CHANGING FACE OF RISK MANAGEMENT

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- Risk is associated with every business activity.
- With deregulation, the unorganized efforts towards risk management have now been substituted by systematic and formal policy endeavours. New concepts like 'anticipate/prevent/monitor/mitigate' have substituted the earlier ethos of inspect/ detect/ react".
- The emphasis is now more on processes and not on people alone.

CHARACTERISTICS OF FINANCIAL RISK

- In order to make profits and earn a spread banker takes a position in the investment market or in loan business.
- Normally, the risks involved in business are fairly known.
- The risk is **probabilistic and generic**.
- Risks in financial markets are **events that are likely to happen**. The uncertainty is more in respect of time of risk and its impact.
- Financial Risks are **ascertainable**, although not always quantifiable. Risk has a direct relationship with return, i.e. higher the risk higher the expected return and vice versa. not mutually exclusive.

TYPES OF RISKS FACED BY A BANK OR FINANCIAL INSTITUTION

- Risk is an **event having adverse impact on profitability** and/ or reputation due to several distinct sources of uncertainty.
- Managerial process must capture both the uncertainty and potential adverse impact on profitability and/or reputation.

Risks are divided into two types

- financial and
- non-financial

Financial Risks are uncertainties resulting in adverse variation of profitability or outright losses.

CREDIT RISK

- It occurs when customers default or fail to comply with their obligation to service debt, triggering a total or partial loss
- It gets reflected in downgrading of the counter party.
- **Difficult to appraise the aggregate of credit risk** over a portfolio of transactions of either loans or market instruments because of diversification effect.
- The sub-components of credit risk are individual loans, market conditions and geographical/ industry group concentrations.

- Risk issues get reflected in loan losses, rising non-performing assets and concentrations.
- **Primary cause** of credit risk is poor credit management.
- **In terms of credit analysis**, the attributable causes are inadequate appraisal, narrowly defined scope of appraisal, over reliance on the realisability of collateral, and over reliance on decision-making tools (models' theoretical prescriptions).
- **Due to Poor Credit administration:** Lack of data integrity, non-availability of data in time and faulty/ inadequate credit rating system/ methodology.

LIQUIDITY RISK

It arises when the **bank is unable to meet a financial commitment** arising out of a variety of situations.

These include usage of non-funded credit line, maturing liabilities (withdrawal or non-renewal of deposits) or disbursement to customers.

Liquidity risk is in terms of

- losing a good customer or
- loss due to distress sale of investments or
- high cost of raising resources.
- Penalties by regulators
- **Loss of reputation**

From the point of investing liquidity risk is the situation when one is not able to exit an investment either on account of credit risk (default by the counter party issuer) or absence of market.

Addressing liquidity risk *reflects:*

- the capability to have alternate sources of funds in place for such eventualities
- Market liquidity position and the individual bank's situation interact constantly to determine the realm on liquidity front.
- Market liquidity indicators include volume of transactions, volatility of the interest rate and difficulties encountered in finding counter party. These issues are taken care of through liquidity policy and its implementation by ALCO (Asset/Liability Committee).

INTEREST RATE RISK

- It occurs due to movements in interest rates.
- It is the possibility that assets/ liabilities have to be re-priced on account of changes in the market rates and their impact on the income of the bank.

Such situations arise when rates fall or rise,

- fixed interest rates become variable after maturity or after a fixed period, or
- variable interest rates become fixed between two revision dates.

The period between two revisions for interest rates on assets and liabilities is not uniform or constant.

These instances are market-driven and regulations-driven changes give rise to interest rate risk.

The components of the interest rate risk are:

- **Basis** (if assets & liabilities are linked with different market quotes)
- **Yield** (change/ shift in the yield),
- **Price** (change in pricing policy methodology or price itself),
- **Reinvestment** (impact of interest rate changes on income from re-invested interest),
- **Embedded option** (impact of prepaid loan or pre-mature withdrawal of deposit on earnings) and
- **Gap** (the difference between rate sensitive assets and rate sensitive liabilities).

Foreign Exchange Risk

- Foreign Exchange or forex risk relates to likely loss due to variations in earnings on account of indexation of revenues and changes in assets and liabilities labelled in foreign currency
- This is primarily a market risk. The movements in the currencies dealt with give rise to forex risk.

