Introduction To Risk Management

UNIT I

Dr SYEDA RUKHSANA KHALID, BCA,
MBA(Fin+Sys), PHD(Finance),UOHYD

What is Risk?

- "The probability of the unexpected happening" – Basel Committee
- "An expression of the danger that the effective future outcome will deviate from the expected in a negative way." – Prof. John Geiger
- "The condition in which there is a possibility of an adverse deviation from a desired outcome that is expected or hoped for." - Vaughan

Concept of Risk

- The chance (or probability) of a deviation from an anticipated outcome. The implications of this definition are given below.
- We can attach probabilities to risk.
- Therefore, it can be ***measured, estimated or calculated*** in some way.
- Risk can therefore be quantified and expressed as a parameter, number or value.
- It is the extent to which the actual result may deviate from the expected result that makes a situation risky.
- Risk is a function of objectives. It is the consequences of the actual result deviating from the expected result that leads to risk. Without an objective or intended outcome, there is only uncertainty.

- A rider to this is that risk arises only where the deviation from the objective matters; that is, if it affects individuals or firms financially, or entails some other adverse consequence.
- It can also provide an opportunity.
- Within the discipline of risk management, of which financial risk management forms a sub-element, the following additional concepts for risk are in use: ***Possibility of a gain or loss Where there is a possibility of a gain or loss, this is often referred to as a risk.***
- **Dun & Bradstreet (2010: 15-30)** identified market risk as the risk of losses due to movements in financial market variables. These may be interest rates, foreign exchange rates, security prices, etc. Thus, market risk is the risk of fluctuations in portfolio value because of movements in such variables.

- Risk can be defined in many different ways but in common terms most people will suggest that
- “risk is the possibility of adverse consequences happening" (Olsson, 2002:5).
- "... risk is the uncertainty of future outcomes", is a better description of risk. From a risk management point of view there is the uncertainty about
  - whether the event/occurrence will take place;
  - and, If it does take place, what the outcome will be.
- Lucouw (2004:80) defined risk as the chance that some unfavourable event will occur, or the chance of not meeting objectives, or not arriving at a particular destination.

Sources of Risk

- Prices
- Market Share
- Technology
- Productivity
- Competition

Nature of Risk

- Banks Financial Institutions deal with money and act as financial intermediaries in any economic system.
- They help in mobilising household/corporate savings and making them available to deficit units.
- Since, they help in credit creation by means of loans and advances, they face many risks.
- In their role as financial intermediaries, they are involved in the following activities, which result in various types of risks:

- Funds Mobilisation
- Funds Deployment
- Funds Transfer
- Risk Transfer
- Transact Services
- Credit Enhancement Services

What is Risk Identification?

- Risk identification is the process of identifying and assessing threats to an organization, its operations and its workforce.
- For example, risk identification may include assessing IT security threats such as malware and ransomware, accidents, natural disasters and other potentially harmful events that could disrupt business operations.
- Companies that develop robust risk management plans are likely to find they're able to minimize the impact of threats, when and if they should occur.

Risk Identification Process Steps

There are five core steps within the risk identification and management process. These steps include risk identification, risk analysis, risk evaluation, risk treatment and risk monitoring.

Risk Identification:

The purpose of risk identification is to reveal the what, where, when, why and how something could affect a company's ability to operate. For example, a business located in central California might include "possibility of wildfire" as an event that could disrupt business operations.

Risk Analysis:

This step involves establishing the probability that a risk event might occur and the potential outcome of each event. Using the California wildfire example, safety managers might assess how much rainfall has occurred in the past 12 months and the extent of damage the company could face should a fire occur.

Risk Evaluation:

Risk evaluation compares the magnitude of each risk and ranks them according to prominence and consequence. For example, the effects of a possible wildfire may be weighed against the effects of a possible mudslide. Whichever event is determined to have a higher probability of happening and causing damage, would rank higher.

Risk Treatment:

- Risk treatment is also referred to as Risk Response Planning.
- In this step, risk mitigation strategies, preventative care and contingency plans are created based on the assessed value of each risk.
- Using the wildfire example, risk managers may choose to house additional network servers offsite, so business operations could still resume if an onsite server is damaged. The risk manager may also develop evacuation plans for employees.

Risk Monitoring:

- Risk management is a non-stop process that adapts and changes over time.
- Repeating and continually monitoring the processes can help assure maximum coverage of known and unknown risks.

Measurement of Risk:

A number of techniques have been suggested by economists to deal with risk in investment appraisal.

Some of the popular techniques used for this purpose are as follows:

1. Risk Adjusted Discount Rate Method:

- This method calls for adjusting the discount rate to reflect the degree of the risk of the project. The risk adjusted discount rate is based on the presumption that investors expect a higher rate of return on risky projects as compared to less risky projects.
- The rate requires determination of (i) risk free rates and (ii) risk premium rate. Risk free rate is the rate at which the future cash inflows should be discounted. Risk premium rate is the extra return expected by the investor over the normal rate.
- The adjusted discount rate is a composite discount rate. It takes into account both time and risk factors.

Year	Expected Cash flow (Rs.)
1	80,000
2	1,20,000
3	1,60,000
4	1,20,000
5	80,000

Should the project be accepted or rejected?
Accept the project: if NPV > 1
Reject the project: if NPV < 1
Using the risk adjusted discount rate we find that

$$NPV = \frac{80,000}{1.18} + \frac{1,20,000}{(1.18)^2} + \frac{1,60,000}{(1.18)^3} + \frac{1,20,000}{(1.18)^4} + \frac{80,000}{(1.18)^5} = Rs.4,00,000$$

2. The Certainty Equivalent Approach:

- According to this method, the estimated cash flows are reduced to a conservative level by apply-ing a correction factor termed as certainty equivalent coefficient. The correction factor is the ratio of riskless cash flow to risky cash flow.
- The certainty equivalent coefficient which reflects the management's attitude towards risk is
- Certainty Equivalent Coefficient = Riskless Cash Flow/Risky Cash Flow

Example:

- A project is expected to generate a cash of Rs. 40,000. The project is risky but management feels that it will get at least a cash flow of Rs. 24,000. It means that certainty equivalent coefficient is 0.6.

