

What is Risk?

We may define Risks as:

- Uncertainties resulting in adverse outcome, adverse in relation to planned objective or expectations.
- Uncertainties associated with risk elements impact the net cash flow of any business or investment and under the impact of uncertainties; variations in net cash flow take place. This could be favorable as well as unfavorable. The possible unfavorable impact is the RISK of the business.
- Lower risk implies lower variability in net cash flow with lower upside and downside potential. Higher risk would imply higher upside and downside potential.

Risk Management Framework

Risk management framework in an organization should have well-articulated processes covering:

a) **The Committee of Senior level executives**

The committee of senior-level executives is responsible for implementation of risk and business policies simultaneously in a consistent manner and decides on the business strategy to achieve these objectives. It also sets up operating prudential limits and is the review authority for the management.

b) **Risk Management support group**

Risk management support group analyses, monitors and reports the risk profiles to the committee of senior-level executives. It also examines the effects of various possible changes in market variables and recommends the action needed. They are also responsible for the critical functions of independent risk monitoring, measurement, analysis and reporting.

Risk Identification

Nearly all transactions undertaken would have one or more of the major risks, i.e., liquidity risk, interest rate risk, market risk, default or credit risk, operational risk with their manifestation in different dimensions. Although all these risks are contracted at the transaction level, certain risks such as liquidity risk and interest rate risk are managed at the aggregate or portfolio level. Risks such as credit risk, operational risk and market risk arising from individual transactions are taken

cognizance of at transaction-level as well as at the portfolio-level. Risk Identification consist of identifying various risks associated with the risk taking at the transaction level and examining its impact on the portfolio and on capital requirement.

Risk Measurement

Risk management relies on quantitative measures of risk. The risk measures seek to capture variations in earnings, market value, losses due to default etc (referred to as target variables), arising out of uncertainties associated with various risk elements. Quantitative measures of risks can be classified into three categories.

1. Sensitivity
2. Volatility
3. Downside Potential

Sensitivity

Sensitivity captures deviation of a target variable due to unit movement of a single market parameter. Only those market parameters, which drive the value of the target variable are relevant for the purpose.

Volatility

It is possible to combine sensitivity of target variables with the instability of underlying parameters. It is a common statistical measure of dispersion around the average of any random variable such as earnings, mark to market values, losses due to default, etc. Volatility is the standard deviation of the value of these variables. Standard deviation is the square root of the variance of the random variable.

Volatility over a time horizon (T) = Daily Volatility x Square root of (T)

For example, If daily volatility of the stock were, say 2%, the volatility for 100 days would be 2×10 (Square root of 100) or 20. Here (T) which is the time horizon is 100 days.

Downside potential

Risk materializes only when earnings deviate adversely. Volatility captures both upside and downside deviations. Downside potential only captures possible losses ignoring profit potential. It is the adverse deviation of a target variable.

The downside potential has two components- potential losses and probability of occurrence. Potential losses may be estimated but difficulties lies in estimating probabilities. Hence, downside risk measures require prior modeling of the probability distribution of potential losses. Worst-case scenario serves to quantify extreme losses but has low probability of occurrence. Downside potential is the most comprehensive measure of risk as it integrates sensitivity and volatility with the adverse effect of uncertainty. This is the measure that is most relied upon by banking and financial services industry as also the regulators. The value at risk (VaR) is a downside risk measure.

The risk measures are essentially forward looking and they estimate possible future losses that may arise within certain confidence level based on historical data.

Risk pricing

Risk pricing implies factoring risks into pricing through capital charge and loss probabilities. This would be in addition to the actual costs incurred in the transaction. The actual costs incurred are costs of funds that has gone into a transaction and costs incurred in giving the services, which are incurred by way of maintaining the infrastructure, employees and other relevant expenses.

$$\text{Risk Pricing} = \text{Cost of deployable Funds} + \text{Operating Expenses} + \text{Loss Probabilities} + \text{Capital Charge}$$

Pricing should be transaction based since risk is measured at transaction level.

Risk Monitoring and Control

Modern best practices consist of setting risk limits based on economic measures of risk while ensuring best risk adjusted return, keeping in view the capital that has been invested in the business. It is a question of taking a balanced view on risk and returns and that too within the constraints of available capital.

In order to achieve the above objective, the banks have to put in place the following:

1. An organizational structure.
2. Comprehensive risk measurement approach.

3. Risk management policies adopted at the corporate level ,which is consistent with the broader business strategies, capital strength, management expertise and risk appetite.
4. Guidelines and over parameters used to govern risk taking including detailed structure of Prudential limits, discretionary limits and risk taking functions.

The Bank should have robust risk management systems for which it should ensure the following:

1. Strong Management Information System for reporting, monitoring and controlling risk.
2. Well laid out procedures, effective control and comprehensive risk reporting framework.
3. Separate risk management frame work independent of operational departments with clear delineation of responsibility for management of risk.
4. Periodical review and evaluation.

