (ABCF) while the latter is generated from loan-based lending (Shaikh, 2014). In addition, an asset-based credit transaction is said to arise from a sale or trading transaction, and therefore the profit from that transaction is permissible. The profit, however, reflects the profit generated from the payment of instalments rather than the payment of cash. There is a number of evidence supporting the take-up of profits due to deferral of payments.

Early Muslim jurists views on the permissibility of charging a higher price from a credit sale presented by Islamweb.com (2016) are as follows:

- The Maaliki School: “The deferment for some period of time has a value in the price.” (Ibn Rushd Al-Hafid, 2/108, Bidayatul Mujtahid)
- The Shaafi’ee School: “Five which is paid in cash is equal to six which is paid on deferred payment basis.” (Abu Hamid Al-Ghazali, 1/85, Al-Wajiz,)
- The Hanbali School: “The period is part of the price.” (Ibn Taymiyyah Fatwa, 29/499)
- The Hanafi School: “The price may be raised in return for delaying payment,” [Badaa’i’ Al-Sanaa’i’, 5/187]

The basis for the legitimate take-up of profits from the sale of instalments is based on the nature of the contract used by the counterparties. It is common knowledge that the pillars of the contracts of sale and purchase must be fully respected to prevent them from becoming void. An important feature of the sale contract is that it involves an exchange of assets for money and not an exchange of money for money or less money, as is evident from interest-bearing loans (Institute of Islamic Banking and Insurance, 2020) which results in customers settling payments on a deferred basis, and hence Islamic banks are exposed to credit risk due to the emphasis on lending in the Murabaha, leasing in the Ijarah, promising to deliver or buy in Istisna and Salam, and investing in the Musharaka and Mudarabah contracts for business performance (Mohamed, 2012). Since most of the Islamic bank's asset side is made up of Istisna'a, Ijara, salaam, Murabaha and other sales-based facilities, credit risks are of major importance (Hassan et al, 2014).

For instance, credit risk in murabaha contracts arises when the bank provides the asset to the client and the client default in full- and on-time payment of debts. The failure to perform may be due to external systematic sources or internal financial causes or may be due to moral hazard (wilful default). Wilful default must be clearly identified, as Islam does not permit debt restructuring based on compensation except in the case of wilful default.

In bay' al-salam or istisnah contracts, the bank is exposed to the risk of failing to supply on time, failing to supply at all, or failing to supply items of the contractually stipulated quality. Such failure could lead to a delay or default in payment or delivery of the product, exposing Islamic banks to financial losses in both income and capital (Helmy. 2012)

In the case of mudarabah investments, where the Islamic bank enters into the mudarabah contract as rab al-mal (principal) with an external mudarib (agent), the Islamic bank is exposed to an increased credit risk on the amounts advanced to the mudarib, in addition to the typical principal-agent problems. The form of the mudarabah contract prevents the bank from exercising proper powers to monitor the mudarib or participate in project management, making it impossible to assess and manage credit risk. The bank is unable to know or decide how the mudarib's activities can be adequately supervised, especially if losses are declared. This risk is especially prevalent in markets with strong information asymmetry and insufficient transparency in mudarib financial disclosure (Malim, 2015)

In nutshell, most Islamic financial products are driven by credit-based contracts. In a *Murabaha* transaction, the debt obligation originates from a credit sale contract rather than a loan contract with interest. S*alam* and *istisna'contracts* are also categorized as credit-based contracts as both contracts deal with future financial obligations. In *Murabaha*, the purchaser has an obligation to make future payments while in *salam* and *istisna'*, the seller has an obligation to make future deliveries of commodities to the purchaser.

When these obligations are not met, the bank's earnings as well as capital are at risk. When Islamic banking portfolios are largely driven by asset-based credit-based products, the bank is expected to install an effective risk management system to prevent bank failure arising from credit risk exposures.

The Islamic Financial Service Board (2005) defines credit risk as the potential that counterparty fails to meet its obligation in accordance with agreed terms principles for credit risk. Credit risk can also be defined as the potential loss from a change in the credit quality of a counterparty that would affect the value of a security or portfolio. Default can be defined as the failure of debtors to pay a substantial portion of financing capital for more than three months. When the counterparty defaults, the bank loses either all the market value of the position or the part of the value that it cannot recover. It is thus important to examine the nature of bank loss from credit risk, its measurement and how useful it is to the bank in managing the risk.

The Islamic Financial Service Board (2005) principles for credit risk are as follows:

- **Principle 2.1**: The Islamic Financial Institutions shall have in place a strategy for financing, using various instruments in compliance with Sharia, whereby it recognizes the potential credit exposures that may arise at different stages of the various financing agreements.
- **Principle 2.2**: The Islamic Financial Institutions shall carry out a due diligence review in respect of counterparties prior to deciding on the choice of an appropriate Islamic financing instrument.
- **Principle 2.3**: The Islamic Financial Institutions shall have in place appropriate methodologies for measuring and reporting the credit risk exposures arising under each Islamic financing instrument.
- **Principle 2.4**: The Islamic Financial Institutions shall have in place Sharia-compliant credit risk mitigating techniques appropriate for each Islamic financing instrument.

The management of credit risk shall be carried out through the credit policy of the bank, which shall be prepared by the credit committee and approved by the board of directors. The objective of the credit risk policy is to identify, measure, monitor, and control credit risk on an aggregate basis across all lines of business. It will cover the methodologies for measurement monitoring and controlling of credit risk. The policy is communicated to all personnel throughout the Islamic bank so that the bank's approach to granting and managing financing is clearly understood. In a nutshell, it is from the credit risk policy that the credit risk management process is built on.

Identification of Credit Risk

Credit risk is identified when applications for loans and financing undergo a series of processes to determine the creditworthiness of the client. One of the processes is the credit analysis, which is described as the credit quality assessment activity of the counterparty. While the term may include credit scoring, it is more commonly used to refer to processes that involve human judgment. The credit analyst will review the counterparty information. For a corporate entity, this may include its balance sheet, income statement, recent trends in its sector, the current economic environment, and so on. The credit analyst can also assess the exact nature of the obligation.

The credit committee shall be responsible for identifying the credit risk. It sets out the bank's credit policy, including the identification of potential losses incurred by the bank for the different types of exposures it intends to take. The Credit Committee shall be authorized by the Board of Directors to make a final decision on the approval or refusal of the proposed financing.

Smith (2015) has identified several factors that need to be taken into consideration when evaluating financing proposals.

1) **the 5 Cs of credit (Muhammad & Melemi, 2021)**
    a) Capacity: Ability to pay, e.g., payment/income ratio and variability.
    b) Character: Willingness to pay, e.g., credit history.
    c) Collateral: Decreases risk but may increase monitoring costs.
    d) Capital: Loan/value; signals borrower's expectations, decreases moral hazard.
    e) Conditions: Affects other 4 Cs as they change over time.

2) **Industry risk**. This risk affects all businesses in the industry and can originate from:
   a) Economic cycle (local, regional, national, or international) and its effect on predictability and stability of revenues and expenses
   b) Sensitivity to inflation, energy costs, exchange rates, international competition, and social and political trends
   c) Projected demand and maturity of market; over- or under-utilized plant capacity
   d) Regulation and potential legislation
   e) Consolidation through mergers and acquisitions
   f) Barriers to or ease of entry

3) **Firm risk:** This risk is internal to the firm and can originate from**:**
   a) Market share and stability of share
   b) Product diversity.
   c) Marketing and distribution requirements
   d) Obsolescence or product life cycle length
   e) Diversity of major customers and percentages and length of relationships or contracts
   f) Ability to maintain or improve profit margins.
   g) Quality of management - experience, succession, depth of management, past performance vs. peers, dependence on key person (especially for small businesses) (Simon, 1999)

4) **Information asymmetry**: availability of adequate information to avoid information asymmetry.
   a) Banks must maintain a good relationship with the borrower to obtain private information over time.
   b) The bank defines conditions within the cost of obtaining the credit referring to both tariff terms (interest) and non-tariff terms (maturity) with the aim of reducing information asymmetry (Tfaily, 2017)
   c) The bank can minimize this risk by setting intermediary (monthly or quarterly) deadlines for monitoring, contract terms/conditions through the loan agreement (Tupangiu, 2017)
   d) Data should be prepared by a reputable accountant, who should be qualified and affiliated with a sound, well-managed accounting firm.
   e) If statements are not audited, the bank's credit analyst will have to conduct the audit.

f) Data should not be too old; information should consist of data from the last 3 to 5 years.

5) Awareness of methods used to analyze financial statements.

a) Valuation of balance sheet items and income statement items
b) Ratio analysis
c) Sources and uses of funds – simple version of cash flow statement
d) Cash budget

6) Valuation of Balance Sheet Items - Common-size ratios, i.e., each item/total assets, should be compared over time for trends and against peers to determine causes of both high and low deviations from norms.

a) Cash - related to length and regularity of collection period.
b) Accounts receivable- with asset-based lending, best way for lender to validate receivables is direct confirmation with customers to determine the amount and that the customer is a real entity; also track checks on daily basis to make sure not returned for insufficient funds.
c) Notes receivable: arise when customers do not pay, and the seller secures a note to strengthen his claims.
d) Intangible assets: goodwill, trademarks, brands, and copyrights, patents, leaseholds, formulas, and franchises - in general, non-goodwill intangibles are amortized; goodwill must be evaluated annually and written down when it is deemed to be worth less than the company paid for it.
e) Current liabilities: accounts payable are usually low in a well-managed business because of advantageous trade credit terms, if the account payable is large, may indicate an inability to secure bank funds.
f) Note Payable may indicate an inability to pay trade receivables and a seller asking for a note rather than selling on an open account.

7) Valuation of income statement items

a) Net Revenues or Sales - examine over time.
b) Cost of Goods Sold:
   i) Focus on large changes over time.
   ii) Examine the effect of depreciation and other non-cash expenses.

iii) Examine Labor Costs - union or labor contracts, permanent vs. temporary, fringe benefits (health and life insurance, retirement, vacations), salaries and bonuses, transportation, expense accounts.

iv) Owner Compensation (particularly for small business)

v) Occupancy Costs - typical costs are rent (vs. Depreciation, repairs, insurance, and property taxes for owned property), and utilities. You may consider whether total occupancy costs (particularly if provided by a related party) are at market value.

vi) Non-recurring items - business interruptions or disturbances (strikes, fires, weather, illness of key person), insurance proceeds, lawsuit settlements, gains or losses on disposal of assets, discontinued operations or products, temporarily low tax rates

vii) Imminent Changes in the Business or Markets

viii) Related Party Transactions (particularly for small businesses) - examine all related party expenses for reasonableness and market values.

ix) Is assumed rate of return on defined pension benefits liabilities reasonable and what effect has it had or will it have on pretax income?

MEASUREMENT OF CREDIT RISK

In measuring credit risk quantitative models, qualitative models, or hybrid models can be implemented to objectively predict the obligors' credit worthiness. The main parameters that should be considered in the valuation of credit risks are the expected and unexpected losses which require the computation of the probability of default (PD), the loss given default (LGD), the exposure at default (EAD) and credit value-at-risk (VaR). The credit VaR is calculated using the distribution of actual losses observed in a credit portfolio, as well as a certain confidence level and a pre-specified loss holding period. The Credit VaR estimation is viewed as the economic capital to be held as a buffer against unexpected losses. Finally, a credit rating system must be used and validated at pre-defined intervals as well as whenever there are new or modified parameters due to market and contract conditions by using qualitative and quantitative validation analysis such as functionality test, back-testing, benchmarking, and stress-testing should be undertaken. The credit rating system should be able to provide efficient ratings when small changes arise, but be easily modified when major changes occur (Akkizidis and Khandelwal, 2008)

MITIGATING CREDIT RISK

Credit risk can be managed or mitigated in a variety of ways. The first line of defense is the use of credit scoring or credit analysis to avoid extending credit to parties with excessive credit risk.

Second, credit risk limits are widely used, as set out in the Bank's credit risk policy. These generally specify the maximum exposure that the firm is willing to take from the counterparty. Industry limits or country limits may also be established to limit the amount of credit exposure that a company is willing to accept from counterparties in a particular industry or country. Calculation of exposure within these limits requires some form of credit risk modeling. Transactions may be structured to include collateralization or a variety of credit enhancements. Credit risks can be hedged against credit derivatives that have not been used by Islamic banks. In the end, firms can hold capital against outstanding credit exposure (Nordic Investment Bank, 2019)

In mitigating credit risk arising from Murabaha transaction, Islamic banks use collateral and guaranties as security against credit risk. The bank may request that the client post additional collateral before entering a Murabaha transaction. In some cases, Murabaha subject matter is accepted as collateral. Posting collateral as security is not without challenges. Typical problems include illiquidity of the bank's collateral or inability to sell the collateral, difficulties in periodically determining the fair market value, and legal hurdles and hindrances in taking possession of the collateral (Mohamed, 2012).

Akkizidis and Khandelwal (2008) emphasized that before taking collaterals and guarantees it is vital to analyze the risk exposure by identifying the relationship between the counterparties, the Islamic financial contracts, and the guaranties and collaterals used to cover a percentage of the potential losses in case of defaults.

In order to manage credit risks effectively in Islamic banks, Mohamed (2012) explained that investment and financing assets should be well structured, policies should be well reflected in internal procedures and manuals, staffing should be adequate and diligent in following established policies and guidelines and the information normally available to the process participants should be timely, accurate, and complete. Moreover, a review of the process should analyze credit manuals and other written guidelines applied by a bank's various departments, and the capacity and performance of all credit function departments.

It should also cover the procedures for originating, assessing, approving, disbursing,

monitoring, collecting, and handling the various credit functions provided by the bank. Specifically, the review should include:

- A detailed credit analysis and approval process, including samples of customer application forms, internal credit summary forms, internal credit manuals and customer files.
- Criteria for the approval of customer requests, the determination of return policies and limits on assets at different bank management levels, and the handling of assets disbursements.
- "Collateral policy for all types of financial instruments and actual methods and practices concerning revaluation of collateral and files related to collateral" (Mohamed, 2012).
- "Administration and monitoring procedures, including responsibilities, compliance, and controls" (Mohamed, 2012).
- A process for handling exceptions- Collateral policy for all types of financial instruments and actual methods and practices relating to the reassessment of collateral and collateral-related files.
- Exceptions handling processes.

3.4.1.2. Business Risk

Money subject to depreciation is one of the essences of the ban on interest (riba) by the Quran. Money or capital must be allowed to depreciate, which means that it may appreciate and depreciate. Both happen when money is channelled into (al-bay) trade and commerce. When money as capital is invested in trading and commercial activities (al-bay), it can either appreciate or depreciate its value. When the venture is profitable, the investor gets the capital plus the profit back. The value of the capital invested has been appreciated. Likewise, capital depreciation is evident when business incurs losses. In this situation, money abides by the law of depreciation (Goldenweiser, 1938). Therefore, capital is exposed to business risk. It expands and contracts based on the health of the economy.

Since Islamic banks take positions in trade and commercial by converting capital into assets through their various financing contracts, they are directly exposed to business risks. Business risk defined by Global Islamic Financial Report (2015) is the potential loss to the bank from positions taken in contracts where ownership and price risks are exposed to an Islamic bank. For example, this can happen when the bank takes on a true Murabaha sale involving the purchase of assets which it will later sell on credit basis. The bank may charge a business risk

premium in addition to the credit risk premium by taking up business risks, which may increase the profit rate on the Murabaha sale (Global Islamic Financial Report, 2015)

Unlike interest-based loans, the practice of trade does not guarantee capital and profit. This means that when Islamic banks engage in trading activities under the Murabaha, Ijarah, Mudarabah and Musharaka contracts, business risk becomes their main concern. This is because these assets are owned by the bank. The bank acquires ownership when it purchases the asset with money, usually using the depositor funds of trade, involving capital mobilization with the aim of generating income. Capital may either be acquired from partnership capital (mudarabah and Musharaka) or used to generate income through murabaha, ijarah, salam and isisna.

When Islamic banking uses the trading model (al-bay), it faces new challenges in dealing with a regulatory regime based on an interest-bearing debtor-credit system. The banking business is a highly leveraged business based on the 8 per cent minimum capital adequacy ratio (CAR) set out in Basel II. At 8 per cent CAR, this means that the bank can use $1 of the deposit fund to make a $1 loan supported by only 8 cents of its own equity (i.e., capital). This poses a risk to depositors when the bank suffers dramatic defaults on loans and unexpected losses that surpass capital. Credit risk is the main concern (Ariff and Rosly, 2011).

Loan defaults eat up the profits of a bank and consume capital when default exceeds the expected losses. For this reason, the capital allocation is required to reflect the risk-taking profile of the loans in terms of their risk weights. Higher credit risk associated with a loan will trigger higher risk weights that require higher allocations of economic capital. Islamic banks operating on the trade (al-bay) principle are attracting even higher economic capital requirements as the risk-weight associated with trade (al-bay) is higher as it involves both business risk and financial risk (Ariff and Rosly, 2011). As a result, capital charges on real sale, operating leasing (ijarah) and equity-based transaction (Musharaka) may be extremely high and may add further capital stress (Bank Negara Malaysia, 2019)

In fact, conventional banking is not free from business risk as the capital of a bank is also exposed to market volatility. However, the portfolios of the bank consist mainly of interest-bearing loans, i.e., retail, corporate loans, and government debt. The main line of business is to make interest-bearing loans using interest-bearing deposits, so the major risk to the portfolio is credit risk with no business risk. Conventional banks are also not afflicted by the tax burden of making loans, as opposed to Islamic banks that suffer tax disadvantages by holding and trading in real assets.

In summary, applying the trading (al-bay) business model to Islamic banking would require the bank to hold more capital, pay more taxes, and set up a robust business or corporate risk management framework to meet the challenges of real business.

In order to motivate Islamic banks to promote a trading model, the Islamic Financial Services Board (2021) has introduced a new capital charge formulation for a financing transaction using the Profit-Sharing Investment Account (PSIA). The PSIA is an equity deposit that acts as a mutual fund. Deposits are not guaranteed, nor are profits. When the PSIA deposits are used for true sale of Murabaha financing, ijarah financing, mudarabah and Musharaka financing, which involve the acquisition of assets on the balance sheet, the capital charge will be relatively lower as most of the business risk is borne by the PSIA depositors. This should reduce the stress on bank capital and therefore make it less painful to include financing that carries business risk as a business strategy. Depositors whose risk appetite is similar to mutual investment should be able to invest in PSIA deposits.

In nutshell, the business risk of Islamic banking involves the ownership of assets whose value fluctuates along with the market forces. For example, when trading, the bank purchases X on a cash basis to sell it to Mr. Y on credit terms. In Ijarah, the bank buys X and leases it to Mr. M. In equity such as Musharaka, the bank purchases common stocks with a plan to sell them at a capital gain. All these positions involve the purchase of assets and, as a result, the holding of a business or price risk before it is sold off on the market. In Ijarah, the risk of ownership remains with the lessor throughout the rental period (Global Islamic Financial Report, 2015).

Prevalence of trading positions in Islamic banks is based on the certainty of sales and purchase activities between the bank and the client, and this is how business risks are mitigated. In other words, the bank will only enter a trading position if there is certainty that the asset will be disposed of at a profit. This is different from retail and wholesale trade where traders do not have guaranteed markets; therefore, they are fully exposed to market movements and price volatility. Some banks further reduce their risk position by making sales binding, where financing is only initiated when the customer has confirmed the purchase of the asset and, therefore, it is highly unlikely that the bank will end up holding unwanted inventories, this is however, an arguable practice by some scholars. (Global Islamic Financial Report, 2015).

3.4.1.3. Market Risk

Market risk, like in conventional banking, is a risk carried by Islamic banks as well as both are exposed to changes in equity instruments, commodities, fixed-income securities and currencies prices. Market risk for banks arises in the form of unfavorable price movements, such as yields (rate-of-return risk), benchmark rates, foreign exchange rates (FX risk), and equity and commodity prices (price risk), which potentially affect the financial value of an asset over the life of the contract. Islamic banks are further exposed to market risk due to tradable, marketable, or leasable asset value volatility. The risks are related to the current and future volatility of the particular asset market value (Mohamed, 2012) such as the commodity price of Salam or Istisna assets, the market value of Ijarah agreements, the market value of Murabaha assets purchased for delivery over a given period.

Akkizidi and Khandelwal (2008) stated that Islamic banks face four major categories of market risk factors that affect the value of the assets held throughout the lifetime of the contracts. The four types of risk that expose Islamic banks to market risk are:

1. Return of return risk related to market inflation and interest rate.
2. Commodity price risks, because Islamic banks typically carry inventory items (pre-defined prices) unlike conventional banks.
3. Like conventional banks, FX-rate risks.
4. Equity investment risks, in terms of equity financing through the PLS modes.

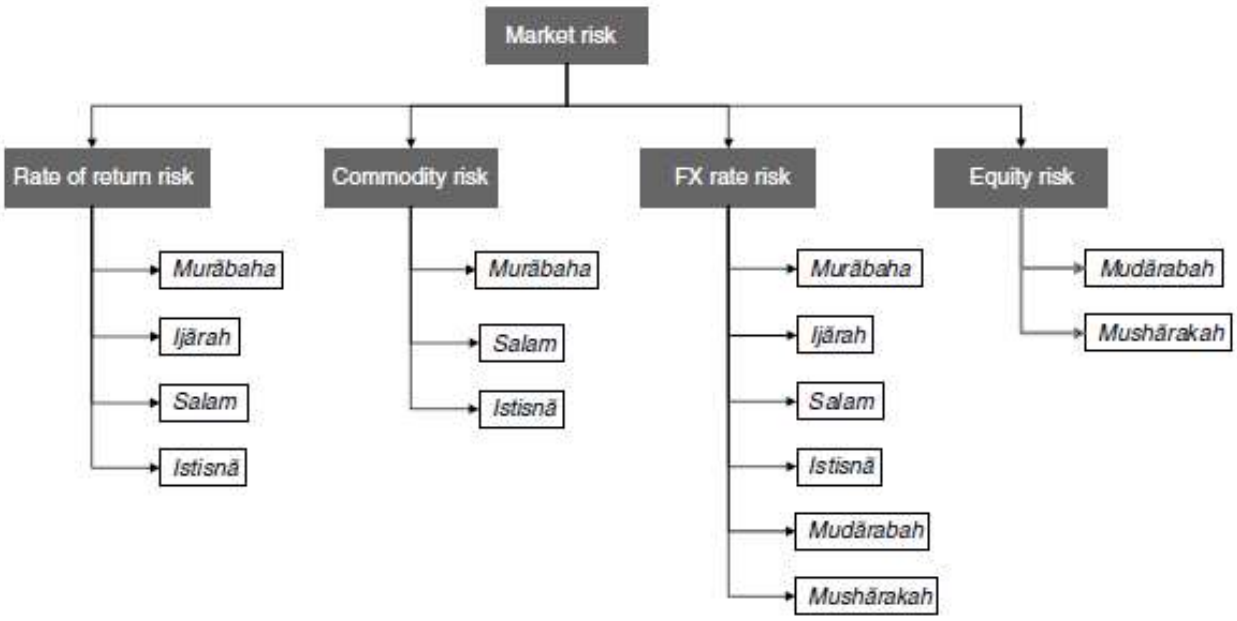


Figure 14: The four Types of Market Risks in the different Islamic Modes of Finance (Akkizidi and Khandelwal, 2008)

Market Risk Categorization

A. Rate of Return Risk

This risk comes when investment returns do not meet the expectations of investors, i.e., a discrepancy between the rates of return expected by profit-sharing investment account holders and the rate of return that the bank can pay them. This risk relates primarily to the nature of profit-sharing equity-based assets, for which return and especially principle is never guaranteed. This is very problematic to the Islamic banks because the former expects a modest and secure rate of return, which is not what one can expect from profit-sharing assets at all. While an Islamic bank has no obligation towards its holders of profit-sharing investment account to keep the invested principal amount intact, it has an obligation to manage its funds with prudence (Islamic Financial Service Board, 2019)

For instance, in the financial contracts of the Murabaha, the rate of return considered should be aligned with the repayment installments which include the commodity price along with the profit of the institutions. If the rate of return set in the Murabaha contract appears to differ from the actual market rate, then there may be a loss in the benefits to be earned from this contract. Furthermore, the rate of return payments defined by the bank's benchmarks should also

correspond to the actual market prices in the Ijarah leasing financial contract. A failure in this case will cause a loss of opportunity to the bank that could be gained from leasing in Ijarah. Finally, by providing contracts for Salam and Istisna financial institutions should define the commodity price with respect to the future delivery date, based on the estimated benchmark rates. The institution may face difficulties in reselling and reinvesting the delivered commodity and receiving the expected profit from the Salam and Istisna agreements if the actual market price differs from the rate of return value (Akkizidi and Khandelwal, 2008)

Investing funds in the above-mentioned risk-sharing assets would expose Islamic banks to rate-of-return risk. Islamic banks, hence, are compelled to pay a higher return than the rate earned on assets financed by the investment account holders or forfeit their share of profits (as Mudarib for example) in whole or part to prevent the withdrawal of funds.

B. Commodity Risk

Commodity risk is the risk that arises from movements in commodity prices. Contracts dealing with the purchase of commodities and/or their production are exposed to commodity price risk at Islamic banks. Commodity risk occurs when the price of a commodity that is planned to be bought or sold has the potential to change.

In contracts with Murabaha, a seller agrees with the buyer to supply a specific commodity. The bank finances the contract on a certain profit which is added to the price of the original commodity. The difference between the commodity's agreed and future market price is the actual exposure of the corresponding risk the banks are taking. In addition, when the Salam and Istisna Islamic financial contracts are provided by the banks, they are also exposed to commodity risk. When the Salam contract is applied, the Islamic bank (who is the purchaser) makes advance payments at a negotiated price for a commodity. However, the delivery of the goods will take place at a specific time in the future, where the price of the goods may differ from the fixed price. Similarly, when the Istisna contract is used, the price of the goods shall be paid in advance at the time of the contract and the goods to be sold shall be produced and delivered at a later date (Akkizidi and Khandelwal, 2008).

C. FX- Rate Risk

FX rate risk is a form of risk that arises from the change in price of one currency to another. Most Islamic financial contracts may be subject to foreign exchange fluctuations because of

general FX spot rate changes in cross-border transactions, operations and foreign currency receivables and payables.

FX rate risk may arise when Islamic banks purchases foreign currency commodities under the Murabaha contract. In addition, in the agreement of the Ijarah contract, leasing agreements between the banks (lessees) and the lessor may involve goods or services from foreign markets that require trading in FX currencies and are therefore subject to FX rate risk by the banks. In addition, institutions are also exposed to such risks when the commodities in the Bai-Salam contracts are related to foreign currency, either before the date of delivery or at the time of resale. In addition, Istisna financial contracts related to the construction of assets using capital investment or operating in foreign regions may also give rise to such exposure. Finally, in the Musharaka and Mudarabah financial partnership contracts, when a financial institution's investment refers to commodities, assets, or business operations across national borders, it may also face FX rate risk (Akkizidi and Khandelwal, 2008).

D. Equity investment risk

Another type of business risk is equity investment risk. Islamic Financial Services Board (2005) defines equity investment risk as the risk rising from entering a partnership for the purpose of undertaking or participating in a particular financing or general business activity as described in the contract, and in which the provider of finance shares in the business risk. This risk is somewhat unique to Islamic financial institutions, given that conventional commercial banks do not invest in equity-based assets.

In order to manage equity investment risk, Islamic banks shall have appropriate strategies, risk management and reporting processes in place about the risk characteristics of equity investments, including those of Mudaraba and Musharaka. In addition, they shall ensure that their valuation methodologies are appropriate and consistent and assess the potential impact of their methods on profit calculations and allocations. The methods shall be mutually agreed between the Islamic banks and the Mudarib and/or Musharaka partners (Islamic Financial Services Board, 2005)

Market risk valuation is reflected in the amount of money the bank was able to lose by assuming that it retained the previous day's portfolio. The most prominent techniques for assessing market risks in financial analysis are value-at-risk (VaR). Various methodologies for applying VaR

models to portfolios containing Islamic financial products should be tested by Islamic banks to evaluate their efficiency and applicability. There are two known ways to conduct such tests: the back test and the stress test. The back-test is used to determine whether the VaR predictions correspond to observed market changes; whereas the stress-test is used to assess the event and the consequences of risks that may arise under extreme circumstances. Islamic banks should have an appropriate market risk management framework (including reporting) in place for all assets held, including those that do not have a ready market and/or are exposed to high price volatility (Akkizidi and Khandelwal, 2008).

3.4.1.4. Liquidity Risk

Liquidity is the ability to raise money easily by selling assets. It is a measure of how easily an asset can be converted into cash. Generally, the liquidity of assets is measured by deducting the value of the inventory from current assets. Increasing cash assets increases liquidity and reduces liquidity risk, which in turn affects the level of profitability. Liquidity management therefore involves a trade-off between risk and return. It involves forecasting the cash needs of a bank and providing them in the most cost-effective manner. In a nutshell, liquidity management is the management of risk and return of investments (Islami Bank, 2020).

Liquidity in the banking industry as explained by Masood and Javaria (2017) is the ability of a bank to fund increases in assets and to meet obligations as they arise, without incurring unacceptable losses. Strong and sound liquidity management could, at any time, raise funds to meet the demands of depositors and borrowers at a satisfactory price. The fundamental role of banks in converting short-term deposits into long-term loans makes banks inherently vulnerable to liquidity risk, both of an institution-specific nature and that which affects markets. Almost every financial transaction or commitment has implications for the liquidity of the bank. Effective liquidity risk management helps ensure the ability of the bank to meet cash flow obligations that are uncertain as they are affected by external events and the behavior of other agents. Liquidity risk management is of paramount importance because a liquidity shortfall in a single institution can have a system-wide impact.

Therefore, liquidity risk arises from either difficulty in obtaining cash from borrowing at reasonable cost or the sale of assets. For Islamic banks the liquidity risk arising from both sources is critical. Without sufficient liquidity, the bank may face additional risks, such as various forms

of fiduciary risk, displaced commercial risk and other risks affecting the financial stability of the banks as a whole. Given that interest-based loans are banned by Shariah, Islamic banks cannot borrow funds to meet liquidity requirements when needed. Additionally, Shariah does not allow debt to be sold, other than its face value. Therefore, raising funds through the sale of debt-based assets is no option for Islamic banks. (Hassan et al, 2014).

For Islamic banks, liquidity management involves estimating the public's demand for funds, such as withdrawals from financing or withdrawals from deposits, and providing sufficient reserves to meet these needs. It is the function of the liquidity management function of the bank to estimate the size of the demand for funds and to meet the demand in a manner consistent with the maximization of shareholder wealth. A bank must be able to meet the demands of its depositors. It therefore requires the holding in reserve of the amount of cash necessary to meet the demand for withdrawals from depositors in different situations. Failure to maintain the necessary liquidity could lead to the Bank's eventual failure. Consequently, the maintenance of a relatively small percentage of liquid assets may not be advantageous to the successful operation of the bank (Islami Bank, 2020). As a result, the primary objective of liquidity management is to ensure that sufficient liquidity is available to meet depositor withdrawals and unusual financing requirements.

The ideal Islamic bank that uses the profit and loss sharing system to operate should be more stable and is in exposed to liquidity problems. This is because under profit and loss sharing contracts, such as Musharaka, the risk is shared proportionately by the bank, the depositors, and the borrowers. In the case of a Mudaraba contract, the risk associated with the fund is fully transferred to the owners or depositors of the fund. Any risk arising from the financing would eventually be shared by all the parties involved. While in a conventional bank which uses an interest-based system, the bank absorbs all the risk on its own. Defaults and problems on the asset side will lead to an inability to meet the obligations on the liability side as the principle of the deposit is guaranteed. In addition, profit and loss sharing on deposit contracts has a longer-term maturity, as is the nature of an investment contract (Rizkiah, 2018). This nature of the contract would solve the main liquidity issue of the asset and liability mismatch. Unfortunately, profit and loss sharing are not most contracts used by Islamic banks (Dar and Parsley, 2000). Most deposit products in Islamic banks use contracts that act as demand deposits such as qardh hassan and wadiah yad dammanah. These types of contracts have a short-term maturity since customers can withdraw their deposit at any time. Moreover, Islamic banks use debt-based

contracts on the asset side such as murabaha, ijarah, salam, isisna and bay'muajal, which are similar to debt-based financing which results in the maturity mismatch between assets and liabilities causing Islamic Bank to face potential liquidity problems, just like the conventional bank.

The conventional bank has a wide range of tools that can be used to manage its liquidity risks, such as the interbank deposit system and the money market instruments, all of which are interest-bearing instruments that are not allowed to be traded by Islamic banks. Islamic banking liquidity risk is mostly due to a lack of market liquidity and access to funds. The lack of market liquidity is caused by Islamic banks' illiquid assets, which make it difficult to meets their liabilities and financial obligations. While lack of access to funds exists because Islamic banking institutions are unable to secure loans or raise funds at reasonable cost when necessary (Mohamad et al. 2013).

Helmy (2012) points out that the liquidity risks faced by Islamic banking are the most critical risk, and this is due to these factors.

- Limited Shariah-compliant interbank money market instruments. The ban on interest-based lending and the lack of an adequate and active interbank market restricted Islamic banking options to manage liquidity efficiently.
- Islamic financial instruments listed on the secondary market are also very limited and Shariah has set certain conditions for transactions involving financial obligations, except for claims involving real assets. Institutions and authorities are therefore required to develop asset-based securities to be traded, such as Sukuk (Rifki Ismal, 2008). Although these instruments are available, market participants were insufficient and limited compared to the conventional system.
- Although conventional liquidity management instruments, such as the interbank market, the secondary market for debt instruments and the lender of last resort, the central bank, have long been established, all instruments are based on interest rates (usury) that are strictly prohibited by Islam.

Factors unquestionably exposed Islamic banking to liquidity risk and restricted the industry from investing in profitable and long-term assets. Several proactive measures have been put in place at international level to address the liquidity problems that arise in Islamic banking. First, the introduction of Sukuk (Islamic bonds) which form the basis for the development of the

secondary market for Islamic banks. Second, the establishment of an institutional framework to address any liquidity issues that arise such as the establishment of the Liquidity Management Center (LMC), the International Islamic Financial Market (IIFM), the Islamic Financial Service Board (IFSB), and the International Islamic Liquidity Management (IILM) (Van Greuning and Iqbal, 2008). Many countries are starting to develop Islamic liquidity management tools, including Islamic Commercial Papers, Interbank Investment Accounts, Murabaha Commodity, Sukuk, Islamic Deposit Certificates, and Islamic Money Market (Rizkiah 2018) to foster the liquidity management of Islamic banks.

Commodity Murabaha

Commodity Murabaha is one of the most widely used tools for managing Liquidity risk in the Gulf region (El Gamal, 2006) and Malaysia where Bursa Suq Al-Sila, an international trading platform for electronic commodities, has been developed to facilitate commodity murabaha. Banks with surplus liquidity use the commodity Murabaha to make some return on the excess cash they have by buying the commodity on a spot payment from a party on the commodity market, and then sell it to another party on a deferred payment basis with the same markup While banks with a shortage of liquidity may purchase commodities from a party in the commodity market on a deferred payment with a mark-up price, they may then sell them to a third party on a spot payment for market price. This transaction is also referred to as tawarruq (Rizkiah 2018).

It is based on commodities traded on the London Metal Exchange (LME) on a spot basis with a 100% payment of the purchase price, then sold to a third party on the Murabaha (cost-plus sale) basis for a deferred payment with a maturity of one week to six months, and on the spot delivery of the sold commodities. In Malaysia, the commodity Murabaha program (CMP) was designed to be the first commodity-based transaction to use Crude Palm Oil (CPO)-based contracts as underlying assets (Mohamad, 2014) Commodity Murabaha provides certainty of returns based on the pre-agreed 'margin' or 'mark-up' of the sale and purchase of the underlying asset.

The use of the commodity Murabaha is not without controversy. These methods are generally disliked by Islamic scholars, who see it as a ploy to legitimize the Riba (Usury) (Noor and Azli, 2009) and prefer that businesses and consumers use less sophisticated methods to finance their activities. This form of financing is more clearly parallel to traditional loans and can be

structured in such a way as to have "rate" resets, rollovers and accommodate late payment recoveries (Alsayyed, 2010).

The Islamic Inter-Bank Market

Islamic Interbank Market acts as an intermediary between surplus and deficit banks to channel their funds to maintain their liquidity position (Bacha, 2008). The mechanism known as the Mudarabah Interbank Investment Scheme (MII) is at the heart of the Islamic Interbank Market and the mechanism for Islamic Banks to place their excess liquidity This is the mechanism by which Islamic banks can borrow and lend to each other. In addition, banks with surplus funds can invest in those with liquidity deficits. As the name suggests, the funding is mudarabah based with a negotiated profit-sharing ratio. The duration of the investment may vary from one night to 12 months (Obiyathulla, 2008). However, this instrument will only be possible for countries with many Islamic banks to exist on the market, or else they would have no deposit placement partner (Rizkiah 2018).

Islamic Money Market Instruments

In developing the Islamic money market, Islamic central banks have introduced a series of Shari'ah-compliant money market instruments. The basic strategy was to replicate the traditional money market instruments in which the common-money market instruments were "Islamized" by removing the interest-bearing feature and replacing it with either a profit rate or a mark-up feature. So, where there were Banker's Acceptances, there were Islamic BAs, Negotiable Deposit Instruments (NIDs) were replicated as Negotiable Islamic Deposit Instruments (NIIDs), Treasury Bills became Islamic Treasury Bills, and so on (Basha, 2008)

Salam and Ijarah Sukuk

Sukuk is the second most well-known instrument traded as liquidity management. Salam and ijarah contracts are widely used for Sukuk as liquidity tools. Sukuk is issued by the central bank or by the government. The use of Sukuk is seen to be superior to the commodity Murabaha, as Sukuk is mostly used to finance real and specific projects.

3.4.1.5. Operational Risk

Operational risk in Islamic banking, given the nascent nature of Islamic banks, faces sophisticated challenges as the financial activities and characteristics of the financial contracts are

substantially different than their conventional peers and carries more than one face mixed between control of internal business flow and business process in terms of people, systems, procedures, and Sharia compliance.

Unlike the Basel 2's definition on operational risk which states "operational risk is the risk of loss resulting from inadequate or failed internal processes, people or system, or from external events" (BCBS, 2001) in Islamic banks, operational risk is associated with the loss resulting from "inadequate or failed internal processes, people and system, or from external events, including losses resulting from Shariah non-compliance and the failure in fiduciary responsibilities" (IFSB, 2005). It is understood that the definition of operational risk in Islamic banks entails legal risk, i.e., potential loss arising from lawsuits, which the bank must compensate its clients who suffered losses resulting from the operational lapses (Djojosugito, 2008); reputational risk, Sharia non-compliance risk and fiduciary risk (IFSB, 2005).

Archer and Haroon (2012) identified the operational risks faced by Islamic banks could be divided into three categories. The first category are the operational risks that result from different types of banking activities and are somewhat similar for all financial intermediaries, whether Shariah-compliant or not. However, the asset-based nature of financing products in Islamic banking, such as Murabaha, Salam, Isisna' and Ijarah, may give rise to forms of operational risk in the drafting and execution of contracts that are specific to such products.

The second type of operational risk consider the risk of Shariah compliance. This is the risk related to potential failure to comply with Shariah rules and principles in the operations of the bank; or the additional risk associated with the Islamic Bank's fiduciary responsibilities as a mudarib (entrepreneur) towards providers of funds in the mudarabah form of a contract according to which in the event of misconduct or negligence by mudarib. Subsequently, the fund invested by the fund providers becomes the responsibility of mudarib.
The third type of operational risk considers the legal risks arising either from either operation of the Islamic Bank or problems of legal uncertainty in the interpretation and enforcement of Shariah contracts.

According to Sundararajan (2005), there are specific aspects which could raise operational risks in Islamic banks as follows:

- Risks of cancelation in non-binding Murabaha and istisna contracts (shariah non-

compliance risk).

- Issues in internal control systems for the detection and management of potential problems in operational processes and back-office functions.
- Technical risks of various kinds.
- Potential difficulties in implementing Islamic finance contracts in a broader legal environment (Shariah non-compliance risk).
- Risk of non-compliance with Shariah requirements that may have an impact on the allowable income (risk of Shariah non-compliance).
- The need to maintain and manage commodity inventories often on illiquid markets.
- Potential costs and risks for the monitoring of the type of equity contracts and
- Related legal risks.
- Increased use of structured finance transactions – in particular, securitization of loans originating from banks to manage risks on the asset side could expose banks to risk-taking.

In Islamic Banks operational risk in terms of personnel risk may be acute. In this respect, operational risk arises because the banks may not have enough qualified professionals (capacity and ability) to conduct Islamic financial operations. In addition, the computer software available on the market for conventional banks may not be appropriate for Islamic banks, due to the different nature of business, which would create system risks in Islamic banks from the development and use of information technologies (Dar et al, 2013)

3.4.1.6. Sharia non-Compliance Risk (SNCR)

The Islamic Financial Services Board (IFSB) defines operational risk in a similar manner to the Banks for International Settlements (BIS). However, it provides for special mention of the Sharia non-compliance risk and failure of Islamic financial institutions to fulfill their fiduciary responsibilities. Failure in these two areas exposes Islamic banks to the withdrawal of funds, the loss of revenue, the invalidation of contracts leading to a reduced reputation or the limitation of business opportunities. The operations of Islamic banks are strongly influenced by the Sharia rules and principles governing their structure and activities. Sharia's non-compliance risk (a form of legal risk) is therefore of particular concern to Islamic banks.

