Daffodil Institute of Information Technology (DIIT)

First Year, Second Semester

Bachelor of Business Administration (BBA)

Theory and Practice of Banking

Chapter-5

RISK ISSUES IN BANK FINANCIAL INTUITIONS

Risk Issues in Bank Financial Intuitions: Introducing risk, Why bank should be concerned about risk, Assets-Liability management by bank, Rate sensitive assets, Rate sensitive liabilities, Types of risk faced by bank financial institutions, Interest rate risk, Model for understanding interest rate risk, maturity model, duration model, Re-pricing model, Market risk, credit risk, Market risk, credit risk, off-balance sheet risk, technology & operating risk.

1. Definition of risk.

Risk: Risk is the deviation between actual return and expected return on an investment. Risk is the variability of the actual return from the expected return associated with a given investment. Risk is the variability of returns from those that are expected on an investment.

Risk is possibility that an actual return of an investment will be lower than the expected return. The greater the variability, the riskier is the security; the lesser the variability, less risky is the security.

According to Brigham, "Risk is the chance that some unfavourable events will occur."

According to Van Horne, "Risk is the variability of returns those that are expected."

The risk–return trade-off (also called spectrum or risk–reward) implies the greater the risk, the greater the return expected. Low levels of uncertainty (low-risk) are associated with low potential returns, whereas high levels of uncertainty (high-risk) are associated with high potential returns.
A common misconception is that higher risk equals greater return. The risk/return trade-off tells us that the higher risk gives us the possibility of higher returns.
All financial decisions involve some sort of risk-return trade-off. The following figure depicts the risk-return trade-off.

In Finance: Risk is the probability that an actual return on an investment will be lower than the expected return. Financial risk is divided into Basic risk, Capital risk, Country risk, Default risk, Delivery risk, Economic risk, Exchange rate risk, Interest rate risk, Liquidity risk, Operations risk, Payment system risk, Political risk, Refinancing risk, Reinvestment risk, Settlement risk, Sovereign risk, and Underwriting risk.

2. Distinguish between Risk and Uncertainty

There are many differences between risk and uncertainty. The basic differences of these two are given below.

Basis for Comparison	Risk	Uncertainty
Meaning	The probability of winning or losing something worthy is known as risk.	Uncertainty implies a situation where the future events are not known.
Ascertainment	It can be measured	It cannot be measured.
Outcome	Chances of outcomes are known.	The outcome is unknown.
Control	Risk is Controllable	Uncertainty is Uncontrollable
Minimization	Risk can be minimized	Uncertainty cannot be minimized
Probabilities	Assigned	Not assigned

3. Important of risk management / why banks should be concerned about risk?

Bank should be concerned with risk for various reasons. The reasons why bank are concerns with risk are given at below-

Risk Identification- Risk management outlines various categories of risks faced by banks including operational, financial, strategic, compliance related and environmental, political, safety and health risks.

Risk Management- Clarifies the importance and events for tackling the risks that banks may face. This includes the information about the evaluation of various risks and four options for managing each risk. This also helps in outlining some preventive ideas to decrease the likely hood of risks immobilizing your business.

Business recovery planning- Outlines disaster planning and also minimizes the impact of the disaster on banks that is why bank should be concerns about risk and this includes aspects such as data security, employees, insurance policies and equipment.

Prevention of crime- now a day's banks are facing many money thefts and account hacking problems this outlines crimes disturbing their businesses. Banks derives some simple steps to tackle it.

Scams-Risk management discusses scars and how they could hamper business. It also lists the methods that could help to avoid scams such as investigating the source of the scam, keeping and maintaining proceedings and filtering the scam.

Money laundering- Risk management discusses money laundering problems in the areas of banks .Risk management helps to protect, such as adopting simple safety measures and by keeping track of the staff and inventory.

Data Security- This offers a variety of information, which protects the businesses and also secures data. Includes disaster recovery, risk assessment, backups and policies regarding data security.

4. Asset -Liability management by bank

Asset Liability Management (ALM) can be defined as a mechanism to address the risk faced by a bank due to a mismatch between assets and liabilities either due to liquidity or changes in interest rates. Liquidity is an institution's ability to meet its liabilities either by borrowing or converting assets. Apart from liquidity, a bank may also have a mismatch due to changes in interest rates as banks typically tend to borrow short term (fixed or floating) and lend long term (fixed or floating).

The broad responsibilities of the ALM are as follows:

1. To oversee the growth and sustainability of assets and the liabilities.
2. To manage and oversee the overall activities of Money Market. To manage liquidity and market risk of the bank.
3. To understand the market dynamics i.e. competition, potential target markets etc.
4. For expansion of the business.
5. To Provide inputs regarding market views and to suggest proper balance sheet
6. Movement (expand or shrink) to cope with the changing situation in the market or in the economy.