- The development/ adoption/ implementation on open positions, monitoring forward maturity positions, studying exchange rate movements, visualizing forecasting relevant currency rates, etc., are some of the strategies employed for managing forex risk.

Market Risk

- It is the **adverse movement in the market value of trading portfolio** during the period required to liquidate the transaction.
- Assessment of market risk is made with reference to instability or volatility of market parameters like interest rates, stock exchange indices, exchange rates, etc.
- Controlling market risk means that the variations in the value of portfolio should be kept within the approved tolerance limits.

COUNTER PARTY RISK

- It is associated with the inability or unwillingness of a customer or a counterparty to meet the commitments in relation to lending/ trading/ hedging/ settlement or any other financial transaction.
- It is the risk of failure of counterparty due to sudden and unforeseen circumstances.
- The default could be intentional for reasons other than financial. When the counter party is a bank or a financial institution, the same risk is referred to as solvency risk.
- Maintaining close watch on counter party performance, ensuring the right kind of mix in business composition, adoption/ adherence to

concentration limits, obtaining and using of market information, etc., are some of the strategies employed to manage counter party risk.

REGULATORY AND LEGAL RISKS

- It refers to the adverse impact of the existing or new rules or statutes
- The loss is considered as potential and not actual due to a variety of possible regulatory actions.
- Litigations like lenders liability, customer employee suits and liability on account of environment compliance are examples of such legal risks.
- Banks are also exposed to fiduciary or contractor shareholders' liability suits. The risk of this kind can primarily be managed if due care is taken to fix reasons causing such situations.
- Litigations emerge out of lack of faith, wrongful discharge, misleading
- information, conflict of interests, vendor non-performance, poor financial performance, unethical behaviour, lack of transparency.

OPERATIONAL RISK

- Operational risk refers to the malfunctioning of information and/or reporting system and of internal monitoring mechanism. The risk is two pronged.
- **At technical level**, it exists due to deficiency or malfunctioning of information system.

- **At the operational organizational level**, lacunae in monitoring reporting and absence of rules/ regulations are the reasons for operational risk.
- **Strategies at operational level:** Supervision and control of high order, training of personnel, regular internal and independent audits, development of personnel policies with ethical codes, constant training on risk management, etc.
- **Strategies at technology level:** arrangement of password and other security measures, creation of succession for technology staff, formulation and testing of disaster recovery plans prove as useful measures.
- It represents the link between credit and market risk. It relates to breakdown in internal controls/ corporate governance, error, fraud and failure to perform in a timely manner.

ENVIRONMENTAL RISK

- The five environmental risk areas covered are: water pollution, waste management, site contamination, air pollution, including of our,
- and noise pollution.
- As lenders, banks need to ensure that the environmental risks are addressed. It is possible that the non-compliance of environmental regulations could force a closure of the plant financed by the bank jeopardizing the recovery of loans.

NON-FINANCIAL RISKS

Non-financial risks to which banks are exposed to are business risk and strategic risk.

BUSINESS RISK

These are the risks that the bank willingly assumes to create a competitive advantage and add value for shareholders.

Business or operating risk pertains to the product market in which the bank operates, and includes technological innovations, marketing and product design.

Products designed by the bank may be made superfluous by technological advancement.

A bank with a pulse on the market and driven by technology as well as a high degree of customer focus, could be relatively protected against this risk.

STRATEGIC RISK

This results from a **fundamental shift in the economy or political environment**.

Strategic risks usually affect the entire industry and are much more difficult to protect oneself.

RISK MANAGEMENT PROCESS

The risks banks face in their normal course of operations can be generic (those that are common to all banks more or less alike) or specific (others that are specific to a bank or transaction).

Risk in lending to a particular industry, say, in troubled times to textiles is a generic risk. Lending to particular chemical industry is again a generic risk. This risk is seen from macro angle.

The **ownership pattern or type** can be another reason for risk differential.

SOURCES OF RISK

Decision/ Indecision: Taking or not taking a decision at the right time is generally the first cause of risk. Suppose a banker takes deposits and decides not to put money in statutory liquidity requirements, the bank would be called upon to pay penalties.

Indecision in selling a Government security when the market is upswing is also a risk as it causes loss of revenue. The risk of revenue

loss is on account of indecision.

Business Cycles/ Seasonality: There are certain exposures that are affected by seasonality or business cycles. Lending to sugar industry in India disregarding the fact that the production of sugar is restricted to six/ seven months in a year, may give rise to risky situations.