3. Sensitivity Analysis:

- The future is not certain and involves uncertainties and risk, the cost and benefits projected over the lifetime of the project may turn out to be different. This deviation has an important bearing on the selection of a project.
- If the project can stand the test of changes in the future, affecting costs and benefits, the project would qualify for selection. The technique to find out this strength of the project is covered under the sensitivity analysis of the project. This analysis tries to avoid over estimation or underestimation of the cost and benefits of the project.
- In sensitivity analysis, we try to find out the critical elements which have a vital bearing on the costs or benefits of the project. In investment decision, one has to consider as many elements of uncertainty as possible on costs or benefits side and then arrive at critical elements which effect the expected costs or benefits of the project.

- How many variables should be tested to carry out the sensitivity analysis in order to find out its impact on costs or benefits of the projects is a matter of judgement.
- In sensitivity analysis, one has to consider the changes in the various factors correlated with changes in the other.
- In order to arrive at the degree of uncertainty, the decision maker has to make alternative calculation of costs or benefits of the project.
- Sensitivity analysis is a simulation technique in which key variables are changes and the resulting change in the rate of return is observed. Some of the key variables are cost, prices, project life, market share, etc. **Usually this analysis provides information about cash flows under the assumptions:**

  (i) Pessimistic,

  (ii) Most likely, and

  (iii) Optimistic.

  It explains how sensitive the cash flows are under these three different situations. If the differ-ence is larger between the optimistic and pessimistic cash flows, the more risky is the project.

	Project A	*Project B*	*Discount factor at 10%*	
Initial Investment	Rs. 10,000	Rs. 10,000	*Project A*	*Project B*
Estimated cash flows for each of 15 years.				
Pessimistic	Rs. 1,500	Rs.—	7.606	7.606
Most likely	Rs. 2,000	Rs. 2,000	7.606	7.606
Optimistic	Rs. 2,500	Rs. 4,000	7.606	7.606

	PRESENT VALUE		*NPV*	
	Project A	*Project B*	*Project A*	*Project B*
Pessimistic	Rs. 11,409	Rs.—	Rs. 1,409	Rs. 10,000
Most likely	Rs. 15,212	Rs. 15,212	Rs. 5,212	Rs. 5,212
Optimistic	Rs. 19,015	Rs. 30,424	Rs. 9,015	Rs. 20,424

The above analysis shows that project B is more risky.

4. Probability Theory Approach:

- Yet another method for dealing with risks is to estimate the value for a result.
- Each value of prospective result is assigned a probability.
- Here one has to see a range of possible cash flows from the most optimistic to the most pessimistic for each pertinent year.
- Probability means the likelihood of happening an event.
- It may be objective or subjective.
- An objective probability is based on a large number of observations under independent and identical conditions repeated over a period of time.
- A subjective probability is based on personal judgement.
- In capital budgeting decisions the probabilities are of a subjective type since they are based on a single event.

Illustration:

- Pioneer Company Ltd. has given the following possible cash inflows for two of their projects A and B. Both the projects will require an equal investment of Rs. 5,000. Let us compute expected monetary values for the projects A and B.

Possible	*Project A*			*Project B*		
event	*Cash in flow*	*Probability*	*Expected value*	*Cash in flow*	*Probability*	*Expected value*
A	Rs. 4,000	.10	Rs. 400	Rs. 12,000	.10	Rs. 1,200
B	Rs. 5,000	.20	Rs. 1000	Rs. 10,000	.15	Rs. 1,500
C	Rs. 6,000	.40	Rs. 2400	Rs. 8,000	.50	Rs. 4,000
D	Rs. 7,000	.20	Rs. 1400	Rs. 6,000	.15	Rs. 900
E	Rs. 8,000	.10	Rs. 800	Rs. 4,000	.10	Rs. 400
Total			Rs. 6,000			Rs. 8,000

Process of Assigning Probabilities:

- Here let us see the process of assigning probabilities.
- **It is subject to certain rules and they are:**
- (i) List of events collectively expansive
- (ii) Events must be mutually exclusive
- (iii) The numerical probabilities must add up to 1.

Basic Probability Theorem:

- We must see certain basic theorems relating to a probability theory.

These are as follows:

- (i) The probability of an event is always a number between 0 and 1 inclusive. If an event is sure to occur, its probability is by definition equal to 1. If it is certain that it will not occur its probability is 0.
- (ii) If 'n' events are equally likely and only one of them may happen, then the probability of that event is 1/n.
- (iii) If two events are mutually independent and the probabilities of one is PI while that of other P2, the probability of the events occurring together is the product of P1, P2.
- (iv) If the events are mutually exclusive and the probability of the one is PI while that of the other is P2, the probability of either one or the other occurring is the sum P1+P2.

5. Standard Deviation:

- Subjective judgment of the decision makers plays a crucial role in practice to resolve the prob-lem which may turn out to be imprecise or biased.
- There is no precise way to find the probabilities of different outcomes. This limitation is overcome by adoption of standard deviation approach.
- The standard deviation is defined as the square root of the mean of the squared deviations of all the items from the mean and it is usual to denote it by the small Greek “Sigma”, σ.
- In the case of capital budgeting, this measure is used to compare the variability of possible cash flows of different projects from their respective mean or expected values.

Steps to be followed for calculating the S.D. of the possible cash flows:

(i) Compute the mean value of the possible cash flows.

(ii) Find out the deviation between the mean value and the possible cash flows.

(iii) Square the deviations.

(iv) Multiply the squared deviations by the assigned probabilities to get the weighted squared deviations.

(v) The sum of the weighted squared deviations and their square root are calculated. The result gives the S.D.

Project A

Possible events	*Cash inflows*	*Deviation from Mean(Rs. 6000)*	*Deviations squared*	*Probability*	*Probability Deviation squared*
A	4,000	-2,000	40,00,000	.10	4,00,000
B	5,000	-1,000	10,00,000	.20	2,00,000
C	6,000	0	0	.40	0
D	7,000	1,000	10,00,000	.20	2,00,000
E	8,000	2,000	40,00,000	.10	4,00,000
				Σ Pdef^2	= 12,00,000

$$\sigma = \sqrt{\text{Pdef}^2} = \sqrt{12,00,000} = 1,095$$

Project B

Possible events	*Cash inflows*	*Deviation from Mean (Rs. 8,000)*	*Deviations squared*	*Probability*	*Probability Deviation squared*
A	12,000	4,000	1,60,00,000	.10	16,00,000
B	10,000	2,000	40,00,000	.15	6,00,000
C	8,000	0	0	.50	0
D	6,000	-2,000	40,00,000	.15	6,00,000
E	4,000	-4,000	1,60,00,000	.10	16,00,000

$$\sigma = \sqrt{\text{EPdef}^2} = \sqrt{44,00,000} = 2,098$$

6. Coefficient of Variation:

- Standard deviation is expressed in the units of the original distribution and is called absolute measure of dispersion.
- Therefore, absolute measure must be reduced to a form which is free from the original unit of measurement.
- This can be done by expressing it in relation to the average from which variation is measured.
- This measure of relative variation is obtained by dividing the absolute measure by that average and is called a coefficient of variation.