5. Objectives of Assets /Liabilities Management (ALM)

ALM refers to the management of a bank's portfolio of assets and liabilities in order to maximize profitability and stockholders' earning over long term, consistent with safety and liquidity considerations.

ALM addresses to the responsibility of managing the acquisition and allocation of funds to ensure adequate liquidity, maximum profitability and minimizing risks. It includes reviewing recent/past performance of exposures as an indicator to take up future activities

Based on the aforesaid premise, the broad objectives of ALM are:

Planning to Meet the Liquidity Needs: Making funds available at a competitive price when they are required is the first task of ALM. The task is to achieve a proper mix of funds by keeping the level of non-interest funds to the bare minimum, maximize the fund allocation to high profit areas while simultaneously ensuring availability of funds to meet all eventualities.

Arranging Maturity Pattern of Assets and Liabilities: Matching of assets and liabilities over different time bands and keeping a tag on their pricing by limiting their exposure to interest rate risk are issues to be looked at in the ALM process.

Controlling the rates received and paid to assets /liabilities to maximize the spread or net interest income is the final responsibility of ALM: The aforesaid objectives are accomplished without exposing the bank to excessive risk of default. Primarily employing a three pronged strategies described below ensures the attainment of these tasks,

Spread Management: Spread or margin, known differently as interest spread or interest margin or net interest spread/margin or net interest income refers to the difference between interest earned on deployment and interest paid on the acquisition of financial resources.

Gap Management: Gap refers to the difference between assets and liabilities that can be impacted due to the change in the interest rates. Such assets/liabilities are referred to as rate sensitive assets (RSA) and rate sensitive liabilities (RSL) respectively.

Interest Sensitivity Analysis: This analysis is an extrapolation of gap management strategy. It concerns with the analysis of the impact of interest changes on the bank's spread/margin and resultant overall earnings.

6. Rate sensitive asset & Rate sensitive liabilities:

Rate sensitivity: Interest rate sensitivity is a measure of how much the price of a fixed-income asset will fluctuate as a result of changes in the interest rate environment. Securities that are more sensitive have greater price fluctuations than those with less sensitivity.

Rate sensitive assets: Rate Sensitive Assets (RSA) Rate sensitive assets are bank assets, mainly bonds, loans and leases, and the value of these assets is sensitive to changes in interest rates; these assets are either re-priced or revalued as interest rates change. Rate sensitive assets are given following-

1. Cash (cash in vault, effectives, money in transit, cheques purchased) and balances with the Central Bank.
2. Financial assets where fair value change is reflected to income statement
3. Money market placements
4. Loans
5. Investments held to maturity
6. Due from banks
7. Bonds

Non rate sensitive assets: Non-RSA or Non-Rate sensitive assets are those assets whose value (Present value/PV or Future Value/FV) does not necessary changes with the change in market interest rate.

7. **Rate sensitive liabilities:** Interest sensitive liabilities are types of short-term deposits with variable interest rates that a bank holds for customers. Interest sensitive liabilities make up a significant amount of the assets of most banks, encompassing money market certificates, savings accounts, and the Super NOW account. Examples of interest sensitive liabilities includes-
   1. Money market certificates
   2. Savings accounts
   3. Super NOW account.
   4. Interbank deposits
   5. Other deposits
   6. Money market takings
   7. Miscellaneous payables
   8. Marketable securities issued
   9. Funds provided from other financial institutions

8. Types of Risk that Bank face.

Risk can be various types according to their nature and impact. Risk will differ for various business institutions. Types of risk in the area of banking is given below-

1. Credit risk
2. Market risk
3. Operational risk
4. Liquidity risk
5. Business risk
6. Reputational risk
7. Systemic risk
8. Moral hazard

Out of these eight risks, credit risk, market risk, and operational risk are the three major risks. The other important risks are liquidity risk.

Credit risk: A credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments. The Basel Committee on Banking Supervision (or BCBS) defines credit risk as the potential that a bank borrower, or counter party, will fail to meet its payment obligations regarding the terms agreed with the bank. It includes both uncertainty involved in repayment of the bank's dues and repayment of dues on time.

Market Risk: Market risk is the possibility of an investor experiencing losses due to factors that affect the overall performance of the financial markets in which he or she is involved. Market risk, also called "systematic risk," cannot be eliminated through diversification, though it can be hedged against.

Market risk is the risk of losses in positions arising from movements in market prices.

Operational Risk: Operational risk is the prospect of loss resulting from inadequate or failed procedures, systems or policies. Employee errors, Systems failures, Fraud or other criminal activities. Any event that disrupts business processes.

The Basel II Committee defines operational risk as: "The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events."