Economic/ Fiscal Changes: The Government's economic and taxation policies are sources of risk.

The levying of import duty on certain capital goods can escalate the funding cost and bank finance requirement. While the borrower's repaying capacity remains the same, such a situation enhances the exposure adding to the risk.

Market Preferences: Over the years, the consumer demands and preferences particularly from the youth segment, are changing substantially.

The preference for a motorcycle over a scooter is an example. Lending to scooter dealers or manufacturers will have to be cautious due to this market trend.

Political compulsions: A Government may force the banks to lend in areas where the rewards may not be proportional.

Regulations: The impact of change in regulations is similar to the changes in government policies.

Indian banks operating in the USA do have to assess the regulatory risks. With the passing of USA Patriot Act, the processes for anti-money

laundering have been strengthened. Compliance of a variety of regulations is also a source of risk.

Competition: In order to remain competitive, banks take risks for enhancing the returns. In order to achieve better result there could be a tendency to assume risks highly unrelated to the return.

The selection of the hit counterparty, lack of proper risk assessment, failure to arrive at correct borrower rating or understand the same etc., all contribute to risk acceleration.

Technology is both a solution and a cause of risk. The process of maker-checker is scrupulously followed while entering into such deals. Still, machines can go wrong. The reflection of inaccurate values like dates, amounts, interest rates, etc., can cause a huge risk. it is a part of operational risk wherein technology itself becomes the source of risk.

Now availability of **Information Technology** is an enabler for decision support for rational and draw based decision making.

Exposures exceed these prudential limits in the absence of real time information, thereby multiplying the risk exposures.

The risk drivers are:

- Changes in external environment, including regulatory aspects
- Deficiencies in systems and procedures
- Errors
- Inadequate information and absence of required flows
- Unsuitable technology supports

- Communication op or failure
- Lack of leadership
- Excessive and unreasonable incentives

RISK INDICATORS

- There are symptoms that indicate the possibility of risk.
- These indicators can be used to take pre-emptive actions.

Some of the indications are as follows:

1. Lack of supervision of lending/ investment activities by designated officers

2. Lack of specific lending or treasury policies or failure to enforce the existing policies

3. Lack of code of conduct or failure to enforce existing code

4. Dominant figure allowed to exerting influence without restraint

5. Lack of separation of duties

6. Lack of accountability

7. Lack of written policies and/or internal controls

8. Circumvention of established policies and/or controls

9. Lack of independent members of management and/or board

10. Entering into transactions where the institution lacks expertise

11. Excessive growth through low quality loans

12. Unwarranted concentrations

13. Volatile sources of funding such as short-term deposits

14. Too much emphasis on earnings at the expense of safety and soundness

15. Compromising credit policies

16. High-rate high risk investments

17. Underwriting criteria allowing high risk loans

18. **Lack of documentation** or poor documentation

19. **Lack** of adequate **credit analysis**

20. Failure to properly obtain and evaluate credit data, collateral, etc.

21. Failure to properly analyse and verify financial statement data

22. Too much emphasis on character and collateral and not enough emphasis on credit

23. **Lack of proper mix in asset portfolio**

24. Unresolved exceptions or frequently recurring exceptions on exception reports

25. Out of balance conditions

26. Funds used for purposes other than the purpose recorded (Diversion of funds).

27. Lax policies on payment of checks against uncollected funds

28. The institution a defendant in a number of lawsuits alleging improper handling of transactions

THE PROCESS

The risk management function would address issues relating to measuring, monitoring and management of the aforementioned risks.

The process involves the following sequential steps.

The identification would involve:

(i) Identify risk by each functional area and/or corporate policy: To properly identify risks, banks must recognize and understand existing risks or risks that may arise from new business initiatives.

Risk identification should be a continuing process, and risks should be understood at both the transaction and portfolio levels.

(ii) Categorize risk by Risk Profile: Risk profile is important in deciding the probability and incidence of risk. The profiling should be done carefully

(iii) Anticipate the direction the risk is expected to take within the next twelve months: Direction of risk is the probable change in the aggregate level of risk over the next twelve months and is characterized as decreasing, stable, or increasing. The direction of risk will influence management's

- strategy and the Audit Compliance Department's review strategy, including the extent to which

- expanded procedures might be used. If the risk is decreasing, aggregate risk should decline over
- the next twelve months. If the risk is stable, the aggregate risk should remain unchanged. If the
- risk is increasing, aggregate risk should be expected to be higher in the next twelve months.

