

CHAPTER 2

RISK EXPOSURES IN BANKS

2.1 Introduction

This chapter contains eleven sections. The chapter provides an overview about risk in banking and risk management in banks; a brief history of risk management around the world; a comprehensive description of the state of risk management in the Central Bank of Jordan; a risk appetite framework in a central bank; credit and liquidity risk exposures in Basel III and in Islamic banking; the techniques of managing credit and liquidity risk exposures in Islamic banks; unique risks that they are exposed to from both sides of assets and liabilities under the headings of risk avoidance/elimination, risk transfer and risk absorption/management. The chapter continues with an explanation about the evaluation of bank performance, and the relationships between efficiency and bank performance and between stability and bank performance. The final section provides a summary of this chapter.

2.2 Risk in Banking

Risk is the probability of loss that may increase from the positions related to financial instruments within the trading accounts of the Bank due to problems that may increase from the financial structures and management of the institutions or guarantee the financial instruments that make up these positions. Risk is another factor that must be taken into consideration while calculating the bank performance (Gunduz, 2021). In addition, risks are defined as uncertainties resulting in adverse variations of profitability or in losses (Abu-Alrop, 2021).

Risk in banking refers to the potential loss that may occur to a bank due to the occurrence of certain events. Risk mainly emerges in financial transactions that take place due to other operational events. The primary concern for risk is the probable decline or loss of assets value as a result of certain events, such as depreciation of exchange rate, decline in interest rate or equity prices, and changes in trade policy. Risks are described as a set of events that are not isolated or perceived, which means that if a number of transactions happened, some may incur losses to the bank.

Banking risk includes two dimensions, namely the uncertainty and intensity of the impact. The uncertainty dimension denotes the possibility that the reverse events will or will not occur, while the intensity dimension denotes the possible loss if the events occur.

There are two broad categories of risks that banks face, namely business risk and control risk. Business risk is closely linked to business, and it emerges as a result of some predicted or unpredicted events in the financial market or the economy as a whole, which leads to impairment in the intrinsic value of banks. That generally identified as the risk that firm's business objectives will not be attained as a result of external and internal factors, forces, and pressures brought to bear on the firm, the risk linked with the entity's profitability and survival (Khorwatt, 2015). There are three main types of risks: market risk, credit risk, and operational risk.

Control risk is related to the failure or inadequacy of control that increases as a result of inferior control staff, in addition to the lack of understanding of the whole business system. Therefore, evaluation the control risk started from assessing the control environment because that increase when the internal control system becomes less effective, after that assess their ability to correct or prevent the material misstatements and their design effectiveness of control procedures, finally assess

whether the controls were effectively applied (Cosserat, 1999) as cited in Khorwatt (2015) .

Credit risk refers to the potential inability of a borrower to meet the payment obligations according to the imposed conditions. Default often happens as a result of business failure or inadequate income, but it might also be intentional because of the unwillingness of the borrower to meet the agreed obligations (Ghosh, 2012). Credit risk is caused by the non-performance of obligations by a borrower. While it is diversifiable, it cannot be completely removed because it is a part of systematic risk (Santomero, 1997). According to the Basel Committee on Banking Supervision (2000a), credit risk is the failure of a bank counterparty or borrower to fulfill its obligations according to the agreed terms.

Credit risk is related to the loan provided by a bank to the customer that may not be fully or partially paid on time (Campbell, 2007). The Basel Committee on Banking Supervision (2001) defined credit risk as the probability of losing outstanding loans, totally or partially, as a result of credit conditions. In other words, credit risk is the possibility of loss due to the default of a borrower or impairment of their credit standing. There are four basic drivers of credit risk, namely exposure risk, migration risk, default risk, and recovery risk.

Exposure risk is the first and most common component of credit risk. Exposure risk relates to the amount at risk with the counterparty. The term “default loss” means missing payment obligations for more than 90 days, and bankruptcy is the consequence of default. Migration is either the improvement or deterioration of the credit standing of debtors, which respectively translates into a lower or higher possibility of default. Recovery risk is the traditional approach that lending is mainly subject to the credit standing of the borrower, not to guarantees or covenants. The

main guarantees for credit recognized by the new Basel Accord are collaterals, third party protection, and covenants (Bessis, 2002).

Ghosh (2012) defined market risk as the probability of decline in the market value of earnings or assets which emerges as a result of changes in market variables. Market risk usually increases when the banks decide to make financial transactions to set up inventories of financial assets or access certain positions for profits, such as movements in equity or bond prices, exchange rates, and interest rates.

Operational risk is defined as the risk of loss as a result of failed or inadequate achievements in all departments of the bank, including treasury, technology, investment, credit, and so on. Operating risk comprises legal, social, political, economic, and regulatory environments. It may be caused by fluctuations in microeconomic and macroeconomic factors, such as high inflation, high interest rate, balance of payments deficit, slow economic growth, and so forth.

Reputational risk is the risk of loss of goodwill, image, and reliability of banks due to the negative perception of society. It is a loss of public confidence, which reduces bank liquidity and eventually causing its failure.

Legal risk is defined as the risk of financial loss which results from the legal actions taken by an external party within or without a court of law. It may also be caused by the misapplication of obligations under the law or misinterpretation of the law.

Money laundering risk is a type of risk that occurs from the failure of a bank to respond to international and domestic anti-money laundering laws and regulations. It may involve affiliated parties and the bank's branches in other countries.

Technology risk arises from the implementation of computer systems in the bank's daily operations, saving and recovery of reports and information, and

reconciliation of books and accounts. This risk may happen as a result of inappropriate technology or wrong choices in its adoption. The risk is mainly associated with unlawful access to the computer system, unlawful manipulation of the system, and unauthorized use of the system.