Financial Service Board (2005) defines Sharia non-compliance risk as “the risk that arises from

IIFSs' failure to comply with the Sharia rules and principles determined by the Sharia Board of the IIFS or the relevant body in the jurisdiction in which the IIFS operate". IIFS are "Institutions (other than Insurance Institutions) offering only Islamic Financial Services" (Islamic Financial Service Board, 2005).

Sharia Compliance is central to the Islamic banking business. All activities undertaken under the bank business model must be guided by the Sharia rules to be Sharia compliant. Sharia scholars generally define Sharia's compliance based on the validity of the contract. Each pillar of the contract, such as the contracting parties, subject matter, price, offer and acceptance (Soualhi, 2015) must be free from the prohibitions of the Sharia, such as the prohibition of riba, gharar, gambling, intoxicants, and the trading of unlawful commodities. If a product or transaction in the underlying contract is flagged as potentially Sharia non-compliant in the Shariah audit, it is referred to the Banks Sharia Board to determine whether the transaction is Batil (void) or Fasid (irregular). The Sharia Board would entail as an assurance service that the IFIs are Sharia compliant in their whole operation (Ali et al, 2016).
If it is determined to be Batil, it means that there was something contrary to Shariah in the fundamentals of the product that could not be redeemed. The income from that product will have to be donated to a charitable cause, and the contract will have to be renewed. However, if the product is declared Fasid, it means that there is a contradiction with the principles of Sharia in the "add-ons" of the contract, which can be remedied in two ways: 1) by removing the contradiction; 2) by redrafting the contract. Both options add to the bank's operating costs. Therefore, Sharia compliance is given higher priority in relation to the other risks, since violation of Sharia principles will result in the transactions being cancelled or income generated from them shall be considered as illegitimate (International Bankers. 2019)

The implementation of Sharia governance is encouraged by international institutions of regulations like Accounting and Auditing Organization for Islamic Financial Institution (AAOIFI) and Islamic Financial Services Board (IFSB). The Sharia Board plays a very important role in ensuring good Sharia governance. The role of the Sharia Board is to include advising board of directors on Sharia matters to ensure that the operations comply with Sharia principles at all times, endorsing and validating relevant documentations pertaining to the products and services, as well as the internal policies and manuals and marketing advertisements (Hussein, 2014)

The Sharia non-compliance risk (SNCR) appears in general where there are some fundamental irregularities in the contract, such as the lack of transfer of ownership from buyer to seller or the lack of true sales in the actual transaction. Another SNCR could be found during the Sharia audit process where some of the sales procedures were not properly observed, such as the failure to name the underlying asset in the letter of offer. Compliance with the principles of Sharia is a continuous process that requires adherence to processes, activities and products. Finally, if significantly increased, Sharia non-compliance risk can expose the bank to reputational and insolvency risks.

Mitigating Sharia Non-Compliance Risk through Sharia Governance Framework

In Malaysia, the governance of the IFIs falls under the control of its Central Bank of Malaysia (CBM). CBM introduced the Sharia Governance Framework (SGF) in 2011 as set out in Figure 18 to strengthen the structure of Sharia governance, processes and arrangements, thereby ensuring compliance with Sharia among the IFIs in Malaysia. The Sharia governance framework defined by Bank Negara Malaysia (2009) is a set of organizational arrangements through which Islamic financial institutions ensure effective oversight, responsibility and accountability of the board of directors, management and Sharia committee.

As shown in figure 18 SGF consists of four functions: Sharia Risk Management Control, Sharia Review, Sharia Research and Sharia Audit. Under the purview of the SGF, the Sharia audit acts as the third line of defense to mitigate the risk of Sharia non-compliance risk of the IFIs (Ali et al., 2016).

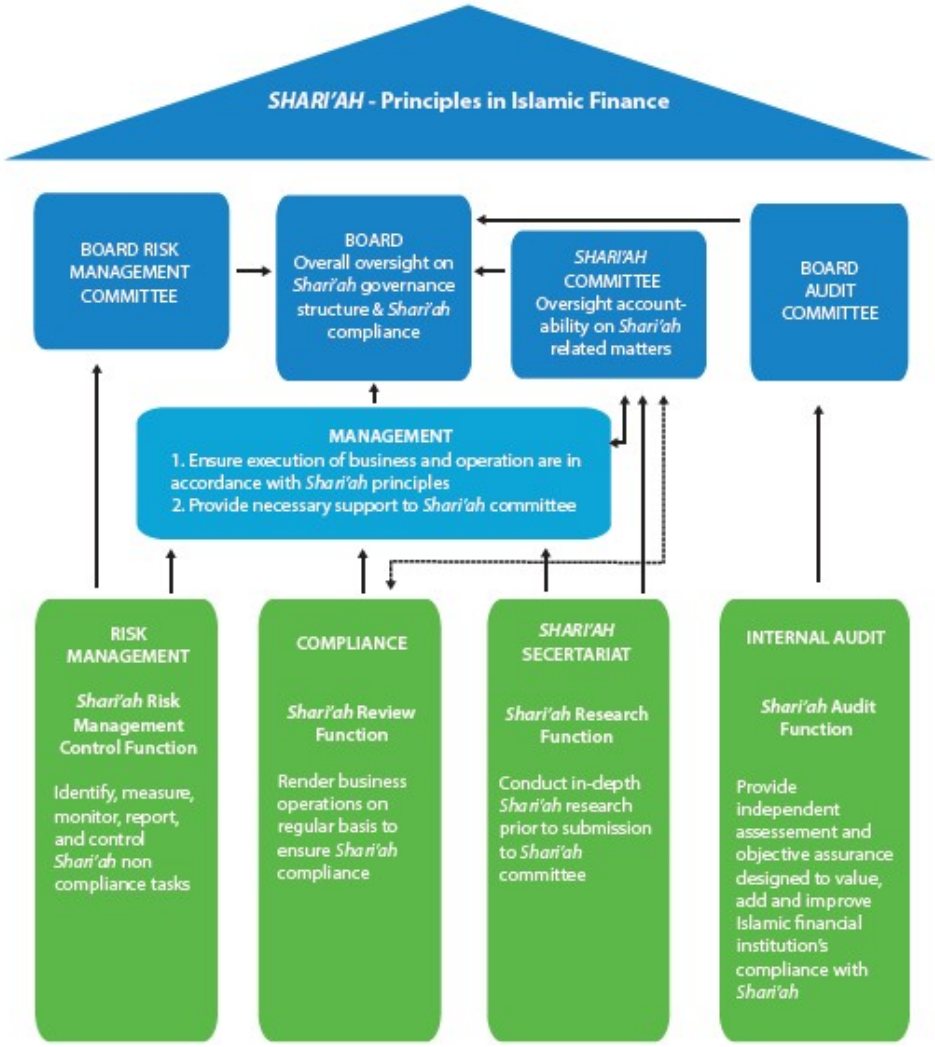


Figure 15: Sharia Governance Framework (Ali et al, 2016)

Sharia Review

The Sharia review function refers to a periodic assessment of Sharia's compliance with the activities and operations of the Islamic Bank by qualified Sharia officers, with the aim of ensuring that the activities and operations of the Islamic Bank do not contravene the Sharia.

The function involves reviewing and evaluating the level of compliance of the Islamic Bank with the Sharia, remedial corrective action to resolve non-compliance and a control mechanism to avoid recurrence. The scope of the Sharia review shall cover the overall business operations of the Islamic Bank, including the end-to-end product development process, starting from product structuring to product offerings (Azahari, 2013)

Sharia Audit

Sharia audit refers to the periodic assessment carried out from time to time, to provide an independent assessment and objective assurance designed to add value and improve the degree of compliance with Islamic Bank business operations, with the main objective of ensuring a sound and effective internal control system for compliance with Shari'ah (Nomran & Haron, 2020) The function shall be performed by internal auditors who have acquired adequate Sharia-related knowledge and training. In addition, internal auditors may engage the expertise of Sharia officers of the Islamic Bank in the conduct of the audit, provided that the objectivity of the audit is not compromised (Ali et al, 2018)

The scope of the audit of the Sharia shall cover all aspects of the operations and activities of the Islamic Bank, including (Muhammed, 2018)

1) Audit of financial statements of the Islamic Bank; audit of compliance with organizational structure, people, processes, and systems of application of information technology; and
2) Review of the adequacy of Sharia governance

The Sharia auditor is not only required to conduct a review of Islamic Bank activities in accordance with the principles of Sharia; he is also responsible for expressing his opinion on the bank´s financial statements (Sarea & Mohd, 2013). In order to perform his auditing role effectively, the Sharia auditor should have adequate and appropriate Islamic knowledge as well as accounting, auditing, and finance knowledge.

In order for the Islamic Banks to achieve their objective, it is vital for the Sharia auditors who audit the Islamic Bank to be able to provide assurance and attestation that the banks operate in accordance with the principles of Sharia. Compliance with the principles of Sharia law, whether real or perceived, is therefore seen as an important consideration for banks to gain Muslim trust and confidence in their products and services (Hamid et al, 2016)

Sharia Risk Management

Sharia risk management is a function of systematically identifying, measuring, monitoring, and controlling Sharia non-compliance risks. The systematic approach to managing Sharia's non-compliance risks would allow the Islamic Bank to continue its operations and activities effectively without exposing the Islamic Bank to unacceptable levels of risk (Lahsasna, 2014)

Hassan et al. (2010) argues that the Sharia risk management function must involve:

i. Facilitating the process of identifying, measuring, controlling and monitoring Sharia's non-compliance risks inherent in the operation of the Islamic Banks.
ii. Formulating and recommending appropriate risk management practices and guidelines for Sharia non-compliance.
iii. Developing and implementing Islamic banks risk awareness processes for Sharia non-compliance.

The first function referred to in the paragraph above generally involves a process flow. The process flow of such a structure begins with the identification of the potential Sharia non-compliance risk, followed by risk assessment and measurement. The next step is to monitor and control the risk of Sharia non-compliance and finally the reporting process (Hassan et al., 2010).

Risk identification

Hassan et al. (2010) explains that people, processes, and systems are the main causal factors that contribute to the occurrence of non-compliance events. Any weaknesses or deficiencies arising from people's incompetence, process inadequacy, or an ineffective system may lead to events that could trigger Sharia's non-compliance risk.

It is the responsibility of the management of Islamic Banks to provide comprehensive training and also to establish an efficient standard operating procedure and policies within the Islamic Bank to reduce the occurrence of errors and negligence among staff. The enrichment of human capital in the Islamic Bank will reduce the occurrence of staff errors in the commission of their tasks.

Process is another risk factor that must be managed by Islamic banks. Process in this context refers to the process involved in the development of the product adopted by the bank in the operation of either the pre-product approval process or the post-product approval process. The process of pre-product approval involves the issuance of Sharia decisions, the structuring of the product, the validation of contracts and agreements, as well as compliance checks before the product is offered to customers. On the other hand, the post product approval process includes a Shariah audit and a Shariah review to ensure compliance with Shariah in the implementation of every product offered to customers. The risk of Sharia non-compliance may arise during

these processes due to unclear processes, policies, procedures, or responsibilities; insufficient internal Sharia governance arrangements; and/or insufficient disclosure Hassan et al. (2010).

System inefficiency may also place Islamic banks at high risk. The Information Technology System plays a vital role in the functioning of Islamic banks. It is well known that Islamic Banks are committed to ensuring that all its activities are consistent with Sharia. Similarly, it must be ensured that the products offered to the public are in line with Sharia. The IT system used by the Islamic Bank must therefore have a Sharia compliance status capable of ensuring strict adherence to Sharia in all contracts.

Risk Measurement and Assessment

The measurement of Shariah non-compliance risk is be summarized as follows>

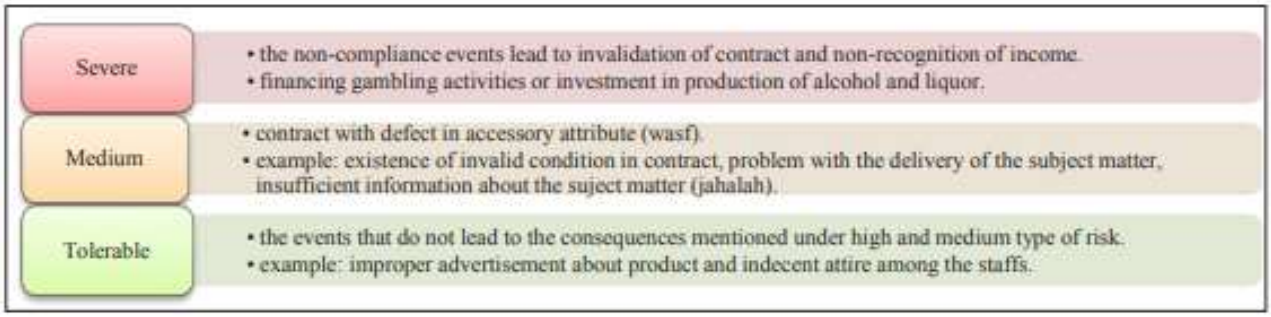


Figure 16: Sharia Non-Compliance Risk Measurement (Hassan, 2017)

The risk will be classified as severe if the event of non-compliance results in the invalidation of contracts or in the non-recognition of income. A contract involving non-halal or non-permissible income, such as the financing of gambling activities, is a clear example of severe risk. The medium type of risk (medium) relates to a situation where the terms of the contract are not fulfilled, such as when the parties have inserted unreasonable conditions in the contract. The tolerable risk, on the other hand, concerns events which do not lead to the consequences referred to in the context of severe and medium risks. For example, an indecent fashion of clothing among Islamic bank staff may lead to a reputational risk, as staff members of the Islamic Bank are expected to wear decent clothing. Similarly, improper marketing by indecent posters made by Islamic banks may also undermine the reputation of the institution (Hassan, 2017).

Risk Monitoring

The last stage of the risk management process is the monitoring and control of risks. Risk monitoring may be used to ensure that risk management practices are sound and effective. Proper

risk monitoring also helps Islamic Banks to discover errors at an early stage, rather than suffer the negative consequences of undetectable risk. In addition, a risk monitoring mechanism is used to monitor variables and factors that may lead to Sharia non-compliance risk (Hassan, 2017).

3.4.1.7. Displaced Commercial Risk (DCR)

Islamic banks are subject to a unique risk called Displaced Commercial Risk (DCR). DCR refers to the risk arising from assets managed on behalf of capital provider which are transferred to the capital of Islamic banking institutions where Islamic banking institutions forfeit part or all their profits on the investments in order to increase the rate of return otherwise payable to capital provider (Arshad et al, 2015) and is a commercial decision.

Displaced commercial risk arises basically from the management of profit distributions on Mudaraba contracts where the depositor acts as a capital provider (Rabb-ul-mal) and Islamic Banks acts as a fund manager (Mudarib). The Islamic Bank invests the depositors' funds on their behalf and has the right to a Mudarib share that constitutes a share of profits from managed funds (Toumi et al, 2018). The contractual duties of Mudaraba stipulate that profits shall be shared between Islamic Banks and the depositor at a previously agreed rate, whereas losses shall be borne only by depositors unless the Islamic Bank has misconduct, negligence, or infringement of contractual terms.

Displaced commercial risk implies that the bank may operate in full compliance with the Sharia requirements but may not be able to pay competitive rates of return compared to other competitors. In such situations, this risk arises when an Islamic bank is underperforming over a period of time and is unable to generate sufficient profits to pay its investors and depositors a rate of return higher than that which is due under the actual terms of the investment contract (Arshad et al, 2015). In the Islamic banking, the reasons to give up part of their profits are quite clear. If the bank does not provide deposit-like rates, the holders of the investment account will move their funds to a bank (Islamic or otherwise) offering better returns. This is a legitimate concern and relates to the mentality of investment account holders who may want a stable low-risk return.

This withdrawal risk threatens the commercial position of the bank as well as the stability of

the financial system and may lead to systemic risk. Competition may force Islamic Banks and their shareholders to forfeit part of their profits to pay depositors comparable and competitive rates of return, which will result in them having to bear losses in cases of shortfall in returns. Supervisors may also require a profit-paying mechanism to provide some protection to avoid systemic risk (Toumi et al, 2018).

The question which arises here is whether this act of forfeiting profits to depositors contradicts the main essence of risk sharing in Islamic banks even if this decision is purely a commercial one. Technically, if customers choose Islamic banks purely on religious grounds, displaced commercial risk should not be a concern because depositors would not withdraw their deposits from Islamic banks due to lower returns compared to conventional banks.

Hidayat (2012) has revealed that Islamic banks have expanded their operations by attracting more customers, including non-Muslims. This means that the clients of Islamic banks are no longer limited to those whose motivation is religious. This translates into the likelihood that these customers will be highly profit-driven, so there is also a high tendency for them to withdraw their deposits if the return from Islamic banks is not at the same level as their competitors conventional banks. In view of this situation, there is a higher likelihood of Islamic banks facing Displaced Commercial Risk (DCR). Hence, Islamic Banks shareholders are forced by competition to relinquish part of their profits in order to smooth out payments to depositors in order to meet market expectations and pay comparable and competitive rates of return to depositors.

The mechanism consists of donating some portion of the shareholders' income to depositors based on Hibah (Gift), with the approval of the shareholders, to offer a level of return close to the market benchmark. The decision of the shareholders to agree to relinquish part (or all) of their income means that they accept that the risk associated with the return on the portfolio of assets financed by the funds of the depositors (partly or entirely) is displaced and largely borne by themselves.

In order to avoid the transfer of risk to shareholders, Islamic Banks may set up two specific prudential reserves, the Profit Equalization Reserve (PER) and the Investment Risk Reserve (IRR) as recommended by IFSB (IFSB-2, 2005; IFSB-15, 2013; IFSB-17, 2015 cited in Toumi et al, 2018) and AAOIFI (AAOIFI, 2015b, 2015c cited in Toumi et al, 2018). The volume of PER and IRR retained for each period is positively correlated with the gross returns generated

by the assets financed by the depositors' funds (Sundararajan, 2007).

3.4.1.8. Withdrawal Risk

All risks faced by Islamic Banks if not dealt with appropriately may lead to withdrawal risk. Withdrawal risk is proportionally related to displaced commercial risk. A variable rate of return on savings / investment deposits creates uncertainty with respect to the actual value of deposits. An important factor in the withdrawal decisions of the depositors may be the preservation of assets in terms of minimizing the risk of loss due to a lower return rate. This introduces a "withdrawal risk" from the bank's perspective, which is linked to the lower rate of return relative to other financial institutions (Khan & Ahmed, 2001). Withdrawal risk exposes the bank to liquidity problems and erosion of its franchise value.

3.4.1.9. Fiduciary Risk

Fiduciary risk is the risk arising from failure by Islamic Banks to perform in accordance with the explicit and implicit standards that apply to their fiduciary responsibilities. Islamic banks may become insolvent because of investment losses and thus be unable to (a) meet current account holders' demands for repayment of their funds; and (b) safeguard their investment account holder's interests. Islamic banks may fail to act with due care when managing investments that may result in the possibility of forgone profits to investment account holder (Islamic Financial Service Board, 2005).

The fiduciary risk may be triggered by the Islamic bank's violation of contract. For example, the bank may not be able to conform fully to the Sharia requirements of different contracts. While Sharia compliance is the justification for the Islamic bank's business, an inability to do so or not to do so intentionally can cause a serious problem of trust and withdrawal of deposits.

Another example would be that in the case of partnership-based investments in the form of Mudaraba or Musharaka, the bank is expected to carry out adequate project screening and monitoring, and any willful negligence in evaluating and monitoring the project can lead to fiduciary risk. Before committing investors-depositors' funds, it is the management's responsibility to perform due diligence (Global Islamic Finance Report, 2015)

Failure to maintain fiduciary responsibilities will lead also to deteriorating reputation of Islamic banks. Reputational damage could ultimately lead to a withdrawal of funds that would lead to a liquidity crisis. It could also make customers stop asking Islamic banks for funding, triggering a downturn in profitability. Therefore, in order to maintain a good reputation, Izhar (2010) explained that the fiduciary duty of Islamic banks is all about preserving the trust from all providers of funds. Izhar, (2010) suggested two important aspects which must be taken seriously in safeguarding the trust are:

A. Sharia aspect: Islamic banks must ensure Sharia compliance for the activities and products.
B. Performance Aspect: Islamic banks need sound financial performance and maintain their fiduciary roles effectively, without which fund providers may indicate mismanagement or misconduct.

3.4.1.10. Equity Investment Risk

Islamic Financial Service Board (2005) defines Equity Investment Risk as the "risk arising from entering into a partnership for the purpose of undertaking or participating in a particular financing or general business activity as described in the contract, and in which the provider of finance shares in the business risk. This risk is relevant under Mudarabah and Musharaka contracts".

Considering that conventional commercial banks do not invest in equity-based assets, this risk is somewhat unique to Islamic financial institutions. Equity investments can lead to fluctuations in the earnings of the financial institution due to liquidity, credit and market risks associated with equity holdings (Swartz, 2013). Although there is credit risk in equity-based assets, there is also considerable financial risk as capital can be lost due to business losses.

In order to manage investment risk of equity, the Islamic Financial Services Board (2005) suggests that Islamic banks shall have appropriate strategies, risk management and reporting processes in place with regard to the risk characteristics of equity investments, including investments in Mudarabah and Musharaka. They shall ensure appropriate and consistent valuation methodologies and assess the potential impacts of their methods on profit calculations and allocations. The methods between the Islamic banks and the Mudarib and/or Musharaka partners shall be mutually agreed. Islamic banks shall define the exit strategies for their equity investment activities.

3.4.2. Unique risks for Islamic Modes of Financing

As previously mentioned, besides the risks common to conventional banks, Islamic banks are also exposed to various risks that are unique to them, such as, withdrawal risk, rate of return risk, fiduciary risk, Sharia compliance risk, displaced commercial risk, and asset price risk. The multiple modes of financing lead to varying risk exposures. Nevertheless, within each mode of financing, risk exposures are changed from one type to another and are difficult to be clearly identified in isolation as the risks are highly correlated.

Murabaha, for instance, and investment partnerships such as Musharaka and Mudharaba, expose Islamic Banks to all four major risks, namely credit, operating, market and liquidity risks, over different periods of the contract. For example, when Islamic banks offer funds through their profit and loss sharing (PLS) facilities, particularly in the Mudaraba contract, there is no defined default on the part of the entrepreneur (mudarib) until the PLS contract expires. Islamic banks have no legal means to control an entrepreneur who manages the business. They are exposed to liquidity and credit risk because of the entrepreneur's failures to provide the expected or future cash flows when an investment project fails to fulfill what is expected. Islamic banks are also exposed to operational risks due to any external or internal event that may arise and cause real business losses. Low profit or loss shall be shared between the parties according to the stipulated profit and loss ratios.

In non-PLS modes of financing such as Salam (purchase with deferred delivery) and Istisna contracts (Islamic forward) commodity risk is highly prominent, although these contracts are also exposed to credit, operational, market and liquidity risks. This is because Islamic banks agree, against the current payment, to buy the commodity on a future date and hold the commodity until it can be converted to cash.

Ijarah (lease) also carries a similar risk because this contract does not give the Islamic bank the ability to transfer significant risks and rewards to the lessee because the leased assets must be carried on the balance sheet of the Islamic banks for the duration of the lease.

In nutshell, account receivables in Murabaha contracts, counterparty risk in Salam contracts, account receivable and counterparty risk in Istisna contracts, and lease payment receivables in Ijrah contracts are all examples of credit risk exposures in Islamic financing. Qard al-hasan is the least risky mode of finance, whereas Mudaraba is the riskiest. Mudaraba is riskier than

Musharaka since the capital provider has no control over the project's management but is fully responsible for any financial losses incurred because of the financing. A Musharaka contract in contrast gives the fund provider some influence over the business and distributes the risk of capital loss with the other parties involved. As a result, Khan and Ahmad (2001) claim that because Murabaha is a short-term instrument, it poses the least risk.

3.4.2.1. Murabaha Financing

Murabaha is one of the most widely used forms of financing in Islamic banks. As Murabaha is a sales-based mode of financing, the profit return is fixed and the customer is indebted to the bank and is liable to repay the Murabaha price, which includes the asset price plus the bank's profit. The structure of the Murabaha financing brings with its unique risks that Islamic banks need to identify, measure and take necessary measures to manage them.

Credit Risk

Credit risk refers to either customers default in payment or customer's delay in payment regarding the agreed Murabaha payment schedule. In Murabaha, Islamic Banks is not allowed to charge the customers with additional payments as opposed to conventional banks. The price of the asset at the time of sale in Murabaha cannot be increased even if the period of the facility has expired. Therefore, in the event of default, the customer cannot be charged for days above the maturity period (Lieven et al, 2014). It is also not permissible for the Bank to arrange e-restructuring/restore over the Murabaha facility to compensate for the delayed period (Lieven et al, 2014).

To mitigate credit risk in Murabaha and prevent moral hazard on part of the customer, Islamic Banks may add a penalty clause mutually agreed by both parties or may take an undertaking from the customer to credit the Charity account in the event of intentional or unintentional default by the customer to deter the customer against misusing the features of the Murabaha product (Lieven et al, 2014). Also, alarming indicators may be used to monitor the customer's business after disbursement and to obtain the updated information and status of the customer's business. In addition, contractual provisions may be incorporated to initiate early recovery in order to save time and avoid potential losses.

Before entering into a Murabaha transaction, the bank may also ask the client to post additional

collateral. In some cases, the subject matter of the Murabaha is accepted as collateral. Helmy (2012) explains posting collateral as security is not without difficulties, particularly in emerging markets. Typical issues include the illiquidity of the collateral or the inability of the bank to sell the collateral, difficulties in determining the fair market value on a periodic basis, and legal obstacles in taking possession of the collateral. In addition to collateral, personal and institutional guarantees and Pari-Passu clauses (Gündoğdu, 2014) could also be included in Murabah contract to mitigate credit risk. With Pari-Passu clauses "all creditors are treated on an equal footing and share in insolvency assets pro rata according to their pre-insolvency entitlements or the sum they are owed" (Finch stated in Mokal, 2001). Also, if it were not possible to obtain a guarantee, the only viable method of mitigating credit risk would be to ask the customer to purchase an insurance policy from Takaful company (Takaful is dealt with in separate chapter).

Markup Risk

Under Murabaha, the markup rate is fixed for the duration of the contract, while the benchmark rate may change. When banks face upward movements in the market price of assets under the Murabaha contract, which means that the prevailing market rate may rise above the rate that the bank has entered into a contract, the Islamic Bank will not be able to benefit from such an increase (Mustafa, 2018). This risk is referred to as a markup risk that may add to the opportunity loss to the Islamic Bank. To mitigate the markup risk in Murabaha financing, Murabaha's tenure must be less than or equal to three months, six months or not more than one year.

Commodity Price Risk

The commodity price risk arises because of the bank holding the commodities at the time between the bank ownership and possession of the goods by the supplier till the sale of commodities to the customer. As Islamic Banks holds ownership over the period mentioned above, any significant decrease in the price of the goods may have an impact on the customer's intention to withdraw from its decision/engagement under the Murabaha Agreement exposing Islamic bank to customer commitment risk. In that case, the Islamic Bank has no option but to sell the commodity at the same low market price and is subject to losses. To mitigate this risk, Islamic banks should enforce strong contractual obligations that restrict the customer from fulfilling its obligations. In addition, the Islamic Bank may, if necessary, obtain a security deposit for any loss suffered by the Bank as a result of the failure of the customer to fulfill their commitment.

Ownership risk

Murabaha requires ownership of the financed goods and therefore results in certain risks to be managed. As a result of ownership, the bank acquires the risks and rewards of the purchased asset over the entire period of ownership of the asset, irrespective of the duration of the asset, which may be shorter or otherwise.

To mitigate the risk of ownership, the Islamic Bank may take measures to reduce the timeframe of ownership by transferring ownership to the customer at the earliest opportunity. The Islamic Bank may be also aiming for Takaful. The goods according to Gündoğdu (2014) must be properly insured at all stages against loss or deterioration, when unloaded, when stored in a truck or train, in the warehouse etc.

Exchange risk

It must be borne in mind that the profit on Murabaha can only be charged after the sale with the customers has been made. There may be instances where the price of the goods is credited to the supplier and the delivery of the goods may take place within a day or more. In this case, the profit charge takes place at the time of the sale process between the bank and the customer. Islamic Bank is subject to an exchange risk if payment is made in foreign currency to suppliers residing outside the country and the customer has been extended by financing Murabaha in local currency. This is because the currency exchange took place at one rate at the time of the supplier's credit account and the exchange rate may vary at the time of the sales declaration (Mansour and Dooukanly, 2019)

To mitigate exchange risk Islamic banks may add a risk premium in terms of exchange rate fluctuations, considering historical developments in commodity acquisition costs. Islamic banks shall extend financing in the same trading currency, where appropriate or considering the Bank's open position.

Operational Risk

Operational risks, incidents, and losses are usually associated with weaknesses in internal control or lack of compliance with existing internal procedures as well as the principles of Sharia. This lack of compliance can be observed in all areas of the Islamic Bank and is mainly due to the combined behavior of individuals, technological systems, processes, and certain unforeseeable events. An Islamic bank is proposed to focus on root causes as opposed to effects. The

causes or originating sources could be identified when a risk event is formulated, and therefore what consequences could also be identified that would take place. It is also necessary to understand the resulting consequences if the risk is to be 'accepted',' avoided', or 'mitigated'.

The following are different dimensions of operational risk that can arise in the Murabaha transaction (Farhan & Alam, 2013).

Shariah Compliance Risk may arise if Islamic banks give money instead of goods, resulting in the exchange of money and money. This is prohibited in Sharia, since the exchange of money with money, plus an additional amount over the principal and paid in different periods, is equivalent to Riba. AAOIFI Sharia Standard (2019) also requires Islamic banks to legally own the good before it is sold to customers. It is important to note that the contract sequence is very central to the Murabaha transaction. Inability or failure to comply with the sequence and the Sharia requirement will result in the transaction being considered illegitimate.

***Fiduciary Risk*:** this risk arises due to the inability to meet the specified commodity stipulated in the contract.

Client´s commitment risk

The Islamic Bank enters a Murabaha agreement with the client with an added profit margin to purchase the desired asset for the customer. At the time of signing the agreement, the assets of Murabaha were not owned by the bank. In the Murabaha sale agreement, the bank promises to purchase the asset from the supplier and the customer promises to purchase the asset from the bank (Haron et al, 2015). The risk arises if the bank purchases the asset from the supplier, but the customer violates the terms and conditions of Murabaha and shows his unwillingness to purchase the asset. Subsequently, the cash flow of the bank is affected, and the bank is left with the assets that can be sold on the market. In this scenario, the Bank may experience losses from two angles. Firstly, the time factor that comes into play when the asset is sold on the open market and, secondly, the bank may not be able to obtain the desired market price of the asset.

To mitigate this risk a strong contractual obligation which ensures that the customer comply with his obligation should be enforced. The Islamic Bank should purchase the desired asset after meeting all the requirements for collateral obligations. In addition, the Islamic Bank may, if necessary, obtain a security deposit for any loss suffered by the Bank in respect of the failure

of the customer in committing his promise. The bank can also keep an option to return the purchased assets within a specified period (Khiyar-e-Shart or option of stipulation) as a risk management measure if the client fails or refuse to purchase the assets from the bank (al-Bashir and al-Amine, 2009)

Supplier Performance Risk

The risk of supplier performance lies in the supplier's attitude and ability to produce and/or deliver the goods irrespective of the circumstances or factors that hinder the supplier's ability to fulfill its obligation in accordance with the pre-determined time frame, which may otherwise have a negative impact on the cash flows of the banks.

Islamic bank should evaluate the ability of the supplier to manage any risk that may arise. In this respect, the supplier's corporate governance should be monitored because strong standards of corporate governance may improve internal risk management capabilities. A series of on-site visits to the manufacturer, often involving third-party experts such as engineers and industry specialists, should involve due diligence in assessing the company's corporate governance capacity.

The criteria explained by Gündoğdu (2014) to be evaluated should include, and not be limited to:

- Supplier proven track record (ability to produce or process).
- Supplier solid business track record.
- Suppliers should be reputable and have prior experience in the specific business.
- There should be no pending dispute or investigation by the supplier for fraud or similar wrongdoing.

Nevertheless, to mitigate the risk of non-performing suppliers, the Bank may obtain a performance bond to avoid the risk of non-performance of the supplier in the event that the supplier fails to fulfill the obligation to supply the products. In addition, as the supplier is chosen by the customer, the customer may undertake to guarantee the performance of the supplier and provide a security deposit for any losses incurred by the bank in relation to the performance of the supplier.

Legal Risk

Profit from Murabaha cannot be matched with interest, although it looks similar. The primary difference is that the resulting profit is associated with the underlying product. This could create legal problems, as regulators only limit the interest rate, not the profit rate, in certain countries. Hence, if there is any dispute, the absence of the so-called 'profit rate cap' has the potential to create legal problems (Izhar, 2020).

At the contract signing stage, another potential problem may arise, since the contract requires the Islamic bank to first buy the asset before selling it to the customer; the bank needs to ensure that the legal implications of the contract are properly matched by the commercial intent of the transactions (Izhar. 2020)

3.4.2.2. Profit and Loss Sharing Agreements: Musharaka & Mudaraba Financing

The profit and loss sharing agreements are mostly uncollateralized equity financing. Such assets carry far more risk than those consisting of non-profit and loss-sharing modes that are collateralized business or retail financing operations. The only difference between Musharaka and Mudaraba in the profit and loss sharing agreement is the participation of Islamic Banks in the investment during the contract period. Islamic banks invest their money as silent partners in the Mudaraba, and the management is the sole responsibility of the other party, the Mudarib. In contrast, Islamic banks and their partners or partners invest their funds together in Musharaka financing, and Islamic banks may be silent partners or may participate in management.

Regardless of the jurisdiction in which the profit-sharing instruments are used, both Musharaka and Mudarabah constitute profit-sharing financing under which the capital invested by the financier does not represent a fixed return but is specifically subject to impairment in the event of losses. Therefore, in an Islamic bank, the ratio of riskier assets to total assets should normally be greater than in a conventional bank. Risk management and capital adequacy standards should, therefore, place more emphasis on this factor in the Islamic environment than is the case in conventional banking.

Credit Risk

In general, credit risk is defined as the potential for a counterparty to fail to fulfil its obligations in accordance with agreed terms (Helmy, 2012). Islamic banks may play the part of rabb-ul-mal (capital provider) and Musharaka partners and there is a risk of a counterparty failing to fulfil its obligations in terms of receiving deferred payment and making or taking delivery of an asset in that situation (State Bank of Pakistan). A failure could be related to a payment delay or default. In the event of proven negligence or misconduct of the Mudarib or the Musharaka's managing partner, the invested capital in a Mudaraba or Musharaka contract will be converted to debt. In the event of default, Islamic banks are prohibited from imposing any penalty except in the case of deliberate default. In the latter case, it is forbidden for Islamic banks to use the penalty amount for their own benefit; they must donate any such amount to a charity (Febianto, 2012).

The Islamic Bank should take part in credit risk identification, measurement, monitoring, reporting and control. Adequate capital should be held against the assumed credit risk. Islamic banks shall obtain sufficient information to allow for a comprehensive assessment of the counterparty's risk profile prior to the funding being granted. Counter-party reviews and assessments should focus on the business purpose, operational capability, enforcement, and economic substance of the proposed project, including the assessment of realistic forecasts of estimated future cash flows (Islamic Financial Services Board, 2005). It may also hire an appropriate technical expert to assess the feasibility of a new project proposed and to evaluate and approve progress billings to be made under the contract.

According to Islamic Financial Services Board (2005) Islamic Banks shall have in place adequate credit management systems and administrative procedures for undertaking early corrective action in the event of counterparty’s financial distress or for the management of potential and defaulting counterparties. The credit management system should be reviewed regularly. Both administrative and financial measures will be included in remedial actions.
Among other things, administrative measures may include:

- Pro-actively negotiating and following up with the counterparty by maintaining frequent contact with the counterparty.
- Ensure that there is sufficient Islamic insurance (Takaful) coverage of the value of the assets. The Islamic Bank shall, where necessary, engage an insurance advisor at an early

stage to review the asset insurance coverage.

Amongst others, financial measures include:

- Imposing penalties in accordance with the Sharia rule to be donated to charity.
- Establishing the enforceability of collateral or guarantees from third parties.

Equity Investment Risk

In profit and loss sharing agreements the risk profiles of potential partners Mudarib or Musharaka partners are essential considerations for the exercise of due diligence when assessing the risk of an investment in Mudaraba or Musharaka. Such due diligence is essential for the fulfillment of Islamic Banks' fiduciary duties as an investor of profit-sharing and loss-bearing deposits (Mudaraba) or a profit-loss-sharing basis (Musharaka).

This type of equity investment is, by nature, exposed to a confluence of risks, business activities and activities associated with Mudarib or the partner of Musharaka. These risk profiles include the management team's previous record and the quality of the business plan of the proposed operation in Mudaraba or Musharaka and the human resources involved (Febianto, 2012)

Factors related to the legal and regulatory environment affect the performance of equity investments and need to be considered in the risk analysis. These factors include tariff, quota, tax or subsidy policies and any sudden changes in policy that affect the quality and viability of an investment.

Moreover, the risks of technological change, the risk of market displacement with new technologies, delays and shifts in cash flow patterns, and problems associated in adopting an effective exit strategy would all have an impact on the output of an investment in each business.

To mitigate equity investment risk according to State Bank of Pakistan Islamic banks shall maintain a review of policies, procedures, and appropriate governance structures to assess and manage the risks associated with the acquisition, holding and disposal of profit-sharing investments. IBIs shall ensure that adequate infrastructure and capacity are in place to continuously monitor the performance and operations of the entity in which IBIs invest as partners. These should include an assessment of Sharia compliance, adequate financial reporting and regular meetings with partners, and proper record keeping of such meetings.

The bank shall also analyze and identify possible factors that affect the expected cash flow

volume and timing for both returns and capital gains arising from equity investments. It should also use Sharia-compliant risk-mitigating techniques that reduce the impact of an investment's potential capital impairment. This may include the use of the partner's permissible Sharia security.

Moreover, the bank shall assess the potential effects of their techniques on profit calculations and allocations and ensure that their valuation methodologies are suitable and consistent. In addition, before the bank signs any agreement, it shall decide with the Mudarib and/or Musharaka partners on the proper valuation techniques and time frames for allocating the profit while taking market trends and liquidity features into account. In order to maintain openness and objectivity in the valuation, the distribution of profits, and the determination of amounts to be redeemed, the bank shall agree with the Mudarib and/or Musharaka partners to appoint independent parties to do audits and valuations of the investments as needed. Furthermore, the bank shall recognize that an investee may not always have the liquidity required to allow profit distributions to be made. Therefore, Islamic Banks shall agree with the investment partner on the methods of treatment by the investee of the retained profits.

Finally, the bank shall also define and establish exit strategies regarding their equity investment activities, including the terms of extension and redemption for investments in Mudaraba and Musharaka, subject to the approval of the Sharia Advisor of the institution.

Displaced Commercial Risk

Displaced commercial risk occurs when depositor funds are invested in long-term maturity assets such as mudaraba, and the rate of return may not be competitive with alternative investments. Although Islamic banks are not supposed to smooth out such revenues, they are virtually forced to do so because of commercial pressure. To manage displaced commercial risk the Islamic banks, create reserves such as profit equalization reserve (PER) and investment risk reserve (IRR) (Kozarevic et al, 2013). A Profit Equalization Reserve (PER) is the “amount appropriated by Islamic banks out of their gross income, before allocating the Mudarib share, in order to maintain a certain level of return on investment for investment account holder and increase owners’ equity” (IslamicMarket, 2021). The basis for determining the amounts should be pre-defined and applied in accordance with the contractual terms accepted by the investment account holder and after formal review and approval by the Board of Directors of Islamic banks. The supervisory authority lays down requirements in certain jurisdictions relating to the

maintenance of the PER. (Helmy, 2012). An Investment Risk Reserve (IRR) is the amount appropriated by Islamic banks out of income of IAH, after allocating the Mudarib share, to cushion the effects of the risk of future investment losses on investment account holder. The terms and conditions whereby IRR can be set aside and utilized should be determined and approved by the Board of Director (Helmy, 2012).

Market Risk

In the context of Musharaka and Mudharaba, different products under these financial structures are eligible for different types of market risk and therefore need to be assessed individually. However, the rate of return risk appears in almost all products and can thus be one of the most influential market risks. Islamic banks must have a conceptual framework to identify and quantify the underlying market risks for each specific product. Bank should have a rate of return risk management systems that assess the effect of its changes on the earnings and economic value of assets. Some of the techniques used to measure the bank's rate of return risk exposure include the GAP analysis, duration analysis, and simulation analysis under different market scenarios (Febianto, 2012).

In addition, banks should also reveal the valuation approach of their assets in all situations. This is particularly important because of the nature of Mudaraba and musharaka, which allow the cash and/or assets of investors to be withdrawn at any time and thus cancel capital investments. When valuating assets for which no clear market prices are available, banks must develop a structured overview from their own product program to evaluate their market risk positions and use appropriate forecasting techniques to determine the value of assets (Helmy, 2012).

Liquidity Risk

In both Mudaraba and Musharaka financial products, liquidity risk exists. For example, a reasonable payout capacity is needed in restricted Mudaraba investment accounts, because fund providers have the option to revoke their funds at any time. Another example can be seen from the financing of Musharaka, in which the bank should be able to provide the committed funds as well as reimburse the counterparty for the costs of the partnership or profit. For these financing products, liquidity risk management is indeed important.