(iv) Establish and implement systems to monitor risk and the frequency of monitoring: Banks should monitor risk levels to ensure timely review of risk positions and exceptions.

Monitoring reports should be timely, accurate, and informative and should be distributed to appropriate individuals, to ensure action, when needed.

(v) Explicitly state policy and/ or procedure to control the risk identified: Banks should establish and communicate risk limits through policies, standards, and procedures that define responsibility

and authority.

- These limits should serve as a means to control exposures to the various risks associated with the bank's activities.
- The limits should be tools that management can use to adjust when conditions or risk tolerances change. Banks should also have a process to authorize and document exceptions or changes to risk limits when warranted.

The process would also incorporate:

Determination of tolerance levels which involves:

- Knowing tolerance level
- Defining tolerance levels in policies and procedures
- Deciding profitability targets

Management of acceptable risks includes:

- Formulation and adoption of policies and procedures
- Involvement of senior management committee
- Adherence to policies and procedures
- Establishing MIS (Management Information System)
- Documenting courses of action when risk is excessive and planning for profitability.
- The major risks faced by a financial institution/ bank include credit risk, market risk and operational risk.
- A risk management function would seek to address and mitigate all the risks mentioned above which are faced by a bank. Any risk measure would need to fulfil at least one of the two requirements: it needs to convey information about the:
  (a) impact of risk factor on the profitability of the bank (usually measured as net interest income) or
  (b) on the economic value of the bank.

MEASURES FOR IDENTIFYING AND CONTROLLING RISKS

The various methods used for risk measurement are as follows:

MARKET RISK

A bank is said to face market risk if a change in the market rate scenario interest rate or exchange rate or equity price) results in variations in its net interest or in its value. Market risk for bank

arises due to the following factors:

(i) GAP

The existence of different maturity profiles of a bank's assets and liabilities result in interest rate risk, which exposes a bank to interest rate risk. This risk is also termed as the mismatch or re-pricing risk. This risk is measured as the difference between the amounts of assets maturing and that of the liabilities. The gap or the difference is both the source for the risk as well rudimentary measure.

(ii) BASIS

When the maturity profiles of the assets and the liabilities of a bank are matched the bank could still carry interest rate risk arising due to basis risk. Basis risk refers to the risk of bank's assets and liabilities being priced on different basis, e.g., while both the assets and the liabilities could be price for 1-year floating rates-the relevant asset rate could be

cut off 364-day T-Bill, while the liabilities could be priced off the 1-year bank CD rate.

(iii) Embedded Option

Even with well-matched final maturities, a bank could face interest rate risk if all of its products carry embedded options such as put and call options

For Example, a financial services company with long assets and liabilities can face tremendous interest rate risk as the face of reputation downgrading can cause depositors in large numbers to exercise the option to withdraw deposits on a premature basis. These add substantially to the risk of the bank as these affect the back at inopportune times.

A depositor would exercise the option of closing a deposit account when interest rates in the market are high and the bank would need to incur higher costs to replace the deposit. Similarly, a client would repay his loan to the bank at a time when the rates in the market are lower than the ones contracted leaving the bank to deploy funds at a lower rate.

(iv) Net Interest Position

The bank's net interest margin (net interest income divided by average earning assets) can vary not only with gaps and exercised options but also with variation in the bank's net interest position.

In case a bank has more interest earning assets than interest bearing liabilities (possibly, assets are funded out of shareholders' funds or idle

assets are near zero), it is said to carry a positive net interest position (NIP).

A positive NIP adds to the bank's net interest margin (NIM), The bank's net interest margin could thus come under pressure when its net interest position alters. In case the bank takes on liabilities exactly equal to its earning assets. the net spread and the NIM would be equal.

(v) Yield Curve

Repricing mismatches can also expose a bank to changes in the slope and shape of the yield curve.

It arises when **unanticipated shifts of the yield curve** have adverse effects on a bank's income or underlying economic value.

For instance, the underlying economic value of a long position in 10-year government bonds hedged by a short position in 5-year government notes could decline sharply if the yield curve steepens, even if the position is hedged against parallel movements in the yield curve.