Control risk is the risk that occurs primarily from human failure in the enforcement of control or inefficiency in the control framework. This failure may arise due to the lack of knowledge about the processes and products of the business. It may also result from negligence in the application of control and noncompliance with the rules and principles of business.

Interest rate risk is caused by the volatility of interest rate. For example, if the interest rate goes up, the insurer portfolio, which includes bonds, will decline in value, and customers may be more attracted to buy new contracts that offer higher yields. All these events will negatively affect the assets and liabilities of banks (Albizzati & Geman, 1994).

Bank liquidity means the capability of banks to meet its short-term financial obligations without disrupting their traditional operations (Alzorqan, 2014). Liquidity risk is the risk of a funding crisis. Some banks plan for unpredicted expansion or growth of credit that can potentially lead to a funding crisis. Such a situation is linked to an unexpected event, for example the loss of confidence, large charge-off, or a currency crisis (Santomero, 1997). It is also expressed as "the risk of being unable to liquidate a position in a timely manner at a reasonable price" (Muranaga & Ohsawa, 1997). Liquidity risk is the most common type of risk for Islamic and conventional banks, and it is the consequent of maturity mismatch. This mismatch either results in an excess of cash, which must be invested, or the shortage of cash, which requires funding (Akhtar et al., 2011). It is expressed as the bank's inability to meet its

obligations. In such a position, the depositors attempt to withdraw their funds but the banks do not have the capacity to repay them (Jenkinson, 2008).

Liquidity risk is a key factor of the financial crisis of 2008-2009. The funding sources of banks were rapidly depleting, causing them to have an inadequate amount of cash to cover their commitments as they came due (Longworth, 2010) as cited in Maaka (2013). It is a fatal risk that has become one of the fundamental risks in banking portfolio; the amplified lack of liquidity leads to bankruptcy. When banks are exposed to problems, depositors will attempt to withdraw their funds from the bank, and creditors will cease their lending to the bank. Extreme liquidity crisis or large withdrawals of money are typically followed by freezing of credit lines by other organizations, which lead to real bankruptcy.

Liquidity risk has three dimensions: 1) market liquidity risk, 2) funding risk, and 3) asset liquidity risk. Market liquidity risk is the impaired capacity to increase funds at a reasonable cost. This depresses liquidity as a result of lack of magnitude, and prices will become highly volatile. Furthermore, it involves high discounts below the par value because of the unwillingness of counterparties to trade. Funding risk relates more to the market than to a particular bank. It describes the riskiness of the issuer and its funding policy as perceived by the market. Asset liquidity risk refers to the lack of liquidity as a result of the asset's nature rather than to market liquidity. A pool of liquid assets works like a cushion against the fluctuating market liquidity. Liquid assets allow banks to meet their short-term obligations without any need for external funding, hence why banks keep an adequate share of liquid assets in their balance sheet (Bessis, 2002). Liquidity risk influences the performance and reputation of banks (Jenkinson, 2008). Depositors may become less confident in the bank if it cannot provide them the funds on time. Furthermore, competition for customer

deposits is stiff, as there is a wide range of funding products in capital and wholesale markets. Therefore, liquidity risk has become a major challenge and concern for banks worldwide (Comptroller of the Currency, 2001) as cited in Arif (2013).

2.3 Risk Management in Banks

Risk management is defined as “the human activity which integrates recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources” (Appa, 1996) as cited in Prakash & Poudel (2012). Risk management is a fundamental approach to address risks. Risks are interrelated and affect more than one area of operation, and so it is essential to determine all types of risk for each activity, process, and consequence, and treat them with an integrated approach. Risk management is an incorporated method that helps banks to optimally balance between risk and return. It helps employees and management to perceive the great number of risks. It is also an essential approach to determine the types and sources of risks, as well as the methods to optimally mitigate them (Ghosh, 2012).

Bessis (2002) indicated that risk management in banks is the application of risk-based practices and policies, including all management techniques and tools to evaluate, monitor, and control risks. Risk management is the harmonious implementation of both business and risk policies. The traditional risk practices contain certain risk limits that depend on the economic measurements of risk to guarantee the best risk-adjusted performance. The main goal of risk management is to enhance the risk-return profile of bank transactions and portfolio because “current risk is tomorrow's potential losses”. The main reason for implementing risk management is that banks are “risk machines” that identify, take, convert, and embed risks in their products and services. Risk management practices employ quantified risk measures to

monitor risks, make decisions to realize competitive advantage, achieve a balance between risk and return, and respond to rigorous regulations (Bessis, 2002).

While risk management is important, it is first necessary to answer these prevailing questions to ensure its proper implementation: What are the substantial steps that should be taken to carry out appropriate risk management? What techniques are used to manage and limit the various types of risk, and how are they controlled? To implement a risk management system, bank management may rely on these four steps: 1) standards and reports, 2) position limits or rules, 3) investment guidelines or strategies, and 4) incentive contracts and compensation. Generally, these techniques are established to measure exposure, determine the procedures that should be used to manage exposure, limit the positions of individuals at appropriate levels, and encourage decision makers to manage and control risk in a manner consistent with the objectives and goals of firms. The four steps are described in detail below:

1. Standards and reports: This step includes two different conceptual activities. The first is standard setting, which includes the classifications of risks, underwriting of standards, assignment of criteria to review all traditional risk management and control tools, and appropriate estimation and rating of exposure for diverse types of risks in the portfolio. These are all necessary for understanding the risks in the portfolio and determining which risks should be absorbed or mitigated. The second is the standardization of financial reporting through regulatory reports, firm-level risk and asset quality evaluation by a rating agency, and external auditing.
2. Position limits and rules: The second internal control technique for risk management is using the minimum standard of participation and/or position

limits. In other words, risk-taking is limited only to counterparties or assets that pass predetermined quality standards.