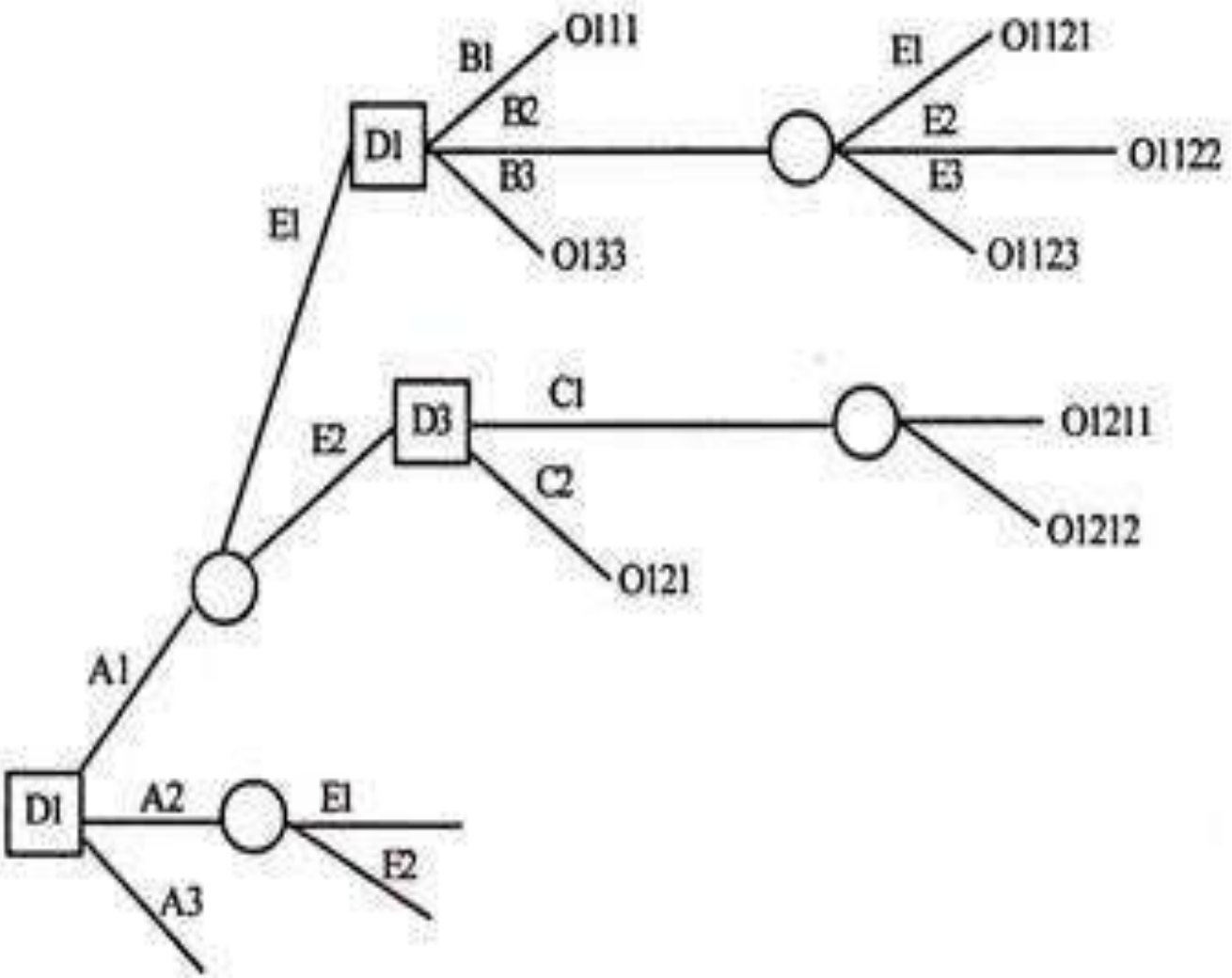
The co-efficient of variation can be calculated as follows:

Coefficient of Variation = Standard Deviation/Expected (or Mean) Cash Flow = σ/Erf

- On the basis of the data given in the standard deviation approach, the standard deviation for project A is 1095, while that for project B is 2098. The coefficient of variation of project B is more as compared to project A. Hence project B is more risky.

Decision Tree Analysis

- The decision tree analysis is another technique which is helpful in tackling risky capital invest-ment proposals.
- A decision tree is a graphic display of various decision alternatives and the sequence of events as if they were branches of a tree.
- In constructing a tree diagram, it is a convention to use the symbol □ to indicate the decision point and O denotes the situation of uncertainty or event.
- Branches coming out of a decision point are nothing but representation of immediate mutually exclusive alternative options open to the decision maker.
- Branches emanating from the event point 'O' represent all possible situations.
- These events are not fully under the control of the decision maker and may represent some other factors.
- The basic advantage of a tree diagram is that another act subsequent to the happening of each event may also be represented.
- The resulting pay-off for each act-event combination may be indicated in the tree diagram at the outer end of each branch.


O111
B1
B2
D1
B3
O133
E1
O1121
E1
E2
O1122
E3
O1123
C1
D3
O1211
E2
C2
O1212
O121
A1
D1
A2
E1
E2
A3

Risk Classification

- Risks can be classified in different ways according to their source.
- From a managerial perspective, risk can be classified into
- Risks that need to be avoided
- Risks that should be transferred
- Risks to be actively managed

From a Functional Perspective:

1. Credit risk/CounterParty Risk
   - Pre-Settlement Risk
   - Settlement Risk
2. Market Risk
   - Price Risk
   - Symmetrical vs UnSymmetrical
   - Absolute Risk vs Relative Risk
   - Directional vs Non-Directional Risk
   - Discontinuity& Event Risk
   - Asset Liquidity Risk
   - Concentration Risk
   - Credit Spread Risk
   - Volatility Risk
   - Systemic Risk
   - Systematic Risk

ii. Forex Risk

- Transaction Exposure
- Translation Exposure
- Economic Exposure

iii. Country Risk

- Economic Factors
- Political
- Socio-Economic
- Legal Framework
- Emerging Markets Risk