As standard liquidity risk guidance, IFSB encourages Islamic banks to have a liquidity management framework and an appropriate system to monitor and evaluate the level of liquidity

exposure for each type of unrestricted and restricted investment account to identify any future liquidity shortfalls by constructing maturity ladders based on appropriate time bands. For example, the potential future shortfall is higher with the unlimited period of Musharaka compared to the declining Musharaka because the latter involves a known cash flow (Fabianto, 2012)

There are at least two major risk mitigation tools within the context of Mudaraba and Musharaka. First, the Islamic bank should control the liquidity position of its funds. This is important because the purpose of liquidity management issue arises from the fact that there is a trade-off between liquidity and profitability and a mismatch between liquidity asset demand and supply. While the bank has no control over the source of the funds, the use of the funds can be monitored, and its liquidity position prioritized. The bank should make all profitable investments, given the opportunity cost of the liquid funds, after it has a reserve for sufficient liquidity (Fabianto, 2012). Secondly, Islamic banks should therefore assess the necessity and extent of their access to the sources of funding available. Natural cash flow from banking activities, the realization of tradable invested assets, asset securitization, and the ability to access shareholder funds are some possible sources of funding (Central Bank of Bahrain, 2019).

Moral Hazard

Mudarabah could subject the Islamic Bank to moral hazard and principal-agent issues when the bank enters as Rab Al-Mal and Mudarib as the managing agency. While the bank is responsible for any losses in the event of an adverse outcome, it cannot compel Mudarib to take suitable measures or put in the necessary effort to achieve the expected profits. Mudarib may take advantage of such circumstances.

This moral hazard issue would be mitigated in Musharaka, as the partner's capital is always at stake. Moreover, the bank as a partner in equity would reduce the problem of information asymmetry because it would have the right to participate in project management and decision taking. However, there is a cost associated with the Musharaka asset class in the form of adverse selection, which necessitates considerable due diligence in terms of screening, information gathering, and improved monitoring subsequently. Each Musharaka deal necessitates rigorous analysis and negotiation of PLS agreements, resulting in higher intermediation costs.

3.4.2.3. Salam financing

Salam is a forward financing contract in which an Islamic Bank pays in advance for the acquisition of specific assets that the seller will deliver at a pre-determined date. Hence, the contracting parties agree on a future date for the delivery of goods in a specified quantity and quality in return for payment in advance (Dchieche and Aboulaich, 2016). Since in Salam contract it is the seller's liability to deliver the object for which advance payment of the price has already been made, it could be considered a type of debt. As a result, Sharia imposes stringent rules in order to protect both parties' interests.

Islamic Banks that are providing Salam financial Islamic contracts might be exposed to various risks which they need to take special care of. Amongst these risks are:

Counter-party Risk

One of the most common risks in Salam-based financing is counter-party risk. After receiving advance payment, the seller can fail to deliver the product on the agreed-upon delivery date in the Salam contract**.**

Market Risk

Another risk associated with Salam is market risk, which occurs when the price of the goods is lower than the price that was originally expected. Even though the commodity price is locked in the Salam contract to protect against commodity risks, both the bank that receives the commodity and the seller that sells it may face market risk at the delivery date due to commodity price fluctuation and mark-up risk.

Islamic Banks can reduce their exposure to market risk and mark-up risk associated with commodity price volatility by assessing the potential market price set for Salam contracts based on various market scenarios and strategies. Furthermore, the VaR analysis can be used to evaluate and manage market risk in Salam contracts using static and dynamic analysis (Anwer, 2020)

Operational and Liquidity risks

Operational risks can develop for Islamic Finance that provide Salam financing. These risks arise when the goods received are not of the desired quality or are unacceptable to the potential customer. There could also be a mismatch between the agreed-upon

specifications and the received commodity (Financialislam.com, 2021).

Such failures could result in more delays in the delivery of the actual product after the agreed-upon sale date between the bank and the buyer (Helmey, 2012), or even the contract being terminated. Delays in receiving commodities can result in reputational and business risks, as well as additional costs, low investment returns, and missed opportunities. Moreover, there is also a risk of liquidity, since the bank anticipates cashflow that may not be obtained at the future time of sale.

Islamic Banks may reduce such operation risks by requesting assurances from sellers that they are implementing a quality control system or some other "standard system," and/or by hedging their losses with insurance policies (Takaful) (Izhar & Hassan, 2013)

Asset-Holding Risk

The bank might also not be able to market the goods in time, resulting in possible asset loss for the unsold goods and locking funds in the goods until they are sold, that implies possible extra expenses on storage and Takaful (Financialislam.com. 2021)

The Salam financial Islamic product exposes the financial institution to commodity price volatility between the time the commodity is delivered and the time it is sold at the current market price. The higher forward price reflects the cost of the item from the trading date to the delivery date, which includes funding, insurance, and storage.

The Islamic Financial Services Board defines institutions that provide Salam financial goods as being exposed to commodity price volatility on a long position after entering into such a contract and retaining the subject matter until it is disposed of or even beyond the contract's maturity date, as long as the commodity remains on the balance sheet of the institution (Financialislam.com, 2021)

Islamic banks need to implement appropriate controls to manage and mitigate the aforementioned risks. Islamic banks should purchase only goods that have good marketing potential (Rahma, 2020); require from the prospective buyers' sufficient amount of money in deposit and a binding promise to purchase these goods (financialislam, 2021); they should also insert a penalty clause in the Salam contract that requires the money to be used for charitable purposes.

In the event of late delivery of goods, the buyer has the right, in addition to the penalty clause, to claim security or collateral from the seller in order to ensure that the seller delivers the goods on the agreed-upon date; the buyer has the right to sell the security and buy the specified products on the market, The buyer has the option to deduct the advance payment from the proceeds of the sale of the security and return any excess to the seller.

3.4.2.4. Istisna financing

An Istisna defined by McMillen (2017) is a “type of contract in which a mustasne (a client requiring the manufacturing or construction of an asset) orders from a sane (manufacturer or constructor) an asset meeting certain specification (the masnou), with asset delivery to be within a specified period of time".

If the asset is manufactured or built within the specified period and meets the agreed-upon specifications, the mustasne will be required to pay the purchase price of that asset. The sane need not produce or construct the asset on its own; it can locate the asset on the market and buy it for delivery to the mustasne or it can cause the asset to be constructed or built by another party. If the original sane causes another sane to manufacture or construct, the original sane remains liable to the original mustasne for the delivery of the masnou (McMillen, 2017).

The requirement to fix the amount to be paid for the masnou' is one of the principles of the Sharia applicable to the contract. That price may not be changed unless the masnou's specifications are changed.

Istisna financing is typically intended for projects that lack existing balance-sheet, the funding is solely based on the future cash flows of the new projects being funded. This entails thoroughly analysing and evaluating the project's risks, as well as their distribution among investors. As a result, project finance necessitates sophisticated due diligence and structuring skills to ensure that all potential risks are identified and appropriately boxed-in upfront.

Istisna contracts face many risks as financing large capital-intensive projects present certain challenges due to their size, complexity, and cost which necessitate the involvement of many participant entities such as developers, sponsors, equity participants, multiple financiers as the capital requirement may exceed the capabilities of single bank, construction contractors,

insurers, and suppliers.

The risk analysis that is required, as well as the eventual risk allocation among participants, is detailed and complex. Each participant will carry out a risk assessment to determine if all risks related to the project's construction, operation, ownership, and financing have been addressed properly; an economic analysis to determine whether the project will provide an acceptable rate of return to equity investors at the end of the day, a financial analysis to determine the adequacy of cash flows for the project's operation and debt service, and a legal analysis to determine the project feasibility and the proposed financing structure under existing legal frameworks, as well as to identify necessary changes and adaptations. The outcome of the risk analysis is a set of risks that are associated with Istisna projects that the stakeholders must mitigate effectively. Amongst those risks are:

Construction risks refer to a variety of individual risk factors that can hinder a project's completion on time and within the specified budget and the agreed standards (Kasapoğlu, 2018). Cost overruns, delays in completion, contractor default, increased financial costs, unforeseeable events, political interference, (Enrica et al. 2021) and so on are all examples of construction risks. Construction risks rise as schedules and technologies become more complex, as well as when difficult terrain and/or geographic location are involved.

Operational Risk: In istisna, an Islamic bank hires a subcontractor to build or manufacture the asset and deliver it. The firm's reliance on the subcontractor may expose it to a variety of operational risks. These risks must be mitigated through a combination of legal safeguards, due diligence in selecting subcontractors, and the hiring of suitably qualified consultants and staff to carry out the subcontractor's contract and, ultimately, deliver the constructed or manufactured asset to the customer. In the event of a subcontractor's late delivery, the asset may not be delivered to the end customer on the agreed-upon date, and the subcontractor may be subject to penalties for late delivery. In the absence of a prior agreement with the Bank, additional costs may have to be absorbed wholly or partially by the subcontractor in the event of cost overruns during the construction or manufacturing process due to increases in raw material prices, increases in manufacturing or production costs, or delays by the subcontractor. If the subcontractor fails to meet the Bank's quality standards or other agreed-upon specifications, the subcontractor may face legal action if no agreement is reached with the Islamic Bank to correct the defects or reduce the contract price. If the subcontractor fails to deliver the asset on time, the

Islamic Bank may be forced to seek a replacement on the market, incurring additional costs (Qatar Financial Center, 2021)

Supply risk: For Istisna projects to succeed, raw materials or commodities are needed. Prices for these commodities can fluctuate, and their availability for the duration of the project is not guaranteed. Participants in the project can mitigate these risks by executing a long-term supply agreement to insure or guarantee the project company's access to key supplies at a pre-agreed-upon price. Furthermore, choosing a qualified supplier who is creditworthy and financially sound is critical to reducing the risk of a supplier going bankrupt (Fletcher and Pendleton, 2014).

Repayment risk: This risk occurs when the project company receives insufficient profits, has commitments to third parties that take priority over payments to the lenders, or is otherwise unable to make the necessary payments to the lenders. This is a non-recourse risk that is largely based on cash flows after construction, which involves many risks and parties. To mitigate this risk, third-party responsibilities of the project company should be kept to a minimum to reduce the likelihood of a third-party bringing a claim against the project company (Fletcher and Pendleton, 2014).

Currency risk: Currency devaluations and currency inconvertibility are two currency threats that project companies face. The first currency risk is exchange rate fluctuation, in which a contract or payment in the project company's home currency, or the currency in which it would service its debt, loses value due to devaluation. The second risk is currency controls, in which the project company's access to foreign exchange is restricted or its ability to make foreign currency purchases outside of the country is restricted (Fletcher and Pendleton, 2014).

Environmental risk: This is the possibility that a project will be affected by environmental problems or accidents during its execution, but it is usually under the control of the construction as well as operation and maintenance companies. The presence of strict legal responsibility in relation to such environmental problems has increased environmental risk over time (Fletcher and Pendleton, 2014).

Common approaches to Istisna risk mitigation include reserving adequate capital to cover financial losses and insuring the property. In Istisna, the seller is responsible for insuring the asset (Habib, 2018). When insurance is insufficient to mitigate risks, the Islamic financier uses a

special purpose vehicle (SPV) to limit their financial liabilities. The use of an SPV to act as the buyer on behalf of the Islamic financier under an Istisna agreement protects the financier from potential liabilities (e.g. property damage, non-completion, environmental liability). If a cost overrun occurs in a project under Istisna contract, the Islamic financier is under no obligation to pay the excess (World Bank, 2017).

Another common banking approach is to break down a large contract into smaller contracts with payments made in installments (Habib, 2018). To minimize the risk of late delivery, the bank pays the contractor dependent on the previous phase's completion (Akkizidis and Khandelwal, 2008) a procedure similar to a conventional loan disbursement request, but the Istisna deals with milestone completion payments rather than loan disbursements. Islamic banks can also obtain collateral from the buyer and warranty from contractor to avoid default risk.

3.4.2.5. Ijara Financing

Ijarah as previously defined is an Islamic jurisprudence term that means giving something on rent. It is the transfer of the usufruct of a particular property or asset s to another person in exchange for a rent claimed from him (Kettle, 2011). The term 'ijarah' is identical to the term 'leasing' in English. The lessor is called 'mu'jir' here, the lessee is called 'musta'jir' and the lessor's rent is called 'ujrah.'

Ijara financing, like other kinds of financing, is subject to unique risks that must be assessed and mitigated. Credit risk, market risk, rate of return risk, operational risk, legal risk, and asset impairment risk are among the risks that will be thoroughly explained.

Credit risk

Credit risk in Ijara refers to the possibility that the lessee will be unable to pay the lease rental when it is due. Possession of the asset reduces credit risk, though repossession of an asset such as home/property can be difficult which might lead to the inability to recover the rentals that are due upon default by the Lessee (loss of invested capital). To mitigate this risk Islamic bank can request an advance payment that can be used as a lease rental. It may also sell the asset in the market after repossession to redeem its investment. In riskier scenarios, the customer can be persuaded to purchase the asset at a pre-agreed-upon price schedule. In case the customer may not buy the assets at the maturity, a separate promise to purchase at the end of the lease

term can be obtained from the customer (Zahid, A).

Market Risk

The risk that if the customer defaults and refuse to fulfill the promise or agreement to lease, the Islamic bank would have to re-rent or sell the asset/property on the open market at a lower price than originally negotiated. Furthermore, if the client wishes not to take possession of the asset/property at the end of the contract, there is a possibility that the market price will be lower than the book value.

The asset/property valuation and advance payment help to mitigate market risk. At the time of the bank's asset acquisition, a binding commitment to lease should also be obtained from the client to guarantee the customer's commitment to lease the asset. In the event of default, the bank can sell the asset on the open market and recover the real loss from the advance payment (Zahid. A)

Rate of Return Risk

Rate of return risk as component of Market Risk appears in long-term Ijarah (Muntahia Bittamleek) with fixed rental as it is vulnerable to changes in market conditions, such as higher returns demanded by investors. Risk mitigation may take the form of renewable short-term leases with price reflex subject to mutual agreement, or variable lease rentals based on a set of benchmarks (Vejzagic, 2014). In addition, Islamic banks may enter into a lease agreement with the provision that the lease rental will be increased by a certain percentage after a certain duration for example 1 year.

Operational Risk

Operation risk in Ijara is the possibility of losing leased profits as well as legal liability if the asset is used in practices that violate Sharia' Principles. It also includes the risk of a bank not being able to find a new lessee, there is also the possibility that the asset will be damaged and the lessee will fail to repair or replace it in which case, a trust receipt should be obtained from the customer to bind him to use the asset as a trustee; the trust receipt will state that any damage caused by the customer's negligence will be borne by the customer (Zahid. A), the risk can also be managed through Takaful facility. Moreover, if the asset is lost due to circumstances outside the lessee's control, the lessor is required to offer an alternative asset.

Legal Risk

Legal risk as part of operational risk is related to claims against lessees who refuse to pay for damaged goods (litigation costs, claims loss) and when the advance payment is insufficient to cover the damages claims. The Islamic Bank (lessor) could designate the Lessee as its purchasing agent to ensure that the products acquired by the lessor match the Lessee's requirements.

Asset Impairment Risk

When a leased asset is destroyed (not because to the lessee's wrongdoing), the risk of asset impairment arises. In this situation, the Islamic Bank (lessor) must supply an alternative asset, and if it fails to do so, the lessee has the right to terminate the lease without paying rent for the remainder of the period (additional cost, low investment return). Risk mitigation could include the lessor insuring the leased item for damages (at a cost to the lessor). The cost of insurance is included in the fixed lease rental and cannot be charged to the lessee separately (Vejzagic, 2014).

3.5. Takaful (Islamic Insurance as a Risk Management Tool)

Takaful insurance, a subcategory of risk management, is a fundamental technique employed in the Islamic banking industry to protect policy holder’s wealth. Takaful aids in reducing concern and dread, indemnifying loss, and protecting policy holders’ properties and wealth.

Takaful as a risk management technique spreads risks across a larger group to reduce individual losses. More importantly, because risk management is the most prominent concern in the takaful industry, the risk management activities must adhere to Shariah regulations and norms.

Takaful is a risk-sharing arrangement between an insurance firm and an individual. The insurance company, or the insurer, agrees to compensate the individual, or the policyholder, for certain losses specified in a contract or in the policy. Insurance is a monetary medium through which individuals and organizations pass risks, or monetary loss ambiguity, on to others.

Takaful is an Islamic alternative to conventional insurance. The word 'Takaful' was derived from the Arabic verb 'Kafala' which means to ensure, to help, to take care of the needs of one another (Minan et. al, 2017)

Before we go into more details about Takaful, we'll look at the conventional insurance system and the factors that led to it being considered illegal in Muslim society. Shariah Scholars has several objections to conventional insurance. Conventional insurance coverage includes Maisir, Gharar and Riba (Uddin, 2015a). Those three elements are strongly prohibited by the Shariah.

Maisir

Maisir means wealth acquired by chance and wishing for something worthwhile without having to work for it; this is like gambling. The nature of betting, which is equivalent to gambling, is considered to be insuring on profit. The Shariah prohibits Maisir, or gambling. However, because of the "insurable interest" aspect conventional insurance is different from gambling. Here the policyholder must have an insurable interest or at least expect to acquire insurable interest in his subject matter. This helps to minimize the use of insurance as a gambling tool. Yet still the aspect of Maisir is available in conventional insurance as the insured makes a bet on the loss occurrence and the same applies vice versa for the insurer (Khan, 2011). It is also considered as gaining wealth by chance or luck at the expense of others (Houston 1964).

Another reason the Shariah forbids Maisir is because it involves the unjust enrichment of one party at the expense of the other. Conventional insurance involves the same kind of unjust enrichment for the insurers because if the insured event does not happen, companies make profits and policyholders are not the same as the shareholders. Hence the Shariah prohibits conventional insurance.

Gharar

Gharar means hazard, risk, and uncertainty. The Islamic framework allows for some degree of Gharar, but it prohibits excessive Gharar. Gharar happens because of insufficient knowledge or lack of adequate and accurate contract information. Let's see how it goes.

Commercial insurance is a business with the goal of profit-maximization. Profit materializes when an underwriting surplus exists, that is, if the total premiums exceed the total claims. However, the total amount of claims is left to uncontrollable and unmanageable factors, which makes gambling similar to the outcome of that business. If there is no loss, the insurer shall pay nothing against the premium already paid by the policy holder, but where the loss occurs, the policy holder receives much greater payment than the small premium paid to the insurer. This insurance uncertainty is called "gharar" in Sharia terms, and when excessive, it is forbidden in

financial transactions and leads to their invalidity. While Shariah tolerates the minor gharar, the type of gharar involved in commercial insurance is excessive and, consequently, Shariah bans conventional insurance (Abozaid, 2016)

Riba

Riba means interest. For Islamic financial ethics and law, the prohibition of Riba is fundamental. Conventional insurance as explained by El-Gamal (2001) involves direct as well as indirect forms of Riba. The indirect Riba is the pre-determined amount expected by the policyholder which is excess than the one invested and direct Riba is in the form of interest earned on interest-based investments e.g., by lending on interest to financial institutions and banks or investing in interest-based activity. Insurance is allowed if the insurer provides profit shares rather than fixed profit and the insurance companies change the nature of the investment to comply with Shariah.

The Demand for Sharia-Compliant Insurance.

Sharia scholars agree that conventional insurance is contrary to Shariah (Abdulazim, 2016). However, Islam accepts human beings' right to protect their religion (belief), life, dignity and honor, property, and talent, therefore the life or property of individuals, organizations and societies must be insured against loss and insurance schemes should exclude elements prohibited by the Shariah. As a result, the Muslim World League Fiqh Council introduced a concept of "cooperative insurance." (Rizvi1 et al., 2022)

- Within the cooperative insurance schemes, people working in similar businesses contribute their funds for a specific period of time.
- If someone suffers specific losses because of unforeseen events, then that individual can be compensated from those funds.
- The remaining money shall be distributed to the members in proportion to their contribution after the time specified.
- All contributions (premiums) should be paid on donation basis (tabarru) to remove the gharar element from the takaful contract (Tolefat, 2006).

The Concept of Cooperative Insurance (Takaful Ta’awuni)

Islam allows insurance if the insurance is contracted under Takaful or mutual cooperation. Under Cooperative Insurance a group of people with common interests contribute their funds to

guarantee or protect against misfortune. Thus, Takaful's concept is based on unity, responsibility, and brotherhood among participants. However, in practice most Takaful covers are not provided through cooperatives or through mutual insurance rather by companies.

Afendi et al, 2019 explained that the Takaful insurance system evolved with the principle of mutual cooperation "ta'awun" and voluntary contribution "tabarru." The members are joint investors in Takaful scheme. They pool their voluntary donations with Takaful vendor who works as "Mudarib." The member who suffers any mishap is given financial assistance. This is a one-way transaction that doesn't guarantee a certain return on a number of donations. The concept of Takaful is based on mutual cooperation and voluntary contribution through which the risk factor is shared between policy members and Takaful operator. The policy members agreed to share in a pool that is reinvested further, and the profits are held in the pool. Later, if any loss occurs to any of the policy members, he would be compensated out of the pool.

Takaful companies divide these contributions into two parts: Donation or Tabarru part to meet the loss of fellow policyholders hence, the Tabarru's clause is included in contract, while the other part goes to investment. Individual rights remain intact in the investment part under the principle of Mudarabah and contributions together with profit (net of expenses) are payable at the end of the policy term to the policyholder or before, if he so desires (Billah, 2007).

In case of deficit in Takaful fund there are several possibilities to be considered to cover the deficit. First, the Takaful concern may borrow money through permissible way. Second, the members should be required to contribute to meet this deficit. Third, Takaful companies establish a fund to meet such emergencies. Fourth, a third party may guarantee to help in such a situation. Fifth, an agreement may be concluded with the re-insurance company to bear such risks (al-QurahDaghi, 2011 cited in Adul Azim, 2013)

The distinction between conventional insurance and Takaful operations is more visible with regards to fund investments, surplus distribution and the concept of Tabarru (donation.).

While insurance companies invest their funds in interest-based businesses and without any consideration to Shariah conformity, Takaful companies invest only in businesses conforming to Shariah standards and the profits are distributed according to the pre-agreed ratios in the

Takaful Agreement.

Furthermore, unlike in conventional insurance, the Takaful operator does not own the fund but is entrusted with the task of administering it for the benefit of the participants. If the operator does not own the fund, then it does not own the fund's surplus either, therefore the surplus will not be retained by the Takaful operator or the shareholders but will be returned to the policy holders in the form of cash dividends or distributions. However, in return for its management of the Takaful operations and fund, the Takaful operator receives fees that can be determined up front, and hence the profit. On the other hand, being a mere agent, the Takaful operator is not responsible for any shortfall in the fund; if the compensations exceed the premiums, then it is not the operator's responsibility to cover the fiscal deficit. The operator may in this case request additional contributions from the participants or terminate the policies (Abozaid, 2016)

Moreover, the concept of Tabarru eliminates the element of gharar (uncertainty) for the Takaful contract. Tabarru is not a premium for meeting loss but a donation that the participant agrees to pay in the Takaful fund in order to fulfill his obligation of mutual aid and joint guarantee if any of his fellow participants suffers a defined loss. Wherever, one of the members suffers a defined loss and makes a legitimate claim, takaful operator would settle the claim by using funds from the Tabarru pool. It is the idea that all parties involved in an endeavor share accountability and commitment to it.

Takaful 's advantages compared to conventional insurance.

The profit return of the Takaful business is guaranteed to the Takaful operator as the fees can be determined up front, so the operator need not worry about the risk of not making profit let alone losing. However, on the other hand, in conventional insurance if the operator was fortunate enough to be demanded less claims, it may make more profit. Takaful gives policy holders the chance to get some of their money refunded Premiums at year end through surplus redistribution. On the other hand, however, the operators are not responsible for any deficit in the Takaful fund towards the policy holders, which is not the case with conventional insurance where the operator is obliged to pay all claims regardless of the deficit. Thus, each type of insurance has its advantages and disadvantages for its parties, but Takaful remains more consistent with the norms of justice for all parties in the final analysis (Abozaid, 2016).

3.5.1.1. Takaful Models

In theory, Takaful is perceived as cooperative insurance, where people with common interests form a group and set up a common fund that can be used to assist any of the members in times of loss or damage. The money for the fund must come from ventures which comply with Shariah. This concept has progressively transformed into commercial Takaful businesses. These Takaful operators belong to shareholders and must balance the traditional concept with the shareholders' need for profit and return. Takaful is being restructured into three models in a commercial venture, based on their view of profit. The model based on Tabarru (Donation) supports non-profitable commercial ventures whereas the model based on Modaraba, and the model based on Wakala view Takaful as profitable commercial ventures.

Tabarru (Donation) Model

This not-for-profit model includes social governmental owned enterprises and programs operated on a non-profit basis which utilizes a contribution that is 100% tabarru (donation) from participants who willingly give to the less privileged members of their community. Ta'awuni model (Billah, 2004) is based on the concept of brotherhood, solidarity, and mutual co-operation among participants in order to achieve the well-being of those who need help because of a sudden calamity, misfortune or catastrophe. This model seeks to attain the welfare of Takāful participants and the wider community. Takāful operator acts on behalf of participants as a trustee, with no intention of profit making. This is why this model is called a non-profit model, too. The profit and the surplus are entirely distributed to the participants.

The Mudarabah Model

In Takaful, the Mudharabah model is a profit-sharing contract (Saeed, 2019) where participants provide capital in the form of a contribution and Takaful operator acts as a mudarib who provides his management expertise to use the Takaful fund efficiently. Takaful operator shares the profit from Takaful fund investments and is responsible for all management expenses.

In the Mudarabah model as shown in Figure 20 the participant pays a contribution to the Takaful operator, who splits this into two parts. The bulk of the fund goes into the Participants´ Account (PA) that belongs to the Participant, whereas the smaller portion is included in the Participants' Special Account (PSA). The funds in the participant's account (PA) belong to the individual

participant, while the amounts in the participants´ special account (PSA) become a community pool of money for help against the covered risks - that is, a common account (Serap, 2013) used to pay claims and underwriting costs. The whole amount of PA and PSA is invested in instruments approved by Shariah.

PA profit is shared between participants and operator Takaful as per agreed ratios. Profit and the amount in PSA are used to pay for claims and the cost of underwriting. If claims payments and underwriting costs exceed the amount prescribed in PSA, the loss is compensated by PA, or shareholders can provide interest-free loans (qard-e-hasana). In the event that claims, and underwriting costs are less than the amount available in PSA, the left amount is treated as surplus underwriting and shared between Takaful operator and participants. In the Mudaraba model, Takaful operator claims to share in the underwriting of surplus as an incentive to manage Takaful funds efficiently (Waheed, 2010).

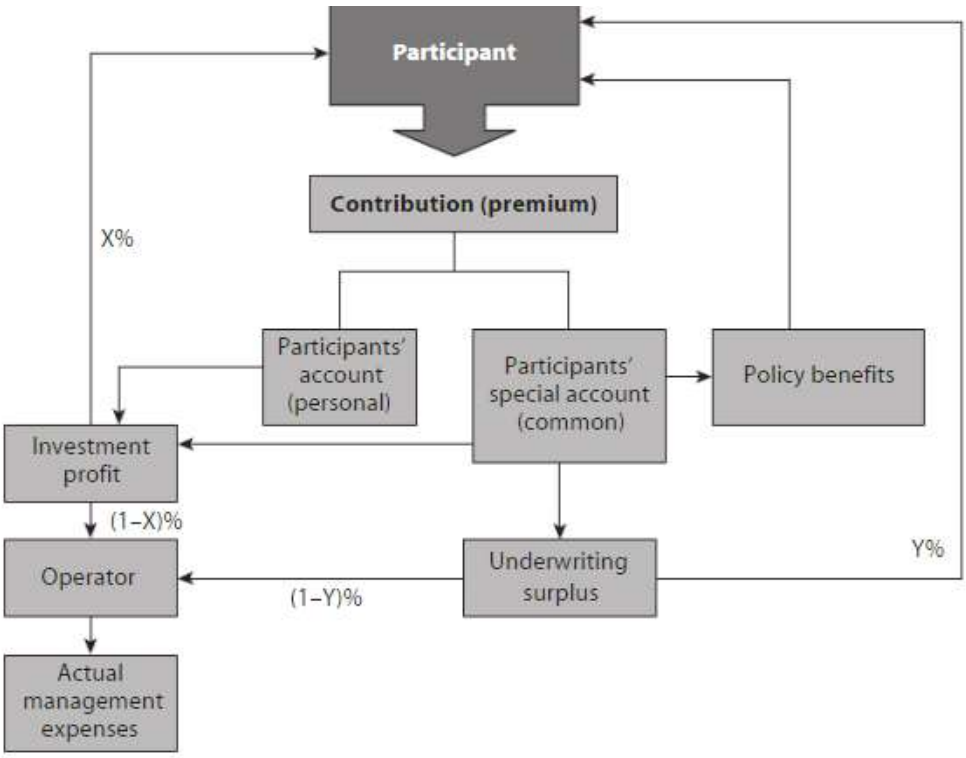


Figure 17: The Takaful- Mudarabah Model (Serap, 2013)

The Wakalah Model

Wakalah model is an Islamic contract driven by fees, in which participants provides capital in the form of contribution while the Takaful operator manages the funds. Here, the Takaful

Operator charges a fixed fee named Wakalah fees rather than profit-sharing as in the Mudaraba contract for providing its managerial services to invest and manage the funds prudently (Waheed, 2010). In general the contribution goes directly into the risk fund for annual renewable products. All investment profit and the surplus underwriting is returned to the participants (Serap, 2013).

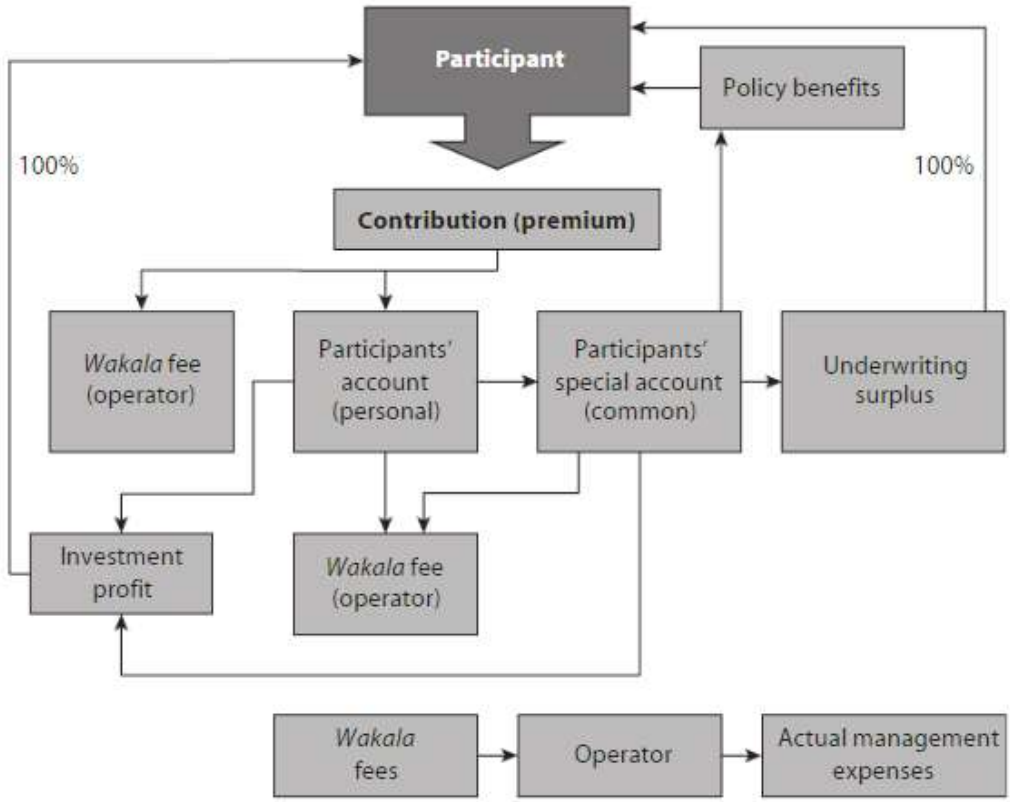


Figure 18: Takaful Wakalah Model (Serap, 2013)

Mixed Model (Mudaraba + Wakalah)

Mixed model as shown in Figure 22 is a combination of al-Mudarabah and al-Wakalah model in which al-Wakalah contract is used to underwrite activities while al-Mudarabah contract is used for investment activities .With regard to underwriting activities, the shareholders act as the wakeel (agent) on behalf of the participants to manage their funds whereby the Takaful operator (shareholders) receives contributions, pay claims, arrange Re-takaful and all other necessary actions related to Takaful business. In exchange for carrying out these tasks, the company charges each participant a fee known as a Wakalah fee which is usually a percentage of each participants´ contribution (Tolefat, 2006). On the investment side, the company invests the surplus contributions in Mudarabah contract-based instruments based on Shariah, whereby the company acts as mudarib on behalf of participants (Rab-al-maal or equity providers).

However, at the start of the contract, to meet the Shariah requirement for the Mudarabah contract, the profit ratio is fixed and agreed between the two parties (Waheed, 2010)

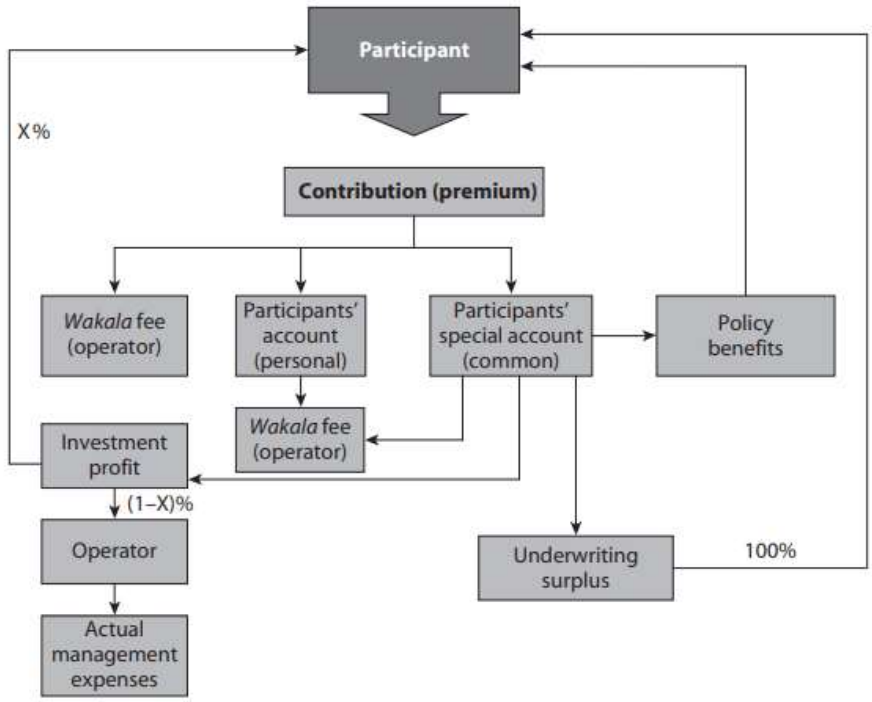


Figure 19: Mixed Model (Mudaraba + Wakalah) (Serap, 2013)

3.5.1.2. Types of Takaful

There are basically three types of Takaful, named as:

- Banca Takaful
- Re-Takaful
- Micro Takaful

1. Banca Takaful

The sale of insurance certificates through banks is called Banca Takaful. It is an arrangement under which a bank acts as the insurance company's agent, so that the insurance company can use the bank's network to sell its certificates to the client base. The collaboration between banks and Takaful operators can add value for banks, Takaful operators and their clients. Therefore, all partners leverage from each other and banca Takaful from all perspectives makes sense. Banca Takaful is expected to be the most important channel of distribution in terms of achieving higher revenues. The target market is easier to reach via banca Takaful as people seeking Shariah-compliant products are connected to Islamic banks that provide banca Takaful products.

So, it produces a synergistic effect and offers wide-ranging financial, functional and marketing advantages to the participants (Middle East Global Advisors, 2016)

From the Islamic banks' perspective, they can distinguish their business activities through banca Takaful. It allows Islamic banks to further increase their offerings and enable customers to meet all their financial needs from a single supplier. Some additional benefits can be summed up as follows (CIBAFI, 2017):

- Banca Takaful increases sales team productivity due to the minimal costs of distribution.
- Islamic banks can benefit from the extensive knowledge of banca Takaful products available from Takaful operators.
- Banca Takaful can be an additional fee-based income, and a way for banks to create a new revenue flow. As such it helps to maintain the stability of their income.
- Because of banca Takaful product offerings, banks can give their customers a positive image and an increased product range.

Banca Takaful offers benefits to Takaful operators, too. For example, Takaful operators can employ various distribution channels and extend their customer base through the network of branches developed by the banks and customers contacts. The ability to tap into customer bases of Islamic banks is a significant motivation for the distribution of mass-market offerings. Some of the benefits to Takaful operators can be summed up as follows (CIBAFI, 2017):

- Takaful operators can design their products for specific targeted markets by extracting important customer information such as gender, age and socio-economic life differences from the bank's clientele.
- Takaful operators benefit from banks' brand recognition and reputation, and reliability in their service.
- Cost savings and improved efficiency of distribution increase the competitiveness of the Takaful operators.

Banca Takaful can also offer the customers great benefits. Customers have easy and convenient access to a range of integrated banking products from a single provider. Additionally, contribution payment facilities are easy for clients as they are collected directly from their accounts. Banca Takaful products are easy to understand and can meet the diverse financial needs of targeted segments such as wealthy clients, mass-affluent clients and retail clients. Furthermore,

the attractive prices of banca Takaful products are another important incentive, too. (CIBAFI, 2017)

Banca Takaful Models

- Takaful Subsidiaries (Integrated) Model
- Direct Selling & Agency Model
- Implant & Joint Venture Model
- Open Architecture Model

Takaful Subsidiaries (Integrated) Model

This model can offer maximum long-term growth potential. Islamic banks set up or acquire their own Takaful providers in this model and bank branches distribute selected Takaful products. The result of deep operational integration within each aspect of partnership creates synergies and minimizes cultural differences between partners and support staff (CIBAFI, 2017).

Direct Selling & Agency Model

In this model, the bank acts as an agent for the Takaful operator and distributes Takaful products for a commission. This model is relatively quick, easy to set up and becomes more important in developing a customer-oriented banca Takaful franchising. Using this model, however, requires a high level of product knowledge and cross-selling skills. Banca Takaful sales professionals and operators must be skilled in minimizing the risk of misapplication (CIBAFI, 2017).

Implant & Joint Venture Model

This model is effective in optimizing the real potential and in providing customized services. It is based on establishing a joint venture between a bank and Takaful operator to develop the products according to the needs of customers of the bank and the nature of other products of the bank. Banca Takaful products can be integrated with other banking products or as standalone (CIBAFI, 2017).

Open Architecture Model

Banks work in this model with multiple Takaful operators. Some studies explain that one of the key factors for future success is the multi-channel and multi-product banking strategies. Consequently, some strategic alliances such as "open architecture model" have begun to develop in various banking jurisdictions such as India. There has been a shift from product-focused cross selling to customer-focused cross selling (CIBAFI, 2017).

2. Retakaful

The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI cited in Serap 2013) defines retakaful as “a contractual arrangement under which the reinsurer will be liable for part or all the risks that the insurer has insured. The insured legal right will not be affected by the reinsurance arrangement and the insurer is liable to the insured for paying claims as per the insurance policy terms and conditions.”

The Malaysian Takaful Act 1984 (cited in Serap 2013) does not define the term per se but imposes a requirement that “an operator shall have arrangements consistent with sound Takaful principles for retakaful of liabilities in respect of risks undertaken or to be undertaken by the operator in the course of his carrying on Takaful business” Act 312

Retakaful is a form of insurance by which the Takaful operator pays to the reinsurance company or retakaful operator an agreed premium from the Takaful fund, and in return, the reinsurance company or the retakaful operator will provide security for the reinsured risk. Reinsurance is best thought of as "insurance for insurance companies." Or we can also say that Retakaful is a "takaful for takaful operators." It's a way to protect a primary insurer against unforeseen or extraordinary losses (Ahmad et al. 2014)

Retakaful is the reinsurance equivalent which complies with the Shariah. The Shariah principles which apply to Takaful also apply to Retakaful operations. The difference is that the participants are Takaful operators rather than individual participants in the Retakaful operations (Rahman, 2009) and risk is shared among participants rather than transferred to the takaful entity’s shareholders. In addition, retakaful requires a Shariah governance structure, separates the shareholders' fund from the risk fund, and limits investment activities to instruments that comply with Shariah law. Another notable difference is the role of the operator as the risk and fund manager, with the

expected or imposed responsibility for extending qard, a benevolent or interest-free loan from the operator (shareholders' fund) to cover a risk fund deficit or fulfill claims obligations (Serap, 2013)

The purpose of reinsurance is to spread risks across a wider risk pool, enabling the insurer to take on more capacity, and allowing the insurer to better manage their capital. It serves to limit liability for specific risks, to share liability when losses overwhelm the resources of the primary insurer, and to help insurers stabilize their business in the face of the large gains and loss margins inherent in the insurance business.

3. Micro Takaful

Micro Takaful insurance defined by Ahmed (2016) “is a contract whereby the operator (insurer) undertakes as an agent of the participants (insured/policy holders) to pay the participant (insured) of the beneficiary a given sum of money or any other indemnity when the risk insured against occurs. The participant (insured) pays the contribution (premium) to the insurer on a donation basis”.