3. Investment guidelines and strategies: These are the third commonly used technique in risk management. The firm develops strategies to concentrate on a specific area of the market, determines the extent of appropriate mismatching of assets and liabilities or exposure, and hedges against a specific type of systematic risk.
4. Incentives schemes: The schemes allow management to enter incentive contracts with managers and provide compensation for risks. These can reduce the need for elaborate and costly controls, but this step needs precise position evaluation and appropriate internal control systems (Santomero, 1997).

2.4 History of Risk Management

The development of risk management can be historically divided into four eras, starting from risk compliance to strategic risk management: Basel I; Basel II; the 2007/8 financial crisis and Basel III and its follow-ups; in IFRS 9. The journey started with Basel I, when risk function developed risk metrics, defined the 'sandbox' in terms of risk appetite (risk limits), and reported and monitored on whether the risk exposures remained within the sandbox. In this era, Basel I capital was risk insensitive, wherefore the finance and risk function worked independently. Capital management was seen as the sole responsibility of finance. Regulatory capital and financial disclosures were not risk sensitive and thus were produced by the finance function in many banks.

The first game changer was Basel II's advanced internal ratings-based approach (A-IRB), thus the required capital under A-IRB became "risk-based", and that

required particular risk knowledge. Internal Capital Adequacy Assessment Process (ICAAP) and Pillar II clearly separated the ‘demand’ and ‘supply’ sides of capital. The demand side was the ‘required capital’ proportional to the level of risk taken, and thus was also called risk capital. The supply side was the available capital managed by the finance function to manage the substantial capital market activities. Both A-IRB regulatory capital and economic capital were risk capital and managed and evaluated by the risk function. These changes required the risk functions and finance to establish an effective partnership for co-management of the demand and supply sides of the capital.

Basel III’s demanding regulatory changes and the following difficult macroeconomic environment placed a lot of pressure on return on equity (ROE), forcing insurance companies and banks to find efficiencies specifically in capital management. Insurance companies and banks, in response to these pressures, tried to re-engineer their capital, performance management processes, and business mix to boost their ROEs. The risk function had a significant role to play. As mentioned in its risk compliance role, the risk function appointed a “sandbox” in terms of risk appetite and monitored and reported on whether the first line remained within the sandbox. In reality, there were very different risky strategies and positions; most of them were in fact ‘sub-optimal’ within the sandbox. Financial institutions must pursue the optimal risk strategy within the sandbox to maximize ROE while staying within their risk appetite limits. This optimal strategy was the risk function’s responsibility. The optimization strategies could only be executed and identified by an advanced risk function. This change turned risk compliance into strategic risk management and expanded the traditional responsibility of risk functions from being the effective brakes to being a co-pilot.

IFRS 9 is the new game changer. The impairment model is risk-based and no longer accounting-based. Provisions are estimated using predictive models by the risk function, along with scenario development and economic forecasting. The risk function also uses developed models and stress testing capabilities for quarterly production of expected credit losses, including what-if analysis and analysis-of-change. This quarterly production of expected credit losses are part of the financial disclosures which are, of course, the finance function's accountability, which requires an advanced partnership between the finance and risk functions (Ozdemir, 2018).

2.5 Risk Management in the Central Bank of Jordan

There are eight tasks related to risk management:

- a. The risks management department shall supervise the compliance of executive departments with a definite acceptable risk level.
- b. The board should verify if the risks management department makes periodical stress testing to evaluate the bank's ability to withstand conditions of stress and high risks. In addition, the main role of board in the scenarios should be clear, and it should approve the assumptions, discuss the test's results, and accept the procedures to be taken in light of the results.
- c. The board should verify the treatment of risks above the bank's risk appetite, containing the concerned senior executive management's accountability as to such overriding.
- d. Before approving any expansion of the bank's activities, the board should take into account the risks created and the qualifications and capabilities of the risk management employees.

- e. The board shall approve the ICAAP methodology of the bank's capital adequacy. This methodology should be effective, comprehensive, and capable of determining all risks to which the bank may be exposed. The capital plan and strategic plan of the bank should be taken into account in this methodology. The board should examine the methodology periodically to ensure that the bank preserves appropriate capital to mitigate all risks and verify its implementation.
- f. The board should accept the risk appetite document of the bank.
- g. The board should verify the independency of the risk management department by granting it the necessary authority to gain easy access to information from other bank departments, report to the risk management committee, and cooperate with other committees to perform its tasks.
- h. Finally, the missions of the risk management department are, as a minimum, as follows:
- i. Reviewing the bank's risk management framework before being approved by the board.
 - ii. Developing methodologies to monitor, define, control, and measure every type of risk.
 - iii. Developing work procedures and policies, carrying out risk management strategy, and managing and controlling all types of risk.
 - iv. Verifying the incorporation of risk measurement mechanisms with the MIS used therein.
 - v. Analyzing and studying all types of risk that the bank is exposed to.
 - vi. Reporting to the board through the risk management committee, with copies being sent to senior executive management. Such reports shall include information on the actual risk profile of all the bank's activities compared to

acceptable risk document (risk appetite) and how to follow up remedy of negative deviations.

- vii. Providing recommendations to the risks management committee on the bank's exposure to risks and recording exclusions out of risk management policy.
- viii. Presenting important information on the bank's risks for disclosure purposes (Central Bank of Jordan, 2016).