Market risk is measured by certain parameters, and more often than not most banks use a combination of all these parameters both to understand the risks they are facing and also to communicate the same to the top management.

GAP ANALYSIS

It indicates the gap between repricing assets and liabilities and hence indicates the interest rate sensitivity of the entire balance sheet.

It would indicate the impact of a change in interest on the net interest income of the bank.

A **typical gap statement** would divide time into buckets of different time periods. These buckets represent the values of maturing and repricing of assets and liabilities.

The gap statement works out the differences between maturing/ re-pricing rate of sensitive assets and liabilities. The gap is translated into an income impact by the simple formula of change in net interest income (NII) equaling the gap multiplied by the assumed change in interest rates. It can also be indicated as "NII, where "NII = Change in Interest Rate (Gap).

INADEQUACIES

- The re-pricing assumes at the same yield or coupon percentage although the interest changes in assets/ liabilities across the balance sheet are not uniform.
- The inability to drill down refers to the gap statement having pre-defined buckets and gaps being constructed or computed on these pre-defined buckets. Where a bucket of one month to register a gap of, say, Rs. 100 crore, the bank would not be able to grasp from this

gap statement as to whether the gap is over one day (with the remaining 29 days having a balanced profile) or it is spread over four weeks. Same case may happen on liabilities side as well. Depending on the maturity within a range of 1 to 30 days in one-month bucket, the NII would be impacted. This reality does not get reflected in the gap statement or repricing thereof.

- A possibility that rates exhibit a lag effect (interest on deposits and loans do not change simultaneously).

RBI has devised a MIS for the banks to measure their interest rate risk. The name of this monthly statement which Banks have to send to RBI is *'Statement of Interest Rate Sensitivity'* (SIR).

NII – Net Interest Income RISK

- NII at risk computed based on the gap statement possesses certain drawbacks.
- Also, the gap computed NII at risk **reflects the level of risk in the balance sheet on a static level**. It does not take into account the impact of new loans and deposit growth.
- These can be **addressed by computing NII in a dynamic fashion** *(taking into account future growth projections)* and subsequently analyzing the impact of interest rate changes on the NII.
- **A broader focus on overall net come** (both interest and non-interest income and expenses)

- **When interest rates fall** ↓, the servicing bank experiences a decline in its fee income as the underlying mortgages prepay. It means even non-interest income is more interest rate sensitive.
- This **increased sensitivity** ↑ has led both bank managements and supervisors to take a comprehensive view of the potential effects of changes in market interest rates on bank earnings.
- The **measures** are for computing the **1.** risk towards the profitability of the bank **2.** for risk towards the value or the economic capital of the bank.

DURATION

- Duration is a measure of the interest rate sensitivity of an instrument or product.
- **Definition**: the weighted average time to maturity with the weights being the present values of the respective cash flows.
- The duration is an indicator of its rate sensitivity. Duration is a source of interest rate risk.
- Duration (D) is **expressed in years**.
- **If interest rates increase** ↑ 1%, present value of cash flows decrease about D%. This gives rise to a risk of loss/ gain in value (assets, liabilities, surplus) due to random interest rate shifts.
- Both liability and asset cash flows have durations. They react similarly to interest rate changes.
- **If duration for assets and liabilities is equal =**, the surplus will not be subjected to interest rate risk from the liabilities or their supporting assets.

- **Numerically**, the percentage change in price is equal to the modified duration times the change in interest rate.

% Change in price = Change in Price/Price = Duration/ (1 + Yield) x Change in yield or

Modified duration = Duration/(1 + yield)

- The duration concept is called Macaulay's Duration after Frederick Macaulay.
- Modified Duration is often referred to as Mod. Duration.

The **Duration of equity** measures the impact of a percentage change in interest rates on the value of equity. (Equity is defined as the difference between assets and liabilities.)

For example, if the duration of equity of a bank is 10 years, then an adverse change in interest rate of 1% would reduce the value of the bank's equity by approximately 10% and a 10% change would almost wipe out the bank's equity.

The **Duration of equity** is the difference between the duration of assets and that of liabilities.

The **duration of the total portfolio of assets** is the weighted sum of the duration of individual assets with the weights being the market values.

The **market value of equity** is computed as the difference between the market value of assets and liabilities.

Shortcomings: its validity is best for small changes in interest rates.