Micro Takaful is the Takaful scheme for low-income people, it is considered as a major opportunity to protect and fund micro-enterprises and low-income families. Generally, Micro-insurance is viewed just like other normal insurance on small scale for low-income people. It can be redefined as a mechanism to provide Shariah-based protection to the blue collared, under-privileged individuals at an affordable cost. In most cases subsidies from government, charity or insurance companies (Corporate Social Responsibility) are required to support the Micro Takaful insurance.

3.6. Risk Mitigation Instruments in Islamic Banks

Some of the risk mitigation instruments employed by conventional banks do not adhere to Sharia law, such as forwards and futures contracts, which are subject to the Shariah's restriction on trading prior to assets possession. In addition to swaps and options contracts which are speculative in nature and includes elements of Gharar (gross uncertainty). In addition, because these contracts are zero-sum games, according to Sharia scholars, they also have characteristics of Qimar (gambling). The occurrence of debt for debt trades, in which participants offset and close their positions before delivery of the underlying assets, is another reason why such contracts are out of compliance. Nonetheless, when the gambling, speculative and gambling parts of conventional hedging are removed, it may be used within the Sharia framework of financing. That is why Islamic finance adopted risk mitigation tools that adhere to Sharia Standards.

3.6.1. Collateral Agreement

Collateral (called Al- Rahn in Arabic) is a security that the borrower deposits to protect a loan that the bank makes to him. Such assets are deposited to serve as a pledge or assurance that the loan will be repaid in full when due; if this is not the case, the security may be sold to pay the bank. It is an important instrument for the security of loan for the banks because it raises the borrower’s cost of default and thereby acts as a disincentive to default (Van Greuning and Iqbal, 2008)

In Islamic banking, collateral is regarded to represent achieving security and certainty based on the transaction's solid case and the commitments made to reduce the risk of capital return. In this context, "adequate security" usually takes the place of the word "collateral." The security required here has much to do with how the applicant's intellectual property, which has never, if ever, been used previously, is employed in conjunction with the code of ethics in the right way. In a Musharaka contract, for instance, the shareholders never request collateral from the issuing company because each shareholder has a proportionate claim to the firm's assets.
Another illustration is in the case of installment sales, where the subject property is used as collateral up until the bank's resources are entirely redeemed.

Islamic banks can hold valuable assets, tittles, and other form of assurances as collateral, like land tittles, gold, other precious, valuable and liquid assets, Shariah compliant debentures or

sukuk certificates, Shariah compliant shares certificates, takaful (Islamic insurance), third party or institutional guarantee, cash deposit, domiciliation of payment, negative pledge, Ijarah agreement, assignment of debt, letter of comfort/awareness written by a reputable person or company to a lending institution acknowledging support of its subsidiary borrowing from the bank, as well as any other means that can give comfort to Islamic bank so long as it is compliant with Shariah (Adamu, 2018).

3.6.2. Guarantees

A guarantee is a formal promise made by the bank to a third party to secure the performance of a customer obligation that are forwarded by Islamic banks (Rahman, 2005). In the case that the client breaches their contract, the Bank guarantees to pay a specific amount upon demand from the third party. Guarantees can either be financial or non-financial.

A bank will provide a written guarantee in a variety of circumstances to assist exporters or contractors. It serves as a safeguard against the breach of another party's duties. If the person on whose behalf it is issued fails or defaults in carrying out a specific commitment, the bank is under an irrevocable and non-cancellable obligation to pay a predetermined sum. Bank guarantees typically do not entail any money, but the bank may charge a "guarantee" commission for the service of providing their own guarantee and taking on the risk for the duration of the guarantee. Islamic banks provide assurances in accordance with the Kafalah principle of Islam.

Banks that provide bank guarantees do so at their own risk since, in the case of default, they are responsible for making payments under the guarantee. As a result, the bank assumes a liability risk and evaluates the client's financial situation before providing any guarantees to decide whether the client's reputation and creditworthiness support the bank's decision to take a chance on the client's performance. To minimize any potential loss, the bank may take the required security. The commission imposed by the bank is justified by these administrative costs incurred during the guarantee-issuing process. Unlike conventional banks, which compute guarantee commission based on the guaranteed amount and length of the guarantee, Islamic banks are required to calculate the commission as a fixed sum on the guaranteed amount, without taking the period of the guarantee into account (Financial Islam, 2022).

3.6.3. Islamic Options

An Islamic option is a contract that promises to buy or sell an asset at a fixed price within a set time frame. These promises cannot be traded within the framework of Islamic Finance, and no premium should be imposed for such options. Options are also found in Bay al Urboun (over the counter Islamic Derivative), which is a transaction in which the buyer pays a deposit to secure the underlying asset as well as the price at the time the contract is signed. This is a risk management strategy in which the buyer attempts to avoid or eliminate future market volatility (Van Greunning & Iqbal, 2008)

Bal Al- Urboun defined by IslamicMarket, 2022 is „Earnest money that is the amount paid by the client (orderer) to the seller after concluding a contract of sale, with the provision that the contract is completed during the prescribed period. The urboun amount will be counted as part of the price; otherwise, the urboun will be kept by the seller if the buyer fails to execute the contract “.

In accordance with this instrument, the client makes a deposit payment to the bank in advance for the purchase of an asset at a later time. The investor has the right to purchase the asset at a defined price at any time up until the contract's expiration, but the client's deposit is non-refundable.

It should be noted that bay al urboun is only permitted by Hanbali jurists (one of the four major Islamic schools of thought). The other three doctrines do not permit it since they consider it a void contract. As a result, its utility in Islamic banks as risk management tool is limited.

3.6.4. Islamic Swaps

The International Accounting Standards Board (IASB) of London defines derivatives as a financial instrument whose value changes in response to a change in the price of an underlying, such as an interest rate, commodity, or security price (IFRS, 2001).

A derivative transaction is essentially an agreement between two parties to hedge specific types of risk such as market risk and credit risk. Derivatives are additionally utilized for speculation in the secondary market (a financial sector where previously issued instruments such as bonds

are purchased and sold).

The term Islamic derivatives was modified by Islamic financial engineering, which attempts to identify those derivatives instruments that would be Islamically acceptable, as well as to modify a variety of approaches to financial innovation with new models and creations that comply with Sharia principles (Alamin2, 2009)

Islamic Swap is therefore defined by Hassan et al (2013) as "a derivative contract where two parties exchange one financial instrument for another backed with an underlying asset and excluding all prohibitive elements under the Sharia for the mutual benefit of the parties".

Islamic Swaps were created because the swap market is one of the largest derivatives markets. Islamic swaps are useful not only for risk management, but also for lowering financing costs, smoothing seasonal cash flows, arbitraging the yield curve, creating synthetic instruments, entering new markets, and realizing economies of scale. Furthermore, risk management and hedging mechanisms are permitted in Islamic finance (Bakar, 2009). It is because these financial instruments are based on Sharia objectives that emphasize property protection. Indeed, from a Sharia standpoint, this contract is permissible as long as it is free of elements that violate Sharia principles, such as Riba, Gharar, Maisir, and Qimar.

According to Bacha (1999), the requirements for Islamic financial instruments require Sharia scholars to provide some basic conditions regarding the sale of assets. Because a derivative instrument is a financial asset whose value is determined by the underlying asset, the Sharia conditions for the validity of a sale are also relevant. Aside from the requirement that the underlying asset be halal, at least two conditions must be met. First, the underlying asset or commodity must be physically present. Second, the seller must be the legal owner of the asset in its final form.

Islamic Swaps are one of the most important types of Islamic derivative instruments used in the market. The market currently employs three types of Islamic SWAPs: Islamic Profit Rate Swap (IPRS), Islamic Cross Currency Swap (ICCS), and Islamic Foreign Exchange SWAP.

Islamic Profit Rate Swap (IPRS)

Islamic Profit Rate Swap (IPRS) is an Islamic finance arrangement that is similar to an interest

rate swap but is structured to be Sharia compliant. A profit rate swap is an agreement between two parties to exchange periodic fixed and floating payments by multiplying a predetermined notional amount by the parties' agreed-upon fixed and floating rates. The resulting sums are then paid by the parties to one another. This exchange is carried out using a murabaha contract to generate fixed rate payments and a reverse murabaha or tawarruq contract to generate floating rate payments (Thomson Reuter, 2022). In an Islamic profit swap agreement, the fixed rate party aims to swap its fixed rate profits for floating rate profits, while the floating rate party aims to swap its floating rate profits for fixed rate profits.

IPRS as explained by Abdul-Rahman (2015) is a bilateral agreement between two parties to make agreed-upon payments to each other on a regular basis. These instruments are used to protect against adverse profit rate movement by converting cash flows from fixed to floating or vice versa within the same currency. On each settlement date, the commodity transaction is used. The amount and time interval between regular payments can be customized by clients and banks.

To achieve a sustainable profit rate swap, funding rates should be aligned with investment return rates. This provides a risk management tool for Islamic financial institutions, which are also shielded from variable borrowing rates due to the implementation of IPRS.

In the current market, a separate contract known as the wa'ad contract is used to ensure that the swap matures. A wa'ad is a unilaterally binding promise that is only binding in one way. The execution of a series of underlying murabaha (deferred plus cost plus sale) contracts on Shariah-compliant assets or commodities is used to carry out the implementation. The counter party provides a wa'ad before each commodity murabaha stage and reverse murabaha stage in the following structure. The wa'ad guarantees that the promise will engage in the relevant commodity murabaha or reverse commodity murabaha trade. This will continue until the swap is terminated. The most common underlying structure for IPRS is a plain vanilla commodity murabaha linked with a Shariah asset-backed structure. The prohibitions stated that it must be free of any elements of riba (usury), gharar (uncertainty), and maysir (gambling) when structured in this manner using commodity murabaha. The payment obligation of each party is calculated using a different pricing formula. The notional principle is never exchanged in IPRS because it is netted off using the Islamic principle of muqassah (effectively defined asset off).

Islamic Foreign Exchange SWAP (IFE)

The IFES structure is based on the concept of wa'ad "promise which connotes an expression of willingness of a person or a group of persons on a particular subject matter" (Razali, 2010). This arrangement includes a Bay'al-Sarf (currency exchange) by the customer at the start of the transaction to enter into currency exchange on a future date at today's exchange rate. For example, a customer with US dollars can sell them to the bank on the spot in order to obtain Euros. Following that, the customer will promise the bank to enter into a Bay'al-Sarf contract at a future date at today's rate, so that the investor will receive the US dollars at the future date without being exposed to the risks of currency fluctuation.

In summary, the IFES involves currency exchange in the beginning, as well as promise to carry out another currency exchange at a later date. The second currency exchange will be implemented at the end of the period to receive the original currency.

Islamic Cross Currency Swap (ICCS)

ICCS is divided into three stages. First, there will be a spot exchange of principal in a currency other than the delivery currency. During the life of the swap and finally upon maturity, an accounting exchange of profit payments will take place, and the parties will exchange a principal amount in a currency other than the spot principal. There will be two murabaha transactions for ICCS: term murabaha and reverse murabaha. Murabaha refers to a financier who buys goods from a supplier and later sells them to another party at a deferred price that is marked up to include the seller's profit rate.

In the case of reverse murabaha, the bank will buy goods on the spot and sell them to the customer on a deferred payment basis. The customer will sell the goods to another party for immediate payment and delivery, in which case the customer will receive cash plus duty to pay the bank's deferred payment on the marked-up price. ICCS is made up of two financial transactions: the exchange of profit rates and the exchange of principal amounts. ICCS enables banks to convert a liability or asset in one currency into another. An exchange of the principal amount (on the start date and/or maturity date) can be included (or excluded) in an ICCS. ICCS profit payment (via Commodity Murabaha) occurs during each settlement period (Abdul-Rahman. 2015).

3.6.5. Parallel contracts

Parallel Contracts is used in Salam and Istisna mode of financing. It is a form of forward sale contract in which the seller undertakes to supply commodities at a future date, against an advanced spot price paid fully in cash. It is critical to highlight that conventional forward and future contracts in which payment and delivery of commodities are postponed are prohibited by Sharia due to the inclusion of gharar and riba elements.

In Islamic banking, a parallel contract is an arrangement in which a bank enters into two separate contracts. In one, the bank is the buyer, and in the other, the bank is the seller (Korshid, 2018). Only parallel contracts with third parties are permitted.

Parallel contract was allowed by the Prophet subject to certain conditions in which to remove the uncertainty, Salam must sell a specific volume and a specific weight on a specific due date.

Parallel Contracts can be used to finance a home using Parallel Istisna. The client may seek financing to build a house on open land, the bank will undertake to build the house based on an istisna contract, and the Islamic bank will use a parallel istisna contract if they lack the expertise to build the asset. Parallel contracts can also be used in the canning and food preservation industries, heavy industries (such as shipbuilding and truck manufacturing), and infrastructure projects (road, bridges, flyover, airport)

In both the contract and the parallel contract advance payments and deferred delivery are involved. The buyers, who are the bank in the Salam contract and the client in the Parallel Salam contract, will pay the full price in cash on the spot for future delivery to the client. Both contracts are completely separate from one another. Shariah law requires that contracts be completely separate and unrelated. As a result, any liability arising from either contract has no bearing on the other. In both contracts, the bank is the common party. The bank acts as the buyer in the Salam contract, purchasing assets or commodities from suppliers. The bank acts as the client's seller in the Parallel Salam contract.

The bank is the common party in both contracts, but the bank plays different roles in each. The bank is the buyer in the Salam contract, paying the supplier in advance. The bank, on the other hand, acts as the seller to the client in the Parallel Salam contract, receiving payment in advance on the spot.

Both contracts have the same delivery date, and the Salam contract is signed first, followed by the Parallel Salam contract. As a result, the Salam contract has a longer duration than the Parallel Salam contract. Because of the contract's timing differences, the price paid in both contracts is not the same. In the Salam contract, the bank pays a lower advance price earlier than the client did in the Parallel Salam contract.

The bank only receives the ownership title in the Salam contract, not the physical asset. This is because the bank's goal is not to physically purchase and receive the assets. The client will then receive the ownership title. As a result, the client receives both the ownership title and physical delivery of the asset under the Parallel Salam contract.

3.7.Summary

Risk arises when there is a possibility that one or more uncertain events will cause an outcome and the ultimate outcome is unknown. According to Islamic commercial beliefs, taking risks is the only way for a business to flourish. One of the reasons for the prohibition of interest-bearing (riba) transactions is the unjust enrichment associated with such transactions, in which the lender earns multiple returns without taking risk; thus, the common legal maxim in financial transactions, al ghunm bi al-ghurm, which means entitlement to return is related to the liability of risk.

Another maxim drawn from the Prophet Muhammed's (PBUH) saying is al-khraj bi al-daman, which means that the right to the return of an asset is linked to the risk connected with its holding. In Islamic finance, no transaction, whether debt-based or equity-based, is without risk. What is forbidden in Islam is excessive risk of transaction based on unpredictable events, which is totally anticipated by the parties engaging in contracts such as games of chance or lottery draws.

The risks associated with Islamic banking are higher than those associated with conventional banking. This is due to Sharia compliance requirements in Islamic banking and the nature of Islamic financial instruments. Islamic Banking is distinctive in that it includes inherent aspects of asset management and handling, which exposes the banker to additional risks in addition to the regular financing risks in conventional banks. Each Islamic Banking mode of financing has a distinct product profile risk that stems from the Islamic financial product's structure and process flow. Understanding and identifying the additional risks of each Islamic product is essential for managing the risk profile of each Islamic financing instrument. In contrast to the conventional concept of money vs. money, Islamic financial products may be a little complex in their whole due to completely different individual characteristics of each product as well as their terms and conditions of use.

The risks that Islamic banks are exposed to can be divided into two categories: risks that they share with conventional banks as financial intermediaries, and risks that are unique to them due to their Sharia compliance. Credit risk, market risk, liquidity risk, operational risk, and other risks that conventional banks face are indeed faced by Islamic banks. However, due to Sharia compliance, the scope of some of these risks differs for Islamic banks. In addition to the risks

that conventional banks face, Islamic banks face additional risks that stem from the unique features of the assets and liabilities and from the profit-sharing feature of Islamic banks. Paying a portion of the bank's profits to investment deposits, in particular, introduces withdrawal risk, fiduciary risk, and displaced commercial risks. Furthermore, the various Islamic modes of finance each have their own distinct characteristics. As a result, the nature of some risks that Islamic banks face differs from those faced by conventional banks.

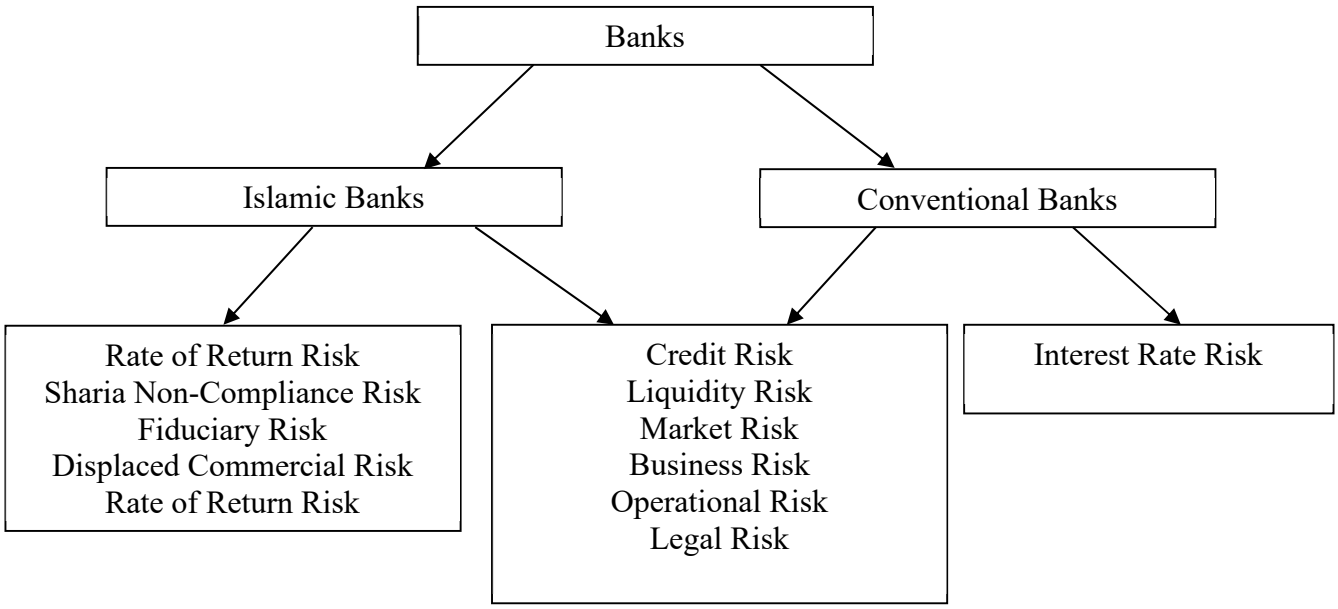


Figure 20: Similarities and differences Between Islamic and conventional Risks Profile

Islamic banks have numerous risks that are harder to manage and mitigate. Despite the fact that Islamic banks use a variety of financing tools such as Murabaha, Mudarabah, Salam, and Ijara, etc. they do so in such a way that their risk exposure is comparable to that of credit-based financing services provided by conventional banks. Despite the fact that the end result of risk management in Islamic and conventional banks may be similar, the risk management procedures are fundamentally different for a variety of reasons. First, unlike conventional banks, Islamic banks' banking books include considerable market and credit risks due to trading-based instruments and equity financing. Second, at various stages of a financing procedure, risks mix migrate from one category to another. For example, with Salam financing, the bank is exposed to credit risk during the transaction, and to commodity price risk after the contract has concluded. Third, the risks are intensified and harder to mitigate due to constraints and deficiencies in infrastructure, institutions, and instruments. For example, it is illegal in Islamic Banks to use

foreign exchange futures to hedge against foreign exchange risk, and most economies lack Sharia-compliant short-term liquidity risk management tools.

Many conventional finance contracts can be amended to become Shariah compliant (Beck and Demirgüç-Kunt, 2013, cited in Gundogdu, 2016). Despite the fact that risk analysis in conventional finance and asset-based Islamic finance contracts are comparable, Islamic finance contracts offer considerable benefits. Islamic banks, unlike conventional banks, would make a disbursement against the transaction, allowing them to better understand how loans are used. Money held in conventional banks would be disbursed to the borrower's account, with the borrower having complete discretion over its use. In Islamic banks the money is sent to the supplier's account. If Islamic banks adhere to this essential principle, the nature of Islamic finance ensures that the loan is used correctly in core business while also providing the bank with more information about the borrower's business. More information would lead to better credit analysis and risk management.

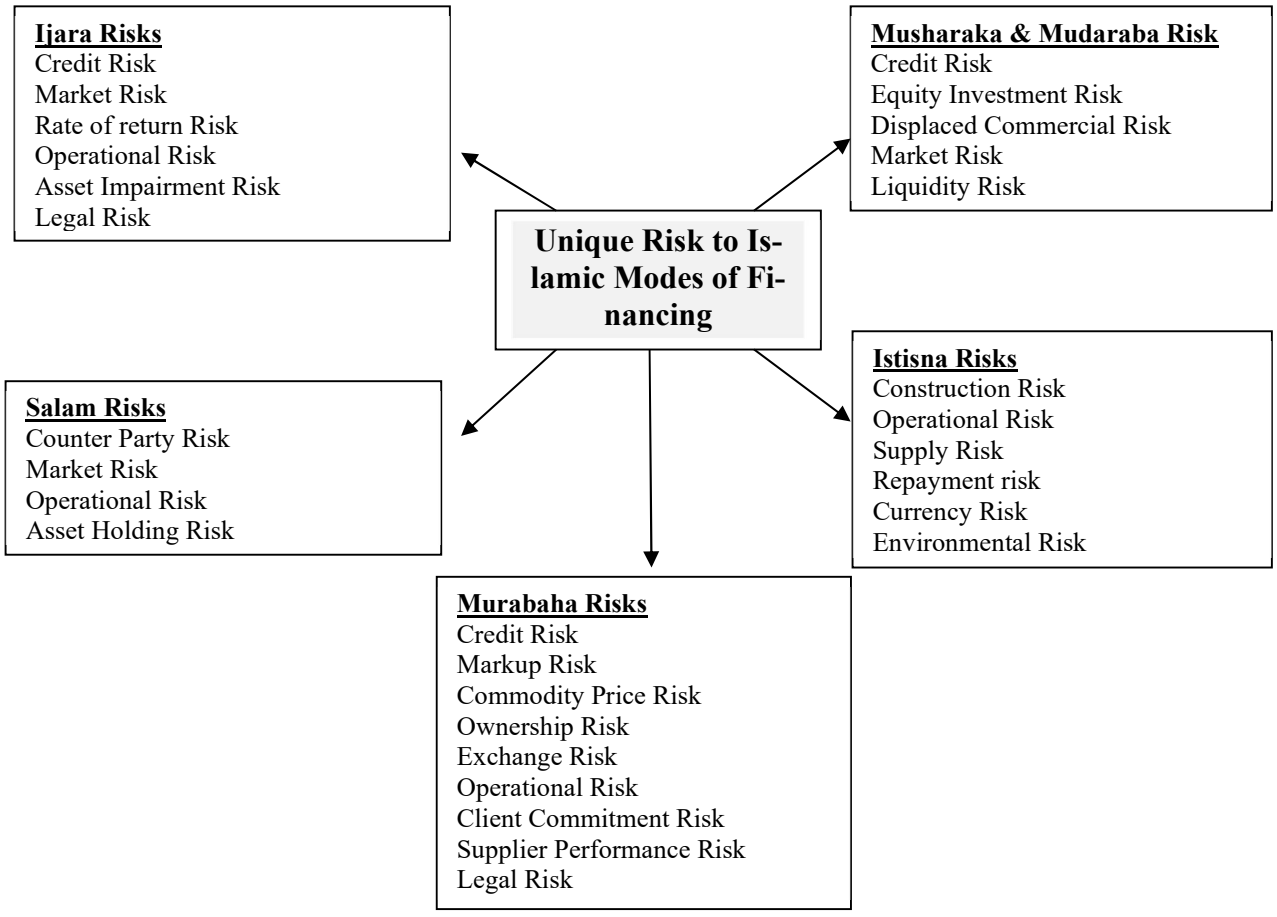


Figure 21: Risks of the Different Modes of Islamic Financing

Credit analysis on the other hand in the conventional bank is well understood, and the concepts can also be applied to Islamic finance. The experience of conventional financing can be applied to Islamic finance as it would not put Sharia compliance at risk because it only affects the creditworthiness of the borrowers, not the structure of the lending transaction. A thorough credit analysis, however, does not guarantee timely loan repayment. Unlike Islamic financing, conventional finance allows lenders to accept late payments since they can charge a late payment fee. In Islamic asset-based financing, interest is not calculated. Murabaha contracts, for example, are not based on interest estimates. The purchase price, supplier distribution amount, sale price, and deferred payment amount to be recovered from the borrower would all be agreed upon by the Islamic bank and the borrower.

Generally, Islamic banks lend money that is secured by assets. Due to the assets-backed nature of Islamic financing, it promotes real economic activities. Furthermore, the underlying asset serves as collateral for Islamic banks' loan transactions.

Unlike conventional banks Islamic banks must adhere to both conventional and Sharia-based regulatory requirements. Islamic banks rigorously adhere to Sharia compliance. Due to a double check on money laundering and other fraudulent actions, this dual check addresses legal risks. The Sharia supervisory board ensures Sharia compliance, the reference power of these experts is being used to further validating the system in the eyes of the general public, as well as improving public acceptance of Islamic banking. Corporate social responsibility (CSR) and ethical compliance are also ensured through Sharia compliance. Islamic banks do not do business with non-Islamic banks. Corporate social responsibility (CSR) and ethical compliance are also ensured through Sharia compliance as tobacco, alcohol, and other toxic-producing firms are not allowed to do business with Islamic banks.

Other factors like fraud, dishonesty, and uncertainty about the goods, pricing, or other components of the contract must be avoided. Gharar-free transactions are common in Islamic banking, which means that each counterparty's obligations are clear from the outset, ensuring mutual benefits while also covering the spreading risks of both parties to the contract. Because Islamic banking transactions are gharar-free, complex conventional instruments like options and swap options are not permissible.

Moreover, most derivative transactions are prohibited in Islamic banking. Currency options,

currency swaps, swap options, short selling, and other complex derivatives are not permitted. Salam (advance sale/purchase) and Istisna (project financing), however, are close substitutes for forward contracts in conventional banking.

When compared to conventional banks, Islamic banks face some fundamental disadvantages. First, the lack of access to the central banks' safety net, forcing them to provide their own very expensive self-insurance due to their inability to diversify the risk of a run.

Second, the lack of access to government guarantees of all securities, allowing them to hold cash and tying up more of their liquid assets than conventional banks.

Third the absence of a global Sharia board issuing fatwas (Islamic opinions) that binds all Muslim countries in order to facilitate cooperation and smooth cross-border initiatives.

Fourth, the higher transaction costs due to Islamic banks direct involvement in all their parties' transactions. In the case of Islamic banks, the banks not only provide loans but also buy assets on behalf of their clients and get directly involved in the key transaction operations. In contrast, conventional banking does not involve itself directly in the process.

Fifth, additional externalities hinder credit risk management for Islamic institutions. Except in cases of purposeful delay, Islamic banks are barred from charging any accumulated interest or imposing any penalty in the event of a counterparty default. Clients may take advantage by postponing payment, knowing that the bank will not charge a penalty or seek further payments. During the waiting period, the bank's capital is trapped in a nonproductive activity, and the bank's investors-depositors are not making any money.

Chapter 4: Risk Management Survey for Islamic Banks and conventional Banks

The goal of this chapter is to briefly describe research methodology and strategies used to conduct this research study. This chapter describes the methodology used to evaluate and compare Islamic and conventional banks' risk management processes. The study is based on a quantitative research methodology and uses primary data for analysis that was gathered through questionnaires from senior managers of conventional and Islamic banks worldwide.

The goal of the empirical study is to compare Islamic and conventional banking risk management approaches, to examine risk measurement techniques and risk mitigation measures utilized by Islamic and conventional banks and to assess the impact of credit risk analysis on Islamic and conventional banks' risk management procedures. frequency analysis, reliability analysis, descriptive statistics, and Mann Whitney U test analysis are all employed to achieve the study's goals.

This chapter is broken into six sections. Section 1 contains information about research instruments, population and sampling techniques, survey design, pilot study, ethical issues and anonymity, study generalization, and data analysis. Section 2 includes reliability analysis, normality test, non-Parametric Test and a frequency analysis of bank and respondent’s profile. Section 3 is based on tabular presentation of types of risks that are present in Islamic and conventional banks as well as the risk identification methods utilized by both. Section 4 compares conventional and Islamic banks on four levels: risk identification, general risk management, and credit risk management, using descriptive statistics and the Man Whitney U test. Section 5 illustrates the risk measurements and mitigation instrument employed by Conventional and Islamic banks and Section 6 illustrates the research results and conclusion.

4.1. Research Instrument

Primary data, or information obtained directly by the researcher, was gathered in this study via a survey questionnaire distributed to senior executives of Islamic and conventional banks. As a sample, 59 completed the questionnaire (24 Islamic Banks and 35 conventional bank). Questionnaires were collected from Chief Risk officers, head managers, head of the risk management, senior risk managers, credit risk managers, risk analyst, branch managers, head of risk

controlling, and members of board committees.

Primary data is more trustworthy, authentic, and objective as they are not yet been published, as primary data has not been altered or changed by humans, its validity exceeds that of secondary data (Kumar, 2017). The questionnaire as a method of primary data collection is regarded as the most appropriate technique for gathering primary data. It is a cost-effective method of collecting data from a large number of respondents to allow statistical analysis of the results (Miller, 1983).

One of the benefits of using a survey is that it allows for the quick and cost-effective collection of a wide range of data that "produce results that are easy to summarize, compare, and generalize" (Kabir; 2016). According to Neuman (2000) quantitative analysis is used to test hypotheses, draw inferences, and generalize findings from questionnaire data. The questionnaire is a simple method of approaching the research topic to analyse its objectives, characteristics, attitudes, beliefs, and behaviours. It is a straightforward and quick method for the respondent to complete. It allows respondents to maintain their privacy while answering sensitive questions, and it is free of the investigator's bias during data collection. It also aids in the collection of responses in a standardized manner. Using a questionnaire survey technique is unquestionably more objective than interviews. Based on the researcher's research experience, it was determined that respondents from banks were more familiar with and comfortable participating in a questionnaire-based survey rather than other forms of survey such as interviews. The disadvantages of a survey, on the other hand, are that it is expensive, time consuming, and requires a greater number of resources.

The questionnaire is developed considering risk management factors and elements in discussed in literature review: (Part I: Concept to Risk Management, Part II: Risk Management in Conventional Banks and Part III: Risk Management in Islamic Banks). The 5-point Likert scale was used to collect responses on risk management practices and processes, with 1 indicating strongly disagree and 5 indicating strongly agree.

The 5-point Likert scale was chosen based on the The Mann-Whitney U Test. The Mann-Whitney U test compares whether there is a difference in the dependent variable between two independent groups. It compares whether the dependent variable's distribution is the same for the two groups and thus from the same population. The test ranks all the dependent values, with

the lowest value receiving a score of one, and then computes the test statistic using the sum of the ranks for each group. (Karadimitriou & Marshall)

Data was gathered from different countries around the world by contacting branch managers, senior credit managers, and senior management including Chief Executive Officers, Chief Financial Officers, Chief Risk Officer, Credit Risk Manager, Senior Executive Vice President, Senior Vice President, Regional Manager, and experts from the risk management departments of Islamic and conventional banks. These individuals were chosen because they were thought to be the most knowledgeable about bank risk management practices.

Data was gathered by sending an anonymous link to respondents. The respondents were either contacted directly via email or through the professional social media platform "LinkedIn". They were asked to complete the questionnaire based on their own experiences, perceptions, observations, and thoughts on some of the issues concerning risk management practices in their banks.

4.2. Population and Sampling Technique

This study's universe included all banks from around the world and population includes branch managers, senior credit managers, senior management including chief executive officers, chief risk officer, credit risk manager, senior executive vice president, senior vice president, regional manager, and experts from Islamic and conventional banks' risk management departments.

This study used selective sampling. Selective sampling is “a sampling technique in which researcher relies on his or her own judgment when choosing members of population to participate in the study” (Business Research Methodology, 2022). In this study the sample concentrated on a specific group in which all the sample members shared similar backgrounds, i.e., members involved with risk management of banks.

The survey was sent to the senior risk managers and personnel from the risk management department. The researcher reached the personnel by either contacting the banks directly or used the professional social media platform "LinkedIn" to search for risk management seniors. Search criteria used were as follows:

- industry: Banks,

- Job Role: risk Manager, chief risk officers, credit risk manager, chief executive officers and branch managers.

Because this research investigates the risk management practices of Islamic and conventional banks, it was decided that the survey would only be collected from senior management and personnel who play an important role in risk management and are directly involved in the risk management process to provide useful and knowledgeable responses about risk management in banks. In addition, respondents were chosen based on their willingness to take part in the research study.

Because there are only a limited number of primary data sources who can contribute to the study, the study's selective sample is the most appropriate method available. However, it can result in high levels of bias such as Selective survival bias. Selection survival bias as defined by Alexander et. al (2015) is a distortion in an association measure caused by a sample selection that does not correctly reflect the target population. Selection bias can arise when investigators adopt ineffective processes for selecting a sample group, but it can also occur because of factors that impact respondents' continued involvement in a study. In either instance, the final research population is not representative of the target population.

Selective survival bias also occurs when researchers focus on individual, objects, or aspects that have survived some form of selection process while ignoring those that did not. As a result, wrong judgments are drawn. For example, if a corporation wants to know why employee turnover is so high, they do study with their present employees instead with those who have left the corporation who will provide them insights into why they left. This is an example of selective survival bias. The bias associated with the study's selective sampling technique was mitigated by selecting respondents based on their experience dealing with risk management. In addition, the questionnaires were completed without the researcher's involvement.

The sample size was 59 respondents, with 35 from conventional banks and 25 from full-fledged Islamic banks. At first, 800 questionnaires were sent to bank employees, with 150 questionnaires returned. Due to missing data, 92 questionnaires were omitted. The overall response rate was 7.37 percent, which is considered satisfactory.

4.3. Survey Design

The questionnaire was developed in view of a previous study on risk management practices conducted by Al-Tamimi (2007). Al-Tamimi study objective is to determine the extent to which UAE banks employ risk management procedures and techniques in dealing with various kinds of risk. The second objective of Al-Tamimi study is to compare risk management techniques between national and foreign banks. The questionnaire was revised by including additional items, statements, and aspects in the risk management process.

The questionnaire is made up of 6 parts: Bank General Information, General Banks Risk, Risk Identification, General Risk Management, Credit Risk Analysis, and Risk Measurement and Mitigation Instruments. (See Appendix 10.2 Questionnaire)
The questionnaire started with a cover letter that explained the purpose of the survey and the time required to complete it. The first part contains general information about banks, such as location, bank ownership, type of bank, nature of the bank, and recent Balance Sheet figures. The second part discussed the general risks that banks face as well as their risk identification tools.

Parts three, four and five include close-ended statements that must be answered on a 5-Likert scale from 1 to 5 (1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5=Strongly Agree). Part three covered risk identification in banks, with 15 closed-ended statements. Part four included 20 close-ended statements about understanding general risk in banks. Part five dealt with credit risk analysis, which included 21 closed-ended statements and 18 ranking statements. Finally, section 6 discussed the bank's risk measurement and mitigation instruments used by the bank.

4.4. Pilot Study

A pilot study was conducted by sending four questionnaires to senior managers from Islamic and conventional banks for feedback on the questionnaire's content validity. The questionnaire was evaluated based on the following criteria:

The length of the questionnaire, the design, and instructions for filling it out, whether there was any ambiguity in the statements asked, the sensitivity and complexity of the statements asked,

and comments and suggestions about the questionnaire. Calls and chats with respondents were used to collect feedback on the questionnaires. Following the receipt of comments and feedback, changes were made to the wording and scaling of specific questions to create a flawless questionnaire.

4.5. Ethical Issues and Anonymity

This type of research study posed no risk to the respondents, researcher, or the university. The questionnaire was distributed to respondents via an anonymous link provided by Qualtrics Experience Management software. The respondents' participation was voluntary, and they were fully informed about the study's research aims and objectives. Furthermore, respondents were free to leave the study at any time without explanation. The completion and return of the questionnaire indicated the participant's willingness and consent to participate in this research study. The questionnaire that was successfully done was considered complete and was used for data analysis. In addition, there was no monetary compensation for taking part in this study.

Because there was no register file or identifiable data to link responses back to a respondent, anonymity was guaranteed. It was impossible to know whether or not an individual participated, so there is no way to establish a link between respondents' participation and their own results. Because participants were told that their answers would be kept anonymous, no personal information or other questions that could reveal their identity were asked.

4.6. Study Generalisation

The topic of risk management comparison between Conventional and Islamic banks is yet at its preliminary stage as there are limited number of research that were done to investigate this issue. The current research study is exploratory research which is conducted to have a better understanding of the differences and similarities between risk management in conventional and Islamic banks in practice, as an adequate response rate on the questionnaire was obtained for this purpose. Before data collection, the questionnaire was carefully developed and tested and validated in a pilot study.

The study, however, does not provide conclusive results and hence are not considered

generalizable to the global population. It provides a broad overview and can be used to identify issues that will be the focus of future research.

4.7. Data Analysis

IBM SPSS Statistic software was used to analyse the questionnaire data. This statistical package for social sciences (SPSS) is likely the most extensively used computer software for quantitative data analysis. The researcher coded all data from the questionnaires using this advanced program. The questionnaire's statements were based on the 5-Likert scale, and a few questions provided appropriate options to answer. The 5-Likert scales used to code statements are as follows:

Strongly Disagree = 1, Disagree = 2, Undecided = 3, Agree = 4, Strongly Agree = 5.

Data analysis for the study's primary data was divided into four sections: the first section included reliability analysis to test data consistency, a normality test to determine if data have a normal distribution, which in turn determines which statistical test can be used for group comparison, and the type of non-parametric test to be used to determine group differences.

Section two covered frequency analysis on sample characteristics: bank names, bank locations, bank ownership, respondent designation in banks, and nature of banks; risk assessment methods, and types of risks found in Islamic and conventional banks.

Section three covered descriptive statistics and the Mann-Whitney test. These statistics were used to determine the differences in characteristics between two types of banks, namely Islamic and conventional banks, in terms of risk identification analysis, general risk management, and credit risk analysis.

The fourth section is based on a tabular presentation of risk measuring methodologies and risk mitigation techniques in both conventional and Islamic banks.

4.8. Research Hypothesis Statement

- **Hypothesis 1: Risk identification differs between conventional and Islamic banks.**
- **Hypothesis 2: General risk management practices differs between conventional and Islamic banks.**
- **Hypothesis 3: Credit risk analysis and management differs between conventional and Islamic banks.**

According to Hassan (2009)'s study on risk management practices of Islamic banks in Brunei Darussalam, Islamic banks in Brunei Darussalam face three types of risks: credit risk, foreign-exchange risk, and operating risk, and they manage those risks very efficiently through risk management practices that include risk identification and risk analysis.

Another study conducted by Al-Ajmi & Hussain (2012) on risk management practices of conventional and Islamic banks in Bahrain have showed that Bahraini banks have a clear grasp of risk and risk management, as well as effective risk identification, risk assessment analysis, risk monitoring, credit risk analysis, and risk management processes. Furthermore, credit, liquidity, and operational risk are identified as the most significant risks confronting both conventional and Islamic banks. Additionally, the degree to which managers understand risk and risk management, efficient risk identification, risk assessment analysis, risk monitoring, and credit risk analysis impact risk management practices. In terms of risk understanding and risk management, Islamic banks are found to be significantly different from their conventional counterparts. The risks that Islamic banks confront are much larger than those that conventional banks face. Similarly, Islamic banks have higher liquidity, operational, residual, and settlement risks than conventional banks.

4.9. Reliability Analysis

Reliable analysis is used to give researchers confidence that repeated or equivalent assessments will yield consistent results. The internal consistency type of reliability analysis was used in this study. It is a type of reliability that describes how well questionnaire items measuring the same underlying construct produce similar results. This means that the researcher conducted the study on a single occasion with a single group of people. This type of reliability is almost always used on questionnaires, which typically have several Likert items.

Cronbach's alpha is a popular measure of internal consistency (a measure of reliability). It is used to determine how much the items on a scale measure the same underlying dimension. It is most used when there are multiple Likert questions in a survey that form a scale or subscale and the researcher wants to know if the scale is reliable.

Cronbach's alpha is used to examine a set of variables measured on an ordinal scale (e.g., Likert items). It is used to compute the internal consistency of several variables.

Often, a specific construct cannot be directly measured, so a questionnaire with multiple questions is designed to indirectly measure this 'underlying' construct. A scale is formed when these questions are grouped together to measure a single underlying construct. A questionnaire may contain multiple scales. The scales in this study are risk identification, general risk management, and credit risk analysis and management.

Reliability Statistics: Case Summary

There were 59 cases included in the analysis and no cases excluded due to missing values because this was done manually in Qualtric Experience Management software before the SPSS analysis; otherwise, the number of excluded cases would be found in the "Excluded" row. The total number of cases is the sum of the number of valid and excluded cases ("Total" row). The "percent" column shows the number of valid and excluded cases as a percentage of the total. All of the cases in our study were valid (i.e., 100 percent).