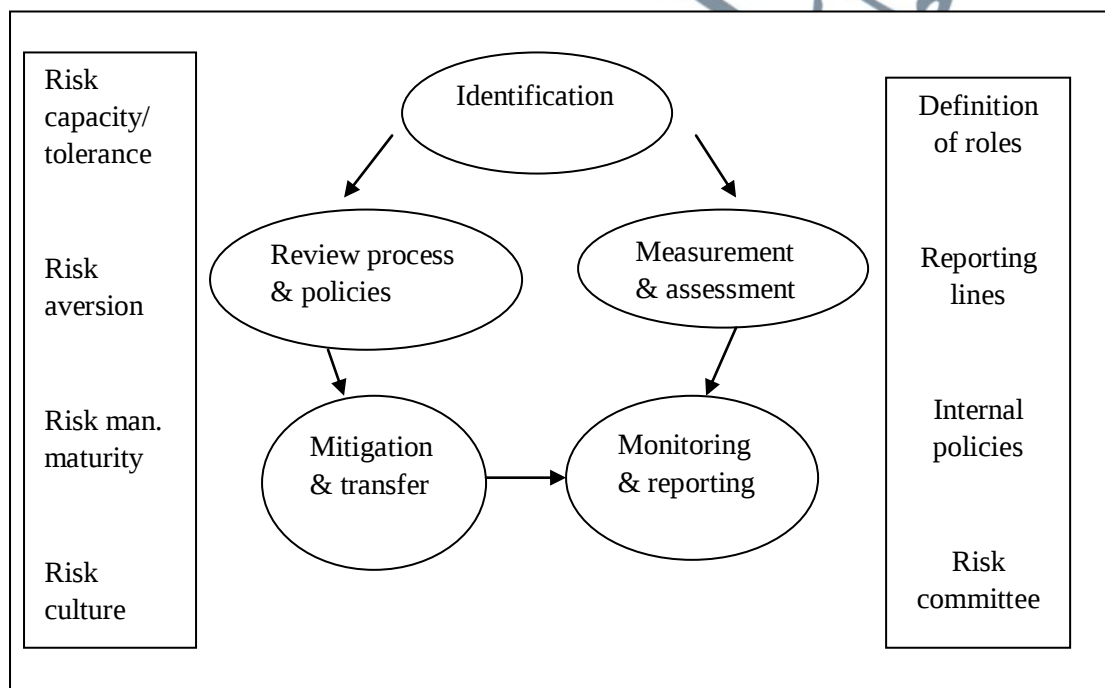


Figure 2.1: Elements of A Risk Management Framework

2.6 A Risk Appetite Framework in a Central Bank

The Institute of Risk Management defines risk appetite as the type and amount of risk that an institution is willing to take in order to meet their strategic objectives. Institutions will have several risk appetites depending on their culture, sector, and objectives. A range of appetites may change over time and exist for different risks.

The Financial Stability Board indicates that risk appetite is “the articulation in written form of the aggregate level and types of risk that a financial institution is willing to accept, or to avoid, in order to achieve its business objectives”. The Basel Committee on Banking Supervision defines risk appetite as “the aggregate types and level of risk that a bank is willing to assume, decided in advance and within its risk capacity, to achieve its business plan and strategic objectives”. Finally, the Federal Reserve of Philadelphia defines it as a formal document that provides guidelines of how much risk an organization is willing to accept. It reflects the risk management approach of the bank as it aligns with the bank’s strategic initiatives and values.

Why is a risk appetite framework necessary in a central bank? Risk appetite strengthens governance and compliance, helps guide strategic management, ensures risk-informed decision making, and forces consideration of specific risk objectives. It can also link to data analytics and the ability to interpret or capture data for risk tolerances accurately. Risk appetite should be refined and iterated over time, focusing initially on most material risk categories. A risk appetite also has a signaling impact: practicing what is preached from the regulation and conduct perspective (Andrade, 2021).

Risk, of course, takes a number of forms and can originate from a variety of sources. One dimension that is particularly important in banking is credit risk – that is, the risk of loss arising from the failure of borrowers to meet their obligations as specified in the loan contract. Another dimension is liquidity risk, which is the risk of being unable to liquidate a position in a timely manner at a reasonable price (Muranaga & Ohsawa, 1997).

2.7 Credit and Liquidity Risk Exposures in Basel III

Basel III brings new standards around capital, liquidity and leverage. There are also significant changes related to credit risk. Measures to reduce credit risk include higher Risk Weighted Assets (RWA), the new Credit Value Adjustment (CVA) charge, identification of Wrong Way Risk, and upgrading stress tests. These changes are intended to strengthen the banking sector's ability to survive significant downturns by managing risk, understanding exposure, and minimizing the impact of negative events (Senior Supervisors Group, 2010).

Credit risk in Basel III

Basel III emphasizes the importance of calculating a bank's capital needs under the "worst case scenario." In doing so, the Basel committee banking supervision focuses on a number of key topics as discussed below:

1. Stress testing of default risk: Banks will be required to calculate their default risk capital charge using a stress calibration as part of the exposure calculation. The stress calibration must be based on at least three years of historical data, which must include a period of actual increased credit spreads for a cross section of the bank's counterparties or use market implied data.
2. Credit valuation adjustment: In addition to default risk capital, banks will be required to hold capital against marked-to-market losses arising from a decline in counterparty creditworthiness.
3. Wrong-way risk: Another measure to improve counterparty credit risk evaluation is the identification and mitigation of "wrong-way risk." This risk arises when a bank's exposure to a counterparty increases as the counterparty's creditworthiness declines.

4. Asset value correlation for large institutions: To account for the potential systemic risk arising from the failure or default of a large market player.
5. Collateralized counterparties: A variety of measures to improve collateral calculation and management have been proposed as part of Basel III. The BCBS has established minimum periods at risk for margin calculations on netting sets of transactions at five business days for repo-style transactions and ten business days for all others.
6. Enhanced counterparty credit risk management: The BCBS proposed further measures to improve the quality of counterparty risk assessment procedures and practices, with particular emphasis on the operation of these functions in times of market turbulence.
7. Central counterparties: The move toward a greater use of central counterparty (CCP) clearing in the over-the counter (OTC) derivatives markets is seen as a key factor in the reduction of risk in those markets (King and Tarbert, 2011).