Iv. Liquidity Risk
- Funding Risk
- Asset Liquidity Risk

v. Interest Rate Risk

vi. Technology Risk

3. Operational Risk
- Internal Risk Factors
- External Risk Factors
- Errors and Omissions
- Frauds

4. Other Risks
- Off-Balance Sheet Risk
- Regulatory Risk

Forex Risk

- Forex risk occurs when a company is involved in international business and the cash in or outflows are in a foreign exchange rate. As this rate is not fixed and cannot be fully anticipated a possible change in a foreign exchange rate leads to the risk of changes in the amount of a payable / receivable and by that a change in the amount of money the company has to pay / will receive.
- This risk is measured by the concept of transaction exposure. Furthermore, economic exposure can be included in the evaluation of exchange rate risk.
- This includes changes in the quantity of future sales due to changes in the exchange rate and therefore relative competitiveness of the company. However, the prediction of this sensitivity is difficult and hardly measurable and thus the company cannot manage this risk actively.
- Most firms therefore concentrate on transaction exposure and by that on the price change and not the quantity change caused by the exchange rate volatility.

Country Risk

- A firm may transform itself into an international one when it starts lending across its borders or invests in instruments issued by foreign organizations.
- When the firm starts doing so, the first risk that it encounters is country risk. This is also called sovereign risk.
- There are number of factors like economic, political, socio-community, legal, etc. that have a bearing on a level of risk associated with a particular country.

Liquidity Risk

- Liquidity risk is of two types:
- Funding risk is the inability to raise funds at normal cost. - Asset liquidity risk is the lack of trading depth in the market for a security or class of assets.
- An institution might lose liquidity if its credit ratings fall, it experiences sudden, unexpected cash outflows, or some other event causes counterparties to avoid trading with or lending to the institution.
- A firm is also exposed to liquidity risk if markets on which it depends are subject to loss of liquidity.

Technology Risk

- Technology is the backbone of every business. It needs a lot of money, time & effort in order to be implemented.
- The primary objective of investment is operational efficiency in terms of economies of scale & of scope.
- However, if the system implementation is too slow or the performance is ineffective, the risk is that the entire investment may not result in adequate repayment.
- In extreme cases, it could even hamper efficiency.
- In such an eventuality, it would have a negative impact on the survival & growth of the organization

Types of Risks

Financial Risks	Non – Financial Risks
• Credit Risk	• Mis-selling
• Interest Rate Risk	• Fraud
• Liquidity Risk	• Mis-pricing
• Currency Risk	• Breach of investment rules
• Insurable	• Non-insurable

Types of Risks

Static Risks

- Losses that occur despite no changes in economic factors. May arise due to natural calamities, human dishonesty, etc.
- More predictable

Dynamic Risks

- Arising due to changes in economic conditions such as price level, customer preferences, income level, technology, etc.
- Unpredictable

Types of Risks

Fundamental Risk

- Losses that are impersonal in origin & consequence
- Caused by natural, economic, social or political phenomena such as inflation, war, earthquake, unemployment, etc.
- They are faced as a group

Particular Risks

- Losses due a specific individual event
- Felt by a single person or few individuals
- Loss due to burning down of a person's house, or loss of job
- Personal in nature

Types of Risks

Pure Risks

- Situation where there is a chance of either loss or no loss, but no chance of gain
- Eg: either a building will burn down or it won't.
- Also called Absolute risk
- Insurable

Speculative Risks

- Situation where the possibility of either a financial loss or a financial gain exists
- Eg: purchase of shares, betting on horses, gambling
- Usually not insurable.

Risk Indicators

- A key risk indicator (KRI) is a metric for measuring the likelihood that the combined probability of an event and its consequence will exceed the organization's risk appetite and have a profoundly negative impact on an organization's ability to be successful.
- Key Risk Indicators (KRIs) are measures and metrics that relate to a specific risk and demonstrate a change in the likelihood or consequence of the risk occurring.
- **KRIs differ from Key Performance Indicators (KPIs) as** they are not concerned with how well something is being done, but rather the possibility of future adverse impact.
- KRIs provide an early warning to identify potential events that may harm continuity of an activity/project.

There are a number of benefits to identifying and using KRIs:

- **Supporting Risk Assessments -** KRIs help in adding more detail and information to risk assessments, making them more reliable and informative to management
- **Proactive management of emerging risks -** KRIs allow for proactive identification of emerging risks by creating an informative framework in which to scan for what is on the horizon
- **Tolerance levels and thresholds -** KRIs detail at what level a risk is considered important for attention or for direct intervention
- **Trending KRIs -** KRIs can help management track trends in risks to the organisation. This can help to identify areas where greater investment may be needed or where opportunities might lie.

- **Lagging -** monitor data retrospectively to identify changes in the pattern or trend of risk / activities.
- These types of KRIs ensure that the exposure is minimised as soon as practicable to prevent or reduce further exposure or consequence.
- **Leading / predictive -** are used to signal changes in the likelihood of a risk event.
- They are more likely to aid management in taking action in advance of risks materialising.

What is Risk Management

- Process which aims to help organisations *understand, evaluate and take action* on all their risks with a view to:

- increasing the probability of success *and*
- reducing the likelihood of failure

- ISO Guide 73 BS 31100 Coordinated activities to direct and control an organization with regard to risk Institute of Risk Management (IRM) Process which aims to help organizations understand, evaluate and take action on all their risks with a view to increasing the probability of success and reducing the likelihood of failure

Risk Management - a comprehensive process

- Supported by appropriate strategies and frameworks
- Designed to identify, analyse, evaluate, treat, monitor and communicate risks that could prevent a department or agency from achieving its objectives.
- Covers strategic, operational, financial and compliance risks.
- The term “enterprise-wide risk management” is widely used both by the Victorian public sector and the private sector to describe this comprehensive approach.

What are the benefits of a Risk Management framework?

- Enables identification of threats and opportunities for an agency
- Improves and informs the planning process
- Reduces likelihood of costly “surprises”
- Contributes to improved resource allocation
- Improves efficiency and performance
- Improves accountability
- Encourages continual improvement

Features of risk management

- Failure to adequately manage the risks faced by an organization can be caused by inadequate risk recognition,
- insufficient analysis of significant risks and failure to identify suitable risk response activities.
- Also, failure to set a risk management strategy and to communicate that strategy and the associated responsibilities may result in inadequate management of risks.
- It is also possible that the risk management procedures or protocols may be flawed, such that these protocols may actually be incapable of delivering the required outcomes.
- The consequences of failure to adequately manage risk can be disastrous and result in inefficient operations, projects that are not completed on time and strategies that are not delivered, or were incorrect in the first place.