Risk Identification, General Risk Management, and Credit Risk Analysis			
		N	%
Cases	Valid	59	100.0
	Excluded	0	0.0
	Total	59	100.0

Table 3: Reliability Statistics

Reliability Statistics: Cronbach's alpha

Individual and collective aspects of the risk management process are evaluated using reliability analysis. Risk identification is evaluated using 14 statements, while risk understanding, and risk management are evaluated using 20 statements. In contrast, credit risk analysis and

management are based on 39 statements.

The reliability analysis of the variables used in the study is shown in the table 4. The reliability analysis is used to ensure that the data is consistent. In general, a Cronbach's alpha coefficient greater than or equal to 0.70 is considered acceptable and an indication of consistent data (Kline, 2005). Cronbach's alpha values for risk identification, understanding general risk management, and credit risk analysis and management are 0.936, 0.941, and 0.899, respectively this means that there is an acceptable level of consistency in responses to each aspect of the risk management process.

	Cronbach's alpha	n of items
Risk Identification	0.936	14
General Risk Management	0.941	20
Credit Risk Analysis and Management	0.899	39

Table 4: Reliability Analysis

4.10. Normality Test

A normality test evaluates whether sample data was drawn from a normally distributed population. This determines which statistical test can be used for group comparison, as some statistical tests, such as the independent sample t-test and one-way and two-way ANOVA, demand a normally distributed sample population.

The normality test for the sample population is shown in Table 5.

H0 is the null hypothesis, which states that the data have a normal distribution.

H1 alternative hypothesis: The data does not have a normal distribution.

The significance level (abbreviated as α or alpha) indicates whether the variable data is statistically different from the normal distribution. The null hypothesis is accepted if the significance level is greater than 0.05; otherwise, it is rejected.

The normality assumption is violated because all significance levels are less than 0.05, implying that we reject the null hypothesis H0 and accept the alternative hypothesis H1 (the sample data is significantly different than a normal distribution). As a result, in the current research study, we

can only use non-parametric tests that do not require normal distribution to determine the difference in risk management practices of Islamic and conventional banks.

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Risk Identification	.334	59	<.001	.669	59	<.001
General Risk Management	.269	59	<.001	.699	59	<.001
Credit Risk Analysis	.266	59	<.001	.712	59	<.001
a. Lilliefors Significance Correction						

Table 5: Normality Test

4.11. Non-Parametric Test- Mann-Whitney U Test

Non-parametric tests are statistical analysis methods that do not require a distribution to meet the required assumptions. It is used when the data is not distributed normally. Nonparametric statistics employ ordinal data, which means it does not rely on numbers but rather on a ranking or order of sorts.

The type of non-parametric test used in this study is the Mann-Whitney U test. The Mann-Whitney U test is used to see if variables differ between two independent (i.e., unrelated) groups with participants in each group sharing common characteristics.

The Mann-Whitney test can be used if the data meets the four required assumptions (Laerd Statistics, 2022):

Assumption #1: The dependent variable should be measured on a continuous or ordinal scale. Likert scale items are examples of ordinal variables (e.g., a 5-point scale from "strongly agree" through to "strongly disagree")

Assumption #2: The independent variable should be divided into two distinct, categorical groups. Gender is an example of an independent variable that meets this criterion (2 groups: male or female).

Assumption #3: Observations should be independent, which means there should be no relationship between the observations in each group or between the groups themselves. For

example, each group must have unique participants, with no participant participating in more than one group.

Assumption #4: the two independent variables are not normally distributed.

All the four Mann-Whitney U test assumptions were met because data were assessed on an ordinal scale (Likert scale), there were two independent groups for comparison, namely Islamic bank and conventional bank, there was no relationship between observations of each group and between groups, and data were not normally distributed as tested by the normality test.

Mann-Whitney U test yields:

Null hypothesis: There is no difference between the two groups in the population,

Alternative hypothesis: There is a difference between the two groups in the population.

The p-value associated with the Asymp. Sig. (2-tailed) row will be interpreted in the Test Statistics output. If it is *less than.10*, there is evidence of a statistically significant difference between the two independent groups in the continuous outcome variable.

If the p-value is *greater than.10,* there is evidence that there is no statistically significant difference between the two independent groups in the continuous outcome variable.

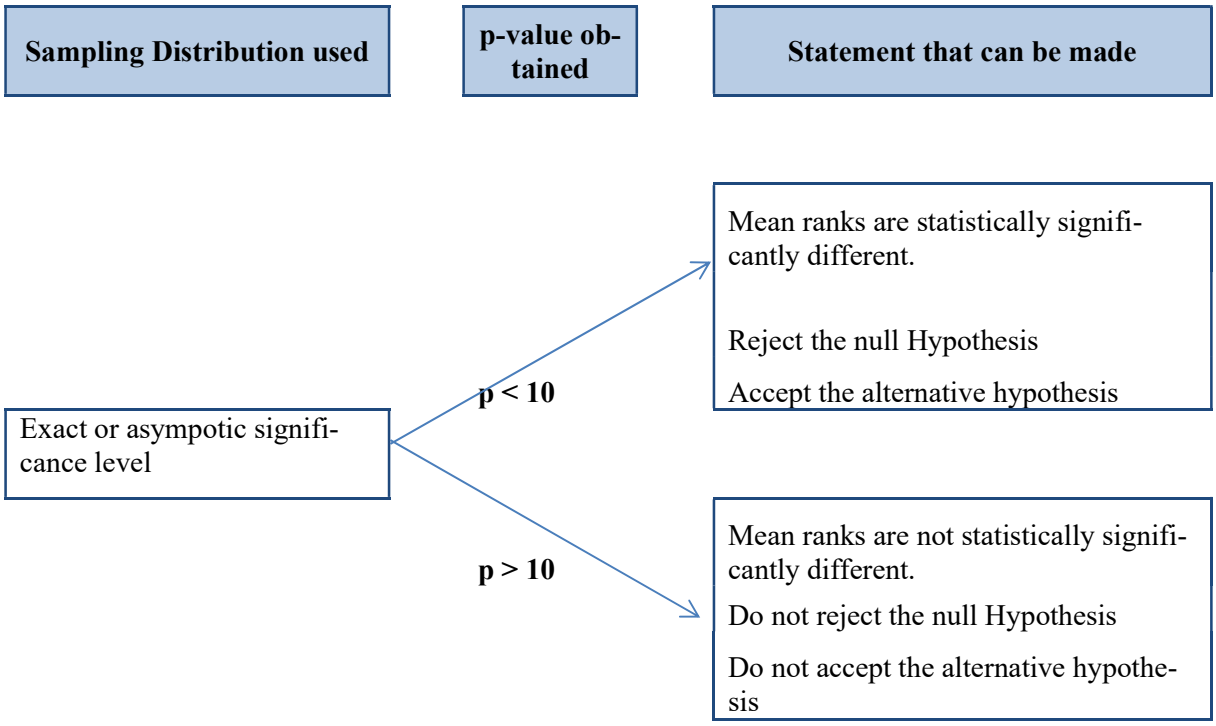


Figure 22: Interpreting Mann Whitney U Test results (Author, 2022)

Asymptotic means that as sample size increases, the p-value approaches the true value. This means that the p-value calculated from this method is only an approximation to the true p-value for smaller sample sizes, with the approximation improving with increasing sample size. SPSS Statistics will run an exact test if there are 20 or fewer cases (e.g., participants) in each group. When both groups have more than 20 cases, it is generally accepted that the asymptotic p-value is a good enough approximation to the real p-value.

The mean rank is the average of all observed ranks within each sample. The Mann-Whitney test compares the mean rank of each group after converting scores into ranks. If the difference in mean ranks is large enough to be significant, the null hypothesis that no difference exists between the two groups is rejected.

4.12. Frequency Analysis

Samples Characteristics

The survey's initial section was designed to collect information about the bank's profile. The information gathered included the bank's name as an optional answer to safeguard privacy, the bank's location, the kind of bank ownership (local, foreign, or other), the Nature of the Bank, and balance sheet data for 2021 such as total assets, liabilities, and total equity.

In addition to bank profile information, respondent designation in the bank was added to ensure that only risk management-related employees responded to the survey.

4.12.1. Banks Names

It was optional to provide the name of the bank. These are the participating banks that chose to reveal their names.

LARIBA - American Finance House & Bank of Whittier-National Association	Bank Nizwa
Zitouna Bank	Deutscher Apotheker und Ärztebank eG
I&M Bank	Al Baraka Bank Pakistan Ltd
Askash	CBI
Local Bank in Qatar	Cambodia Post Bank
Dubai Green Fund	Santander Consumer Bank AG
Ahli Bank Oman SAOG	ABK
BAHL	China CITIC Bank
QNB	Sharja Islamic Bank
Duba Islamic Bank	Bank Misr- Europe
Meezan Bank	

Table 6: Participating Banks Names

4.12.2. Bank Location

Table 7 shows the locations of participating banks and their frequency. The survey was distributed throughout all continents. The survey bank participants were not assigned to a specific geographical area. Germany has the most bank participants (18.64%), followed by the Kingdom of Saudi Arabia (11.86%).

Location	Frequency	%	Location	Frequency	%
Afghanistan	2	3.39%	Jordan	2	3.39%
Australia	1	1.69%	Kuwait	2	3.39%
Austria	1	1.69%	Pakistan	5	8.47%
Bahrain	3	5.08%	Qatar	3	5.08%
Bangladesh	1	1.69%	Kingdom of Saudi Arabia	7	11.86%
Cambodia	1	1.69%	Singapore	1	1.69%
Canada	1	1.69%	Sultanate of Oman	2	3.39%

Location	Frequency	%	Location	Frequency	%
Egypt	2	3.39%	Tanzania	1	1.69%
Germany	11	18.64%	Tunisia	1	1.69%
India	1	1.69%	UAE	8	13.56%
Indonesia	1	1.69%	UK	1	1.69%
			USA	1	1.69%
Total		**59**			

Table 7: Partcipating Banks Location

4.12.3. Bank Ownership

Table 8 shows the profile of banks. Results for overall banks show that 33 out of 59 (55.9%) banks are domestic banks whereas 20 out of 59 (33.9%) banks are foreign Banks, others were 6 out of 59 banks (10.2%) which included foreign shareholders, regional bank, semi government bank, state owned bank, and UAE Local.

Conventional bank results show that 16 of 33 (48.5%) banks are domestic, while 13 of 20 (65%) are foreign banks. According to the results of Islamic banks, 17 of 33 (51.5%) banks are domestic, while 7 of 20 (35%) banks are foreign. The remaining are 6 conventional banks that are neither domestic nor foreign.

			Conventional Bank	Islamic Bank	Total
Bank Ownership	**Domestic**	Frequency	16	17	33
		%	48.5%	51.5%	100.0%
	Foreign	Frequency	13	7	20
		%	65.0%	35.0%	100.0%
	Other	Frequency	6	0	6
		%	100.0%	0.0%	100.0%
Total		**Frequency**	**35**	**24**	**59**
		%	**59.3%**	**40.7%**	**100.0%**

Table 8: Banks Ownership Types

4.12.4. Respondents Designation in Banks

Table 9 displays the job titles of survey participants from both Islamic and conventional banks. As stated in the table, all respondents are bank risk management executives. Most of them are Risk Managers, followed by Chief Risk Officers and Heads of Risk Management.

Job Title	Frequency	Job Title	Frequency
Auditor	1	Head of Credit and Debt Management	1
AVP Quantitative Analyst	1	Head of Credit Monitoring	1
Branch Manager	1	Head of Enterprise Risk Management	1
Chair Risk Committee	1	Head of Islamic Bank	1
Chief Compliance Officer	1	Head of Retail Risk	1
Chief Executive Officer	2	Head of Risk Controlling	2
Chief Risk Officer	8	Head of Risk Management	5
Credit Chief	1	Head of Risk Support	1
Credit Manager	2	Head of Sharia	1
Credit Risk Analyst	4	Member Board	1
Deputy Head Treasury	1	Risk Manager	11
Executive Manager Credit Risk	1	Senior Manager	1
Head Credit risk	4	Head of Credit and Debt Management	1
Head Market Risk	2		

Table 9: Respondents Designation in Bank

4.12.5. Nature of Banks

The type of participant banks from both conventional and Islamic banks is shown in Table 10. Conventional Commercial Banks (37.1%) and Islamic Commercial Banks (50%), followed by Conventional Corporate Banks (31.4%) and Islamic Retail Banks (29.2%), rated top among participant banks. Saving and loan associations and investment banks from conventional banks (2.9%) and Islamic investment banks (4.2%) had the fewest participants. Captive banks and private banks were among the others (6.8%).

		Conventional Bank	Islamic Bank	Total
Retail Bank	Frequency	6	7	13
	%	17.1%	29.2%	22.0%
Corporate Bank	Frequency	11	3	14
	%	31.4%	12.5%	23.7%
Commercial Bank	Frequency	13	12	25
	%	37.1%	50.0%	42.4%
Investment Bank	Frequency	1	1	2
	%	2.9%	4.2%	3.4%
Saving and Loan association	Frequency	1	0	1
	%	2.9%	0.0%	1.7%
Other	Frequency	3	1	4
	%	8.6%	4.2%	6.8%
Total	**Frequency**	**35**	**24**	**59**
	%	**100.0%**	**100.0%**	**100.0%**

Table 10: Nature of Banks

4.13. Illustration of Banks' Risks Identification Methods

Table 11 shows the frequency of risk identification strategies employed by conventional and Islamic banks. According to the findings, conventional banks mostly utilize 'Financial Statement Analysis' to identify risks, followed by 'Scenario Analysis, Risk Mapping, and Benchmarking.' However, research suggest that 'Stress Testing' is the most commonly utilized risk identification approach in Islamic banks, followed by 'Audit and Physical Inspection, Financial Statement Analysis, Risk Mapping, and Scenario Analysis'. The least used approaches for risk identification in conventional banks are 'internal communication and inspection by Sharia board members', whereas the least used approaches for risk identification in Islamic banks are 'checklist of possible disturbances and internal communication'. Other risk identification methods included Reputation Risk Analysis and Scenarios.

		Conventional Bank	Islamic Bank	Total
Sensitivitiy Analysis	Frequency	30	16	46
	%	65.2%	34.8%	
Inspection byBank staff	Frequency	14	6	20
	%	70%	30%	
Audit and Physical Inspection	Frequency	21	20	41
	%	51.2%	48.8%	
Financial Statement Analysis	Frequency	29	18	47
	%	61.7%	38.3%	
Analysis Risk Survey	Frequency	11	10	21
	%	52.4%	47.6%	
Process Analysis	Frequency	12	7	19
	%	63.2%	36.8%	
SWOT Analysis	Frequency	17	9	26
	%	65.4%	34.6%	
Inspection by Sharia Board Members	Frequency	3	16	19
	%	15.8%	84.2%	
Benchmarking	Frequency	20	11	31
	%	64.5%	35.5%	
Stress Testing	Frequency	32	21	53
	%	60.4%	39.6%	
Risk Workshops	Frequency	13	14	27
	%	48.1%	51.9%	
Examination of corporate process	Frequency	9	6	15
	%	60%	40%	
Internal Inspection	Frequency	15	11	26
	%	57.7%	42.3%	

		Conventional Bank	Islamic Bank	Total
Loss Balance and recommendation by external experts	Frequency	5	7	12
	%	41.7%	58.3%	
Scenario Analysis	Frequency	25	15	40
	%	62.5%	37.5%	
Risk Mapping	Frequency	25	20	45
	%	55.6%	44.4%	
Internal Communication	Frequency	7	3	10
	%	70%	30%	
Checklist of possible disturbances or breakdowns	Frequency	8	3	11
	%	72.7%	27.3%	
Other	Frequency	3	1	4
	%	75%	25%	

Table 11: Risk identification methods used by Conventional and Islamic Banks

4.14. Illustration of Banks' exposure to risks

Table 12 summarizes the sorts of risks that conventional and Islamic banks face. Conventional banks identify credit risk, operational risk, liquidity risk, interest rate risk, and reputation risk as the top five risks. Credit risk, foreign exchange risk, operational risk, liquidity risk, and Sharia risk are the top five risk listed by Islamic banks.

Credit risk and liquidity are regarded as the most important types of risk faced by Islamic banks, as they are by conventional banks. Credit risk is justified by the fact that Murabaha, the most popular source of finance offered by Islamic banks, has a high default rate (Rosly, 2011). Liquidity risk in Islamic banks is caused by banks tying up their investment money in illiquid long-term assets such as Ijarah assets or profit-sharing agreements such as mudaraba/musharaka (Arifin, 2012). Furthermore, in the Islamic interbank market, which is still developing, Islamic banks' liquidity management is rigorously limited. Other risks include Concentration risk.

		Conventional Bank	Islamic Bank	Total
Credit Risk	**Frequency**	34	20	54
	%	63%	37%	
Operational Risk	**Frequency**	26	17	43
	%	60.5%	39.5%	
Foreign Exchange Rate Risk	**Frequency**	12	19	21
	%	57.1%	42.9%	
Interest Rate Risk	**Frequency**	23	8	31
	%	74.2%	25.8%	
Equity Risk	**Frequency**	4	2	6
	%	66.7%	33.3%	

		Conventional Bank	Islamic Bank	Total
Legal Risk	**Frequency**	14	9	23
	%	60.8%	39.1%	
Rate of Return Risk	**Frequency**	4	9	13
	%	30.8%	69,2%	
Assets Impairment Risk	**Frequency**	7	5	12
	%	58.3%	41.7%	
Markup Risk	**Frequency**	0	1	1
	%	0	100%	
Commodity Price Risk	**Frequency**	1	1	2
	%	50%	50%	
Liquidity Risk	**Frequency**	23	16	39
	%	59%	41%	
Strategic Risk	**Frequency**	13	7	20
	%	65%	35%	
Reputation Risk	**Frequency**	16	10	26
	%	61.5%	38.5%	
Sharia Risk	**Frequency**	3	17	20
	%	15%	85%	
Displaced Commercial Risk	**Frequency**	2	4	6
	%	33.3%	66.7%	
Other	Frequency	4	1	5
	%	80%	20%	

Table 12: Risks faced by Conventional and Islamic Banks

4.15. Risk Identification Analysis

4.15.1. Descriptive Statistics

Table 13 shows some descriptive statistics such as mean value and standard deviation of survey responses on fourteen statements about risk identification for Islamic and conventional banks that used a 5-point likert scale. Response rates between conventional and Islamic banks are not significantly different.

Overall, the mean (average) response of Islamic banks (3.99) is higher than that of conventional banks (3.94). Statement 8 that states "In your bank risk identification takes place on a regular and continuous basis throughout the organization to guarantee that the whole list of risks the institution faces, as well as the magnitude of those risks, are up to date" has the highest mean for conventional bank (4.26 with a standard deviation of 0.852) and Islamic bank (4.21 with a

standard deviation of 0.833). This demonstrates that both conventional and Islamic banks are aware of their risks and keep them up to date.

Statement 14 “Everyone at the bank has access to detailed risk documentation to ensure a thorough grasp of the bank's risks” has the lowest mean for both conventional banks (3.37 with a standard deviation of 1.114) and Islamic banks (3.29 with a standard deviation of 0.955). This statement shows that both conventional and Islamic banks must involve all employees in the risk identification process and provide them with access to documents as needed. The slight difference in means, however, shows that employees of conventional banks have greater access to bank risks than employees of Islamic banks.

Statement 3 “Your bank conducts Top-Down risk identification i.e. identifies largest risks” shows a difference in the mean value of conventional bank (4.09 with standard deviation of 1.040) and Islamic banks (3.96 with standard deviation 0.859) which shows that conventional banks perform better in identifying critical risks.

Statement 5 “Risk changes are detected and assessed to the bank's policies and responsibilities” shows a difference in the mean value of conventional bank (3.94 with standard deviation of 0.802) and Islamic banks (4.29 with standard deviation 0.690). The high mean response rate of Islamic banks demonstrates that Islamic banks are more responsive to risk fluctuations and make better remedies than conventional banks.

Likewise, statement 6 which states "Your bank has designed and implemented systems for identifying investment opportunities and revenue drivers in a systematic way" shows a difference in the mean value of conventional bank (3.43 with standard deviation 1.037) and Islamic Bank (3.67 with standard deviation 0.816). Islamic banks clearly have a better understanding of market business opportunities and revenue drivers. This is due to the profit/loss sharing nature of Islamic banks, which compels them to actively participate in their clients' businesses.

Risk Identification							
		Conventional Banks		Islamic Banks		Total	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
1	- Your bank conducts a thorough and systematic assessment of its risk in relation to each of its stated goals and objectives	4.20	1.023	4.21	0.977	**4.20**	**0.996**
2	- Your bank experiences no difficulties identifying and prioritizing its major risks	4.00	1.029	3.92	0.929	**3.97**	**0.982**
3	- Your bank conducts Top-Down risk identification i.e. identifies largest risks	4.09	1.040	3.96	0.859	**4.03**	**0.964**
4	- Your bank conducts Bottom-Up risk identification i.e. identifies a comprehensive list of risks and drivers at the Business Unit Level	3.89	0.963	4.00	0.722	**3.93**	**0.868**
5	- Risk changes are detected and assessed to the bank's policies and responsibilities	3.94	0.802	4.29	0.690	**4.08**	**0.772**
6	- Your bank has designed and implemented systems for identifying investment opportunities and revenue drivers in a systematic way	3.43	1.037	3.67	0.816	**3.53**	**0.953**
7	- In your bank risk identification is a continuous process to test both firm-level risks as well as key systemic vulnerabilities	4.00	0.907	4.13	0.680	**4.05**	**0.818**

Risk Identification							
		Conventional Banks		Islamic Banks		Total	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
8	- In your bank risk identification takes place on a regular and continuous basis throughout the organization to guarantee that the whole list of risks the institution faces, as well as the magnitude of those risks, are up to date	4.26	0.852	4.21	0.833	**4.24**	**0.837**
9	- Your bank assign owners responsible for measuring, reporting, and controlling significant risks	4.17	0.747	4.25	0.737	**4.20**	**0.738**
10	- In your bank risk identification is not only limited to the risk function but the entire organization is involved in order to ensure comprehensiveness	3.86	0.879	4.08	0.717	**3.95**	**0.818**
11	- Your bank can timely identify established as well as emerging risks	3.86	0.810	3.79	0.779	**3.83**	**0.791**
12	- In your bank the relationship between risks and business activities is well understood	3.80	0.964	3.88	0.900	**3.83**	**0.931**
13	- There is a risk assessment template in your bank to document risks, their drivers, and their materiality.	4.29	0.622	4.17	0.816	**4.24**	**0.703**
14	- Everyone at the bank has access to detailed risk documentation to ensure a thorough grasp of the bank's risks	3.37	1.114	3.29	0.955	**3.34**	**1.044**
	Overall Mean Average	**3.847619**		**3.67735**			

Table 13: Risk Identification-Descriptive Statistics

4.15.2. Mann- Whitney U Test

A Mann-Whitney U test was used to see if there were any differences in risk identification variables between conventional and Islamic banks. The distributions of the risk identification variables for conventional and Islamic banks were not similar. The variables under risk identification for conventional and Islamic bank mean rank were not statistically significantly different, as shown in Table 14. All p-values (Sig) except one are greater than 0.10 (i.e., p >.10), indicating that the null hypothesis cannot be rejected.

The results demonstrate that the mean difference in risk identification between conventional **(mean rank= 29.79**) and Islamic banks **(mean rank= 30.28857143)** is insignificant, which is supported by the Mann- Whitney U test statistics **(U=422.75, p-value=0.621)** that show no statistically significant difference. This suggests that conventional and Islamic banks perform at the same level in terms of risk identification with no differences between them.

Risk Identification						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
1	Conventional	35	30.10	The distribution of Risk Identification - Your bank conducts a thorough and systematic assessment of its risk in relation to each of its stated goals and objectives is the same across categories of Type of Bank.	.952	416.5
	Islamic	24	29.85			
2	Conventional	35	31.01	The distribution of Risk Identification - Your bank experiences no difficulties identifying and prioritizing its major risk is the same across categories of Type of Bank.	.544	384.5
	Islamic	24	28.52			
3	Conventional	35	31.61	The distribution of Risk Identification - Your bank conducts Top-Down risk identification i.e. identifies largest risks is the same across categories of Type of Bank.	.345	363.5
	Islamic	24	27.65			
4	Conventional	35	29.74	The distribution of Risk Identification - Your banks conduct Bottom-Up risk identification i.e. identifies a comprehensive list of risks and drivers at the Business Unit Level are the same across categories of Type of Bank.	.875	429.0
	Islamic	24	30.38			
5	Conventional	35	26.93	The distribution of Risk Identification - Risk changes are detected and assessed to the bank's policies and responsibilities are the same across categories of Type of Bank.	.050	527.5
	Islamic	24	34.48			
6	Conventional	35	28.73	The distribution of Risk Identification - Your bank has designed and implemented systems for identifying investment opportunities and revenue drivers in a systematic way are the same across categories of Type of Bank.	.463	464.5
	Islamic	24	31.85			

Risk Identification						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
7	Conventional	35	29.52	The distribution of Risk Identification - In your bank risk identification is a continuous process to test both firm-level risks as well as key systemic vulnerabilities is the same across categories of Type of Bank.	.760	437
	Islamic	24	30-71			
8	Conventional	35	30.44	The distribution of Risk Identification - In your bank risk identification takes place on a regular and continuous basis throughout the organization to guarantee that the whole list of risks the institution faces, as well as the magnitude of those risks, are up to date is the same across categories of Type of Bank.	.787	404.5
	Islamic	24	29.35			
9	Conventional	35	29.24	The distribution of Risk Identification - Your bank assign owners responsible for measuring, reporting, and controlling significant risks is the same across categories of Type of Bank.	.649	446.5
	Islamic	24	31.10			
10	Conventional	35	28.46	The distribution of Risk Identification - In your bank risk identification is not only limited to the risk function but the entire organization is involved in order to ensure comprehensiveness is the same across categories of Type of Bank.	.334	474
	Islamic	24	32.25			
11	Conventional	35	30.69	The distribution of Risk Identification - Your bank can timely identify established as well as emerging risks is the same across categories of Type of Bank.	.664	396
	Islamic	24	29			

Risk Identification						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
12	Conventional	35	29.6	The distribution of Risk Identification - In your bank the relationship between risks and business activities is well understood is the same across categories of Type of Bank.	.819	433
	Islamic	24	30.5			
13	Conventional	35	30.5	The distribution of Risk Identification - There is a risk assessment template in your bank to document risks, their drivers, and their materiality. is the same across categories of Type of Bank.	.766	403
	Islamic	24	29.3			
14	Conventional	35	30.6	The distribution of Risk Identification - Everyone at the bank has access to detailed risk documentation to ensure a thorough grasp of the bank's risks is the same across categories of Type of Bank.	.731	339
	Islamic	24	29.1			
	Total				**0.62**	**422.75**
	Mean Rank Conventional Banks		**29.79786**			
	Mean Rank Islamic Banks		**30.28857**			

Table 14: Risk Identification-Mann Whitney U Test

4.16. General Risk Management Analysis

4.16.1. Descriptive Statistics

Table 15 shows some descriptive statistics such as mean value and standard deviation of survey responses on twenty statements general risk management for Islamic and conventional banks that used a 5-point likert scale. Response rates between conventional and Islamic banks are not significantly different.

Overall, the mean (average) response of Islamic banks (4.025) is higher than that of conventional banks (3.767143). Statement 3 “Your bank has internal guidelines and concrete procedures with respect to the risk management systems” has the highest mean for conventional bank (4.46 with standard deviation of 0.780) and Islamic bank (4.25 with standard deviation of 0.737). The differences between the two banks are not significant, indicating that both conventional and Islamic banks are well aware of the concrete guidelines for their risk management procedures, which is essential to help safeguard the bank and minimize risk to its objectives. Internal guidelines reduce risks and protect assets, ensure record accuracy, enhance operational efficiency, and promote compliance with policies, rules, regulations, and laws.

Statement 2 “A committee in your bank is in charge of identifying, monitoring, and controlling certain risks” has the highest mean for Islamic banks (4.46 with standard deviation of 0.884) and conventional banks (4.40 with standard deviation of 0.881). The differences between the two banks are not significant, indicating that both banks have established a risk management committee. A risk committee is necessary because it improves the board's monitoring of the bank's risk and risk-taking and provides advice to management.

Statement 17 “Your bank foregoes a portion of its profit to pay depositors (Displaced Commercial Risk)” has the lowest mean for conventional banks (2.91 with the standard deviation of 1.292) and Islamic Banks (3.54 with standard deviation of 0.977). The difference is significant. It is clear from the difference that conventional banks are less susceptible to displaced commercial risk. If an Islamic bank is unable to manage the rate of return risk, it will continue to have displaced commercial risk as a problem.

Due to the existence of both conventional and Islamic banks which both practice the intermediation principle, customers now receive new advantages. The main benefit is that customers now have more options for obtaining fair, legal, and, of course, Islamic law-compliant loans that don't charge interest. However, as a newcomer, Islamic banks must manage many of the same risks as conventional banks, and they also face a unique risk referred to as the displaced commercial risk.

The return determination systems used by conventional and Islamic banking differ in theory. The interest rate is the return in the traditional banking system. A certain portion of the money held in traditional banks goes to the depositors. However, in Islamic banks, the return is based on profit-loss sharing principles with Mudaraba and Musharaka variations. Depositors receive a specific portion (ratio) of the investment fund's profits as managed by the bank. There appears to be a problem with displaced commercial risk because there are differences in the method used to calculate return. As a result, the risk of depositor withdrawal is a crucial factor that should be carefully managed in Islamic banks.

Due to the dual banking system's adoption and the highly motivated (floating) customers who it attracts, all of the funding for Islamic banks is extremely susceptible to changes in deposit interest rates at conventional banks, regardless of the concept of usury's prohibition. Customers with a profit motive will withdraw money from an Islamic bank and then save it again in a conventional bank if the conventional interest rate rises because they are drawn to the higher return. While on the one hand, Islamic banks have complied with the initial agreement's ratio set to depositors.

Statement 18 and 20 share the lowest mean for Islamic banks.

Statement 18 “The inability to use derivatives in Islamic Banks for hedging is seen as a bottleneck in your bank's risk management approach” for Islamic banks (3.50 with the standard deviation of 1.103) and conventional banks (3.09 with standard deviation 1.011) indicates that the derivatives ban does not pose a problem in Islamic banks because Islamic banks have developed alternatives that are compliant with Islamic law. For example, in the case of forward and futures contracts, Islamic trading rules allow Salam and Istisna, while experts recommend using Bai Arboun in place of options. In addition, instead of interest rate swaps, lease contracts can be

priced using a variable-rate benchmark with a cap and floor. This can help Islamic banks reduce the risk of large fluctuations in the benchmark rate.

Statement 20 “In low-performing periods, your bank has a reserve that is used to boost the profit share (rate of return) of depositors” has low mean for conventional banks (2.97 with the standard deviation of 1.224) and Islamic banks (3.50 with the standard deviation of 1.063)

Reserve requirements are the amount of funds that a bank holds in reserve to ensure that it can meet liabilities in the event of sudden withdrawals and is not permitted to lend. Traditional banks make loans to customers based on a percentage of the cash they have on hand. In exchange for this ability, the government requires them to keep a certain number of deposits on hand to cover possible withdrawals, known as fractional reserve requirements.

Islamic banks, on the other hand, must hold reserve requirements, either fractional reserve requirements or 100 percent reserve requirements, to cover unexpected withdrawals as well as low-performing activities that are based on profit and loss sharing funding.

Both banks have a significant gap in improving their reserve requirements, especially given the current unstable economy caused by the Corona Pandemic and the Russia/Ukraine war which they must work on to improve.

General Risk Management							
		Conventional Banks		Islamic Banks		Total	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
1	Your bank has a structured risk management system in place	4.43	0.778	4.25	0.794	**4.36**	**0.783**
2	- A committee in your bank is in charge of identifying, monitoring, and controlling certain risks.	4.40	0.881	4.46	0.884	**4.42**	**0.875**
3	- Your bank has internal guidelines and concrete procedures with respect to the risk management systems.	4.46	0.780	4.25	0.737	**4.37**	**0.763**
4	- For senior officers and management at your bank, there is a periodical risk management reporting system.	4.37	0.877	4.29	0.690	**4.34**	**0.801**
5	- Your internal auditor is in charge of reviewing and validating your risk management systems, guidelines, and risk reports.	4.09	1.147	4.42	0.776	**4.22**	**1.018**
6	- Your bank has a system in place to deal with accidents and crises.	4.26	0.919	4.00	0.933	**4.15**	**0.925**
7	- Bank risk appetite statement clearly defines the target market, minimum credit standards, desirable sectors, and the type of products to be developed. is the same across categories of Type of Bank.	4.06	0.938	4.29	0.806	**4.15**	**0.887**

General Risk Management							
		Conventional Banks		Islamic Banks		Total	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
8	- The internal control system at your bank is capable of responding rapidly to newly identified risks are the same across categories of Type of Bank.	3.77	1.031	3.67	0.963	**3.73**	**0.997**
9	- Your bank monitors and evaluates the risk management measures it employs on a regular basis. is the same across categories of Type of Bank	4.14	0.944	4.08	0.776	**4.12**	**0.873**
10	- Material risks are immediately reported to senior management and the board of directors, and they are promptly addressed. is the same across categories of Type of Bank.	4.26	0.886	4.08	0.881	**4.19**	**0.880**
11	- Following the loan extension, your bank examines the borrower's business performance	4.26	0.852	4.13	0.947	**4.20**	**0.886**
12	- Your bank views that the Basel Committee standards should be applicable to Islamic Banks too.	3.66	1.027	4.13	1.076	**3.85**	**1.064**
13	- Your bank views that supervisors/regulators are able to assess the true risks inherent in Islamic banks.	3.43	0.884	4.42	0.717	**3.83**	**0.950**
14	- Your bank views that the capital requirement for Islamic banks should be the same to the conventional banks.	3.46	1.010	3.58	1.412	**3.51**	**1.180**

General Risk Management							
		Conventional Banks		Islamic Banks		Total	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
15	- Deposit rates of return in Islamic Banks must be comparable to interest return offered by conventional banks.	3.37	0.942	3.67	1.274	**3.49**	**1.089**
16	- Your banks have a good understanding of the various risk involved with each Islamic modes of financing.	3.11	1.105	4.33	0.868	**3.61**	**1.175**
17	- Your bank foregoes a portion of its profit to pay depositors (Displaced Commercial Risk).	2.91	1.292	3.54	0.977	**3.17**	**1.206**
18	- The inability to use derivatives in Islamic Banks for hedging is seen as a bottleneck in your bank's risk management approach. is the same across categories of Type of Bank.	3.09	1.011	3.50	1.103	**3.25**	**1.060**
19	- Your bank is working hard to establish Islamic-compliant risk management instruments and methodologies.	2.86	1.264	3.92	1.100	**3.29**	**1.301**
20	- In low-performing periods, your bank has a reserve that is used to boost the profit share (rate of return) of depositors.	2.97	1.224	3.50	1.063	**3.19**	**1.181**
	Overall Mean Average	**3.77**		**4.03**			

Table 15: General Risk Management-Descriptive Statistics

4.16.2. Mann- Whitney U Test

A Mann-Whitney U test was used to see if there were any differences in the General Risk Management variables between conventional and Islamic banks. The distributions of the risk identification variables for conventional and Islamic banks were not similar. The variables under general Risk Management for conventional and Islamic bank mean rank were not statistically significantly different, as shown in Table 16. Most p-values (Sig) are greater than 0.05 (i.e., p >.05), indicating that the null hypothesis cannot be rejected.

The results demonstrate that the mean difference in General Risk Management between conventional **(mean rank= 28.5)** and Islamic banks **(mean rank= 31.9)** is insignificant which is further supported by the supported by the Mann- Whitney U test statistics (**U=470.7, p-value=0.21)** that show no statistically significant difference. This suggests that conventional and Islamic banks perform at the same level in terms of General Risk Management with no differences between them.

General Risk Management						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
1	Conventional	35	31.66	The distribution of General Risk Management - Your bank has a structured risk management system in place is the same across categories of Type of Bank.	.316	362
	Islamic	24	27.58			
2	Conventional	35	29.19	The distribution of General Risk Management - A committee in your bank is in charge of identifying, monitoring, and controlling certain risks. is the same across categories of Type of Bank.	.615	448.5
	Islamic	24	31.19			
3	Conventional	35	32.23	The distribution of General Risk Management - Your bank has internal guidelines and concrete procedures with respect to the risk management systems are the same across categories of Type of Bank.	.175	342
	Islamic	24	26.75			
4	Conventional	35	31.47	The distribution of General Risk Management - For senior officers and management at your bank, there is a periodical risk management reporting system. is the same across categories of Type of Bank.	.370	368.5
	Islamic	24	27.85			
5	Conventional	35	28.5	The distribution of General Risk Management - Your internal auditor is in charge of reviewing and validating your risk management systems, guidelines, and risk reports. is the same across categories of Type of Bank.	.389	471
	Islamic	24	32.1			

General Risk Management						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
6	Conventional	35	32.1	The distribution of General Risk Management - Your bank has a system in place to deal with accidents and crises. is the same across categories of Type of Bank.	.217	346
	Islamic	24	26.92			
7	Conventional	35	28.3	The distribution of General Risk Management - Bank risk appetite statement clearly defines the target market, minimum credit standards, desirable sectors, and the type of products to be developed. is the same across categories of Type of Bank.	.320	479.5
	Islamic	24	32.5			
8	Conventional	35	30.91	The distribution of General Risk Management - The internal control system at your bank is capable of responding rapidly to newly identified risks are the same across categories of Type of Bank.	.596	388
	Islamic Bank	24	28.67			
9	Conventional Bank	35	31.1	The distribution of General Risk Management - Your bank monitors and evaluates the risk management measures it employs on a regular basis. is the same across categories of Type of Bank.	.505	381
	Islamic Bank	24	28.3			
10	Conventional Bank	35	31.5	The distribution of General Risk Management - Material risks are immediately reported to senior management and the board of directors, and they are promptly addressed. is the same across categories of Type of Bank.	.358	366
	Islamic	24	27.75			

General Risk Management						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
11	Conventional	35	30.9	The distribution of General Risk Management - Following the loan extension, your bank examines the borrower's business performance is the same across categories of Type of Bank.	.563	387
	Islamic	24	28.6			
12	Conventional	35	26.59	The distribution of General Risk Management - Your bank views that the Basel Committee standards should be applicable to Islamic Banks too. is the same across categories of Type of Bank.	.052	539
	Islamic	24	34.98			
13	Conventional	35	22.61	The distribution of General Risk Management - Your bank views that supervisors/regulators are able to assess the true risks inherent in Islamic banks. is the same across categories of Type of Bank.	<.001	678.5
	Islamic	24	40.77			
14	Conventional	35	28.51	The distribution of General Risk Management - Your bank views that the capital requirement for Islamic banks should be the same to the conventional banks. is the same across categories of Type of Bank.	.407	472
	Islamic	24	32.17			
15	Conventional	35	27.66	The distribution of General Risk Management - Deposit rates of return in Islamic Banks must be comparable to interest return offered by conventional banks. is the same across categories of Type of Bank.	.188	502
	Islamic	24	33.42			

General Risk Management						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
16	Conventional	35	22.63	The distribution of General Risk Management - Your banks have a good understanding of the various risk involved with each Islamic modes of financing. is the same across categories of Type of Bank.	<.001	678
	Islamic	24	40.75			
17	Conventional	35	26.41	The distribution of General Risk Management - To avoid withdrawals due to reduced returns, your bank foregoes a portion of its profit to pay depositors (Displaced Commercial Risk). is the same across categories of Type of Bank.	.046	545.5
	Islamic	24	35.23			
18	Conventional	35	27.2	The distribution of General Risk Management - The inability to use derivatives in Islamic Banks for hedging is seen as a bottleneck in your bank's risk management approach. is the same across categories of Type of Bank.	.112	518
	Islamic	24	34.1			
19	Conventional	35	24.23	The distribution of General Risk Management - Your bank is working hard to establish Islamic-compliant risk management instruments and methodologies. is the same across categories of Type of Bank.	.001	622
	Islamic	24	38.42			

General Risk Management						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent-Samples Mann-Whitney U Test**	
					Asymptotic Sig.	U Value
20	Conventional	35	27.17	The distribution of General Risk Management - In low-performing periods, your bank has a reserve that is used to boost the profit share (rate of return) of depositors. is the same across categories of Type of Bank.	.116	519
	Islamic	24	34.13			
	Total				**0.23915**	**470.675**
	Mean Rank Conventional Banks		**28.5435**			
	Mean Rank Islamic Banks		**31.8755**			

Table 16: General Risk Management-Mann Whitny U Test

4.17. Credit Risk Analysis and Management

4.17.1. Descriptive Statistics

Table 17 presents the mean and standard deviation on thirty-nine (39) statements about credit risk analysis and management by two groups' i.e., Islamic and conventional banks. The overall average shows that conventional banks (3.85) have a higher mean value on credit risk analysis and management than Islamic banks (3.68), indicating that conventional banks have better credit risk management practices. The highest mean value is given to statement 1 (4.34 with a standard deviation of 0.906) and 9 (4.34 with a standard deviation of 0.968) respectively and which states that 'Your bank has a tight credit risk policy (Centralization of approval power)" and "Your bank employs an internal risk rating system in order to manage credit risk" by conventional banks. Whereas Statement 19 which states that "The credit risk strategy and policy are evaluated by the board on a regular basis" has the highest mean value (4.46 with a standard deviation of 0.588) for Islamic banks.