Liquidity Risk in Basel III

In addition, this section outlines metrics to be used as a cornerstone of information that aid supervisors in evaluating the liquidity risk of a bank. In utilizing these metrics, supervisors should take action when a deteriorating liquidity position is identified or when potential liquidity difficulties are signaled through a negative trend in the metrics, or when the absolute result of the metric recognizes a potential or current liquidity problem. The metrics discussed in this part include the following:

- i. Contractual maturity mismatch: This point provides the extent to which the bank depends on maturity transformation under its current contracts. This metric identifies the gaps between the contractual outflows and inflows of liquidity for

defined time bands. These maturity gaps tick how much liquidity a bank would need to increase in each of these time bands if all outflows occurred at the earliest possible date. Supervisors should define the time buckets to be able to understand the cash flow position of the bank. In addition, instruments and accounting information that have no specific opportunity (open maturity or non-defined) such as nonperforming loans or capital should be reported separately. This metric enables supervisors to identify market outlier's vis-à-vis liquidity and build a market-wide view.

II. Concentration of funding: this point encourages the diversification of funding resources recommended in the committee's sound principles. That determine those sources of wholesale funding that are of such significance that withdrawal of this funding could trigger liquidity problems. This metric determines the extent of funding concentration to a specific counterparty, both the supervisors and bank must record that currently it is not possible to determine the actual funding counterparty for many types of debt. This transaction affects the amount of net outflow and the strength of commercial ties.

III. Available unencumbered assets: These metrics provide supervisors with data on the key characteristics and quantity, containing location and currency denomination, of banks' available unencumbered assets. That could serve as collateral for secured borrowing in secondary markets at current or prearranged haircuts at reasonable costs. This would include collateral remains unused but that has already been accepted at the central bank. After that, a bank should report the expected monetized value of the collateral and where the assets are actually held, in terms of the location of the assets and what business lines have access to those assets. This point is useful for examining the potential for a bank to generate an additional source of secured funding or high-quality liquid assets (HQLA).

IV. LCR by significant currency: While the liquidity coverage ratio (LCR) is required to be met in one single currency, to better capture potential currency mismatches, in addition supervisors and banks should monitor the LCR in significant currencies. This metric will allow the supervisor and the bank to track potential currency mismatch issues that could arise.

V. Market-related monitoring tools: High frequency market data with no or little time lag is an early warning indicator in monitoring potential liquidity difficulties at banks. Supervisors can monitor data at the following levels: 1. Market-wide information: that control and monitor the information both on the absolute direction and level of major markets and their potential effect on the specific bank and the financial sector, 2. Information on the financial sector: this means the information to be monitored contains debt and equity market information for the financial sector broadly and for specific subsets of the financial sector, 3. Bank-specific information: To monitor whether the market has identified risks at an institution or is losing confidence in a particular institution it is useful to collect information on credit default swap (CDs) spreads, equity prices, money-market trading prices, the accurate interpretation of such information is important (Basel Committee on banking supervision, 2013).

2.8 Credit and Liquidity Risk Exposures in Islamic Banking

Islamic banks face two types of risks: risks that are unique owing to their compliance with Islam and risks that are similar to those faced by traditional financial institutions. In addition, Islamic banks cannot use the risk mitigation instruments that conventional banks use because these are not allowed under Islamic commercial law.

Risk entails both income growth opportunity and asset value vulnerability. Successful institutions take advantage of the opportunities provided by risks (Damodaran, 2005). A significant part of risk management is to understand the risk-return trade-off of different investments and assets. Investors can predict a higher return only by increasing their exposure to risks. As Islamic banking is relatively new, the risks inherent in its instruments are not well comprehended.

Islamic banks are exposed to unique risks in both sides of asset and liability. The Islamic banking model has evolved to a single tier *mudarabah* with multiple investment tools. On the asset side, Islamic banks use *murabahah* (cost-plus or mark-up sale), *ijarah* (leasing), profit-sharing modes of financing (*musharakah* and *mudarabah*), installment sale (medium/long-term *murabahah*), *istisnaa/salam* (object deferred sale or pre-paid sale), and *bai-muajjal* (price-deferred sale). On the liability side, demand deposits or checking/current accounts take the nature of *qard hasan* (interest-free loans) that are returned fully on demand. Saving and investment deposits take the form of profit-sharing investment accounts. Credit and liquidity risks faced by Islamic banks are discussed below.

2.8.1 Credit Risk in Islamic Banks

Credit risk is the loss of income as a result of the counterparty's delay in payment in full or on time as contractually agreed. Such an eventuality can underlie all Islamic modes of finance. For instance, credit risk in *murabahah* contracts emerges in the form of the counterparty's defaulting in paying the debts in time and in full. Non-payment can be caused by internal financial causes, external systematic sources, or willful default (moral hazard). Islam does not allow debt restructuring based on compensations except in the case of willful default. In the case of profit-sharing

modes of financing (like *musharakah* and *mudarabah*), credit risk comes in the form of non-payment of the bank's share by the entrepreneur when it is due. This problem may arise because of asymmetric information, where the bank does not have sufficient information on the actual profit of the firm.