- In order to be successful, the risk management initiative should be proportionate, aligned, comprehensive, embedded and dynamic (PACED).
- ***Proportionate*** means that the effort put into risk management should be appropriate to the level of risk that the organization faces.
- Risk management activities should be ***aligned*** with other activities within the organization.
- Activities will also need to be ***comprehensive,*** so that any risk management initiative covers all the aspects of the organization and all the risks that it faces.
- There are means of ***embedding*** risk management activities within the organization.
- Finally, risk management activities should be ***dynamic*** and responsive to the changing business environment faced by the organization.

Benefits Of Risk Management

- There are a range of benefits arising from successful implementation of risk management as compliance, assurance, decisions and efficiency/ effectiveness/efficacy (CADE3).
- Compliance refers to risk management activities designed to ensure that an organization complies with legal and regulatory obligations.
- The board of an organization will require assurance that significant risks have been identified and appropriate controls put in place. In order to ensure that correct business decisions are taken, the organization should undertake risk management activities that provide additional structured information to assist with business decision making.
- Finally, a key benefit from risk management is to enhance the efficiency of operations within the organization.

- Risk management should provide more than assistance with the efficiency of operations.
- It should also help ensure that business processes (including process enhancements by way of projects and other change initiatives) are effective and that the selected strategy is efficacious, in that it is capable of delivering exactly what is required.
- Risk management inputs are required in relation to strategic decision making, but also in relation to the effective delivery of projects and programmes of work, as well as in relation to the routine operations of the organization..

- The benefits of risk management can also be identified in relation to these three timescales of activities within the organization.
- The outputs from risk management activities can benefit organizations in three timescales and ensure that the organization achieves:
  - efficacious strategy;
  - effective processes and projects;
  - efficient operations.
- In order to achieve a successful risk management contribution, the intended benefits of any risk management initiative have to be identified.
- If those benefits have not been identified, then there will be no means of evaluating whether the risk management initiative has been successful.
- Therefore, good risk management must have a clear set of desired outcomes/benefits.
- Appropriate attention should be paid to each stage of the risk management process, as well as to details of the design, implementation and monitoring of the framework that supports these risk management activities

Need for Risk Management

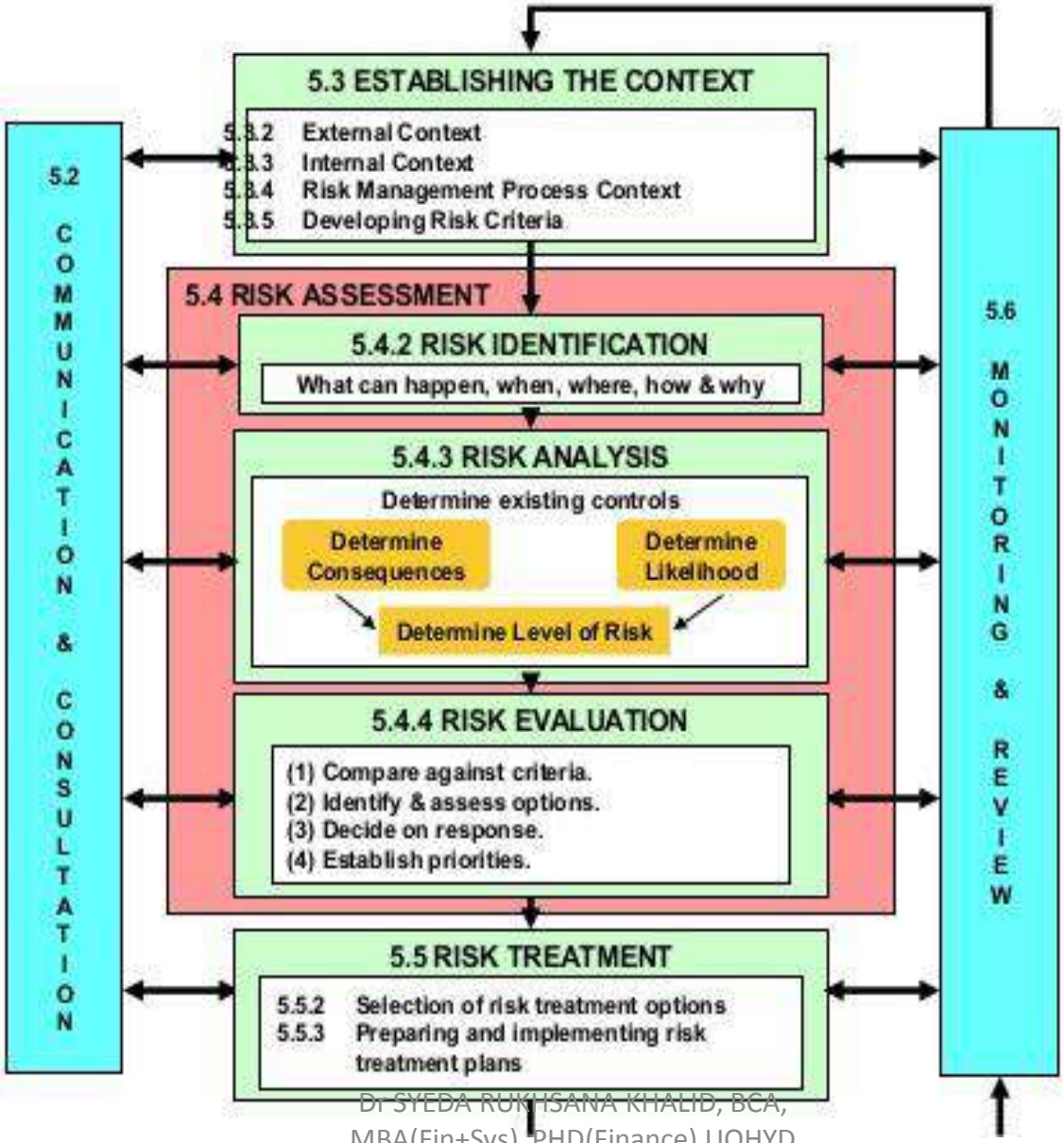
- Globalisation has resulted in pressure on margins.
- The lower the margin, the greater the need for risk management.
- Failure of many banks/FI in the recent past, has attracted the attention of regulators also
- The challenge of a modern corporation is to ensure wealth maximisation for their shareholders that is consistent with their risk preference.
- On one hand risk to be managed and on the other, adequate returns have to be ensured.