The conventional banks have the lowest mean value (2.91 with a standard deviation of 1.292) for statement 2, which states "Your bank has a lenient attitude toward risk in order to garner a higher market share (decentralization approval powers)". This shows that conventional banks disagree with the statement. The results of Islamic banks' mean responses on statements 30 and 38 are very low, indicating that Islamic banks do not face significant credit risks when financing automobiles and foreign trade.

Statement 3 "Your bank rely on financial statement as well as information related to the general economy, industry and the borrower to conduct credit analysis" has a higher mean value for conventional banks than Islamic banks, indicating that conventional banks are better able to combine internal and external sources, which allows them to deliver better results and gain better insights into credit risk management.

The mean value for statement 10 "Your bank has information systems and analytical techniques that provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk" is higher for conventional banks than it is for Islamic banks. The risk associated with exposures to specific borrowers or counterparties can be

quantified by conventional banks using better methodologies than Islamic banks. Concentrations as explained by Basel Committee on Banking and Supervision (2022) are most likely the single most significant source of serious credit problems. Credit concentrations are defined as any exposure where the potential losses are high in comparison to the bank's capital, total assets, or, where adequate controls exist, the bank's overall risk level.

Statement 12 “Your bank has a process in place for independent, continuing evaluation of its credit risk management systems, and the outcomes of these evaluations are disclosed to the board of directors immediately” has a higher mean for conventional banks than Islamic banks. This demonstrates that conventional banks' boards of directors perform better when it comes to routinely reviewing a bank's credit risk management strategy and key policies and procedures for identifying, measuring, evaluating, monitoring, reporting, and mitigating credit risk consistent with the approved risk appetite.

In contrast to Islamic banks, conventional banks have a higher mean for Statement 13, which states that “Your banks have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations” has a higher mean for conventional banks than Islamic banks”, indicating that conventional banks are better at directing problems to remedial management on time.

Statement 7, on the other hand, states that "In order to analyze credit risk of clients both operating risks and financial risks are studied together" has a higher mean for Islamic banks than conventional banks.

Credit Risk Analysis and Management								
		Conventional Bank		**Islamic Bank**		**Total**		
		Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**
1	Your bank has a tight credit risk policy (Centralization of approval power).	4.34	0.906	4.33	0.482	**4.34**	**59**	**0.757**
2	Your bank has a lenient attitude towards risk in order to garner a higher market share (decentralization approval powers).	2.91	1.292	2.88	1.296	**2.90**	**59**	**1.282**
3	Your bank relies on financial statement as well as information related to the general economy, industry and the borrower to conduct credit analysis	4.29	0.789	4.13	0.850	**4.22**	**59**	**0.811**
4	Credit analysts rely only on historical data to analyze the creditworthiness of the client.	2.97	1.339	3.38	1.279	**3.14**	**59**	**1.319**
5	Credit Analyst prepares scenario analysis: (i) Base Case, (ii) Realistic Case, and (iii) Worst Case to predict the future creditworthiness of the client.	3.63	1.114	3.79	0.932	**3.69**	**59**	**1.038**
6	Character, capital, capacity, conditions, collateral are considered in the credit risk analysis of clients.	4.31	0.900	4.33	0.565	**4.32**	**59**	**0.776**
7	In order to analyze credit risk of clients both operating risks and financial risks are studied together.	3.89	1.051	4.17	0.565	**4.00**	**59**	**0.891**

Credit Risk Analysis and Management								
		Conventional Bank		**Islamic Bank**		**Total**		
		Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**
8	Your bank has in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.	4.14	0.944	4.17	0.761	**4.15**	**59**	**0.867**
9	Your bank employs an internal risk rating system in order to manage credit risk.	4.34	0.968	4.42	0.717	**4.37**	**59**	**0.869**
10	Your bank has information systems and analytical techniques that provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk.	4.29	0.957	4.04	1.042	**4.19**	**59**	**0.991**
11	Your bank has a system in place to keep track of the credit portfolio's overall composition and quality.	4.26	0.780	4.29	0.908	**4.27**	**59**	**0.827**
12	Your bank has a process in place for independent, continuing evaluation of its credit risk management systems, and the outcomes of these evaluations are disclosed to the board of directors immediately.	4.23	0.877	4.17	0.816	**4.20**	**59**	**0.846**
13	Your banks have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.	4.14	0.944	3.83	0.963	**4.02**	**59**	**0.956**

Credit Risk Analysis and Management								
		Conventional Bank		**Islamic Bank**		**Total**		
		Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**
14	The credit risk strategy clearly defines the bank's willingness to grant credit based on exposure type (for example, commercial, consumer, real estate), economic sector, geographical location, currency, maturity and anticipated profitability.	4.14	0.912	4.29	0.690	**4.20**	**59**	**0.826**
15	Borrowers are rated in your bank according to a risk factor.	4.09	0.919	4.33	0.637	**4.19**	**59**	**0.819**
16	Your bank obtains information about the borrowers from credit information bureau (Bonität Schufa, credit reforms, S&Ps, Moodys, etc.)	4.11	1.022	4.38	0.647	**4.22**	**59**	**0.892**
17	Management of your bank has set out credit limits for different client segments, economic sectors, geographical locations etc. to avoid concentration of credit.	4.20	0.833	4.38	0.711	**4.27**	**59**	**0.784**
18	Credit administration ensures proper approval, completeness of documents, receipt of collateral, and approval of exceptions before credit disbursement.	4.29	0.825	4.33	0.637	**4.31**	**59**	**0.749**
19	The credit risk strategy and policy are evaluated by the board on a regular basis.	4.26	0.919	4.46	0.588	**4.34**	**59**	**0.801**

Credit Risk Analysis and Management								
		Conventional Bank		**Islamic Bank**		**Total**		
		Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**
20	Your bank has a financing strategy in place that identifies potential credit exposures that may occur at different stages of the different modes of financing utilizing various instruments.	3.83	1.043	4.04	0.690	**3.92**	**59**	**0.915**
21	Your bank conducts the necessary due diligence analysis when evaluating the risk of an investment which includes the management team's track record, the quality of the business plan, the human resources involved, and the market size for the proposed activity.	4.03	0.891	4.13	0.797	**4.07**	**59**	**0.848**
22	Please allocate a numerical value to the severity of credit risk associated with each of the following. (1 being NOT SERIOUS and 4 being CRITICALLY SERIOUS, 5 Not Applicable) - Murabaha	3.91	1.422	2.75	1.189	**3.44**	**59**	**1.442**
23	Mudarabah	4.29	1.100	3.42	1.349	**3.93**	**59**	**1.271**
24	Musharaka	4.20	1.232	3.25	1.113	**3.81**	**59**	**1.266**
25	Ijara	4.06	1.282	2.54	1.215	**3.44**	**59**	**1.454**
26	Istisna	4.26	1.197	2.96	1.268	**3.73**	**59**	**1.375**
27	Salam	4.29	1.178	3.42	1.283	**3.93**	**59**	**1.285**
28	Personal Loans	3.20	1.052	3.42	1.316	**3.29**	**59**	**1.160**

Credit Risk Analysis and Management								
		Conventional Bank		**Islamic Bank**		**Total**		
		Mean	**Std. Deviation**	**Mean**	**Std. Deviation**	**Mean**	**N**	**Std. Deviation**
29	Mortgages	3.29	1.152	2.83	1.435	**3.10**	**59**	**1.282**
30	Automobile Financing	3.03	1.200	2.42	1.316	**2.78**	**59**	**1.274**
31	Credit Cards	3.26	1.197	3.17	1.404	**3.22**	**59**	**1.274**
32	Business loans	3.40	1.006	3.33	1.049	**3.37**	**59**	**1.015**
33	Bonds	3.20	1.232	3.50	1.351	**3.32**	**59**	**1.279**
34	Overdrafts	3.43	0.948	4.04	1.197	**3.68**	**59**	**1.090**
35	Line of Credits	3.34	0.968	3.13	1.227	**3.25**	**59**	**1.076**
36	Equipment leasing	3.34	1.187	3.42	1.316	**3.37**	**59**	**1.230**
37	Project Finance	3.91	0.781	3.17	0.917	**3.61**	**59**	**0.910**
38	Foreign Trade Financing	3.51	1.147	2.96	1.197	**3.29**	**59**	**1.190**
39	Account receivable financing	3.46	1.172	3.46	1.285	**3.46**	**59**	**1.208**
	Overall Mean Average	**3.85**		**3.68**				

Table 17: Credit Risk- Descriptive Statistics

4.17.2. Mann- Whitney U Test

A Mann-Whitney U test was used to see if there were any differences in the Credit Risk Management variables between conventional and Islamic banks. The distributions of the risk identification variables for conventional and Islamic banks were not similar. The variables under Credit Risk Management for conventional and Islamic bank mean rank were not statistically significantly different, as shown in Table 18. Most p-values (Sig) are greater than 0.05 (i.e., p >.05), indicating that the null hypothesis cannot be rejected.

The results show that the mean difference in Credit Risk Management between conventional **(mean rank= 31.3)** and Islamic banks **(mean rank= 28.25)** is insignificant. It is concluded that the overall credit risk management (**U=378.14, p-value=0.423)** in conventional banks and Islamic banks is not statistically different. However, there are significant differences between Islamic and conventional banks in terms of the severity of credit risk in the different financing methods used by banks such as Murabaha, Musharaka, Ijara, Istisna, Salam, car financing, overdraft and project financing. This is due to the fact that conventional banks do not use the different types of financing such as Murabaha, Musharaka, Ijara, Istisna and Salam as Islamic banks do.

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
1	Conventional	35	31.6	Your bank has a tight credit policy (centralization of approval power).). is the same across categories of Type of Bank	0.333	364
	Islamic Bank	24	27.67			
2	Conventional Bank	35	30.23	Your bank has a lenient attitude towards risk in order to garner a higher market share (decentralization approval powers). is the same across categories of Type of Bank.	0.897	412
	Islamic Bank	24	29.67			
3	Conventional Bank	35	31.41	Your bank relies on financial statement as well as information related to the general economy, industry and the borrower to conduct credit analysis is the same across categories of Type of Bank.	0.382	370
	Islamic Bank	24	27.94			
4	Conventional Bank	35	28.11	Credit analysts rely only on historical data to analyze the creditworthiness of the client. is the same across categories of Type of Bank.	0.284	370
	Islamic Bank	24	32.75			
5	Conventional Bank	35	29.34	Credit Analyst prepares scenario analysis: (i) Base Case, (ii) Realistic Case, and (iii) Worst Case to predict the future creditworthiness of the client. is the same across categories of Type of Bank.	0.703	443
	Islamic Bank	24	30.96			
6	Conventional Bank	35	30.91	Character, capital, capacity, conditions, collateral are considered in the credit risk analysis of clients. is the same across categories of Type of Bank.	0.580	388
	Islamic Bank	24	28.67			

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
7	Conventional Bank	35	28.94	In order to analyze the credit risk of clients both operating risks and financial risks are studied together. is the same across categories of Type of Bank.	0.524	457
	Islamic Bank	24	31.54			
8	Conventional Bank	35	30.4	Your bank has in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves. is the same across categories of Type of Bank.	0.810	406
	Islamic Bank	24	29.42			
9	Conventional Bank	35	30.2	Your bank employs an internal risk rating system in order to manage credit risk. is the same across categories of Type of Bank.	0.903	413
	Islamic Bank	24	29.71			
10	Conventional Bank	35	31.69	Your bank has information systems and analytical techniques that provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk. is the same across categories of Type of Bank.	0.322	361
	Islamic Bank	24	27.54			
11	Conventional Bank	35	29.19	Your bank has a system in place to keep track of the credit portfolio's overall composition and quality. is the same across categories of Type of Bank.	0.627	448
	Islamic Bank	24	31.19			

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
12	Conventional Bank	35	30.71	Your bank has a process in place for independent, continuing evaluation of its credit risk management systems, and the outcomes of these evaluations are disclosed to the board of directors immediately. is the same across categories of Type of Bank.	0.675	395
	Islamic Bank	24	28.96			
13	Conventional Bank	35	32.46	Your banks have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations. is the same across categories of Type of Bank.	0.149	334
	Islamic Bank	24	26.42			
14	Conventional Bank	35	29.29	The credit risk strategy clearly defines the bank's willingness to grant credit based on exposure type (for example, commercial, consumer, real estate), economic sector, geographical location, currency, maturity, and anticipated profitability. is the same across categories of Type of Bank.	0.659	445
	Islamic Bank	24	31.04			
15	Conventional Bank	35	28.49	Borrowers are rated in your bank according to a risk factor. is the same across categories of Type of Bank.	0.351	473
	Islamic Bank	24	32.21			
16	Conventional Bank	35		Your bank obtains information about the borrowers from credit information bureau (Bonität Schufa, credit reforms, S&Ps, Moodys, etc.) is the same across categories of Type of Bank.	0.498	460
	Islamic Bank	24				

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
17	Conventional Bank	35	28.71	The management of your bank has set out credit limits for different client segments, economic sectors, geographical locations etc. to avoid concentration of credit. is the same across categories of Type of Bank.	0.434	465
	Islamic Bank	24	31.88			
18	Conventional Bank	35	30.09	Credit administration ensures proper approval, completeness of documents, receipt of collateral, and approval of exceptions before credit disbursement. is the same across categories of Type of Bank.	0.959	417
	Islamic Bank	24	29.88			
19	Conventional Bank	35	29.04	The credit risk strategy and policy are evaluated by the board on a regular basis. is the same across categories of Type of Bank.	0.565	453
	Islamic Bank	24	31.4			
20	Conventional Bank	35	29.04	Your bank has a financing strategy in place that identifies potential credit exposures that may occur at different stages of the different modes of financing utilizing various instruments. is the same across categories of Type of Bank.	0.584	453.5
	Islamic Bank	24	31.4			
21	Conventional Bank	35	29.53	Your bank conducts the necessary due diligence analysis when evaluating the risk of an investment which includes the management team's track record, the quality of the business plan, the human resources involved, and the market size for the proposed activity. is the same across categories of Type of Bank.	0.774	436.5
	Islamic Bank	24	30.69			

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
22	Conventional Bank	35	35.71	The distribution of Please allocate a numerical value to the severity of credit risk associated with each of the following. (1 being NOT SERIOUS and 4 being CRITICALLY SERIOUS, 5 Not Applicable) - Murabaha is the same across categories of Type of Bank.	0.001	220
	Islamic Bank	24	21.67			
23	Conventional Bank	35	34.8	Mudarabaha is the same across categories of Type of Bank.	0.006	252
	Islamic Bank	24	23			
24	Conventional Bank	35	35.99	Musharaka is the same across categories of Type of Bank.	0.001	210
	Islamic Bank	24	21.27			
25	Conventional Bank	35	37.24	Ijara is the same across categories of Type of Bank.	0.000	166
	Islamic Bank	24	19.44			
26	Conventional Bank	35	36.67	Istisna is the same across categories of Type of Bank.	0.000	186.5
	Islamic Bank	24	20.27			
27	Conventional Bank	35	34.97	Salam is the same across categories of Type of Bank.	0.004	246
	Islamic Bank	24	22.75			

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
28	Conventional Bank	35	28.43	Personal Loans is the same across categories of Type of Bank.	0.374	475
	Islamic Bank	24	32.29			
29	Conventional Bank	35	32.26	Mortgages is the same across categories of Type of Bank.	0.211	341
	Islamic Bank	24	26.71			
30	Conventional Bank	35	33.3	Automobile Financing is the same across categories of Type of Bank.	0.068	304.5
	Islamic Bank	24	25.19			
31	Conventional Bank	35	30.53	Credit Cards is the same across categories of Type of Bank.	0.769	401.5
	Islamic Bank	24	29.23			
32	Conventional Bank	35	30.79	Business loans are the same across categories of Type of Bank.	0.655	392.5
	Islamic Bank	24	28.85			
33	Conventional Bank	35	28.7	Bonds. are the same across categories of Type of Bank.	0.466	465.5
	Islamic Bank	24	31.9			

Credit Risk Analysis						
	Type of Bank	**N**	**Mean Rank**	**Null Hypothesis**	**Independent Samples Mann-Whitney U Test**	
					Asymptotic Sig.	**U Value**
34	Conventional Bank	35	25.94	Overdrafts. are the same across categories of Type of Bank.	0.022	562
	Islamic Bank	24	35.92			
35	Conventional Bank	35	31.59	Line of Credits is the same across categories of Type of Bank.	0.370	364
	Islamic Bank	24	27.69			
36	Conventional Bank	35	29.69	Equipment leasing is the same across categories of Type of Bank.	0.860	431
	Islamic Bank	24	30.46			
37	Conventional Bank	35	35.07	Project Finance is the same across categories of Type of Bank.	0.004	242.5
	Islamic Bank	24	22.6			
38	Conventional Bank	35	33.16	Foreign Trade Financing is the same across categories of Type of Bank.	0.079	309.5
	Islamic Bank	24	25.4			
39	Conventional Bank	35	30.17	Account receivable financing is the same across categories of Type of Bank.	0.924	414
	Islamic Bank	24	29.75			

Credit Risk Analysis						
	Type of Bank	N	Mean Rank	Null Hypothesis	Independent Samples Mann-Whitney U Test	
					Asymptotic Sig.	U Value
	Overall Average				0.423	378.14
	Mean Ranks Conventional Banks		31.3			
	Mean Ranks Islamic Banks		28.25			

a. The significance level is .100.

b. Asymptotic significance is displayed.

Table 18: Credit Risk- Mann Whitney U Test

4.18. Risk Measurements and Mitigation Instruments

4.18.1. Risk Measurements

Table 19 summarizes the results of risk measurement approaches employed by conventional and Islamic banks. The top five risk measurement tools employed by conventional banks are: Value at Risk (VAR), stress testing, credit rating, internal rating system, and Risk Adjusted Return on Capital (RAROC). Whereas the top five risk measuring techniques employed by Islamic banks are stress testing, credit rating, Value at Risk (VAR), Internal Rating System, and Earning at Risk (EAR).

The least ranked risk measurement techniques employed by conventional banks is Earning at Risk (EaR), whereas Islamic bank rank it as one of the top five risk measurement techniques. This is most likely because with earnings at risk (EaR), multiple metrics of earnings can be utilized, including accounting earnings, interest margins, commercial margins, cash flows, and market values, particularly for the trading portfolio used largely by Islamic banks. As a result, the outcome is more comprehensive as opposed to the deviation from predicted earnings caused just by fluctuations in interest rates only.

The least ranked risk measurement techniques employed by Islamic banks is Duration Analysis.

		Conventional Bank	Rank	Islamic Bank	Rank	Total
Value at Risk (VAR)	**Frequency**	30	1	16	3	46
	%	65,2%		34.8%		
GAP Analysis	**Frequency**	21	5	10	6	31
	%	67.7%		32.3%		
Duration Analysis	**Frequency**	17	6	8	7	25
	%	68%		32%		
Earning at Risk (EaR)	**Frequency**	13	8	12	5	25
	%	52%		48%		
Risk Adjusted Return on Capital (RAROC)	**Frequency**	25	4	13	4	38
	%	65.8%		34.2%		
Stress Testing	**Frequency**	30	1	22	1	52
	%	57.7%		42.3%		
Credit Rating	**Frequency**	29	2	19	2	48
	%	60.4%		39.6%		
Internal Rating System	**Frequency**	28	3	16	3	44
	%	63.6%		36.4%		

		Conventional Bank	Rank	Islamic Bank	Rank	Total
Estimates of worst-case scenario	**Frequency**	14	7	10	6	24
	%	58.3%		41.7%		
Other	**Frequency**	**3**	**9**	**0**	**8**	**3**
	%	**100%**		**0**		

Table 19: Risk Measurement in Conventional and Islamic banks

4.18.2. Risk Mitigation Instruments

Table 20 displays the frequency and ranking of risk mitigation strategies used by conventional and Islamic banks. Among other techniques, 'collateral arrangement' is voted first by conventional and Islamic banking respondents. Guarantees were placed second by conventional banking respondents, while they were ranked first by Islamic banks. Securitisation is ranked second by Islamic banking consumers.

Islamic banks prioritize collateral and guarantees because they are thought to be more Shariah compliant as they are more easily convertible into cash, tangible assets, money, treasury bills, and stocks, all of which are interest-free financial instruments.

'Securitisation' is the third most popular approach among conventional banking respondents, while 'Parallel Contracts and Islamic SWAPS' are ranked third among Islamic banks. 'Interest Rate Derivates' is placed fourth among conventional bank respondents. While 'Urboun (Over the Counter Islamic Derivatives)' is placed fourth among Islamic bank respondents.

On the other hand, Urboun (Over the Counter Islamic Derivatives) is the least used risk mitigation techniques by conventional bank respondents, whilst Options Derivatives is the least used risk mitigation technique by Islamic banks.

Other risk mitigation techniques mentioned by respondents is Full Collateralization.

		Conventional Bank	Rank	Islamic Bank	Rank	Total
Securitisation	**Frequency**	19	3	10	2	29
	%	65.5%		34.5%		
SWAP-Derivatives	**Frequency**	17	5	2	6	19
	%	89.5%		10.5%		
Options Derivatives	**Frequency**	6	7	0	7	6
	%	100%				
Interest Rate Derivates	**Frequency**	18	4	3	5	21
	%	85.7%		14.3%		
Collateral Agreement	**Frequency**	26	1	17	1	43
	%	60.5%		39.5%		
Islamic SWAPS	**Frequency**	2	9	5	3	7
	%	28.6%		71.4%		
Parallel Contracts	**Frequency**	2	9	5	3	7
	%	28.6%		71.4%		
Guarantees	**Frequency**	25	2	17	1	42
	%	59.5%		40.5%		
Urboun (Over the counter Islamic Derivatives)	**Frequency**	0	10	4	4	4
	%			100%		
Third Party Agreement	**Frequency**	16	6	4	4	20
	%	80%		20%		
Other	**Frequency**	**3**	**8**	**4**	**4**	**7**
	%	**42.9%**		**57.1%**		

Table 20: Risk Mitigation Techniques in Conventional and Islamic Banks

4.19. Research Hypothesis and Results

Hypothesis 1: Risk identification differs between conventional and Islamic banks.

Hypothesis 1 is rejected as tables 13 and 14 reveal that there is no substantial difference in risk identification between conventional and Islamic banks.

Hypothesis 2: General risk management practices differs between conventional and Islamic banks.

Hypothesis 2 is rejected as tables 15 and 16 reveal that there is no substantial difference in General risk management practice between conventional and Islamic banks.

Hypothesis 3: Credit risk analysis and management differs between conventional and Islamic banks.

Hypothesis 3 is partially accepted as tables 17 and 18 reveal that there is a substantial difference in credit risk analysis and management between conventional and Islamic banks in terms of certain financing products like Murabaha, Mudaraba, Musharaka, Ijara, Istisna, Salam, Automobile financing, overdraft, project financing, and foreign trade financing.

The following results are based on risk identification methodologies used by conventional and Islamic banks, the types of risks encountered by both banks, and risk mitigation and measurement systems utilized by both conventional and Islamic banks.

In terms of ***risk identification methods*** employed by conventional and Islamic banks. Conventional banks mostly utilize Financial Statement Analysis, Scenario Analysis, Risk Mapping, and Benchmarking. Whereas Islamic banks utilises mostly Stress Testing, Audit and Physical Inspection, Financial Statement Analysis, Risk Mapping, and Scenario Analysis. The least used approaches for risk identification in conventional banks are internal communication and inspection by Sharia board members, whereas the least used approaches for risk identification in Islamic banks are checklist of possible disturbances and internal communication.

The ***main risks*** faced by conventional banks are credit risk, operational risk, liquidity risk, interest rate risk, and reputation risk. Whereas main risks faced by Islamic banks are credit risk, foreign exchange risk, operational risk, liquidity risk, and Sharia risk.

The main ***risk measurement*** tools employed by conventional banks are Value at Risk (VAR), stress testing, credit rating, internal rating system, and Risk Adjusted Return on Capital (RA-ROC). Whereas the main measuring techniques employed by Islamic banks are stress testing, credit rating, Value at Risk (VAR), Internal Rating System, and Earning at Risk (EAR).

The main ***risk mitigation*** instruments employed by conventional banks are collateral arrangement, Guarantees, Securitisation, and Interest Rate Derivatives. Whereas the main risk mitigation instruments utilised by Islamic banks are Guarantees, Securitisation, Parallel Contracts and Islamic SWAPS, and Urboun (Over the Counter Islamic Derivatives)

Chapter 5: Conclusion and Recommendations

The purpose of this study is to analyze and contrast the risk management practices of conventional and Islamic banks, both conceptually and empirically. The empirical study is based on quantitative research methods and was conducted using primary data.

The primary data is analyzed using descriptive statistics which included frequency analysis, mean and standard deviation in addition to Mann-Whitney U test that has aided in the comparison of risk management practices between Islamic and conventional banks.

The **first objective of the study** was to examine the risk identification methods employed by conventional and Islamic banks. The result to this research subject is determined through data collected via questionnaire. This research topic was discussed and analyzed in chapter (7.11.2) Illustration of Banks' Risk Identification Methods.

The research found that the risk identification methods used by both banking systems are 'Financial Statement Analysis,' 'Scenario Analysis, and Risk Mapping (Table 11). Conventional banks largely utilize Financial Statement Analysis, whilst Islamic banks mostly use Stress Testing.

The **second objective of the study** was to examine the types of risk exposures to conventional and Islamic banks, as mentioned in Chapter 7.11.3. Illustration of Banks' exposure to risks. The findings show that both banking systems are vulnerable to credit risk, operational risk, and liquidity risk. Conventional banks are particularly vulnerable to interest rate risk, whereas Islamic banks are subject to Sharia risk.

The **third objective of the study** was to determine the differences between conventional banks and Islamic banks in terms of risk identification analysis (chapter 7.12), general risk management analysis (chapter 7.13), and credit risk analysis (chapter 7.14). This objective was examined using descriptive statistics and the Mann-Whitney U test and is related to the study hypotheses 1-3 outlined in Chapter 7.16.

The findings show that there are no significant differences in risk identification and general risk

management analysis between conventional and Islamic banks, but there are partial significant differences in credit risk analysis due to the severity of credit risk in the various financing methods used by banks such as Murabaha, Musharaka, Ijara, Istisna, Salam, car financing, overdraft, and project financing.

These distinctions occur because credit risk is more aligned based on contract types because of the unique contract structuring in Islamic banking. Shariah rulings can establish a wide range of contracts. Profit and loss sharing is a feature of several Islamic financial contracts, as is the changing relationship of the parties over the course of the contract. Another aspect that contributes to these differences is the lack of standardization brought on by the availability of numerous financing options. There is no legal restriction to regulate the relationship with the entrepreneur, particularly when financing through Mudarabah, but if financing through Musharaka, the bank may have some control over how the business operates. Another reason for the risk differences is the nature of PLS contracts, which are based on the project's profitability as opposed to the borrower's creditworthiness.

Furthermore, Islamic contracts are heavily influenced by agreements that have distinctive and particular features. In contrast to conventional contracts, such features are more qualitative in nature and are not usually adequately defined and recorded. For instance, it may not always be evident whether and how the credit risk exposure is covered by guaranties and collaterals over the course of an Islamic contract. Due to the relatively recent introduction of Islamic financial contracts, it is also crucial to keep in mind that little is known about the qualitative and quantitative criteria that were used to design the contracts.

Most credit risk evaluations for Islamic financial products are dependent on subjective analysis, in contrast to conventional contracts. In many circumstances, banks that operate in Islamic countries or offer Islamic contracts are driven by information from various borrowers. The outcome may be subjective and based on experts approving (or not accepting) the contracts, for example, a Murabaha contract.

Therefore, Financial institutions must use strategies and procedures for implementing complex models in order to enhance their credit risk management systems and objectively approve or reject applications for Islamic contracts due to the large number of borrowers with various financial standings and from various market sectors.

The **fourth objective of the study** was to identify risk measurement techniques (chapter 17.5.1) and risk mitigation instruments (chapter 17.5.2) that are employed by conventional and Islamic banks. The questionnaire's findings reveal both banking systems employ Value at Risk (VAR), stress testing, and internal rating system as risk measurements approaches. Conventional banks use specifically Risk Adjusted Return on Capital (RAROC) whereas Islamic banks employ Earning at Risk (EAR).

In terms of risk mitigation techniques results reveals that both banking systems use collateral arrangement, Guarantees, and securitisation. Conventional banks use Interest Rate Derivates whereas Islamic banks use Parallel Contracts and Islamic SWAPS' as well as Urboun (Over the Counter Islamic Derivatives).

Because of the common or unique nature of the risks faced by Islamic banks, the risk measurement and mitigation techniques employed by these banks are of two kinds: Standard traditional techniques and Sharia Compliant techniques. Standard traditional techniques that do not contradict Islamic financial principles are equally applicable to Islamic banks such as GAP analysis, maturity matching, internal rating systems, risk reports, and RAROC, Value at Risk (VAR), and stress testing. Furthermore, there is a need to adapt traditional tools in order to develop new techniques that are Sharia-compliant. However, Islamic banks must further develop these procedures and processes to address the industry's additional unique risks.

In nutshell, while Islamic Banks and conventional banks share many similarities, there are also significant differences that reflect the fact that Islamic banks must adhere to Shariah Law. As a result, the nature of the risks faced by Islamic Banks and conventional canks differs. Risks specific to Islamic Banks stem directly from the characteristics of Islamic contracts (including the nature of risk-sharing). Islamic Banks face risks similar to Conventional Banks, though their importance varies due to the unique characteristics of Islamic finance. In theory, operational, liquidity, transparency, and legal risks are higher in Islamic Banks than in Conventional Banks, and overall credit and concentration risks are also higher in Islamic Banks.

Though in theory Islamic banks are less vulnerable to instability than conventional banks, in practice they are just as vulnerable. In theory, the risk-sharing feature of Islamic banks gives them a competitive advantage (i.e., banks participate in the risks of their counterparties and

investment depositors share the risk of the banking business). In practice, this advantage is neutralized because Islamic banks end up paying competitive "market" returns to investment account holders regardless of their performance (Displaced Commercial Risk)

However, certain characteristics as explained by Mejía et. al (2014) of Islamic banks may make them more stable than conventional banks. In particular

i. the risk-sharing arrangements on the liability side arguably provide an additional layer of protection to the bank (on top of its book capital).
ii. there are incentives for Islamic banks to be more conservative given the need to provide a stable and competitive return to investors, the shareholders' responsibility for negligence or misconduct, and the difficulty in accessing liquidity.
iii. Islamic financial products are typically associated with real economic products (and typically have no deposit insurance)
iv. Because they share the risks, holders of investment accounts have a stronger incentive to exert tight control over bank management.

In terms of governance, Islamic banks require the same corporate, legal, and regulatory framework as conventional banks due to the risks they face (Mejía at al, 2014). A solid legal framework is required for the secure development of Islamic banks. While authorities have taken a variety of approaches to developing the legal framework, a critical decision must be made regarding the establishment of a unified set of banking laws and regulations when Islamic and conventional banks operate in the same jurisdiction. In this context, having a unified set of banking laws and regulations that cover both Islamic and conventional banks is preferable in order to avoid duplication of regulatory and legal provisions that are equally crucial for both types of banks. This practice has been adopted by the majority of countries.

Risk management in general is a neglected area of study in Islamic finance. As a result, a variety of challenges arise from various sources. First, due to Sharia compliance requirements, several risk management techniques are not available to Islamic banks. Credit derivatives, swaps, derivatives for market risk management, commercial guarantees, money market instruments, commercial insurance, and so on are examples. However, due to a lack of research, efficient alternatives to these techniques have not been explored enough. Second, there are several Sharia positions that have a direct impact on risk management processes. Some of these include a lack of effective means to deal with willful default, a prohibition on debt sales, and a prohibition on

currency forwards and futures contracts. This, as well as the lack of standardization of Islamic financial contracts, is a significant source of difficulties in this area.

There is an urgent need to improve the Sharia Scholars' consensus process so that Islamic banks can develop Sharia compliant risk management systems as soon as possible.

6. References

AAOIFI (2019) *FAS 28 Murabaha and other deferred payment sales* [Online] Accounting and Auditing Organization for Islamic Financial Institution: Manama. Available from: http://aaoifi.com/books/fas-28-murabaha-and-other-deferred-payment-sales/?lang=en (Accessed 27 November 2020)

Abu Hamid Al-Ghazali, *Al-Wajiz.* Volume 1

Abdulazeem. A. (2016) A critical Shariah review of Takaful structures: Towards a Better Model [Online] Munich Personal RePEc Archive: Munich. Available from: https://mpra.ub.uni-muenchen.de/93015/1/MPRA_paper_93015.pdf (Accessed 16.06.2022)

Abdul-Khaliq, S. (2014) "Comparison study of Murabaha and Istisnaa in Islamic banking in Jordan" *Interdisciplinary Journal Of Contemporary Research In Business,* 5 (9) [Online] Available from: https://www.zuj.edu.jo/wp-content/staff-research/economic/dr.Thikraiat-Soufan/4.pdf (Accessed 27 March 2020)

Abdul-Rahman, A. (2015) "Islamic Cross Currency Swap (ICCS):hedging against currency fluctuations" *Emerald Emerging Markets Case Studies*, 5 (4) pages 1 – 18 [Online] Available from: https://www.academia.edu/34177604/Emerald_Emerging_Markets_Case_Studies (Accesssed 18 December 2022)

Abdul-Rahman, Yahia (2014) *The Art of RF (Riba-Free) Islamic Banking and Finance: Tools and Techniques for Community-Based Banking* (Wiley Finance). New Jersey: John Wiley & Sons.

Abozaid, Abdulazeem (2015) *The internal challenges facing Islamic finance industry* [Online] Munich Personal RePEc Archive: Munich. Available from: https://mpra.ub.uni-muenchen.de/92518/4/MPRA_paper_92518.pdf (Accessed 02 January 2019)

Abozaid, Abdulazeem (2016) *A critical Shariah review of Takaful structures* [Online] Munich Personal RePEc Archive: Munich. Available from: https://mpra.ub.uni-muenchen.de/93015/1/MPRA_paper_93015.pdf (Accessed 11 June 2020)

AccountingTools (2024) *Residual Risk Definition* [Online] AccountingTools.com. Available from: https://www.accountingtools.com/articles/residual-risk (Accessed 18 July 2021)

Adamu, I. Y. (2018) "Idea of Collateral and Guarantor in Islamic Bank Financing". *SEISENSE Journal of Management,* 1 (5)[Online] : DOI: https://doi.org/10.5281/zenodo.1474664, 49-57 (Accessed 30 October 2022)

Afendi, F., Jaenudin, D., Firdaus, A., Possumah, B. (2019). "Analysis Of Ta'awun Fund Model Best Practice From Indonesia". *IKONOMIKA*. 3. Pp. 139-166. DOI: 10.24042/febi.v3i2.3497.

Agha, S. (2015) "Risk Management in Islamic Finance: An Analysis From Objectives Of Shari'ah Perspective" *International Journal of Business, Economics and La,* 7(3) page 46-52, ijbel [Online] Available from: http://ijbel.com/wp-content/uploads/2015/09/RISK-MANAGEMENT-IN-ISLAMIC-FINANCE-AN-ANALYSIS-FROM-OBJECTIVES-OF-

SHARI%E2%80%99AH-PERSPECTIVE.pdf (Accessed 10 July 2020)

Ahmad, A. F., Mahbob, I., Ayub, M. (2014) *The nature of retakaful: risk sharing or transferring risks?* [Online] Edward Elgar Publishing. Available from: https://www.elgaronline.com/view/edcoll/9781785363351/9781785363351.00020.xml (Accessed 16 June 2020)

Ahmed., Ah. (2009) Shariah Opinion (Fatwa) on Istisna', Contracting & Salam [Online] Al-Baraka Banking Group: Saudi Arabia. Available from: https://www.iefpedia.com/english/wp-content/uploads/2009/11/Shariah-Opinion-Fatwa-On-Istisna-Contracting-Salam.pdf (Accessed 20 August 2020)

Ahmed, H., Khan, T. *Risk Management in Islamic Banks* [Online] IsFin: London. Available from: https://www.isfin.net/sites/isfin.com/files/risk_management_in_islamic_banking.pdf (Accessed 30 December 2018)

Ahmed, MH. (2016) ´Micro Takaful Insurance as a Tool to Guaranteeing Financing and Protecting Micro Enterprises´ *Journal of Business and Financial Affairs,* Saudi Arabia, 5 (4), Hilaris Publiser [Online]. Available from: https://www.hilarispublisher.com/open-access/micro-takaful-insurance-as-a-tool-to-guaranteeing-financing-andprotecting-micro-enterprises-2167-0234-1000228.pdf (Accessed 25 June 2020)

Akkizidis, I., Khandelwal, S. (2008) *Financial Risk Management for Islamic Banking and Finance,* SpringerLink [Online] Available from: https://link.springer.com/book/10.1057/9780230598751 (Accessed 26 August 2020)

Akrama, M. (2020) *Running Musharaka-based working capital finance case study from Pakistan* [Online] AAOIFI: Bahrain. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3705866 (21.07.2021)

Akther, U. Md. (2015) Principles of Islamic Finance: Prohibition of Riba, Gharar and Maysir [Online] INCEIF: Kuala Lumpur. Available from: https://mpra.ub.uni-muenchen.de/67711/1/MPRA_paper_67711.pdf (Accessed 15 December 2019)

Al-Ajmi, J. Abu Hussain, H. (2012). "Risk management practices of conventional and Islamic banks in Bahrain". *The Journal of Risk Finance*, 13 [3] pg. 215-139. Available from: https://doi.org/10.1108/15265941211229244

Alam, N., Gupta, L., shanmugam, B (2017) *Islamic Finance: A practical Perspective,* Springer [Online] Available from: http://doi.org/10.1007/978-3-319-66559-7 (Accessed 23 March 2020)

Alam, Z., and Masukujjaman, Md. (2011) 'Risk management practices: A critical diagnosis of some selected commercial banks in Bangladesh'. *Journal of Business and Technology (Dhaka)*, 6(1), pp. 15-35, Bangladesch Journal Online [Online]. Available from: https://doi.org/10.3329/jbt.v6i1.9992 (Accessed 19 March 2019)

Al-Bashir, M., Al-Amine, M. (2009) "Risk Management in Islamic Finance: An Analysis of Derivatives Instruments in Commodity Markets", Brill's Arab and Islamic Laws Series [Online] Available from: https://doi.org/10.1163/ej.9789004152465.i-338.68 (Accessed 16

November 2020)

Alexander, L. Lopes, B. Mastersonn, K. Yeatts, K. (2015) *Selection Bias* [Online] Gillings Schoold of Global Public Health: New York. Available from: https://sph.unc.edu/wp-content/uploads/sites/112/2015/07/nciph_ERIC13.pdf (Accessed 20 September 2023)

Alharbi, A. (2015) "Development of the Islamic Banking System" *Journal of Islamic Banking and Finance,* 3 (1), pp. 12-25 [Online] Available from: https://www.researchgate.net/publication/338898444_Development_of_the_Islamic_Banking_System (Accessed 19 April 2020)

Ali, M., Zakiah, M. Shahimi, S., Shafii, Z. (2016) "Knowledge for Shari'ah Auditors' Competency in Islamic Financial Institutions" *International Journal of Trade, Economics and Finance,* 7 (4), Semantic Scholar [Online] Available from: https://pdfs.semanticscholar.org/0779/5ceebc09dd3ff3483b8a230a153fdada865a.pdf
(20 October 2020)

Ali, N., Shahimi, S., Shafii, Z. (2018) *Knowledge, Skills and Characteristics Requirements for Shari'ah Auditors* [Online] DOI: 10.17576/AJAG-2018-09-15 (Accessed 20 October 2020)

Al-Tamimi, H. and Al-Mazrooei M., 2007. Banks' Risk Management: A Comparison Study of UAE National and Foreign Banks. *The Journal of Risk Finance*, 8(4), pp. 394-409 [Online] Available from: https://www.researchgate.net/publication/257933657_Banks'_Risk_Management_A_Comparison_Study_of_UAE_National_and_Foreign_Banks_Journal_of_Risk_Finance_Vol8_No_4394-409_2007 (Accessed 02 December 2021)

AlTarik, N. (2015) *Basel III: Guidelines on Risk Based Capital Adequacy* [Online] Professional Finance Studies: Bangladesh. Available from: https://www.pfsbd.net/basel-iii-guidelines-on-risk-based-capital-adequacy/ (Accessed 10 October 2018)

Alsayyed, N. (2020) *The Uses and Misuses of Commodity Murabaha: Islamic Economic Perspective* [Online] Available from: https://mpra.ub.uni-muenchen.de/20262/1/ (Accessed 06 October 2020)

Amin, F., Yahya, S., Ibrahim, S., Kamara, M., (2018) Portfolio Risk Measurement Based On Value at Risk (VaR) [Online] Researchgate.com. Available from: https://www.researchgate.net/publication/326061292_Portfolio_risk_measurement_based_on_value_at_risk_VaR (Accessed 11 May 2020)

Andersen, T. Bollerslev, T., Christoffersen, P. Diebold, F. (2013) *Financial Risk Measurement for Financial Risk Management*. [Online] National Bureau of Economic Research Working Paper No. 18084: Cambridge. Available from: http://www.nber.org/papers/w18084.pdf (Accessed 10 July 2018)

Anwer, Z. (2020), "Salam for import operations: mitigating commodity macro risk", *Journal of Islamic Accounting and Business Research*, 11 (8), pp. 1497- 1514. [Online] Available from: https://doi.org/10.1108/JIABR-09-2018-0142

Archer, S., & Haron, A. (2012). Operational Risk Exposures of Islamic Banks. In S. Archer &

R. A. A. Karim (Eds.), Islamic Finance: The New Regulatory Challenge. Singapore: John Wiley & Sons. doi: https://doi.org/10.1002/9781118390443.ch6

Arif, M., Hussain, A., Azeem, M. (2012) "Riba Free Economy" *International Journal of Humanities and Social Science,* Vol. 2(6), page.141-159, [Online] http://www.ijhssnet.com/journals/Vol_2_No_6_Special_Issue_March_2012/12.pdf (Accessed 11 November 2019)

Ariff, M. and Rosly, S. (2011) "Islamic Banking in Malaysia: Unchartered Waters" *Asian Economic Policy Review,* 6, page 301-319, [Online] available from: http://ierc.sbu.ac.ir/File/Article/Islamic%20Banking%20in%20Malaysia%20Unchartered%20Waters_93587.pdf (Accessed 02 September 2020)

Arifin, J., Yazid, A., Sulong, Z. (2013) "A Conceptual Model of Literature Review for Family Takaful (Islamic Life Insurance) Demand in Malaysia", *International Business Research,* 6 (3), page 210 [Online] Canadian Center of Science and Education. DOI: 10.5539/ibr.v6n3p210 (Accessed 29 June 2020)

Arshad, N. C., Ismail. A. G (2010) 'Shariah parameters for Musharaka Contract: A comment. *International Journal of Business and Social Science,* 1 (1), [Online] Available from: https://www.isfin.net/sites/isfin.com/files/shariah_parameters_for_musharakah_contract.pdf (Accessed 18 March 2020)

Arshad, N., Zakaria, R., Mohamad, A. (2015) "An Empirical Assessment of the Displaced Commercial Risk in Malaysian Islamic Banking Institutions: Bank Profitability Model Evidence" *Journal of Islamic Banking and Finance* [Online] EBSCO. Available from: https://repo.uum.edu.my/id/eprint/26260/ (Accessed 06 November 2020)

Ayub, N. (2016) *Ijarah: The Concept, Development and Progress of Islamic Finance Leasing in Ireland's Aviation Sector* [Online] Dublin Business School: Bublin. Available from: https://pdfs.semanticscholar.org/54fa/a017aaac3fb5b0396f3263f467e2eebe8504.pdf (Accessed 31 March 2020)

Azahari, F. (2013) *Sharia Audit in a Legal Process: Future Growth in Specialized Skills* [Online] High Court of Malaya: Malaysia. Available from: https://nfcfakihah.files.wordpress.com/2013/11/shariah-audit-in-a-legal-process-1.pdf (Accessed 20 October 2020)

Bacha, O. I. (1999) *Derivative Instruments and Islamic Finance: Some Thoughts for a Reconsideration* [Online] INCEIF the Global University in Islamic Finance. Available from: https://mpra.ub.uni-muenchen.de/12752/1/Derivatives_and_Islamic_Finance.pdf (Accessed 15 October 2022)

Bandyopadhyay, A. (2016) *Managing Portfolio Credit Risk in Banks*. Cambridge: Cambridge University Press, doi: 10.1017/CBO9781316550915 (Accessed 24 May 2019)

Banwait, G. (2017) *What's at Risk? The Use of Sensitivity Analysis to Measure Your Portfolio's Risk* [Online] Treasury Management International: England. Available from: https://www.treasury-management.com/article/1/188/1653/what%C2s-at-risk-the-use-of-sensitivity-analysis-to-measure-your-portfolio%C2s-risk.html (Accessed 10 October 2016)

Bank Negara Malaysia (2009) Prudential *Regulation and Supervisory Framework* [Online]

Bank Negara Malaysia: Malaysia Central Bank. Available from: https://www.bnm.gov.my/documents/20124/856392/cp03.pdf (Accessed 15 October 2020)

Bank Negara Malaysia (2019) *Capital Adequacy Framework for Islamic Banks (Risk-Weighted Assets)* [Online] Bank Negara Malaysia: Malaysia Central Bank. Available from: https://www.bnm.gov.my/documents/20124/761679/CAFIB+%28RWA%29+PD_TCIT.pdf (Accessed 20 October 2019)

Basel Committee on Banking Supervision (2000) *Principles for the Management of Credit Risk* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/publ/bcbsc125.pdf (Accessed 13 July 2022)

Basel Committee on Banking Supervision (2001) *Consultative Document: The New Basel Capital Accord* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/publ/bcbsca02.pdf (Accessed 18 July 2018)

Basel Committee on Banking Supervision (2005) *Trading book survey: a summary of responses* [Online] Bank for International Settlement: Basel. Available from: www.bis.org: www.bis.org/publ/bcbs112.htm (Accessed 12 December 2020)

Basel Committee on Banking Supervision (2004) *International Convergence of Capital Measurement and Capital Standards* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/publ/bcbs128.pdf (Accessed25 February 2017)

Basel Committee on Banking Supervision (2008) *Liquidity Risk: Management and Supervisory Challenges* [Online] Bank for International Settlements: Basel. Available from: http://www.bis.org/publ/bcbs136.pdf (Accessed 28 February 2017)

Basel Committee on Banking Supervision (2011) *The Basel Committee's response to the financial crisis: report to the G20* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/publ/bcbs179.pdf (Accessed 22 July 2020)

Basel Committee on Banking Supervision (2011) *Principles for the Sound Management of Operational Risk* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/publ/bcbs195.htm (Accessed 22 July 2020)

Basel Committee on Banking Supervision (2011a) *Consultative Document Sound Practices for the Management and Supervision of Operational Risk* [Online] Bank for International Settlement: Basel. Available from: http://www.bis.org/publ/bcbs183.pdf (Accessed 02 March 2017)

Basel Committee on Banking Supervision (2011b) *Principles for the Sound Management of Operational Risk* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/publ/bcbs195.pdf (Accessed 02 November 2019)

Basel Committee on Banking Supervision (2017) Guidelines *Identification and management of step-in risk* [Online] Bank for International Settlements: Basel. Available from: https://www.bis.org/bcbs/publ/d423.pdf (Accessed 03 March 2018)

Basel Committee on Banking Supervision (2017a) *Finalizing Basel II in brief* [Online] Bank

for International Settlements: Basel. Available from: https://www.bis.org/bcbs/publ/d424_inbrief.pdf (Accessed 27 April 2019)

Basel Committee on Banking Supervision (2019*) Basel Committee completes review of Principles for sound liquidity risk management and supervision* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/press/p190117.htm (Accessed 23 October 2019).