2.8.2 Liquidity Risk in Islamic Banks

Liquidity risk arises from either difficulty in obtaining cash when selling assets (asset liquidity risk) or at reasonable cost from borrowings (funding liquidity risk). Islamic banks are vulnerable to serious liquidity risks for three reasons. *First*, Islamic banks are unable to raise funds quickly from the markets because of the slow development of financial instruments. *Second*, there is a *fiqh* restriction on the securitization of existing assets that are predominantly debt in nature, considering that there is no inter-Islamic bank money market. *Finally*, while the lender of last resort provides emergency liquidity facility to banks whenever needed, these facilities are based on interest and therefore Islamic banks cannot benefit from these.

2.9 Managing Credit and Liquidity Risk Exposures in Islamic Banks

The risks faced by Islamic banks are difficult and complex to mitigate for several reasons. *First*, the risks change from one kind to another at different stages of a transaction. *Second*, there are significant market risks along with credit risks in the banking book of Islamic banks, given their trading-based instruments and equity financing, unlike conventional banks. *Third*, because of deficiencies and rigidities in the infrastructure, instruments, and institutions, the risks faced by Islamic banks are magnified and/or difficult to mitigate.

There are two types for risk management techniques available for Islamic banks. The first comprises standard techniques, such as GAP analysis, internal and external audit, risk reporting, risk-adjusted return on capital (RAROC), internal rating, and so on. These are consistent with the Islamic principles of finance. The second type consists of techniques that relate to the requirements for Shariah compliance. Therefore, the discussion of risk management techniques for Islamic banking is a challenging one. This thesis discusses risk mitigation challenges and techniques under the headings of risk avoidance/elimination, risk transfer, and risk absorption/management below.

2.9.1 Risk Avoidance/Elimination

Risk avoidance techniques include the standardization of all business-related construction of a diversified portfolio, processes, and activities, as well as implementation of an incentive-compatible scheme with accountability of actions (Santomero, 1997). Some risks that banks face can be eliminated or reduced by selling or transferring them in well-defined markets. The ways used by Islamic banks to reduce or eliminate risks are discussed below.

First, contractual risk mitigation: Some risks need to be mitigated by appropriate documentation of products. *Gharar* (uncertainty of outcome caused by ambiguous conditions in contracts of deferred exchange) could be unavoidable and mild but could also be excessive and lead to contract defaults and failures. Proper contractual agreements between counterparties work as risk control techniques. A number of these can be cited as examples. For instance, to overcome the counterparty risks increasing from the non-binding nature of the *murabahah* contract, up-front payment of a substantial commitment fee has become a perpetual feature of the

contract. To avoid fulfilling the promise made by a client in taking possession of the ordered goods (in the case of *murabahah*), the contract should not be binding on the bank and be binding on the client. This case assumes that the bank will supply the goods as contractually agreed and honor the contract, even if the contract is not binding on it.

Secondly, at least theoretically, the bank holds the asset for some time, since the *murabahah* contract is approved on the condition that the bank will take possession of the asset. Thus, the holding period is more or less eliminated by the Islamic banks when appointing the client as an agent of the bank to buy the asset. Thirdly, in an *istisnaa* contract, enforceability becomes a problem specifically with respect to fulfilling the qualitative specifications. To eliminate such counterparty risks, *fiqh* scholars have allowed the addition of a penalty clause (*bund al-jazaa*). Disbursement of funds in *istisnaa* financing can be made on a staggered basis at every stage of the construction, instead of lump-sum payment at the beginning of the construction work. In addition, several contracts provide an incentive for repayment, such as a rebate on the remaining amount of mark-up.

In an environment with no formal litigation system or Islamic courts, dispute settlement is one of the significant risk factors in Islamic banks. To mitigate such risks, the counterparties can contractually agree on a process to be followed if disputes become inevitable. Islamic financial contracts include dispute settlement clauses and choice-of-law (Vogel & Hayes, 1998). These features can improve the credit quality of contracts in certain circumstances.

Second, two-step/parallel contracts: GAP analysis is one of the most reliable and common tools to manage interest rate risk. The effectiveness of a GAP management strategy depends on the “re-priceability” of liabilities and assets. Using two-step

contracts is considering one way to reduce the rate of return risk in Islamic banks. In this case, the Islamic bank can play the role of a guarantor in facilitating funds to the users. Since in a two-step contract a guarantee cannot be provided as a commercial activity under Islam, it can be provided by the Islamic bank's participation in the funding process as an actual buyer. In a two-step contract, the bank will have two *murabahah* contracts, one as a buyer with the actual supplier and the other as a supplier to the client. Thus, the bank will not make an upfront payment to the actual supplier; it only does so when it receives payment from the buyer.

Third, on-balance sheet netting, i.e., matching mutual gross financial accounting and obligations for only the net positions of the mutual obligations. There could be several considerations in this arrangement, including the maturity of the two obligations and the financial instruments and currencies involved. It can reduce the exposure of risks to the net amount between the payables and receivables to the counterparty. Netting is more convenient for payments between two subsidiaries of a firm. With non-subsidiary counterparties, the financial position of payables and receivables can generally be matched so that the mutual exposures are minimized. With the participation of a third party, the arrangement becomes a powerful risk-mitigating technique, playing the role as a clearinghouse for the obligations. Islamic banks, so far, have not designed any such techniques. This is an important area for future cooperation between Islamic banks, specifically in the market for two-step contracts.

Fourth, immunization: Once the net exposure of foreign currency is minimized, there is a possibility that the exposure can be hedged. The bank can protect against this risk by raising profit and loss sharing (PLS) deposit.

2.9.2 Risk Transfer

Risk-transferring techniques include selling or buying financial claims, using derivatives for hedging and changing borrowing terms. It is necessary to mention that most conventional derivative instruments do not conform to Islam. Some techniques that can be used to transfer risks in Islamic banks are discussed below.