Liquidity Risk: Liquidity risk is the risk that a company or bank may be unable to meet short term financial demands. This usually occurs due to the inability to convert a security or hard asset to cash without a loss of capital and/or income in the process.

Liquidity risk is the risk that stems from the lack of marketability of an investment that cannot be bought or sold quickly enough to prevent or minimize a loss.

Business Risk: Business risk is the possibility a company will have lower than anticipated profits or experience a loss rather than taking a profit. Business risk is influenced by numerous factors, including sales volume, per-unit price, input costs, competition, and the overall economic climate and government regulations.

Reputational Risk: Reputational risk is the risk of damage to a bank's image and public standing that occurs due to some dubious actions taken by the bank. Sometimes reputational risk can be due to perception or negative publicity against the bank and without any solid evidence of wrongdoing. Reputational risk leads to the public's loss of confidence in a bank.

Systematic risk: Systematic risk, also known as "market risk" or "un-diversifiable risk", is the uncertainty inherent to the entire market or entire market segment. Also referred to as volatility, systematic risk consists of the day-to-day fluctuations in a stock's price.

Moral hazard: Moral hazard is a situation in which one party gets involved in a risky event knowing that it is protected against the risk and the other party will incur the cost. It arises when both the parties have incomplete information about each other.

So these are the main risk associated with banking activities. There are many others risk factors in banks. Like, legal risk, country risk. Banks should minimize these risks to ensure higher return and achieve highest margin.

9. Interest rate risk

Interest rate risk: Interest rate risk is the chance that an unexpected change in interest rates will negatively affect the value of an investment.

Let's assume you purchase a bond from Company XYZ. Because bond prices typically fall when interest rates rise, an unexpected increase in interest rates means that your investment could suddenly lose value. If you expect to sell the bond before it matures, this could mean you end up selling the bond for less than you paid for it (a capital loss). Of course, the magnitude of change in the bond price is also affected by the maturity, coupon rate, its ability to be called, and other characteristics of the bond.

One common way to measure a bond's interest rate risk is to calculate its duration.

10. Models for understanding interest rate risk

Interest risk management is very important for financial institutions, because most of their assets and liabilities are affected by changes in interest rates.

Duration and Convexity Model: Duration is the most commonly used risk measure for measuring the interest rate risk exposure of a security Convexity usually complements duration, providing a closer approximation to interest rate risk Consider a bond with cash flows Ct, payable at time t. The bond sells for a price P and Is priced using a term structure of continuously compounded zero-coupon yields given by y(t) Example: Compute the Interest-Rate Risk Exposure Let's take an option-free bond with an 8% coupon, ten-year bond with a price of 125. Yield to maturity is 7% Answer:

Scenario 1 is an increase of 50bps that drives the price down to 120 (this is just an estimate). To see the percentage change you take the new price after the yield change and subtract it from the initial price after the change divided by the initial price.

120 - 125 / 125 = -. 04 = a 4 % decrease in the price of the bond due to a 50 bps change

Scenario 2 is an increase of 100 bps that drives the price down to 114.

114 - 125 / 125 = - . 088 = an 8.8% decrease in price due to a 100 bps change. You can use this for any type of scenario concerning a change in yields.

11. Duration model

Duration model: Duration is a measure of the sensitivity of the price -- the value of principal -a fixed-income investment to a change in interest rates. Duration is expressed as a number of years. Bond prices are said to have an inverse relationship with interest rates.

How it works (Example):

There is more than one way to calculate duration, depending on one's compounding assumptions, but the Macaulay duration (named after Frederick Macaulay, an economist who developed the concept in 1938) is the most common. The formula is:

$$\text{Macaulay Duration} = \frac{\sum_{t=1}^{n} \left(\frac{t \times C}{(1+y)^t} + \frac{n \times M}{(1+y)^n} \right)}{\text{Current Bond Price}}$$

where:

$t = \text{respective time period}$

$C = \text{periodic coupon payment}$

$y = \text{periodic yield}$

$n = \text{total number of periods}$

$M = \text{maturity value}$

$\text{Current Bond Price} = \text{present value of cash flows}$

12. Re-pricing model:

Re-pricing model: Re-pricing risk is the risk of changes in interest rate charged (earned) at the time a financial contract's rate is reset. It emerges if interest rates are settled on liabilities for periods which differ from those on offsetting assets. Re-pricing risk also refers to the probability that the yield curve will move in a way that influence by the values of securities tied to interest rates -- especially, bonds and market securities.

The Re-pricing or funding gap is the difference between those assets whose interest rates will be re-priced or changed over some future period and liabilities whose interest rates will be re-priced or changed over some future period**.**

13. Weakness of re pricing model:

Weakness of re pricing model: The re-pricing model has some major weaknesses.