- Risk in the institutional context, needs to be understood and dealt with appropriately.
- In FI core business and risk are two sides of the same coin, hence need to be integrated.
- Increased volatility around the world and highly leveraged positions (due to derivatives participation)create a further need for risk management .
- Prudent policies and procedures should be set up by the organisation to identify, measure, monitor, and control the risk.

Risk management as a process comprising the following four discrete stages.

- Risk identification
- Risk quantification
- Risk control directed at loss elimination, or more usually, loss reduction and
- Risk financing via transfer.

The risk management process described in more detail



Communication and Consultation

It is critical to:

- Establish channels of communication with internal and external stakeholders
- Risk management tasks and activities must be allocated with responsibilities, accountabilities and authorities clearly understood and defined
- Draft a communications plan and a distribution timetable
- Identify what specialist advice might be needed (engineers, actuaries, OHS specialists, VMIA support)
- Identify the stakeholders –
    - Internal (Board, Minister, executive and operational management)
    - External (Regulators, customers, the public, key suppliers)

Establishing the context

Know and understand:

- the purpose, goals and objectives of the agency;
- where the risk management process is being applied within the agency;
- the cost/benefit of the risk management program and the resource allocation required;
- the need to maintain documented records of the program;
- the external and internal environment in which the agency operates;
- the sources of risk facing the agency;
- the benchmarks around which risk will be evaluated within the agency;

Risk Appetite and Tolerance

Risk appetite - The amount and type of risk that an organisation is willing to accept in pursuit of its long term strategic and operational objectives
Risk tolerance - The boundaries of risk taking outside of which the organisation is not prepared to venture in the pursuit of its long term objectives.

Sources of risk

Consequence and Likelihood

- A process for evaluating the risk facing the agency using agreed criteria;
- **Likelihood** means the probability of the identified risk occurring
- **Severity** means the impact on or cost to the agency if the identified risk occurred
- The likelihood and severity ratings are multiplied together and plotted on a **heat map** which gives a view of the overall risk profile for the agency. An informed decision can then be taken as to the response strategies, treatment plan and resource allocation that might be appropriate.
- Responsibilities can then be allocated to a risk owner with the treatment tasks allocated to a control owner.
- Examples of the tools used to plot severity and likelihood are in the following slides

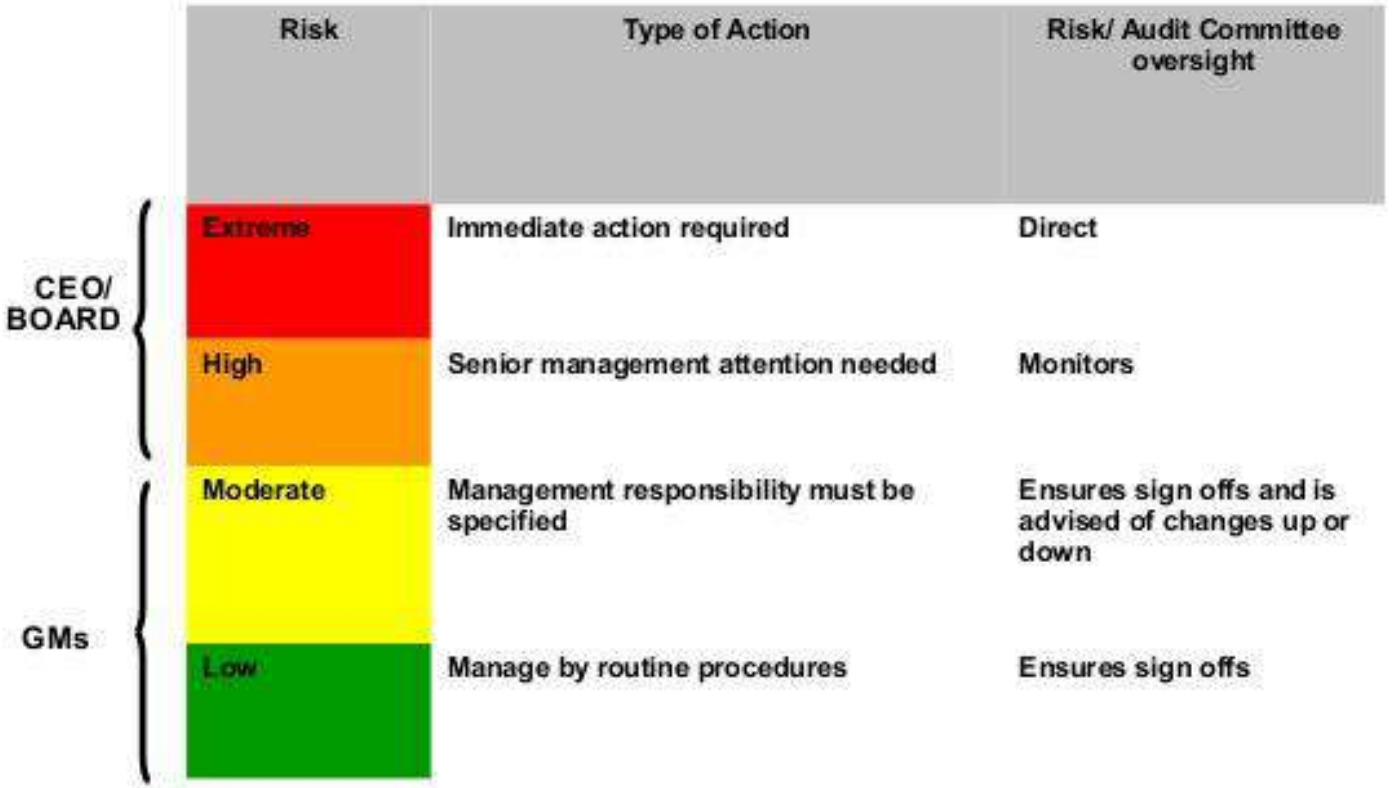
Tools for assessing risk - Risk rating scales (likelihood)

**A time horizon is selected that best suits the unique profile of the agency

LIKELIHOOD

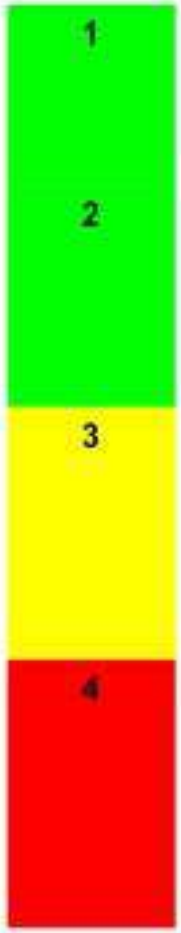
Score		Detailed description
5	Frequent	The event is very likely to occur within 3 months
4	Likely	The event will probably occur within 1 year
3	Occasionally	The event could occur between 1-3 years
2	Unlikely	The event could occur between 3-10 years
1	Rare	The event may possibly occur, but unlikely at a frequency less than 10 yearly