- a. Credit derivatives: One of the newest instruments for credit risk management. But Islamic banks are not using any equivalent of credit derivatives, as sale of debts is prohibited, except in Malaysia.
- b. Swaps: "In a swap agreement, parties agree to exchange sets of cash flows over a period in the future" (Kolb, 1997, p. 613). Swapping variable fixed returns is one of the most common forms of swaps. Since adjustable-rent and fixed-rent sukuk have recently been introduced in the markets, this may provide the opportunity to develop additional financial engineering in the form of Islam-compatible swap arrangements.
- c. Forwards/futures: Contemporary futures contracts in terms of both receipt and payment of assets/goods are prohibited under Islamic law because of the presence of elements of *riba* and *gharar*.
- d. Options: Risk management instrument prohibited by the Islamic Fiqh Academy.

2.9.3 Risk Absorption/Management

Some risks must be absorbed by the banks and cannot be transferred or eliminated for two reasons. The first is the difficulty and complexity in separating risk from assets. The second is that financial institutions accept some risks as these are central to their business. For instance, market risks are inherent in the trading book

activities of banks and credit risks in banking book activities. Some issues related to risk management in Islamic banking are discussed below.

First, collateral, one of the most significant securities against credit loss. Islamic banks use collateral to secure finance. It is allowed in Islam and called *al-rahn* (an asset as a security in a deferred obligation). According to the principles of Islamic finance, cash, gold, silver, tangible assets and other precious commodities, and shares in debt and equities due from the finance provider to the finance user are assets eligible for collateral. On the other hand, a debt due from a third party, such as an interest-based financial instrument, is not considered as an asset in Islamic law and is not eligible for use as collateral.

Second, guarantees, which supplement collateral to enhance credit quality. Commercial guarantees are extremely important techniques to control credit risk in conventional banks. The general *fiqh* understanding prohibits their use, although some Islamic banks also use commercial guarantees.

Third, adequate loan loss reserves offer protection against expected credit losses. The effectiveness of these reserves depends on the credibility of the systems in calculating the expected losses. Islamic banks are required to maintain mandatory loan loss reserves, subject to the regulatory requirements in different jurisdictions. The reserves provide protection to investment deposits and capital against any risk of loss, including default, thereby minimizing withdrawal risk. AAOIFI Standard No. 1 provides the basis of income and loss recognition for the Islamic modes of finance. In addition to the mandatory reserves, some Islamic banks have established investment protection reserves. The Jordan Islamic Bank has pioneered the establishment of these reserves, which are established with the contributions of bank owners and investment depositors.

Fourth, allocating capital. The main concept of RAROC is to provide a decision rule to allocate capital to investments/projects according to risk (Thomson, 2001). RAROC can be used for allocating capital across business units and among several classes of assets by examining their associated risk-return factors. An application of RAROC in Islamic finance would be to assign capital for several modes of financing Islamic financial instruments with different risk profiles. For example, profit-sharing modes of financing like *mudarabah* and *musharakah* are considered riskier than *murabahah*.

Finally, Islamic banks face additional risks due to Islamic compliance and the nature of their balance sheet. Non-availability of financial instruments for Islamic banks is a major hindrance in managing market risks. Obviously, owing to religious restrictions, Islamic banks cannot enter the conventional banking market, but conventional banks can offer both Islamic and their own products. Competition no doubt improves performance, but a level playing field is a prerequisite for a healthy competitive environment (Ahmed & Khan, 2007).

2.10 Bank Performance

Performance evaluation for firms must be done using accepted criteria that consider several aspects of limitation on activities and the probability of taking advantages of facilities. It is important to first consider the purpose of performance evaluation: Different groups and individuals, whose goals are likely dissimilar, may require different evaluation approaches to make their decisions. For example, public and governmental organizations, asset owners, and creditors have different views on the definition of performance assessment and outcomes of performance (Healy, 1998) as cited in Itumo (2015).

In general, performance assessment criteria are divided into two groups: financial and non-financial (Spigelman, 1994) as cited in Itumo (2015). Financial performance is a subjective measurement of how well a firm can use assets from its primary mode of business to generate revenue. This term is also used as a general measure of a firm's overall financial health over a given period of time. It can also be used to compare similar firms within the same industry or to compare industries or sectors in aggregation. The performance assessment concept indicates that employees can maximize the firm's value by accelerating the receipt of cash flow or making them less risky or more certain (Allen and Rai, 1996) as cited in Itumo (2015).

There are several ways to measure financial performance, for example profitability ratios, liquidity ratios, market value ratios, asset management ratios, and leverage ratios (Itumo, 2015). Bank performance is the capacity to generate sustainable profitability because it is the first line of defense against unexpected losses, it improves future profitability, and it strengthens the bank's capital position.

Different stakeholders view bank performance from different perspectives. For instance, debt holders look at the ability of the bank to repay its obligations, a concern taken up by rating agencies. On the other hand, depositors are interested in the ability of banks to secure their savings in the long-term; their interests are safeguarded by supervisory authorities. Equity holders, meanwhile, focus on profit generation or insuring a future return on their current holding (European Central Bank, 2010).

2.10.1 Efficiency and Bank Performance

Banks are the most important intermediation channel between savings and investments in a country. The best financial systems quantify, limit, negotiate, and encourage savers to invest (Gulde et al., 2006). Financial intermediaries should

efficiently channel financial resources for productive use to stimulate economic growth (Levine, 1997). Efficiency measurement has become an essential emphasis; it determines how banks provide an optimal combination of financial services with a set of inputs. Measuring efficiency is the degree of process (or set of process), whether it relates to the level of success of processing within an organization, the erosion of income by expense, or the cost effectiveness of a market.

Banks as financial firms seek profitability. To do so, they efficiently and technically produce financial services for economic agents. This efficiency is evaluated by comparing optimal and observed values of production, profit, revenues, or costs of all the production system, which is under appropriate prices and quantities constraints.