Basel Committee on Banking Supervision (2019a) *Interest rate risk in the banking book* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/basel_framework/chapter/SRP/31.htm?inforce=20191215&published=20191215 [Accessed 25 November 2020]

Basel Committee on Banking Supervision (2019b) *Liquidity Coverage Ratio* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/basel_framework/standard/LCR.htm [Accessed 25 November 2020]

Basel Committee on Banking Supervision (2019c) *Net stable funding ratio* [Online] Bank for International Settlement: Basel. Available from: https://www.bis.org/basel_framework/standard/NSF.htm [Accessed 25 November 2020]

Basel Committee on Banking Supervision (2023) *IRB Approach: Minimum requirements to use IRB approach* [Online] Bank for International Settlements: Basel. Available from: https://www.bis.org/basel_framework/chapter/CRE/36.htm?inforce=20220101&export=pdf&pdfid=1561362689026322 (Accessed 27 April 2023)

Basel Committee on Banking Supervision (2023a) *Risk-based capital Requirements: Calculation of minimum risk-based capital requirements* [Online] Bank for International Settlements: Basel. Available from: https://www.bis.org/basel_framework/chapter/RBC/20.htm?inforce=20230101&published=20201126 (Accessed 27 Mai 2024)

Bacha, O. I. (2008). "The Islamic Inter Bank Money Market and a Dual Banking System: the Malaysian Experience". International Journal of Islamic and Middle Eastern Finance and Management, Vol. 1(3): 210-226. Available form: https://mpra.ub.uni-muenchen.de/12699/1/MPRA_paper_12699.pdf (Accessed 07 October 2020)

Bellalah, M. (2013) "Islamic Banking and Finance" Cambridge: Cambridge Scholar Publishing

Board of Governors of the Federal Reserve System (2021) *Market Risk Management* [Online] The Federal Reserve: USA. Available from: https://www.federalreserve.gov/supervisionreg/topics/market_risk_mgmt.htm (Accessed 13 December 2021)

Bessis, J., 2015. Risk Management in Banking. 4th Ed. Wiley.

Beuhler, K., Freeman, A., Hulme, R. (2008) The New Arsenal of Risk Management [Online] Harvard Business Review. Available from: https://hbr.org/2008/09/the-new-arsenal-of-risk-management (Accessed 25 September 2016)

Bodie Z., Kane A., Marcus A. (2011) *Investments and Portfolio Management.* Global Edition.

USA: The McGraw-Hill Companies, Inc.

Böcker, K. (2008) *Modelling and Measuring Business Risk* [Online] Researchgate. Available from: https://www.researchgate.net/publication/228893285_Modelling_and_Measuring_Business_Risk (Accessed 02 March 2017)

Borhan, J. T. (2009) *Rationale and Consequences of the Prohibition of Riba in an Islamic Economic System* [Online] Akademi Pengajian Islam, Universiti Malaya: Kuala Lumpur. Available from: https://www.researchgate.net/publication/313798147_Rationale_and_Consequences_of_the_Prohibition_of_Riba_in_an_Islamic_Economic_System (Accessed 14 November 2019)

Billah, M. M (2004). *Different models of Takaful in global sound market* [Online] , Academia. Available from: https://www.academia.edu/4669588/Different_Models_of_Takaful_In_the_Global_Sound_Market (Accessed 14 June 2020)

Billah, M. M. (2007) *Takaful Funds- An Overview* [Online] Eurek Hedge. Available from: https://www.eurekahedge.com/Research/News/870/Takaful-Funds-An-Overview (Accessed 08 June 2020)

Business Research Methodology (2022) *Purposive sampling* [Online] Available from: https://research-methodology.net/sampling-in-primary-data-collection/purposive-sampling/ (Accessed 06 April 2022)

Caproasia (2016) *List of Economic Crisis scince1900-2015* [Online] Caproasia: Singapore. Available from: https://www.caproasia.com/2016/04/12/economic-crisis-since-1900-2015/ (Accessed 30 September 2017)

Casper, M. (2012) *Sharia Boards and Sharia Compliance in the context of European Corporate Governance* [Online] Munster University: Germany. Available from: https://www.uni-muenster.de/imperia/md/content/religion_und_moderne/preprints/crm_working_paper_012012_casper.pdf (Accessed 30 April 2017)

Central Bank of Bahamas (2016) *Technology Risk Management Guidelines* [Online] Central Bank of Bahamas: Bahamas. Available from: http://www.centralbankbahamas.com/download/095400500.pdf (Accessed 08 March 2017)

Central Bank of Bahrain (2019) *Liquidity Risk: Operational Consideration* [Online]. Central Bank of Bahrain: Manama. Available from: https://cbben.thomsonreuters.com/entiresection/208408 (Accessed 21 January 2021)

Chhapra, I. U., Ahmed, A., Rehan, R., & Hussain, F. (2018). Consumer's Preference and Awareness: Comparative Analysis Between Conventional and Islamic Ijarah Auto Financing in Pakistan. AlIqtishad: Jurnal Ilmu Ekonomi Syariah (Journal of Islamic Economics). Vol. 10 (2): pp 389 – 402. doi: http://dx.doi.org/10.15408/aiq.v10i2.7106 (Accessed 30 March 2020)

Chisambara, P. (2019) *Thinking About The Upside of Risk* [Online] erpminsights. Available from: https://erpminsights.com/thinking-about-the-upside-of-risk/ (Accessed 11 July 2020)

CIBAFI (2017) *CIBAFI BRIEFING: BancaTakaful: Building Synergies, Creating Opportunities.* General Council for Islamic Banks and Financial Institutions: Bahrain. Available from: https://cibafi.org/Files/L1/Content/CI1387-ENGLISHBRIEFING6.pdf (Accessed 14 June 2020)

Cochrane, H. (2007) Portfolio Theory [Online] University of Chicago Graduate School of Business: USA. Available from: https://faculty.chicagobooth.edu/john.cochrane/research/papers/portfolio_text.pdf (Accessed 23 January 2017)

Cole, H. and Kocherlakota, N. (1998) "Zero Nominal Interest Rates: Why They're Good and How to Get Them" *Federal Reserve Bank of Minneapolis Quarterly Review.* 22 (2) pp. 2–10 [Online] http://faculty.wcas.northwestern.edu/~lchrist/papers/zerointerestrate.pdf (Accessed 19 November 2019)

Congressional Research Service (2018) *Systemically Important or "Too Big to Fail" Financial Institutions* [Online] Washington: USA. Available from: https://crsreports.congress.gov/product/pdf/R/R42150 (Accessed 04 January 2019)

Cirillo, P (2018) *Approaching Credit Risk: the Standardized Approach* [Online] Delft University of Technology: Netherlands. Available from: https://courses.edx.org/c4x/DelftX/TW3421x/asset/Week2_STA.pdf (Accessed 27 April 2019)

Crouhy, M., Dan G.,and Robert M., (2001). Risk Management. McGraw Hill, New York. ´

CRO Forum (2008) *CRO Forum: Internal models benchmarking study summary results* [Online] Available from: https://www.thecroforum.org/wp-content/uploads/2012/10/crofint-modelbms30jan09.pdf (Accessed 02 March 2017)

Crosbie, P. & Bohn, J. (2019) Modeling Default Risk [Online] USA: Semantic Scholars. Available from https://www.semanticscholar.org/paper/Modeling-Default-Risk-Crosbie-Bohn/fe74ef4bb41b2b4fa4979993af7d9b7504c8f55b (Accessed 04 June 2019)

Cuatero, R. (2019) *Systematic Risk: What Investors Need to know* [Online] smartassets: New York. Available from: https://smartasset.com/investing/systematic-risk (Accessed 19 April 2020)

Cumming, C. M., & Hirtle, B. J. (2001) *The Challenges of Risk Management in Diversified Financial Companies.* [Online] Economic Policy Review: Federal Reserve Bank of New York. Available at: http://www.newyorkfed.org/research/epr/01v07n1/0103cumm.pdf (Accessed 23 December 2018).

Daly, H. (2014) *Negative Natural Interest Rate and Uneconomic Growth* [Online] Center for the Advancement of Steady State Economy: USA. Available from: https://steadystate.org/the-negative-natural-interest-rate-and-uneconomic-growth/ (Accessed 21 Nov 2019)

Daly, H. (2015) *What is Wrong with a Zero Interest Rate?* [Online] Center for the Advancement of Steady State Economy: USA. Available from: https://steadystate.org/what-is-wrong-with-a-zero-interest-rate/ (Accessed 21 November 2016)

Dar, H.A., Presley, J. R. (2000) *Lack of Profit Loss Sharing in Islamic Banking: Management and Control Imbalances* [Online] Loughborough University: UK. Available from: https://iaif.ir/images/khareji/articles/bank/29.pdf (Accessed 02. October 2020)

Dar, M., Azeem, M., Masood, O. (2013) "Operational Risk Management, Risk Management Approaches, and Risk Mitigation Techniques: Challenges Faced By Islamic Financial Services" *Journal of Business and Management,* 11 (2), pp. 72-79. [Online] IOSR Journal. Available from: http://www.iosrjournals.org/iosr-jbm/papers/Vol11-issue2/J01127279.pdf?id=5023 (Accessed 22 July 2020)

Dchieche, A., Aboulaich, R. (2016) *New approach to model Salam contract for profit and loss sharing* [Online] Researchgate. Available from: https://www.researchgate.net/publication/298714498_New_approach_to_model_Salam_contract_for_profit_and_loss_sharing (Accessed 20 August 2020)

Dean, J.D. and Giffin, A.F. (2009) *Enterprise Risk Management: What is your Risk Appetite* [Online] Scribd.com. Available from: https://www.scribd.com/document/86601444/What-s-your-Risk-Appetite-J-David-Dean-and-Andrew-F-Giffin (Accessed 21 November 2016)

Deutsche Bank (2023) Deutsche Bank AG, Bangkok Branch Pillar 3 Report [Online] Deutsche Bank: Frankfurt. Available from: https://country.db.com/thailand/documents/information-disclosure-regarding-capital-fund-maintenance/Pillar3Dec2023.pdf (Accessed 06 January 2024)

Deutsche Bundesbank (2008) Liquidity risk management at credit institutions [Online] Deutsche Bundesbank: Frankfurt. Available from: https://www.bundesbank.de/resource/blob/706934/61fbf49ae51e8653fcaaaeda73d08db3/mL/2008-09-liquidity-risk-management-data.pdf (Accessed 28 February 2017)

Djojosugito, R. (2008) "Mitigating Legal Risk in Islamic Banking Operations", *Humanomic,* 24 (2), page 110-121. Emerald Group Publishing Limited [Online] DOI: 10.1108/08288660810876822 (Accessed 12 October 2020)

Dow, S.C. (2010) *Moral Hazard and the Banking Crisis* [Online] University of Stirling: UK. Available from: https://www.boeckler.de/pdf/v_2010_10_29_dow.pdf (Accessed 28 April 2017)

Dowd, K. (2005) *Measuring Market Risk.* 2nd ed. England: John Wiley & Sons, Ltd.

Du, W., Gadgil, S., Gordy, M., Vega, C. (2023) "Counterparty Risk and Counterparty Choice in the Credit Default Swap Market. Management Science" 70(6):3808-3826. https://doi.org/10.1287/mnsc.2023.4870

Drehmann, M. (2008) `Stress Tests: Objectives, Challenges and Modelling Choices`, *Riksbank Economic Review*, June (2), pp. 60-92 [Online] Available from: http://archive.riksbank.se/Upload/Dokument_riksbank/Kat_publicerat/Artiklar_PV/2008/drehmann2008_2_eng_ny.pdf (Accessed 01 November 2019)

Ejolt, (2013) Discounting the Future [Online] European Commission. Available from:

http://www.ejolt.org/2013/01/discounting-the-future/ (Accessed 05 December 2019)

El-Gamal, M. A. (2001) *An Islamic Explication of the Prohibition of Riba in Classical Islamic Jurisprudence.* Available from: http://www.ruf.rice.edu/~elgamal/files/riba.pdf (Accessed 15 April 2020)

El-Gamal, M. A. (2006) "Islamic Finance: Law, Economics and Practice" *Islamic Economic Journal* 21 (2), page 97-108 [Online] Available from: https://iei.kau.edu.sa/Files/121/Files/153881_IEI-VOL-21-2-11E-BRIslahi.pdf (Accessed 06 October 2020)

Elgari, M. (2003) *Credit Risk in Islamic Banking and Finance* [Online] Islamic Economic Studies: Kingdom of Saudi Arabia. Available from: http://iesjournal.org/english/Docs/104.pdf (Accessed 15 December 2016)

Elasrag, Hussein (2014) *Corporate governance in Islamic Finance: Basic concepts and issues* [Online] Munich Personal RePEc Archive: Munich. Available from https://mpra.ub.uni-muenchen.de/56649/1/MPRA_paper_56649.pdf (Accessed 22 March 2021)

Elderson, F. (2024) *You have to know your risks to manage them – banks' materiality assessments as a crucial precondition for managing climate and environmental risks* [Online] European Central Bank: Frankfurt. Available from: https://www.bankingsupervision.europa.eu/press/blog/2024/html/ssm.blog080524~d4ed83af2c.en.html (Accessed 17 July 2024)

ENISA (2016) *Communication, Awareness, & Consulting* [Online] European Union Agency for Network and Information Security. Available from: https://www.enisa.europa.eu/topics/threat-risk-management/risk-management/current-risk/risk-management-inventory/rm-process/crm-strategy/communication-awareness-consulting (Accessed 21 September 2016)

Enrica, M., Purba, H., Purba, A. (2021) *Risks Leading to Cost Overrun in Construction Projects: A Systematic Literature Review* [Online] Researchgate. Available from: https://www.researchgate.net/publication/351424048_Risks_Leading_to_Cost_Overrun_in_Construction_Projects_A_Systematic_Literature_Review (Accessed 27 June 2022)

Esposito, J. L. (2014). Islamic Law: The Oxford Dictionary of Islam. London: Oxford University Press.

European Banking Authority (2018) *Guidelines on institutions` stress testing* [Online] Available from: https://eba.europa.eu/sites/default/documents/files/documents/10180/2282644/2b604bc8-fd08-4b17-ac4a-cdd5e662b802/Guidelines%20on%20institutions%20stress%20testing%20%28EBA-GL-2018-04%29.pdf?retry=1 (Accessed 02 November 2019)

e-Marefa (2017) *Permanent Musharaka (Islamic law)* [Online] E-Marefa Database. Available from: https://search.emarefa.net/en/detail/THSD-2481-permanent-musharaka-islamic-law (22.07.2017)

Farhan, M, Alam, H. (2018) "Operational Risk Management in Islamic Banking; A System Thinking Approach" *Journal of Islamic Business and Management, 8 (2), pg. 450-464. Available from:* https://doi.org/10.26501/jibm/2018.0802-007 (Accessed 27 June 2019)

Febianto, I. (2012) "Adapting Risk Management for Profit and Loss Sharing Financing of Islamic Banks" *Modern Economy*, 3 (1), Scientific Research Open Access [Online] DOI:10.4236/me.2012.31011 (Accessed 22 December 2020)

Finance and Development (2008) *Will Basel II Help Prevent Crises or Worsen Them?* [Online] International Monetary Fund: Washington. Available from: https://www.imf.org/external/pubs/ft/fandd/2008/06/pdf/saurina.pdf (Accessed 04 January 2019)

Financialislam (2021) *Salam* [Online] Available from: http://www.financialislam.com/salam.html (Accessed 11 April 2021)

Financialislam (2022) *Bank Guarantee* [Online] Available from: http://www.financialislam.com/bank-guarantee.html (Accessed 11 October 2022)

Financeformulas.net (2017) *Capital Asset Pricing Model* [Online] Available from: http://www.financeformulas.net/Capital-Asset-Pricing-Model.html (Accessed 06 February 2017)

Friend, L. (2016) *What is the meaning of Organizational Structure?* [Online] Small Business: USA. Available from: http://smallbusiness.chron.com/meaning-organizational-structure-3803.html (Accessed 29 September 2016)

Frost, S. (2016) *The Importance of Training & Development in the Workplace* [Online] Small Business: USA. Available from: http://smallbusiness.chron.com/importance-training-development-workplace-10321.html (Accessed 10 October 2016)

Financial Islam (2018) *Diminishing Musharaka* [Online] Available from: https://www.financialislam.com/diminishing-musharakah1.html#:~:text=Diminishing%20Musharakah%20is%20used%20mostly,of%20financing%20from%20another%20party. (Accessed 28 February 2020)

Financial Islam (2022) *Bank Guarantee* [Online] Available from: https://www.financialislam.com/bank-guarantee.html#:~:text=Islamic%20banks%20are%20required%20to,and%20period%20of%20the%20guarantee. (Accessed 28 February 2023)

First Citizens Bank (2020) *5 Cs of Credit: What Banks Look for When Lending* [Online] First Citizens Bank: Carolina. Available from: https://www.firstcitizens.com/personal/insights/credit/5-cs-of-credit (Accessed 15 September 2020)

Gallagher, R. (1956) "Risk Management: New Phase of Cost Control", *Harvard Business Review.* 34 (5), p75-86, ebscohost [Online]. Available from: https://web.s.ebscohost.com/ehost/results?vid=0&sid=622c5d22-4fd6-4062-b223-b897b3d669b6%40redis&bquery=%28%28IS%2B%252200178012%2522%29%2BAND%2BVI%2B34%2BAND%2B%28IP%2B5%2BOR%2BIP%2B5%29%2BAND%2BSP%2B75%29&bdata=JmRiPWJ1aCZ0eXBlPTEmc2VhcmNoTW9kZT1TdGFuZGFyZCZzaXRlPWVob3N0LWxpdmU%3d (Accessed 9 December 2020)

Gatti, S. (2018) *Project Finance in Theory and Practice: Designing, Structuring, and Financing Private and Public Projects*. 3rd Edition. Academic Press, US.

Ghosh, A. (2012) *Managing Risks in Commercial and Retail Banking* [Online] USA: Wiley. Available at:https://onlinelibrary.wiley.com/doi/book/10.1002/9781119199250 (Accessed 25 March 2019).

Glantz, M., Kissel, R.(2014) Equity Derivatives [Online] *Sciencedirect* . Available from: https://doi.org/10.1016/B978-0-12-401690-3.00006-8 (Accessed 27 June 2020)

Gleason, James T. (2000), *Risk: The New Management Imperative in Finance*, Bloomberg Press, Princeton, New Jersey

Global Islamic Finance Report (2015) *Risk Management in Islamic Finance and Banking* [Online] Global Islamic Finance Report: London. Available from: http://www.gifr.net/gifr2015/ch_08.pdf (Accessed 20 December 2018)

Girotra, K. Netessine, S. (2011) "How to Build Risk into Your Business Model" *Harvard Business Review*, Vol 89(5), page 92-100, EBSCOhost [Online] Accession Number: 60156462, Available from: https://hbr.org/2011/05/how-to-build-risk-into-your-business-model (Accessed 21 September 2016)

Goldenweiser, E. A. (1938) "The Function of Deposit Banking", *Journal of the American Statistical Association*, 33 (202), page 303-310, https://doi.org/10.2307/2278904 (Accessed 22 September 2020)

Gomez, A., Landier, A. Sraer, D., Thesmar, D. (2016) *Banks' exposure to interest rate risk and the transmission of monetary policy* [Online] European Systematic Risk Board: Germany. Available from: https://www.esrb.europa.eu/pub/pdf/wp/esrbwp13.en.pdf (Accessed 20 June 2018)

Gundogdu, A. S. (2016) *Risk Management in Islamic Trade Finance* [Online] Research Gate. Available from: https://www.researchgate.net/publication/315375187_Risk_Management_in_Islamic_Trade_Finance (Accessed 20 September 2021)

Grabowski, M. and Roberts, K. (1998). "Risk mitigation in virtual organizations" *Journal of Computer-Mediated Communication*, Vol. 10(6), page. 704-722, Wiley Online Library [Online] DOI 10.1111/j.1083-6101.1998.tb00082.x (Accessed 21 September 2016)

Greenbaum, S. I., and Thakor, A.V. (2019) *Contemporary financial intermediation*. 4th ed. London: Academic Press.

Gualrad, J. H. (2014) "Legal Risks and Bank Ratings: The case of the two recent guilty pleas in the US" [Online] Scope Rating: USA. Available from: file:///C:/Users/HP/Downloads/Legal%20risks%20and%20bank%20ratings.pdf (Accessed 04 Mai 2017)

Gündoğdu, A. S. (2016) "Risk Management in Islamic Trade Finance", *Boğaziçi Journal Review of Social, Economic and Administrative Studies*, 30(2) (2016), page. 59-77. Semantic Scholar [Online] Available from: doi: 10.21773/boun.30.2.4 (Accessed 09 November 2020)

Habib, S. F. (2018), "Fundamentals of Islamic Finance and Banking: Chapter 9: Istisna" [Online], Oreilly: USA. Available from: https://learning.oreilly.com/library/view/fundamentals-of-islamic/9781119371007/c10.xhtml (Accessed 24 March 2021)

Hamid, A., Sidek, A., Abdullah, W., Ali, I.(2016) *Shari'ah Auditing: A Review Of Shari'ah Audit Practices In Islamic Financial Institution (IFIS)* [Online] SHS Web of Conferences. https://www.shs-conferences.org/articles/shsconf/pdf/2017/04/shsconf_icga2017_00019.pdf (Accessed 21 October 2020)

Haron, M., Ramli, R., Injas, M. M., Injas, R. A. (2015) "Reputation Risk and its Impact on the Islamic Banks: Case of the Murabaha", *International Journal of Economics and Financial Issues,* 5 (4), page 854-859, [Online] Econjournals.com, Available from: https://www.econjournals.com/index.php/ijefi/article/view/1406 (Accessed 15 November 2020)

Hasan, N. Farid, A. Mamun, C. (2014) "Profitability and Credit Risk Management: A Comparative Study of Commercial Banks in Bangladesh" *Journal of Business and Management*, Vol 16 (9), page 53-64, IOSR-JBM [Online] Available from: http://iosrjournals.org/iosr-jbm/papers/Vol16-issue9/Version-5/H016955364.pdf

Handy, C. (1995). "Trust and the Virtual Organization". *Harvard Business Review*, 73(3), page 40–50, EBSCOhost [Online] Accession Number: 9506195264. Available from: https://hbr.org/1995/05/trust-and-the-virtual-organization (Accessed 29 September 2016)

Hashem, S. Q., & Giudici, P. (2016) "Systemic Risk of Conventional and Islamic Banks: Comparison with Graphical Network Models" *Journal of Applied Mathematics,* 7 (17), *Scientific Research* [Online] 2079-2096. Available from: http://dx.doi.org/10.4236/am.2016.717166 (Accessed 23 December 2016)

Hassan, A. (2009). "Risk management practices of Islamic banks of Brunei Darussalam". *The Journal of Risk Finance*, 10 [1] pg. 23-37. Available from: https://doi.org/10.1108/15265940910924472

Hassan, M. K., Ashraf, A., Rashid, M., Hippler, W. Oseni, O. (2014) *Risk Management in Islamic Financial Instruments* [Online] Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (COMCEC): Karachi. Available from: https://sbb.gov.tr/wp-content/uploads/2018/11/Risk_Management_in_Islamic_Financial_Instruments.pdf (Accessed 17 July 2020)

Hassan (2017) *Shari'ah risk management framework for Islamic Financial Institutions* [Online] Research Gate. Available from: https://www.researchgate.net/publication/292844514_Shari%27ah_risk_management_framework_for_Islamic_financial_institutions (Accessed 03 November 2020)

Hassan, R., Othman, A., Omar, M., Napiah, M., Abdullah, M., Yusoff, A., Karim, M. (2010) *Shariah Risk Management Process For Islamic Financial Institutions In The Context Of Shariah Governance Framework 2010* [Online] Semantic Scholar. Available from: https://pdfs.semanticscholar.org/0b42/49958b8548742f7935cace91496aaeca9ff9.pdf (Accessed 21 October 2020)

Hassanain. K. (2016) *Principles and Practices of Islamic Insurance* [Online] Islamic

Research and Training Institute Member of the Islamic Development Bank Group: Jeddah. Available from: https://courses.edx.org/asset-v1:IRTIx+IIPP101x+3T2017+type@asset+block@Islamic_Insurance.pdf (Accessed 10 July 2020)

Helmy, M. (2012) *Risk Management in Islamic Bank* [Online] ESLSCA Business School: France. Available from: https://mpra.ub.uni-muenchen.de/38706/1/Final_Draft-Risk_management_in_islamc_banks.pdf (Accessed 01.10.2020)

Hempel, G., Donald, S., and Alan, C. (1994). Bank Management: Text and Cases. 4th Ed. Hoboken, NJ: John Wiley and Sons.

Henriksen, P. and Uhlenfeldt, T. (2006), Contemporary Enterprise-Wide Risk Management Frameworks: A comparative Analysis in a Strategic Perspective, Andersen T.J. (ed.), 57 Perspectives on Strategic Risk Management: 107-130. Denmark: Copenhagen Business School Press.

Hofstede, G. (2005). Cultures and Organizations: Software of the mind. New York: McGraw Hill

Hossain, M., Chowdhury, A. (2015) *Moral Hazard in Banking* [Online] Researchgate. Available from: https://www.researchgate.net/publication/320685615_Moral_Hazard_in_Banking (Accessed 29 April 2017)

Houston, D. B. (1964). "Risk, Insurance, and Sampling". *The Journal of Risk and Insurance* 31(4), page 511- 538 JSTOR [Online] Available from: https://www.jstor.org/stable/pdf/250806.pdf (Accessed 15 April 2020)

Hidayat, S. (2012) *Non-Muslims' Perceptions Toward Islamic Banking Services in Saudi Arabia* [Online] Researchgate. Available from: https://www.researchgate.net/publication/266478556_Non-Muslims%27_Perceptions_Toward_Islamic_Banking_Services_in_Saudi_Arabia (Accessed 06 November 2020)

Hull, John C (2012) *Risk Management and Financial Institutions.* 3rd ed. USA: John Wiley & Sons, Inc.

Hull, John C (2018) *Options, futures, and other derivatives.* 9th ed. USA: John Wiley & Sons, Inc

Hussein, E. (2014) *Corporate governance in Islamic financial institutions* [Online] Munich Personal RePEc Archive. Available from: https://mpra.ub.uni-muenchen.de/56221/1/MPRA_paper_56221.pdf (Accessed 20 October 2020)

Hurly, R. (2006) "The Decision to Trust" *Harvard Business Review*, 84(9), page 55-62 [Online] Accession number: 21882950, Available from: https://hbr.org/2006/09/the-decision-to-trust (Accessed 29 September 2016)

Hyde, P.,Lieber, T., Wackerber, P. (2009) *A Comprehensive Risk Appetite Framework for Banks.* Booz&Co: USA. Available from: https://de.scribd.com/document/397809580/A-Comprehensive-Risk-Appetite-Framework-for-Banks-En (Accessed 15 December 2017)

Hull, J. (1993) *Options, futures, and other derivatives securities* [Online] University of Toronto: Canada. Available from: https://personal.lse.ac.uk/ROBERT49/teaching/ph232/pdf/Hull-Ch1.pdf (Accessed 02 May 2023)

IBISWorld (2019) *Measure Industry Risk with Industry Research* [Online] IBISWorld: UK. Available from: https://www.ibisworld.com/industry-insider/how-to-use-industry-research/measure-industry-risk-with-industry-research/ (Accessed 15 September 2020)

Ibrahim M. F., Kamarduddin R., (2014) „The Islamic Home Financing in Malaysis Istisna' Base on Debt: Qualitative Approach" Labuan e-Journal of Muamalat and Society, Vol 8, pp. 27-38 [Online] Researchgate. Available from: https://www.researchgate.net/profile/Rosila_Kamarudin2/publication/280712491_The_Islamic_home_financing_in_Malaysia_Istisna'_base_on_debt_Qualitative_approach/links/55c1edf208ae4a2aa89324b4/The-Islamic-home-financing-in-Malaysia-Istisna-base-on-debt-Qualitative-approach.pdf (Accessed 30 March 2020)

IFN (2020) *Musharaka* [Online] Islamic Finance News: Kuala Lumpur. Available from: https://www.islamicfinancenews.com/glossary/Musharaka (Accessed 13.02.2020)

Indrianto, N., Nirwana, A., Hamsin, M. (2022) "A Review of Sharia Economic Law on the Application of the Rule of Riba in Online Sales and Purchases on the Shopee and Facebook Platforms" *Advances in Social Science, Education and Humanities Research*, 676, page 145-152 [Online] Atlantis Press. Available from: https://www.atlantis-press.com/proceedings/icims-22/125976406 (Access 14.06.2023)

Ingram, D. (2014) *Guide to ERM: Risk Appetite and Tolerance* [Online] Willi Towers Watson Wire: USA. Available from: http://blog.willis.com/2014/12/guide-to-erm-risk-appetite-and-tolerance/ (Accessed 29 September 2016)

Institute of Business and Finance (2016) *Systematic and Unsystematic Risk.* [Online] Institute of Business and Finance: San Diego. Available from: http://icfs.com/financial-knowledge-center/systematic-and-unsystematic-risk (Accessed 24 January 2016)

International Bankers (2019) *Shariah Non-Compliance Risk In Islamic Banks, And What It Means For Meeting Capital Adequacy Requirements* [Online] International Bankers. Available from: https://internationalbanker.com/banking/shariah-non-compliance-risk-in-islamic-banks/ (Accessed 15 October 2020)

Iqbal, J. (2009) "Islamic Financial Management, Volume1". Global Vision Publishing House: India

Islamic Bankers Resource Centre (2014) *Islamic Banking & Finance: Principles And Practices* [Online] Available from: https://islamicbankers.me/wp-content/uploads/2014/09/marifas-practical-guide-to-islamic-banking-and-finance.pdf (Accessed 17 July 2020)

IslamiCity (2019) *Riba* [Online] IslamiCity.org: USA. Available from: https://www.islamicity.org/IslamicGlossary/action.lasso.asp?-database=Services&-Table=IslamicGlossary&-noresultserror=SearchGlossary.asp&-Response=SearchGlossary.asp&-

MaxRecords=10&-SortField=Term&-SortOrder=Ascending&-op=cn&fsearch=riba&-find (Accessed 11 November 2019)

Islamic Financial Services Board (2005) Guiding Principles of Risk Management for Institutions (Other than Insurance Institutions) Offering Only Islamic Financial Services. IFSB: Kuala Lumpur. Available at: https://www.ifsb.org/wp-content/uploads/2023/10/IFSB-1-December-2005_En.pdf (Accessed 22 July 2020)

Islamic Financial Services Board (2021*) Revised Capital Adequacy Standard for Institutions Offering Islamic Financial Services* [Online] Islamic Financial Services Board, Bank Negara Malaysia, Kuala Lumpur. Available from: https://www.ifsb.org/wp-content/uploads/2023/10/IFSB-23_En.pdf (Accessed 02 September 2022)

Islamic Financial Services Board (2014) *Islamic Financial Services Industry Stability Report 2014* [Online]. Islamic Financial Services Board, Bank Negara Malaysia, Kuala Lumpur. Available from: http://www.ifsb.org/docs/2014-05-06_IFSI%20Stability%20Report%202014%20(Final).pdf (Accessed 23 October 2016)

Islamic Markets (2019) *Riba And Nasiyah – Explained* [Online] Islamicmarkets.com. Available from: https://islamicmarkets.com/education/riba-an-nasiyah-explained (Accessed 12 November 2019)

Islamic Markets (2019) *Profit Equalization Reserve* [Online] Islamicmarkets.com. Available from: https://islamicmarkets.com/dictionary/p/profit-equalization-reserve (Accessed 06 January 2021)

Islamic Markets (2021) *Urboun* [Online] Islamicmarkets.com. Available from: https://islamicmarkets.com/dictionary/u/urboun (Accessed 13 October 2022)

Islamweb (2016) *Payment through installment* [Online] Islamweb.com. Available from: https://www.islamweb.net/en/article/135440/paying-through-installments (Accessed 12 September 2020)

Izhar, H., (2010) *Identifying Operational Risk Exposures in Islamic Banking* [Online] Kyoto University: Japan. Available from: https://kias.asafas.kyoto-u.ac.jp/1st_period/contents/pdf/kb3_2/05hylman.pdf (Accessed 27 July 2020)

Izhar, H, Hassan, Z., A., (2013) "Applying Core Principles of Risk Management in Islamic Banks' Operational Risk Analysis" *Afro Eurasian Studies,* 2(1,2), page 15-40. Dergi Park Akademik [Online] Available from: https://dergipark.org.tr/en/download/article-file/700429 (Accessed 27 November 2020)

Jasienė, M., Martinavičius, J., Jasevičienė, F. and Krivkienė, G. (2012) "Bank Liquidity Risk: Analysis and Estimates. Business, Management and Education", *Researchgate* 10(2), pp.186–204. Available from: https://www.researchgate.net/publication/273362127_Bank_Liquidity_Risk_Analysis_and_Estimates (Accessed 10 December 2019].

Jonsson, D. (2006) *Islamic Economics and the Final Jihad,* 1st ed. Xulon Press: USA

Jorion, P., & Khoury, S. J. (1996). *Financial Risk Management: Domestic and International*

Dimensions. Cambridge: Blackwell Business.

Joseph, C. (2013) *Advanced credit Risk Analysis and Management*, Wiley Finance [Online]. Available from: http://dx.doi.org/10.1002/9781118604878 *(Accessed 10 December 2018)*

Kabir, S., M. (2016) Methods of Data Collection [Online] ResearchGate: Bangladesh. Available at: https://www.researchgate.net/publication/325846997_METHODS_OF_DATA_COLLECTION (Accessed 24 March 2022)

Kaleem, A. and Abdul Wajid, R. (2009), "Application of Islamic banking instrument (Bai Salam) for agriculture financing in Pakistan", *British Food Journal*, Vol. 111 No. 3, pp. 275-292. [Online] Available from: https://doi.org/10.1108/00070700910941471 (Accessed 27 March 2020)

Karadimitriou, S. M & Marshall, *E. Mann-Whitney U test (Non-parametric equivalent to independent samples t-test)* [Online] SPSS: USA. Available from: https://maths.shu.ac.uk/mathshelp/Stats%20support%20resources/Resources/Nonparametric/Comparing%20groups/Mann-Whitney/SPSS/stcp-marshall-MannWhitS.pdf (Accessed 24 March 2022)

Kasapoğlu, E. (2018) *Risk Management in Construction* [Online] IntechOpen: UK. Available from: https://www.intechopen.com/books/sustainable-buildings-interaction-between-a-holistic-conceptual-act-and-materials-properties/risk-management-in-construction (Accessed 20 February 2020)

Kennedy, M. (1995) *Interest and Inflation Free Money*. Seva International

Kettell, B. (2011) *Introduction to Islamic Finance,* 1st ed. UK: John Wiley & Sons Ltd.

Khan, T., and Ahmed, H. (2001) *Risk Management: An Analysis of issues in Islamic Financial Industry*. IRTI/ Islamic Development Bank Occasional paper, no. 5, Jeddah. [Online] Available at: http://www.sbp.org.pk/departments/ibd/Risk_Management.pdf (Accessed 12 December 2018).