The banks establish an adequate system for monitoring and reporting risk exposures and assessing the banks changing risk profile. The bank's senior management or board of directors should on a regular basis, receive reports on the banks risk profiles and capital needs. These reports should allow senior management to:

- ✓ Evaluate the level and trend of material risks and their effect on capital levels.
- ✓ Evaluate the sensitivity and reasonableness of key assumption.
- ✓ Assess banks risk profile on a continuous basis and make necessary adjustments to the banks' strategic plan accordingly.

Risk Mitigation

Since risks arises from uncertainties associated with the risk elements, risk reduction is achieved by adopting strategies that reduce the uncertainties associated with the risk elements. This is called Risk Mitigation.

Risk Mitigation measures aim to reduce downside variability in net cash flow but also reduces upside potential simultaneously. In fact, risk mitigation measure reduce the variability in net cash flow. In addition, risk mitigation would involve counterparty and it will always be associated with counterparty risk. It may also be stated here that markets have responded to the counterparty risk by

establishing Exchanges such as stock exchange, commodity exchanges, futures and options exchanges. Such Exchanges, take up the role of counter-party and have established rules for risks minimization. As a result, when we enter into a contract with exchange as counterparty, counterparty risk remains, but gets reduced very substantially. In OTC deals, however, counterparty risk would depend upon the risk level associated with party to the contract.

RISKS IN BANKING BUSINESS

BANKING BOOK

The banking book includes all advances, deposits and borrowings, which usually arise from commercial and retail banking operations. All assets and liabilities in banking book have following characteristics:

1. They are normally held until maturity
2. Accrual system of accounting is applied

Since all assets and liabilities in the banking book are held until maturity, maturity mismatch between assets and liabilities result in excess or shortage of liquidity. This is commonly known as Liquidity Risk.

In addition, interest rate changes take place during the period on assets and liabilities held in the banking book . This affects net interest margin, i.e. ,interest received net of interest paid. This is called Interest Rate Risk.

Further, the asset side of the banking book generates credit risk arising from defaults in payment of principal and/or interest by borrowers. This is called Default Risk or Credit Risk.

Exposures under banking book also suffer from Operational Risk. These arise due to human failures of omission, deficiencies in information system and system failure, inadequacy or non – adherence to internal processes and external events.

The banking book is mainly exposed to liquidity risk, interest rate risk, default or credit risk and operational risks.

TRADING BOOK

The trading book includes all the assets that can be traded in the market. Trading book assets have following characteristics:

1. They are normally not held until maturity and positions are liquidated in the market after holding it for a period.
2. Mark-to-market system is followed and the difference between market price and book value is taken to profit and loss account.

Trading book mostly comprises of fixed income securities, equities, foreign exchange holdings, commodities, etc. held by the bank on its own account. Derivatives that are held for trading in the market or Over the Counter (OTC) and for hedging exposure under trading book would also form a part of trading book. Trading book is open to adverse movement in market prices until they are liquidated. This is termed as Market Risk.

Trading book may have liquidity issues. Instruments having lower demand have lower trading volume and are exposed to liquidation risk, where trading may trigger off adverse price movement.

Trading book is also exposed to Credit Risk or Default Risk, which arises due to failure on the part of the counterparty to keep its commitment.

Trading book is also exposed to operational risks. These arise due to human failures of omission, deficiencies in information system and system failure, inadequacy or non – adherence to internal processes and external events.

OFF – BALANCE SHEET EXPOSURES

Off- Balance sheet exposures are contingent in nature. Where banks issue guarantees, committed or back up credit liners, letters of credit etc., banks face payment obligations contingent upon some event. These contingencies adversely affect the revenue generation of banks.

Banks also have contingency receivable. Here banks are the beneficiaries subject to certain contingencies. Derivatives are off-balance sheet market exposures. They may be swaps, futures, forward contracts, foreign currency contracts, options etc.

Contingent exposure may become a fund - based exposure. Such exposures may become a part of the banking book or trading book depending upon the nature of off-balance sheet exposure. Therefore , off-balance sheet exposures may have liquidity risk, interest rate risk, market risk, default or credit risk and operational risks.

Banking Risks

The major risks in banking business are

- Liquidity Risk
- Interest Rate Risk
- Market Risk
- Default or Credit Risk
- Operational Risk

Liquidity Risk

Liquidity risk is defined as the inability to obtain funds to meet cash flow obligations at a reasonable rate.

The liquidity risk in banks may be of the following types:

- Funding risk
This arises from the need to replace net outflows due to unanticipated withdrawal /non- renewal of deposits (wholesale and retail).
- Time Risk
This arises from the need to compensate for non-receipt of expected inflows of funds .
- Call Risk
This arises due to crystallization of contingent liabilities. This may also arise when a bank may not be able to undertake profitable business opportunities when it arises.