- The **sensitivity of a bank's economic value** to fluctuations in interest rates is a particularly important consideration of shareholders, management and supervisors alike.
- The **economic value of an instrument** represents an assessment of the present value of its expected net cash flows, discounted to reflect market rates.
- **"Net cash flows"** as the expected cash flows on assets minus the expected cash flows on liabilities plus the expected net cash flows on a balance sheet position.
- In this sense, the economic value perspective reflects the sensitivity of the net worth of the bank to fluctuations in interest rates.
- Economic value considers the potential impact of interest rate changes on the present value of all future cash flows, it provides a more comprehensive view of the potential long-term effects of changes in interest rates than is offered by the earnings perspective.
- Measures for interest rate risk focus on the two areas that a bank should be concerned about: its short- term profitability (through Gap

and NII at risk) and its long-term viability or economic capital (through duration and market value of equity at risk).

- While the first is usually the immediate area of concern for the bank management, the second attracts considerable attention from the regulatory authorities.

LIQUIDITY RISK

For measuring the liquidity risk of the banks, **RBI has introduced a MIS** by name "Structural Liquidity Statement" which is a fortnightly statement which banks have to send to RBI on reporting Fridays.

FACTORS:

Commitments: A bank can over-commit on disbursements or delivery and subsequently face risk on meeting these commitments. A sudden drawl on underwriting obligations, a call on account of a line of credit extended to a client, a guarantee which devolves upon the bank could expose the bank to liquidity risk (called as Call (option to buy) Risk).

Liquid Products: The bank could be long (buy) on illiquid contracts and at the same time find the market to be shallow. Over the counter contracts are particularly affected by this phenomenon.

Markets: The bank could have presence in under-developed markets that are not liquid enough for trades to be fruitfully carried out.

MEASURES:

The **ratio of liquid assets of a bank to its total assets** identifies the proportion of a bank's assets that are invested in cash and cash equivalents and can be liquidated in order to meet the requirements.

(**Liquid assets** refer to cash and near cash assets including bank deposits, government securities, re-purchase agreements, short-term investments, etc.).

Basel III guidelines have come out with ratio called 'Liquidity Coverage Ratio' (LCR). This ratio measures the Bank's Cash outflows for the next 30 days vis-a-vis the availability of High Quality of Liquid Funds (HQLAs). When implemented, Basel standards looks for a ratio of 1:1 or 100%.

Ratio of liquid assets to demand deposits and short-term borrowings measure the ability of a bank to meet its deposit and borrowing repayment obligations.

The ratio of net loans to total deposits measures the quantum of deposits raised that have been lent out as loans *(Net loans are gross outstanding minus specific provisions held for non-performing loans).*

The **ratio of non-deposit liabilities to total liabilities** identifies the proportion of total assets that have been funded through non-deposit liabilities.

CREDIT RISK

The risk of counter party defaults is measured in a variety of ways, some of which are indicated below.

Exposures as a percentage to total outstanding: In order to diversify their holdings in a variety of industries, companies and countries, banks follow measures like exposure to an industry vis-à-vis the total outstanding.

Other measures would be variations of the numerator. Company outstanding, group outstanding, geographical region outstanding, country outstanding could replace industry.

Credit ratings also serve as an indicator of the credit risk being carried by the bank.

Rating changes lag the market and markets do not have rating related rates of interest and therefore rating cannot be the only tool for credit risk measure.

The **ratio of impaired loans to total loans** serves as an indicator of the credit risk.

In its more detailed format, not just the impaired loans (non-performing assets) but also the asset classification (standard, substandard, doubtful and loss) is used as credit risk indicator.

OPERATIONAL RISK

- Operational risk can be defined as the risk of monetary losses resulting from inadequate or failed internal processes, people, and systems or from external events.
- Losses from external events, such as a natural disaster that damages a bank's physical assets or electrical or telecommunications failure that disrupt business, are relatively easier to define than losses from internal problems, such as employee fraud and product flaws.
- Operational risk is intrinsic to financial institutions and thus should be an important component of their bank-wide risk management systems.
- Operational risk includes legal risks, but excludes reputational and strategic risks.

Examples of operational risk losses include: internal frauds (insider trading, misappropriation of assets)

or external frauds like theft, natural disasters like terrorism or system related failures like M&A related disruption and other technological breakdowns.

Operational risk is harder to quantify and model than market and credit risks.