Kihanga, C. (2020) "Liquidity Risk in Conventional and Islamic Banks Literature Review" *International Journal of Scientific and Research Publications*, 10 (8). Available from: http://dx.doi.org/10.29322/IJSRP.10.08.2020.p104101 (Accesssed 17 August 2022)

Kim, Mauborgne (1997) "Fair Process: Managing in the Knowledge Economy" *Harvard Business Review.* 75(4), page 65-75, [Online] Accession number: 9706292944. Available from: 10.1093/oso/9780199291793.003.0016 (Accesssed 29 September 2016)

Kline, R. B. (2005). Principles and practice of structural equation modeling (2nd ed.). New York: The Guilford Press.

Kozarevic, E., Nuhanovic, S., Nurkic, M. B. (2013) "Comparative Analysis of Risk Management in Conventional and Islamic Banks: The Case of Bosnia and Herzegovina" *International Business Research,* 6(5), The Canadian Center of Science and Education [Online]. DOI:10.5539/ibr.v6n5p180 (Accessed 06 January 2021)

Kumar , M. (2017) Source of Data. [Online] https://pandeyusolution.wordpress.com/sources-

and-nature-of-data/ (Accessed 19.09.2022)

Kumar, R. (2014) *Strategies of Banks and Other Financial Institutions : Theories and Cases,* Ebookcentral Proquest [Online] Available from: https://ebookcentral.proquest.com/lib/ulbd/reader.action?docID=1754621&ppg=4 (Accessed 18 March 2020)

Laerd Statistics (2022) Mann- Whitney U Test [Online] Available from: https://statistics.laerd.com/spss-tutorials/mann-whitney-u-test-using-spss-statistics.php (Accessed 02 June 2022)

Lahsasna, A. (2014) *Shari'ah Non-compliance Risk Management and Legal Documentations in Islamic Finance.* 1st ed. John Wiley and Sons Singapore Pte.Ltd. Singapore

La Porte, T.R., & Consolini, P. (1991). "Working in theory but not in practice: Theoretical challenges in high reliability organizations". *Journal of Public Administration Research and Theory*. 1(1), page 19–47, [Online] Available from: http://polisci.berkeley.edu/sites/default/files/people/u3825/LaPorte-WorkinginPracticebutNotinTheory.pdf

Lastra, R.M. (2004) "Risk-based capital requirements and their impact upon the banking industry: Basel II and CAD III"*, Electronic Journal of Financial Regulation and Compliance,* Vol 12, no. 3[Online] Available from: https://www.emeraldinsight.com/doi/pdfplus/10.1108/13581980410810803 (Accessed 04 January 2017)

LawTeacher (2013) *Application of Salam in Malaysian Banking System* [Online] Available from: https://www.lawteacher.net/free-law-essays/contract-law/application-of-salam-in-malaysian-banking-system-contract-law-essay.php?vref=1 (Accessed 14 June 2018)

Layton, R. & Finger (2011) *In re Goldman Sachs Group, Inc. Shareholder Litigation: Court of chancery Dismisses Compensation and Oversight Claims against Directors* [Online] Available from: http://www.rlf.com/Practices/5147 (Accessed 09 September 2016)

Lieven, B., Moazzam, F., Steven, O. (2014) "Of religion and redemption: evidence from default on Islamic loans", *Journal of Banking and Finance,* 44, page 141-159. Zurich Open Repository and Archive, University of Zurich [Online]. Available from: https://doi.org/10.5167/uzh-99376 (Accessed 15 November 2011)

Lleo, S. (2009) *Risk Management: A Review* [Online] CFA. Available from: https://www.cfainstitute.org/-/media/documents/book/rf-lit-review/2009/rflr-v4-n1-1-pdf.ashx (Accessed 28. June.2018)

Lopez, J (2002) *What is Operation Risk* [Online] Federal Reserve Bank of San Francisco: USA. Available from: http://www.frbsf.org/economic-research/publications/economic-letter/2002/january/what-is-operational-risk/ (Accessed 15 December 2016)

LSE (2018) *What are social discount rates?* [Online] London School of Economics: London. Available from: http://www.lse.ac.uk/GranthamInstitute/faqs/what-are-social-discount-rates/ (Accessed 0 December 2019)

Madni, A., Qayyum, H., Khadam, N. (2023) "The Practices of Running Musharakah by Islamic Financial Institutions: The Shariah Analysis" *Journal of Southwest Jiaotong University,*

58 (1), Available from: DOI：https://doi.org/10.35741/issn.0258-2724.58.1.51 (Accessed 14.06.2023)

Malim, N. (2015) Islamic Banking and Risk Management: Issues and Challenges [Online] INCEIF University: Malaysia. Available from: https://kmcportal.inceif.org/custom/web/content/Islamic_banking_risk_management_issues_challenges_nurhafiza.PDF (Accessed 25. 08. 2019)

Mansour, F., Dooukanly, H. (2019) "Exchange Rate Risk in Participating (Islamic) Banks in Turkey" *International Business Management,* 13 (2), page 44-48 [Online] Medwell Journals. Available from: http://docsdrive.com/pdfs/medwelljournals/ibm/2019/44-48.pdf (Accessed 15 November 2020)

Mangelli, S. & Engle, R. (2001) *Value at Risk Model in Finance* [Online] European Central Bank: Frankfurt. Available from: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp075.pdf (Accessed 25 October 2018)

Marifa (2014) Islamic Banking & Finance: Principles and Practices [Online] Marifa Academy: India. Available from: https://islamicbankers.files.wordpress.com/2014/09/marifas-practical-guide-to-islamic-banking-and-finance.pdf (Accessed 21.08.2022)

Marin, M. (2016) *Liquidity vs. Solvency* [Online] Gateway Commercial Finance: Florida. Available from: https://gatewaycfs.com/bff/liquidity-vs-solvency (Accessed 15 December 2016)

Markowitz, H. (1952) "Selection Portfolio", *Journal of Finance* 7(1), page 77-90, Wiley Online Library [Online] DOI: 10.1111/j.1540-6261.1952.tb01525.x (Accessed: 05 September 2016)

Masood, O. Ghauri, S, M. (2015) *The rightful way of Banking*. 1 ed. Cambridge Scholar Publishing: UK

Masood, O., Javaria. K. (2017) "Liquidity Risk Management And Financial Performance In Malaysia: Empirical Evidence From Global Islamic Banks", *Journal of Islamic Financial Studies,* 3, page 62-70. DOI 10.12785/JIFS/030201 (Accessed 07 September 2022)

Masud. H. (2011) *Takaful: An Innovative Approach to Insurance and Islamic Finance*, 32 U. PA. J. INT'L L. 1133.
Available from https://scholarship.law.upenn.edu/jil/vol32/iss4/4 (Accessed 09 Junw 2020)

McCormick, R. (2010) *Legal Risk in the Financial Markets.* 2nd ed. New York: Oxford University Press

Mejía, A., Aljabrin, S., Awad, R., Norat, M. Song, I. (2014) *Regulation and Supervision of Islamic Banks* [Online] IMF Working Paper: Washington. Available from: https://www.imf.org/external/pubs/ft/wp/2014/wp14219.pdf (Accessed 06.01.2023)

Meezan Bank (2002) *Murabaha.* Ethica Institute. Available from: https://nscpolteksby.ac.id/ebook/files/Ebook/Accounting/Ethica%20Handbook%20of%20Islamic%20Finance/25.%20MURABAHA.pdf (Accessed 15 Juli 2019)

Miller, W.L., 1983. “The survey method in the social and political sciences: achievements, failures, prospects” Journal of Social Policy , 14 (1) pp. 123 – 124. DOI: https://doi.org/10.1017/S0047279400014422

Minan, S., Jaafar, S., Mohamed, S., Zamziba, N. (2017) “Future Challenges of Islamic Insurance (Takaful) in Malaysia” *International Journal of Recent Research in Commerce Economics and Management (IJRRCEM)* 4 (2), page: 87-91 Available from: https://www.paperpublications.org/upload/book/Future%20Challenges%20of%20Islamic%20Insurance-971.pdf (Accessed 17 July 2020)

Mishkin, F. S. (2001) “Prudential Supervision: Why Is It Important and What Are the Issues?” University of Chicago Press: Chicago [Online] Available from: https://www.nber.org/chapters/c10756.pdf (Accessed 14 April 2020)

Mohamed, H. (2012) Risk Management in Islamic Banks [Online] ESLSCA Business School: Paris. Munich Personal RePEc Archive. Avialable from: https://mpra.ub.uni-muenchen.de/38706/1/Final_Draft-Risk_managment_in_islamc_banks.pdf (Accessed 22 July 2020)

Mohamad, A. S., Mohamad, M. T., Samsudin, M. L. (2013) “How Islamic Banks of Malaysia Managing Liquidity? “An Emphasis on Confronting Economic Cycles“ *International Journal of Business and Social Science* [Online], 4 (7). Available from: https://ijbssnet.com/journals/Vol_4_No_7_July_2013/28.pdf (Accessed 01.10.2020)

Mohamad, N. (2014) Tawarruq In Malaysian Financing System: A Case Study on Commodity Murabahah Product at Maybank Islamic Berhad [Online] University of Malaysia: Kuala Lumpur. Available from: https://core.ac.uk/download/pdf/268876526.pdf (Accessed 15 July 2018)

Mokal, R. (2001) “Priority as Pathology: The pri passu Myth”, *The Cambridge Law Journal.* 60 (3), page 581-621. JSTOR [Online] Available from: https://www.jstor.org/stable/4508821 (Accessed 15 November 2020)

Muhammad, M. Z, Chong, R. (2007) “The Contract Of Bay’ Al-Salam And Istisna’ In Islamic Commercial Law: A Comparative Analysis” *Labuan e-Journal of Muamalat and Society,* Vol. 1, pp 21-28 [Online] Available from: https://pdfs.semanticscholar.org/5c34/9425a60a9cb9796d41771a0845b7574f0ab6.pdf (Accessed 27 March 2020)

Muhammad, T., Melemi, A. (2023). *Assessment of 5Cs Relationship towards Credit Risk Management: Evidence from Islamic Banks* [Online] Researchgate. Available from: https://www.researchgate.net/publication/372245334_Assessment_of_5Cs_Relationship_towards_Credit_Risk_Management_Evidence_from_Islamic_Banks (Accessed 17 December 2023)

Muhammed, R. (2018) *Shariah governance for Islamic banking: What can be learnt from Malaysia?* [Online] Universitas Islam Indonesia: Indonesia. Available from: https://journal.uii.ac.id/CIMAE/article/view/11935 (20 October 2020)

Muneeza, A., Nurul Atiqah Nik Yusuf, N. and Hassan, R. (2011), "The possibility of application of salam in Malaysian Islamic banking system", Humanomics, Vol. 27 No. 2, pp. 138-147.[Online] Emerald Insight. Available from: https://doi.org/10.1108/08288661111135135 (Accessed 27 March 2020)

Mustafa, O. A. (2018) "Why do Islamic Banks Concentrating Finance in Murabaha Mode? Performance and Risk Analysis (Sudan: 1997-2018)" *International Business Research,* 13(7), Canadian Center of Science and Education [Online]. Available from: https://doi.org/10.5539/ibr.v13n7p208 (Accessed 15 November 2020)

National Research Council (2005) *The Owner´s Role in Project Management,* The National Academies Press [Online] Available from: https://www.nap.edu/catalog/11183/the-owners-role-in-project-risk-management (Accessed 30.05.2018)

Neuman, W. L. (2000) "Social Research Methods: Qualitative and Quantitative Approaches" *Teaching Sociology,* 30 (3) DOI: 10.2307/3211488

Ng, K.L. and Hamby, D.M. *Fundamentals for Establishing a Risk Communication Program* [Online] University of Michigan. Available from: http://web.engr.oregon-state.edu/~hambydm/papers/ng.pdf (Accessed 21 September 2016)

Nikolau, K. (2009) *Liquidity Risk Concept Definitions and Interactions* [Online] European Central Bank: Frankfurt. Available from: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1008.pdf?e87aba3a52137adea91048bf54801968 (Accessed 28 February 2017)

Noor, A., Azil, R. M. (2009) "A Review of Islamic Credit Card Using Bay' Al-'Inah and Tawarruq Instrument as Adopted by Some Malaysian Financial Institution" *Journal of Muamalat and Islamic Finance Research (JMIFR)* 6 (1), Universiti Sains Islam Malaysia [online] Available from: https://jmifr.usim.edu.my/index.php/jmifr/article/view/85/84 (Accessed 06 October 2020)

Nordic Investment Bank (2024) *Risk Management Policies* [Online] Nordic Investment Bank: Helsinki. Available from: https://www.nib.int/files/b03a398106c9522e70639f435b0e79cf4bfd2eb8/risk-management-policy.pdf (Accessed 15 July 2024)

Nomran, N., Haron, R. (2020) *Shari'ah Governance for Islamic Banking: Evidence From Diverse Regulatory Environments.* IGI Global [Online] Available from: https://www.igi-global.com/gateway/chapter/249042?ct=-8585984092395870763 (Accessed 20 Oktober 2020)

Omar, H. and Mugabe, A. (2016) *Camels Model Analysis and Financial Performance in Rwanda* [Online] The International Journal of Business and Analysis. Available from: https://www.internationaljournalcorner.com/index.php/theijbm/article/view/127344 (Accessed 04 July 2017)

Osman, M. (2013) *Evaluation of the Feasibility of Islamic Bonds "Sukuk" as an alternative to Conventional Bonds.* Unpublished Manuscript, Düsseldorf Business School at the Heinrich Heine University.

Pearce, D.W. and Turner, R.K. (1991) "Economics of Natural Resources and the Environment", *The Journal of Land & Public Utility Economics*, 67 (2), pp. 272-276, JSTOR [Online]. DOI: 10.2307/3146419 (Accessed 05 December 2019)

Platen, E. and Stahl, G. A (2003) *Structure for General and Specific Market Risk* [Online] CiteseerX. Available from: https://link.springer.com/article/10.1007/BF03354603 (Accessed 18 July 2021)

Qatar Financial Center (2021) *Operational risks—istisna* [Online] Qatar Financial Center: Doha. Available from: https://qfcra-en.thomsonreuters.com/rulebook/ibank-757-operational-risks-istisna (Accessed 12 February 2021)

Rahma, A. T. (2020) New Model of Salam sale for Agricultural Development Finance [Online] Imam Mohammed Ibn Saud Islamic University: Kingdom of Saudi Arabia. Available from: https://www.corpuspublishers.com/assets/articles/article-pdf-20.pdf (Accessed 19 April 2021)

Rahman, A. Marhaini, W., Ahmad, W., Buang, A.(2011) *Can a takaful company reinsure with a reinsurance company?* [Online] Reasearchgate: Available from: https://www.researchgate.net/publication/266463073_Can_a_takaful_company_reinsure_with_a_reinsurance_company (Accessed 16 June 2020)

Rahman, S. (2005) The Classical Islamic Law Of Guarantee and its Application in Modern Islamic Banking and Legal Practice [Online] University of Wales Aberystwyth: Wales. Available from: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=1af96f344746374063da3a170d5bf9412c6baaab (Accessed 05 May 2022)

Rammal, H.G. (2004) Financing Through Musharaka: Principles and Application [Online] University of Adelaide: Australian. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1442430 (Accessed 21 August 2022)

Razali. S. (2010) *THE CONCEPT OF WA'AD IN ISLAMIC FINANCIAL CONTRACT* [Online] International Islamic University Malaysia: Malaysia. Available from: https://www.iefpedia.com/english/wp-content/uploads/2010/02/The-Concept-of-Waad-in-Islamic-Financial-Contract.pdf (Accessed 19 November 2022)

Riley, J. (2015) *Introduction to Training Employees (GCSE)* [Online] Tutor2u: England. Available from: http://www.tutor2u.net/business/reference/introduction-to-training-employees (Accessed 10 October 2016)

Riykiah, S. K. (2018) "Liquidity Management in Islamic Banking: Issues and Challenges" *Tazkia Islamic Finance and Business Review,* 12 (2), page 131-152.

Rizvi, A. Javed, K., Watto, M. Qureshi, M. (2022) *Islamic Perspective on Insurance: Concept, Issues and Prospects* [Online] Lahore Leads University: Pakistan. Available from: https://www.archives.palarch.nl/index.php/jae/article/download/11092/9954 (Accessed 18 Januar 2021)

Rocho, L. & Rossi, S. (2003) Modern Theories of Money: The Nature and Role of Money in Capitalist Economies. Edward Elgar Publishing: Massachusetts

Rowan, K.E. (1994) "Why rules for risk communication are not enough: a problem-solving approach to risk communication". *Risk Analysis* 14(3), page 65-374; Wiley Online Library [Online] DOI: 10.1111/j.1539-6924.1994.tb00253. (Accessed: 21 September 2016)

Saeed, M.(2019) *Effect of Takaful Models on Performance of Takaful Operators* [Online] SSRN. Available at SSRN: https://ssrn.com/abstract=3500383 or http://dx.doi.org/10.2139/ssrn.3500383 (Accessed 16. June 2022)

Salman, S. A. (2015) "Takaful Islamic Insurance: Where We Started And Where We Are Now" *International Journal of Economics, Finance and Management Sciences,* 3 (5), page 7-15; Science Publishing Group [Online] DOI: 10.11648/j.ijefm.s.2015030502.12 (Accessed 26 June 2020)

Santomero, Anthony M. (1997) "Commercial bank risk management: an analysis of the process". *Journal of Financial Services Research* 12(2), page 83–115; SpringerLink [Online] DOI: 10.1023/A:1007971801810 (Accessed: 21 November 2016)

Sarea, M., Hanefah, M. (2013) "The need of accounting standards for Islamic financial institutions: evidence from AAOIFI". *Journal of Islamic Accounting and Business Research* Online] 4(1), 64-76. Emerald Insight. Available from: https://www.emerald.com/insight/content/doi/10.1108/17590811311314294/full/html (Accessed 21 October 2020)

Scandizzo, S. (2011). A framework for the analysis of reputational risk. Journal of Operational Risk, 6 (3), 41-63.

Schooner, H. M. & Taylor, M. W. (2010) *Global Bank Regulations: Principles and Policies,* ScienceDirect [Online] Available from: https://www.sciencedirect.com/science/book/9780126410037 (Accessed: 18 July 2018)

Senior Supervisory Group (2009) *Risk Management Lessons from the Global Banking Crisis of 2008* [Online] Bank for International Settlements: Basel. Available at: http://www.sec.gov/news/press/2009/report102109.pdf (Accessed 7 December 2007]

Serap, O. G. (2013) *Takaful and Mutual Insurance: Alternative Approaches to Managing Risk* [Online] World Bank: Washington. Available from: http://hdl.handle.net/10986/13087 (Accessed 12 June 2020)

Shaikh, S. (2014) *Towards a Sustainable Islamic Microfinance Model in Pakistan* [Online] National University of Malaysia. Munich Personal RePEc Archive: Munich. Available from: https://mpra.ub.uni-muenchen.de/68748/1/MPRA_paper_68748.pdf (Accessed 18 September 2020)

Shaikh, M. F. (2012) *Financing under Islamic Export Refinance Scheme* [Online] Bank Islami: Pakistan. Available from: https://studylib.net/doc/5575091/export-refinance-under-islamic-banking (Accessed 27 March 2020)

Sheehan, Norman T. (2010) "A risk-based approach to strategy execution", *Journal of*

Business Strategy 31(5), page.25 – 3; Emeraldinsight [Online] DOI http://dx.doi.org/10.1108/02756661011076291

Siddiqui, A. (2018) *Mudaraba?* [Online] Meezan Bank: Pakistan. Available from: https://www.meezanbank.com/wp-content/themes/mbl/downloads/Mudarbah.pps (Accessed 20 March 2020)

Simon, R. (1999) *How Risky is your Company?* [Online] Harvard Business Review: Harvard. Available from: https://hbr.org/1999/05/how-risky-is-your-company (Accessed 15 September 2020)

Smith, S. (2015) *DEBT CREDIT RISK ANALYSIS* [Online] University of Central Florida: Florida. Available from: https://webcourses.ucf.edu/files/43874416/download?verifier=p0VHXRQYl-rGw87QSGDOlzAQvaOLwUOiW3BK8N1Ke (Accessed 17 September 2020)

Soualhi, Y. (2015) *Application of Sharī'ah contracts in contemporary Islamic finance: A maqāṣid perspective* [Online] International Shariah Research Academy (ISRA): Malaysia. Availabe from: https://www.researchgate.net/publication/290450824_Application_of_Shari'ah_contracts_in_contemporary_Islamic_finance_A_maqasid_perspective (Accessed 15 October 2020)

State Bank of Pakistan. Risk Management Guidelines for Islamic Banking Institutions. State Bank of Pakistan: Karachi [Online] Available from: https://www.sbp.org.pk/ibd/2008/Annex-c1.pdf (Accessed 11 December 2020)

Stamati, D. H. (2012) *10 Essentials for High Performance Quality in the 21st Century.* Taylor and Francis Group, LLC: USA

Steven, A. (2013) Financial risk management a practitioner's guide to managing market and credit risk. NJ Wiley: USA

Storbeck, O. (2019) German small savers hit with negative rates [Online] Financial Times: London. Available from: https://www.ft.com/content/ab8ed346-0ae7-11ea-bb52-34c8d9dc6d84 (Accessed 22 November 2019)

Study.com (2016) *What is Organizational Culture? - Definition & Characteristics* [Online] Available from: http://study.com/academy/lesson/what-is-organizational-culture-definition-characteristics.html (accessed 21 September 2016)

Sundararajan, V. (2005*) Risk Measurement and Disclosure in Islamic Finance and the Implications of Profit Sharing Investment Accounts* [Online] Iqtishad Consulting: Jakarta. Available from: https://www.iqtishadconsulting.com/assets/media/file/file-risk-measurement-and-disclosure-in-islamic-finance-and-the-implications-of-profit-sharing-investment-accounts.pdf (Accessed 12 October 2020)

Suprayitno, E., Ihyak, M., Segaf, S., (2023). "Risk management in Islamic financial institutions (literature review)". *Enrichment : Journal of Management*, *13*(2), 1560-1567. https://enrichment.iocspublisher.org/index.php/enrichment/article/view/1473/1075 (Accessed 19.12.2023)

Surbhi, S. (2017) *Difference between Systematic and Unsystematic Risk* [Online]

keydifferences.com. Available from: http://keydifferences.com/difference-between-systematic-and-unsystematic-risk.html (Accessed 24 January 2017)

Swartz, N. O. (2013) "Risk Management in Islamic Banking" *African Journal of Business Management,* 7(37), Page 3799-3809 [Online] Academic Journals. DOI: 10.5897/AJBM12.741 (Accessed 11 November 2020)

Taqi Usmani, M. (1998) *An Introduction to Islamic Finance* [Online] Available from: https://www.alhilalsa.com/advisory/intro_islamic_finance.pdf (Accessed 23 October 2019)

Tesfatsion, L. (2011) *Financial Risk Management* [Online] IOWA State University: USA. Available from: http://www2.econ.iastate.edu/classes/econ458/tesfatsion/FinancialRiskManagement.LT.pdf (Accessed 23 January 2017)

Tfaily, A. (2017) Managing Information Asymmetry And Credit Risk – A Theoretical Perspective [Online] Proceedings Of The 11th International Management Conference: Bucharest. Available from: http://conferinta.management.ase.ro/archives/2017/pdf/3_20.pdf (Accessed 15 September 2020)

The Guardian (2019) *Danish Bank Launches World's First Negative Interest Rate Mortgage* [Online] The Guardian: UK. Available from: https://www.theguardian.com/money/2019/aug/13/danish-bank-launches-worlds-first-negative-interest-rate-mortgage (Accessed 21 November 2019)

The Institute of Risk Management (2002) *The Risk Management Standard* [Online] The Institute of Risk Management: UK. Available from: https://www.theirm.org/media/4709/arms_2002_irm.pdf (accessed 20 June 2017)

Thomson Reuters (2022) Indemnification clauses in commercial contracts [Online] Thomson Reuters Practical Law: UK. Available from: https://legal.thomsonreuters.com/en/insights/articles/indemnification-clauses-in-commercial-contracts#:~:text=Indemnification%2C%20also%20referred%20to%20as,stemming%20from%20third%2Dparty%20claims. (Accessed 17.012.2023)

Thomson Reuters (2023) *Profit Rate Swap* [Online] Thomson Reuters Practical Law: UK. Available from: https://uk.practicallaw.thomsonreuters.com/9-503-3029?transitionType=Default&contextData=(sc.Default)&firstPage=true (Accessed 17.01.2023)

Thune, K. (2015) "What is Risk Tolerance? Understanding Market Risk and Yourself" [Online] Available from: https://www.thebalance.com/what-is-risk-tolerance-2466649 (accessed 22 November 2016)

Tolefat, A. (2006) Mixed Model is best approach [Online] ICMIF Takaful: Bahrain. Available online: http://www.iefpedia.com/english/wp-content/uploads/2010/06/Takaful-Articles-Mixed-Model-is-Best-Approach-by-Abdulrahman-Tolefat.pdf (Accessed 16 June 2020)

Toumi, K., Viviani, J., Chayeh, Z. (2019) "Measurement of the displaced commercial risk in Islamic Banks". *Quarterly Review of Economics and Finance*, 74, pp.18-31. ScienceDirect [Online] Available from: https://www.sciencedirect.com/science/article/abs/pii/S1062976917301989?via%3Dihub (Accessed 06 November 2020)

Tupangiu, L.(2017) “Information Asymmetry and Credit Risk“, *Finance Journal*, University of Craiova, Faculty of Economics and Business Administration, XVII (19) pp 153. 158,

Uddin, Md. A. (2015a) *Principles of Islamic Finance: Prohibition of Riba, Gharar and Maysir* [online] INCEIF: Kuala Lumpur. Available from: https://mpra.ub.uni-muenchen.de/67711/1/MPRA_paper_67711.pdf (Accessed 12 November 2019)

Uddin, Md. A. (2015b) *Risk Management Practices in Islamic Bank: A Case Study of Islami Bank Bangladesh Limited* [Online] INCEIF: Kuala Lumpu. Available from: https://mpra.ub.uni-muenchen.de/68781/1/MPRA_paper_68781.pdf (Accessed 24 April 2018)

Usmani, M. T. (1999) “The Concept of Musharaka and its Application as an Islamic Method of Financing” [Online] *Arab Law Quarterly,* 14 (3), pp 203-220. Brill [Online]. DOI: https://doi.org/10.1163/026805599125826435 (Accessed 17 March 2020)

Usmani, M. T. (1999b) *Diminishing Musharaka- An Intro to Islamic Finance* [Online] Available from: http://www.beautifulislam.net/finance/intro_to_islamic_finance.htm (accessed 17 March 2020)

Usmani, M. I (2015) *Islamic Finance: Revised & Updated Edition of Meezan Bank´s Guide to Islamic Banking* [Online] Meezan Bank: Pakistan. Available from: https://www.meezan-bank.com/wp-content/themes/mbl/downloads/GIBcomplete.pdf (Accessed 18 March 2020)

Van Greuning, H. and Iqbal, Z. (2008) Risk Analysis for Islamic Banks [Online] World Bank: Washington. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/6923/424810PUB00ISB101OFFICIAL0USE0ONLY1.pdf?sequence=1&isAllowed=y (Accessed 01 October 2020)

Van Greuning, H. Bratanovic, S. B. (2009) Analyzing Banking Risk A Framework for Assessing Corporate Governance and Risk Management [Online] World Bank: Washington. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/2618/482380PUB0Anal101OFFICIAL0USE0ONLY1.pdf?sequence=1 (Accessed 02 October 2020)

Vejzagic, M. (2014) Ijarah Muntahia Bittamlik: A Risk Management Perspective [Online] Academia.edu. Available from: https://www.academia.edu/3771266/Ijarah_Muntahia_Bittamlik_A_Risk_Management_Perspective (Accessed 15 May 2021)

Waheed, A. (2010) *Takaful Models and Global Practices* [Online] COMSATS Institute of Information Technology: Lahore. Available from: https://mpra.ub.uni-muenchen.de/40010/1/MPRA_paper_40010.pdf (Accessed 15 June 2020)

Zaharuddin, A. (2008) Money, You and Islam Views on contemporary and Islamic Banking Issues. 1 ed. True Wealth Sdn Bhd: Malaysia

Zahid. A. Ijara Risks and Mitigation [Online] Academia.edu. Available from: https://www.academia.edu/17405166/Ijarah_Risks_and_Mitigation (Accessed 15. April 2020)

Zahir, T. S. & Hassan, M. K. (2002) “A Comparative Literature Survey of Islamic Finance

and Banking". *Wiley Online Library* 10 (4), ppg. 155-199 [Online] https://doi.org/10.1111/1468-0416.00044 (Accessed 23 March 2020)

Zaino, Z., Kassin, S. (2010) "An Analysis of Islamic Banks` Exposure to Rate of Return". *Journal of Economic Cooperation and Development*, 31 (1), pp.59-84 [Online] http://www.sesric.org/files/article/341.pdf (Accessed 30 January 2019)

7. Questionnaire

Subject: You are invited to a research survey "Comparative Analysis of Risk Management Practices in Islamic Banking vs. Conventional Banking."

Dear Participant,

You are cordially invited to take part in a study called "Comparative Analysis of Risk Management Practices in Islamic Banking vs. Conventional Banking".

Manal Jaber Shaki Osman, a doctoral candidate at Heinrich Heine University-Dusseldorf, Germany, is conducting this research. The research's main purpose is to understand more about how banks (both conventional and Islamic) handle risks. This form can be filled out by bank managers, risk managers, senior credit managers, senior management, risk committee, and audit committee members, as well as experts from your bank's risk management department.

If you opt to participate, you will be asked to complete an anonymous survey. Your participation in this study is entirely voluntary, and you have the right to withdraw at any time. The survey should take no more than 30 minutes, and I'm hoping to get 100 people to participate.

There are no risks involved in taking part in this study. Answers will remain confidential, no personally identifiable information will be collected in the survey, and no one will be able to link your responses to you. The survey responses will all be recorded anonymously. Your identity is further safeguarded by the fact that you will not be asked to sign and return a consent form.

If you have any queries about this study, you may contact Manal Jaber Shaki Osman at maman109@uni-duesseldorf.de, manal.osman@gmail.com or advisor Prof. Dr. Christoph J. Börner at Christoph.Boerner@uni-duesseldorf.de.

By completing and submitting this survey, you are indicating your consent to participate in the study.

Your participation is highly appreciated.

Best regards,

Manal Jaber Shaki Osman, Doctoral Candidate, Heinrich Heine University, Germany.

Advisor Prof. Dr. Christoph J. Börner, Chair of Business Administration, in particular Financial Services, Heinrich Heine University, Germany.

Survey

Part 1: Bank General information

1. Bank Name (Optional): ----------
2. Location: ----------
3. Ownership:
    a. Domestic:
        i. Private owned
        ii. State Owned
    b. Foreign
4. Type of bank:
    a. Islamic Bank
    b. Conventional Bank
5. Your Designation in Bank: ----------
6. Nature of the bank:
    a. Retail Bank
    b. Corporate Bank
    c. Commercial Bank
    d. Investment Bank
    e. Community development bank
    f. Neobank
    g. Credit unions
    h. Saving and loan association
    i. Others (Please specify)----------
7. Most recent basic Balance Sheet Figures: Year ----------
    a. Total Assets: €---------- Domestic Currency----------
    b. Total Liabilities: €---------- Domestic Currency----------
    c. Equity Capital: € ---------- Domestic Currency----------

Part 2

1. Which of the following risk identification methods and instruments are used by your bank (you can choose more than one option)

- Sensitivity Analysis
- Delphi Interviews
- Inspection by the bank staff
- Audit and Physical Inspection
- Financial Statement Analysis
- Analysis Risk Survey
- Process Analysis
- SWOT Analysis
- Inspection by Sharia Board Members
- Benchmarking
- Scenario Analysis Internal Communication
- Stress Testing
- Checklists of possible disturbances or breakdowns
- Risk workshops

- Examination of corporate processes
- internal inspections and interviews
- Loss balance and recommendations by external experts.
- Scenario analysis
- Risk mapping
- Others (Please specify)----------

2. Main risks faced by your bank are (you can choose more than one option)

- Credit Risk
- Operational Risks
- Foreign Exchange Rate Risk
- Interest rate risk
- Equity Risk
- Legal Risk
- Rate of Return Risk
- Assets Impairment Risk
- Markup Risk
- Commodity Price Risk
- Ownership Risk
- Liquidity Risk
- Strategic Risk
- Legal risk
- Reputation Risk
- Sharia Risk
- Displaced Commercial Risk
- Assets Holding Risk
- Construction Risk
- Environmental Risk
- Supply Risk
- Others (Please specify)----------

Part 3: Risk Identification

The following questions are about your bank's risk identification system. Please mark the appropriate number on the scale below to show the extent of your agreement:

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	2	3	4	5

1	Your bank conducts a thorough and systematic assessment of its risk in relation to each of its stated goals and objectives.	1	2	3	4	5
2	Your bank experiences no difficulties identifying and prioritizing its major risk.	1	2	3	4	5
3	Your bank conduct Top-Down risk identification i.e. identifies largest risks	1	2	3	4	5
4	Your banks conduct Bottom- Up risk identification i.e. identifies comprehensive list of risks and drivers at the Business Unit Level	1	2	3	4	5
5	Risk changes are detected and assessed to the bank's policies and responsibilities.	1	2	3	4	5
6	Your bank has designed and implemented systems for identifying	1	2	3	4	5

	investment opportunities and revenue drivers in a systematic way.						
7	In your bank risk identification is a continuous process to test both firm level risks as well as key systemic vulnerabilities	1	2	3	4	5	
8	In your bank risk identification takes place on a regular and continuous basis throughout the organization to guarantee that the whole list of risks the institution faces, as well as the magnitude of those risks, are up to date.	1	2	3	4	5	
9	Your bank assign owners responsible for measuring, reporting, and controlling significant risks	1	2	3	4	5	
10	In your bank risk identification is not only limited to the risk function but the entire organisation is involved in order to ensure comprehensiveness	1	2	3	4	5	
11	Your bank can timely identify established as well as emerging risks	1	2	3	4	5	
12	In your bank the relationship between risks and business activities is well understood	1	2	3	4	5	
13	There is a risk assessment template in your bank to document risks, their drivers, and their materiality.	1	2	3	4	5	
14	Everyone at the bank has access to detailed risk documentation to ensure a thorough grasp of the bank's risks.	1	2	3	4	5	

Part 4: Risk Management: General

The following questions are about the general risk management issues in your bank. Please mark the appropriate number on the scale below to show the extent of your agreement:

Strongly Disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

1	Your bank has a structured risk management system in place.	1	2	3	4	5	
2	A committee in your bank is in charge of identifying, monitoring, and controlling certain risks.	1	2	3	4	5	
3	Your bank has internal guidelines and concrete procedures with respect to the risk management systems	1	2	3	4	5	
4	For senior officers and management at your bank, there is a periodical risk management reporting system.	1	2	3	4	5	
5	Your internal auditor is in charge of reviewing and validating your risk management systems, guidelines, and risk reports.	1	2	3	4	5	
6	Your bank has system in place to deal with accidents and crises.	1	2	3	4	5	
7	Bank risk appetite statement clearly defines the target market, minimum credit standards, desirable sectors, and the type of products to be developed	1	2	3	4	5	
8	The internal control system at your bank is capable of responding rapidly to newly identified risks.	1	2	3	4	5	
9	Your bank monitors and evaluates the risk management measures it employs on a regular basis.	1	2	3	4	5	
10	Material risks are immediately reported to senior management and the board of directors, and they are promptly addressed.	1	2	3	4	5	
11	Following the loan extension, your bank examines the borrower's business performance.	1	2	3	4	5	

12	Your bank views that the Basel Committee standards should be applicable to Islamic Banks too.	1	2	3	4	5
13	Your bank views that supervisors/regulators are able to assess the true risks inherent in Islamic banks.	1	2	3	4	5
14	Your bank views that the capital requirement for Islamic banks should be the same to the conventional banks.	1	2	3	4	5
15	Deposit rates of return in Islamic Banks must be comparable to interest return offered by conventional banks.	1	2	3	4	5
16	Your banks have a good understanding of the various risk involved with each Islamic modes of financing.	1	2	3	4	5
17	To avoid withdrawals due to reduced returns, your bank foregoes a portion of its profit to pay depositors (Displaced Commercial Risk).	1	2	3	4	5
18	The inability to use derivatives in Islamic Banks for hedging is seen as a bottleneck in your bank's risk management approach.	1	2	3	4	5
19	Your bank is working hard to establish Islamic-compliant risk management instruments and methodologies.	1	2	3	4	5
20	In low-performing periods, your bank has a reserve that is used to boost the profit share (rate of return) of depositors.	1	2	3	4	5

Part 5: Credit Risk Analysis & Management

The following questions are about the credit risk analysis in your bank. Please mark the appropriate number on the scale below to show the extent of your agreement:

Strongly Disagree	Disagree	Undecided	Agree	Strongly agree
1	2	3	4	5

1	Your bank has a tight credit risk policy (Centralisation of approval power).	1	2	3	4	5
2	Your bank has lenient attitude towards risk in order to garner higher market share (decentralization approval powers).	1	2	3	4	5
3	Your bank relies on financial statement as well as information related to the general economy, industry and the borrower to conduct credit analysis	1	2	3	4	5
4	Credit analysts rely only on historical data to analyse the credit worthiness of the client.	1	2	3	4	5
5	Credit Analyst prepares scenario analysis: (i) Base Case, (ii) Realistic Case and (iii) Worst Case to predict the future creditworthiness of the client.	1	2	3	4	5
6	Character, capital, capacity, conditions, collateral are considered in the credit risk analysis of clients.	1	2	3	4	5
7	In order to analyse credit risk of clients both operating risks and financial risks are studied together.	1	2	3	4	5
8	Your bank has in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.	1	2	3	4	5
9	Your bank employs an internal risk rating system in order to manage credit risk.	1	2	3	4	5
10	Your bank has an information systems and analytical techniques that provide adequate information on the composition of the credit portfolio, including identification of any concentrations of risk.	1	2	3	4	5
11	Your bank has a system in place to keep track of the credit portfolio's overall composition and quality.	1	2	3	4	5
12	Your bank has a process in place for independent, continuing evaluation of its credit risk management systems, and the outcomes of these evaluations are disclosed to the board of directors immediately.	1	2	3	4	5
13	Your banks have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.	1	2	3	4	5
14	The credit risk strategy clearly defines the bank’s willingness to grant credit based on exposure type (for example, commercial, consumer, real estate), economic sector, geographical location, currency, maturity and anticipated profitability.	1	2	3	4	5
15	Borrowers are rated in your bank according to a risk factor.	1	2	3	4	5
16	Your bank obtains information about the borrowers from credit information bureau (Bonität Schufa, creditreforms, S&Ps, Moodys, etc..)	1	2	3	4	5
17	Management of your bank has set out credit limits for different	1	2	3	4	5

	client segments, economic sectors, geographical locations etc. to avoid concentration of credit.					
18	Credit administration ensures proper approval, completeness of documents, and receipt of collateral and approval of exceptions before credit disbursement.	1	2	3	4	5
19	The credit risk strategy and policy are evaluated by the board on a regular basis.	1	2	3	4	5
20	Your bank has a financing strategy in place that identifies potential credit exposures that may occur at different stages of the different modes of financing utilizing various instruments.	1	2	3	4	5
21	Your bank conducts the necessary due diligence analysis when evaluating the risk of an investment which includes the management team's track record, the quality of the business plan, the human resources involved, and the market size for the proposed activity.	1	2	3	4	5
22	Your bank holds a controlling role in the companies in which it invests in order to better manage the project's use of funds and reduce the moral hazard problem.	1	2	3	4	5

Please allocate a numerical value to the severity of credit risk associated with each of the following. (1 being NOT SERIOUS and 6 being CRITICALLY SERIOUS, 7 Not Applicable)

23	Murabaha	1	2	3	4	5
24	Mudaraba	1	2	3	4	5
25	Musharaka	1	2	3	4	5
26	Ijara	1	2	3	4	5
27	Istisna	1	2	3	4	5
28	Salam	1	2	3	4	5
29	Personal Loans	1	2	3	4	5
30	Mortgages	1	2	3	4	5
31	Automobile Financing	1	2	3	4	5
32	Credit Cards	1	2	3	4	5
33	Business loans	1	2	3	4	5
34	Bonds	1	2	3	4	5
35	Overdrafts	1	2	3	4	5
36	Line of Credits	1	2	3	4	5
37	Equipment leasing	1	2	3	4	5
38	Project Finance	1	2	3	4	5
39	Foreign Trade Financing	1	2	3	4	5
40	Account receivable financing	1	2	3	4	5

Part 6: Risk Measurement and Mitigation Instruments

1. Please identify the metric(s) that your bank employs to measure the risk that is inherent in your bank by ticking (x) in the appropriate boxes (Please select the proper option.)

A Value at Risk (VAR)
B GAP Analysis
C Duration Analysis
D Earning at Risk (EaR)
E Risk Adjusted Return on Capital (RAROC)
F Stress Testing

G Credit ratings
H Simulation Techniques
I Internal Rating System
J Estimates of Worst-Case Scenario
I Other (please specify) ----------

2. Please identify the techniques that your bank employs to mitigate the risk that is inherent in your bank by ticking (x) in the appropriate boxes (Please select the proper option.)

A Securitisation
B SWAP Derivatives
C Options Derivatives
D Interest Rate Derivatives
E Collateral agreement
F Islamic SWAPS
G Parallel Contracts
H Guarantees
I Urboun (over the counter Islamic derivatives)
J Third Party Agreement
K Other (please specify) ----------

3. For Islamic Banks: Please share with us any Islamic Complaint Risk Management techniques that your bank use

---

If you have any further information to share regarding your bank's risk management policies, please do so in the area provided below.

Thank you!

END OF QUESTIONNAIR