1. The Re-pricing model (RPM) measures only short-term profit changes, not shareholder wealth changes.
2. All assets and liabilities that mature within the maturity bucket are considered equally rate-sensitive; this is defector, not true if a spread effect exists
3. The RPM ignores prepayments
4. The RPM ignores cash flows generated from off-balance-sheet activities

14. Market risk:

Market risk: Market risk is the possibility of an investor experiencing losses due to factors that affect the overall performance of the financial markets in which he or she is involved. Market risk, also called "systematic risk," cannot be eliminated through diversification, though it can be hedged against.

Beta is a statistical measure of the volatility of a stock versus the overall market. It's generally used as both a measure of systematic risk and a performance measure. The market is described as having a beta of 1. The beta for a stock describes how much the stock's price moves in relation to the market.

It is the risk of loss due to the factors that affect an entire market or asset class. Market risk is also known as un-diversifiable risk because it affects all asset classes and is unpredictable. An investor can only mitigate this type of risk by hedging a portfolio. There are four primary sources of risk that affect the overall market: interest rate risk, equity price risk, foreign exchange risk and commodity risk.

15. Factors affecting market risk

Interest Rate Risk: Interest rate risk is the risk of increased volatility due to a change of interest rates. There are different types of risk exposures that can arise when there is a change of interest rates, such as basis risk, options risk, term structure risk and re-pricing risk.

Equity price risk: Equity price risk is the risk that arises from security price volatility - the risk of a decline in the value of a security or a portfolio. Equity price risk can be either systematic or unsystematic risk. Unsystematic risk can be mitigated through diversification, whereas systematic cannot be.

Foreign exchange risk: Currency risk, or foreign exchange risk, is a form of risk that arises when there is volatility in currency exchange rates. Global firms may be exposed to currency risk when conducting business due to imperfect hedges.

Commodity Risk: Commodity price risk is the volatility in market price due to price fluctuation of a commodity. Commodity risk affects various sectors of the market, such as airlines and casino gaming. A commodity's price is affected by politics, seasonal changes, technology and current market conditions.

16. Off balance sheet risk

Off balance sheet risk: Off-balance sheet (OBS), or Incognito Leverage, usually means an asset or debt or financing activity not on the company's balance sheet. Total return swaps are an example of an off-balance sheet item.

Off balance sheet risk is the risk posed by factors not appearing on an insurer's or reinsurer's balance sheet. Excessive (imprudent) growth and legal precedents affecting defence cost coverage are examples of off-balance-sheet risk.

Off balance sheet risk

1. Contingent assets
2. Contingent liabilities
3. Derivative securities

17. Liquidity risk:

Liquidity risk: The Bank defines liquidity risk as the risk of incurring losses due to an inability to meet payment obligations in a timely manner when they become due. The Bank categorizes liquidity risk into funding liquidity risk, which occurs when payment obligations cannot be fulfilled because of an inability to obtain new funding, and market liquidity risk, which occurs when the Bank is unable to sell or transform assets in the liquidity buffer into cash without significant losses. The Bank's business model gives rise to liquidity risk mainly through maturity mismatches between assets (loans and treasury investments) and liabilities (borrowing and equity).

18. Operational risk:

Operational risk: The Bank defines operational risk as the risk of direct or indirect losses or damaged reputation due to failure attributable to technology, employees, processes, procedures or physical arrangements, including external events and legal risks. The Bank is exposed to operational risk in all its activities.

19. Green banking

Green banking: Green Banking Green banking is like a normal bank, which considers all the social and environmental/ ecological factors with an aim to protect the environment and conserve natural resources. It is also called as an ethical bank or a sustainable bank.

Banks are financial institution which can play an outstanding role between sustainable economic growth and environmental protection in order to prove themselves as environment friendly and socially accountable institution. For promoting this there is nothing but "Green Banking" which is the most talked topic in the recent banking activities and responsibilities. Green Banking refers to the banking business conducted in selected area and technique that helps the reduction of carbon emission surround the world. To aid the reduction of carbon emission bank should finance green technology and pollution reducing sectors.

20. Banks' in house Green activities

1. Use of papers on both sides for internal consumption
2. Introduction of e- statement for customers in lieu of paper statement.
3. Use of online communications in the best possible manner.
4. Using more daylight instead of electric lights and proper ventilations' in lieu of using air conditioning.
5. Using energy saving bulbs.
6. Video /audio conferencing in lieu of physical travel.
7. Conversion of bank's vehicles into CNG and use of energy efficient electronic equipment.
8. Efficient use of printer cartridges, photocopy toner, office stationary etc.
9. Sharing electronic files, voice mail, and e-mail instead of paper memos.
10. Common use of table stationeries instead of individual use.