Interest Rate Risk

Interest Rate Risk (IRR) refers to potential adverse impact on Net Interest Income or Net Interest Margin or Market value of Equity (MVE), caused by changes in

market interest rates. Interest Rate Risk can take different forms. IRR can be viewed in two ways. Its impact is on the earnings of the bank or its impact on the economic value of the bank assets, liabilities and off- balance sheet positions.

Gap or Mismatch Risk

A gap or mismatch risk arises from holding assets and liabilities and off- balance sheet items with different principal amounts, maturity dates or repricing dates, thereby creating exposures to unexpected changes in the level of market interest rates.

An example of this risk would be where an asset maturing in two years at a fixed rate of interest have been funded by a liability maturing in six months or a liability maturing over a period but getting re priced periodically. The Interest margin would undergo a change after six months / re pricing period, causing variation in net interest income (NII).

Basis Risk

The risk that the interest rate of different assets, liabilities and off- balance sheet items may change in different magnitude is termed as basis risk.

An example of basis risk would be to say in a rising interest rate scenario asset interest rate may rise in different magnitude than the interest rate on corresponding liability creating variation in net interest income.

Yield Curve Risk

In a floating interest rate scenario, banks may price their assets and liabilities based on different benchmarks, i.e. treasury bills yields, fixed deposit rates, call money rates, MIBOR etc. In case the banks use two different instruments maturing at different time horizon for pricing their assets and liabilities, any non-parallel movements in yield curves would affect the NII.

It may be noted that yield curve risk is a type of basis risk and this arises with respect to different maturity sectors.

An example would be when a liability raised at a rate linked to say 91 days Treasury bills is used to fund an asset linked to 364 days Treasury bills. In a rising interest rate scenario both 91 days and 364 days Treasury bills may increase but not equally resulting a non-parallel movement of yield curve resulting in an impact on Net Interest Income.

Embedded Option Risk

Decrease in market lending rates and increase in the market deposit rates encourages prepayment of cash credit / demand loans, term loans and exercise of call / put options on bonds/ debentures and / or premature withdrawal of term deposits before their stated maturities. These prepayments of loans and advances and premature withdrawal of deposits result in reduction of projected cash flow and income for the bank. The faster and higher the magnitude of changes in interest rate, the greater will be the hit in the NII resulting in low profitability. This risk is called embedded option risk.

Re investment Risk

Uncertainty with regard to interest rate at which the future cash flows could be reinvested is called reinvestment risk. Any mismatches in cash flows would expose the banks to variations in NII as the market interest rates move in different directions.

Net Interest Position Risk

Where banks have more earning assets than paying liabilities, interest rate risk arises when the market interest rates adjust downwards. Such banks will experience a reduction in NII as the market interest rate declines and increases

when interest rate rises. Its impact is on the earnings of the bank or its impact is on the economic value of the bank's assets and liabilities. This is referred as Net Interest Position Risk.

Market Risk

Market risk is the risk of adverse deviations of the mark-to-market value of the trading portfolio, due to market movements during the period of holding. This results from adverse movements of the market prices of interest rate instrument, equities, commodities and currencies. Market risk is also referred to as Price Risk.

Price risk occurs when assets are sold before their stated maturities. In the financial market, bond prices and yields are inversely related. The price risk is closely associated with the trading book, which is created for making profit out of short-term movements in interest rates.

Forex Risk

Forex Risk, also termed as Exchange Risk, is the risk that a bank may suffer losses as a result of adverse exchange rate movements during a period in which it has an open position, either spot or forward, or a combination of the two, in an individual foreign currency.

Market Liquidity Risk

Market Liquidity Risk arises when a bank is unable to conclude a large transaction in a particular instrument near the current market price.

Default or Credit Risk

Credit risk is defined as the risk of a bank borrower or counterparty failing to meet the obligations in accordance with agreed terms.

Counter party Risk

Non-performance of the trading partners due to counterparty's refusal or inability to perform results in counter party risk.

Country Risk

The non- performance by a borrower or counter-party arising due to constraints or restrictions imposed by a country is called country risk.

Operational Risk

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. Strategic risk and reputation risk are not a part of operational risk. It includes Fraud risk, Communication risk, Documentation risk, Competence risk, Model risk, Cultural risk, External events risk, Legal risk, Regulatory risk, Compliance risk , System risk and so on.

Strategic Risk

Strategic Risk is the risk arising from adverse business decisions, improper implementation of decisions, or lack of responsiveness to industry changes. This risk is a function of the compatibility of an organization's strategic goals, the business strategies developed to achieve those goals, the resources deployed against those goals and the quality of implementation.

Reputation Risk

Reputation Risk is the risk arising from negative public opinion. This risk may expose the institution to litigation, financial loss, or a decline in customer base.