Risk response and escalation



	Risk	Type of Action	Risk/ Audit Committee oversight
CEO/ BOARD	Extreme	Immediate action required	Direct
CEO/ BOARD	High	Senior management attention needed	Monitors
GMs	Moderate	Management responsibility must be specified	Ensures sign offs and is advised of changes up or down
GMs	Low	Manage by routine procedures	Ensures sign offs

Control effectiveness scales



Effective	Indicates minimal uncontrolled risk, due to excellent risk management/controls in place, tested and monitored
Good	Indicates good risk management and control system, but an opportunity for refinement exists to reduce risk further.
Fair/ Partially Effective	Indicates a need for improvement in controls, increased adherence to controls or that controls are being developed, but are not fully in place and tested.
Poor	Indicates effective risk controls have not yet been developed and a significant lack of risk control exists – additional risk management or treatment is a matter of priority

The Risk Register

- The risk register is a key document which records the output of the risk management process
- At a minimum it would contain the following:
  - Risk Description
  - Assessment of Inherent Risk
  - Assessment of Controls
  - Assessment of Residual Risk
  - Treatment of Risk
  - **Remember the distinction between inherent (untreated) and residual (treated) risk

Risk Treatment

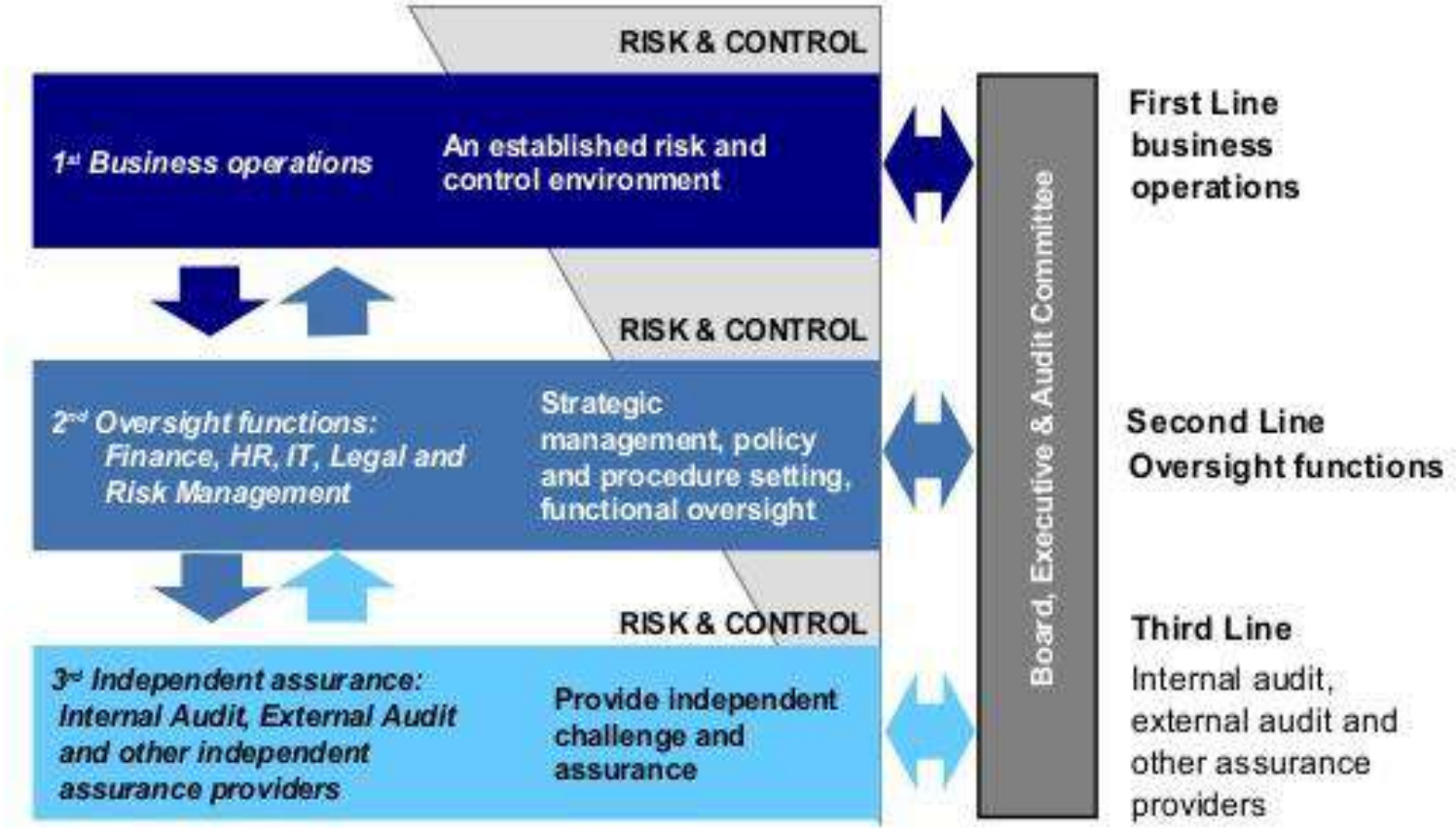
There are five risk treatment options available as defined below:

- Avoid the Risk
- Transfer the Risk
- Share the Risk
- Treat the Risk
- Accept the Risk

Module 8 – Monitoring and review

Reporting – the right things at the right level

Three levels of defence



Prerequisites for effective Enterprise Risk Management

- The term Enterprise Risk Management (ERM) describes a comprehensive and integrated framework for managing risk at all levels within an organization.
- Four organizational characteristics are required if ERM is to work properly:**Defined objectives at all levels.**
- Risk is defined in terms of objectives and without clearly defined objectives it is not possible to identify or manage risk.
- Objectives exist at various levels in an organisation, forming a hierarchical structure.
- ERM requires these objectives to be clear (everyone knows and agrees what they are), aligned (all objectives contribute to the overall goal) and coherent (fitting together as a set, both top-down and bottom-up).

Matching organization to objectives.