Efficiency measurement is one aspect of a bank's performance. It can be measured in three ways: minimization of costs, maximization of output, and maximization of profit.

The efficiency/performance of banks can be evaluated using a number of financial ratios, such as return on asset (ROA) and return on equity (ROE). Financial ratios can measure the operating efficiency of its management and the overall financial soundness of a bank. These ratios provide valuable information about the financial performance of banks when compared with previous periods and their peers. Efficiency is "the managerial use of cost information explicitly directed at one or more of the four stages of strategic management: formulating strategies, communicating those strategies throughout the organization, developing and carrying out tactics to implement the strategies, and developing and implementing controls to monitor the success of objectives" (Shank & Govindarajan, 1993) as cited in Itumo (2015). Efficiency strategy helps banks to produce standards, provide high volume of

services and products at the most competitive price to customers, and improve the financial performance of companies competing in emerging economies (Aulakh et al., 2011).

Implementing efficiency initiatives in firms will bring a positive impact on their financial performance. These initiatives include developing and continuing substantial efficiency programs and promoting aggressive cost reduction initiatives, which will help managers to understand the long-term and short-term effects of cost reduction and efficiency programs. Efficiency also improves the productivity and strategic position of the firm, thereby increasing revenue and customer satisfaction, delivering attractive returns to shareholders, and achieving an acceptable level of profitability (Itumo, 2015).

2.10.2 Stability and Bank Performance

Bank performance is a significant factor that could influence the phases of financial stability. The financial system can be said to be stable if it fulfills these key characteristics: (i) it should comfortably absorb real economic and financial shocks; (ii) financial risks should be evaluated and priced reasonably and accurately and should also be relatively well managed; and (iii) it should be able to efficiently and smoothly transfer resources from savers to investors. Financial stability indicates a condition in which the intermediaries of a financial system and market infrastructures can effectively allocate the banks' savings to productive investment and able to withstand shocks without major disruption to the banks.

As the financial markets become more complex and their assets riskier, it becomes necessary to introduce interventions that can reduce their risks. The increasing mobility of capitals, complexity of financial instruments, openness of

markets, and growth of integration between countries make the financial markets more vulnerable to several risks. So, how does the performance of banks affect financial stability? If a financial intermediary achieves high profitability, managers will allocate part of it in monitoring and screening processes to reduce the percentage of credit risk or bad loans held by agents that invest in risky projects. This can improve the efficiency and financial stability of the bank (Barra & Zotti, 2019).

2.10.3 Bank Performance (ROE, ROA, and Tobin's Q)

In our contribution, we model bank financial performance via return-on-assets (ROA) and return-on-equity (ROE) in a stochastic setting, and then this thesis used Tobin's Q. We recall that the ROE is a measure of equity holder returns and the potential growth on their investment, while ROA is an indication of the operational efficiency of the bank while. As regards the ROE, banks hold capital in order to meet bank capital requirements set by the regulatory authorities and prevent bank failure. These stochastic models arose from a consideration of the bank's income statements and balance sheet associated with off-balance sheet items (Petersen & Schoeman, 2008). Tobin's q ratio has been used in a several situations in the financial literature to examine several financial decisions and phenomena, is assumed to represent a firm's investment or growth opportunities that explain cross-sectional returns implying that it is also a proxy for risk (Fu et al., 2017).

Efficiency analysis is essential for the evaluation of banks' performance. There are several methods to estimate banks' efficiency. Analysis of financial indicators is the most popular efficiency analysis method in banks. These methods can be classified in several ways. Such as estimating the efficiency levels is the non-parametric frontier Data envelopment analysis (DEA) method. Another way is a balance sheet

characteristic index has monopolized the banking practice. These indicators can be divided into four groups: profitability rates, margin rates, weighted result rates, and employment efficiency rates. The first groups of the indicators are profitability rates. The most common ones in this group are: return on assets (ROA), return on equity (ROE), return on sale (ROS), costs ratio (C/I) – a ratio of costs to incomes (Wozniowska, 2008).

While, bank stability has two methods to measure; Z-score and CAMELS variables, The International Monetary Fund (IMF) measures financial vulnerability and soundness using handful dimensions of Financial System Soundness with acronym CAMEL, which signifies five major dimensions of a bank namely Capital adequacy, Asset quality, Management quality, Earnings ability and Liquidity, Currently, CAMELS becomes the regulatory bodies monitoring instruments and also bank's evaluation of its performance Roman and Şargu (2013) as cited in (Abdul Karim et al., 2018). The IMF and the World Bank recommend the usage of CAMELS as the measures for financial soundness of the banking sector. While, the development of the Z-score measure which indicates the distance from insolvency combining accounting measures of leverage, profitability, and volatility. The Z-score is inversely related to the probability of a bank's insolvency Rajhi and Hassairi (2013) as cited in (Abdul Karim et al., 2018).

The financing structures of the banks affect the risk exposure, bank's profitability, capital structure decisions, degree of risk tolerance and economic performance. There are three methods of measuring risks namely Z-score, CAPM risk measures and Zrisk index. The Z-score can be interpreted as the number of standard deviations below the mean by which profits would have to fall in order to deplete equity Rahman (2010) as cited in (Abdul Karim et al., 2018).

2.11 Chapter Summary

The chapter has defined risk in banking and types of risks, mainly focusing on credit and liquidity risk. After that, it provided a brief background about risk management in banks and the techniques used to measure, control, and manage these risks. The chapter then went on to comprehensively describe risk management in the Central Bank of Jordan and around the world, credit and liquidity risk exposures in Basel III and in Islamic banking and to explain the main differences in managing risk exposures in Islamic and conventional banks. After that, it provided some explanation on bank performance, efficiency, and stability.