- Effective organizations have structures that mirror the hierarchy of objectives, with clear mapping between levels.
- Senior management are responsible for achieving strategic objectives, and front-line staff (project teams, operational groups, supply chain partners etc.) must meet operational and delivery objectives.
- The levels in between are covered by middle management, and it is often here that objectives lose clarity, alignment and coherence.

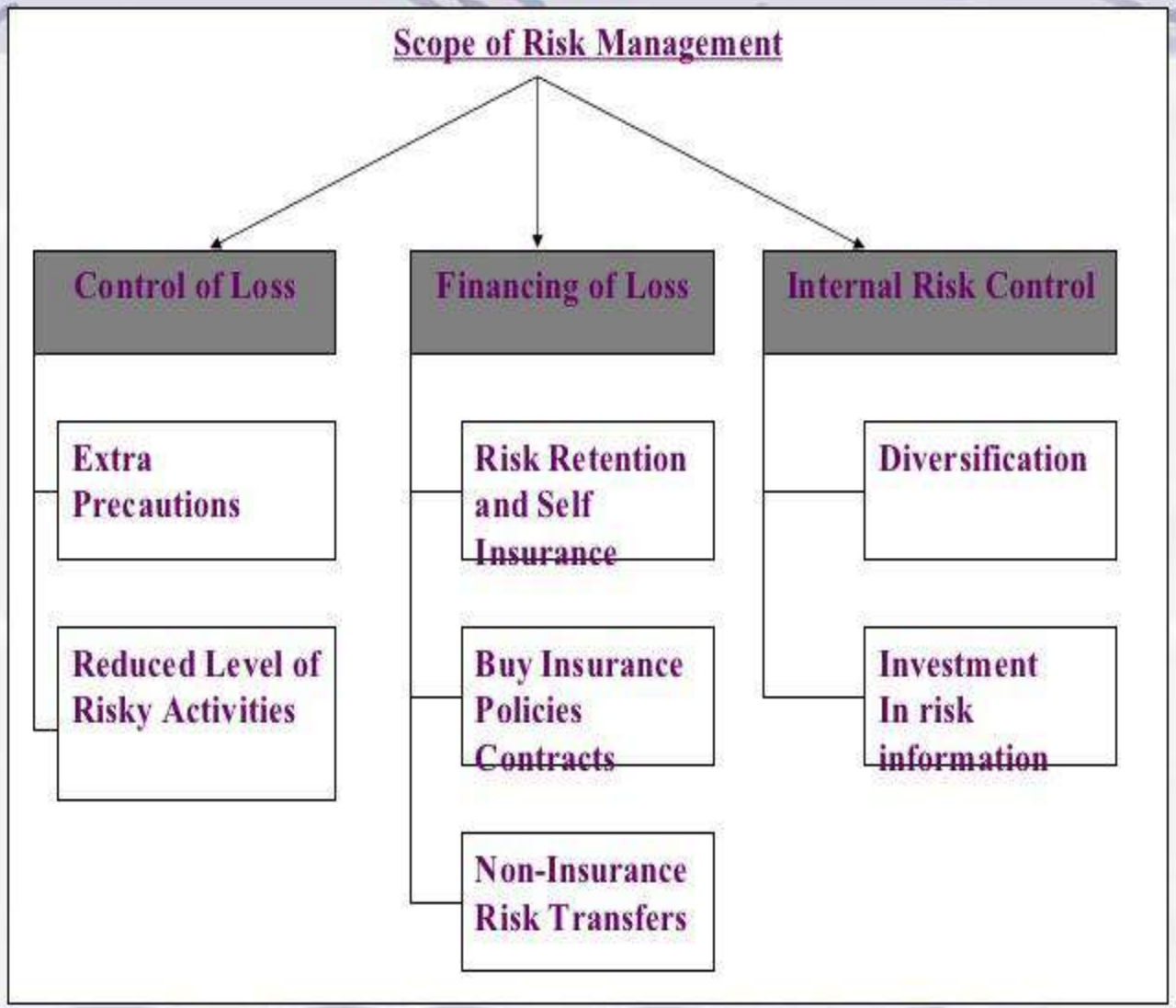
Clear Boundaries.

- Effective ERM requires clear interfaces between levels, for both objectives and the organization.
- There must be no uncertainty about whether a particular objective belongs at a particular level or to the level above or below.
- The organisational hierarchy must be equally clear, with defined lines of responsibility, communication and decision-making authority.

Risk-aware culture.

- The organization needs a fully mature risk-aware culture at all levels, with a commitment to manage risk wherever it is found, and this must be properly resourced and supported.
- ERM cannot operate effectively if any level within the organisation denies the existence of risk or refuses to take responsibility for managing risk in their area of authority.
- What happens if one or more of these four elements are missing in your organization?
- Perhaps there are no clear overall objectives, or your organization is unstructured or has inconsistent boundaries, or the risk culture is immature?
- Is it possible to implement ERM in these circumstances?

  An organization that is deficient in one or more of these characteristics should take steps to develop them.
- Objectives can be put in place at the various levels across the business quite quickly, but it might take some time to implement structural changes to the organization with clear boundaries and thresholds, and developing a risk-aware culture takes much longer.


Scope of Risk Management
Control of Loss
Financing of Loss
Internal Risk Control
Extra Precautions
Reduced Level of Risky Activities
Risk Retention and Self Insurance
Buy Insurance Policies Contracts
Non-Insurance Risk Transfers
Diversification
Investment In risk information

Methods of Risk Management

- **Avoid -** Negative Approach
- **Retain –** Contingency Fund
- **Transfer -** Insurance
- **Share –** Mergers/Joint Ventures
- **Reduce –** Maintenance costs, low debt, etc.

RISK REPORTING

What is Risk Reporting?

- Communicating the facts & data through reports & statements to the appropriate person for whom the data is collected & complied.
- Eg: Director's Report, Auditor's Report, Income Statement & Balance Sheet
- An efficient risk reporting process is the foundation for clear & timely communication of risk across the enterprise.

Objectives of Risk Reporting

- To fulfill statutory requirements
- To provide a record of activity under consideration
- To aid planning & control
- To ensure continuity in policies & programs of the firm
- To provide a quick review
- To facilitate timely communication

Risk Reporting

INTERNAL

- Corporate level
- Business unit level
- Desk level

EXTERNAL

- Regulatory norms
- Voluntary disclosure

Levels of Risk Reporting

Level	Coverage	Focus & content of report
• **Corporate**	• Firm-wide	• Senior mgrs focus on risk concentration between business units & stress testing • VAR nos. are reported & daily written commentary made
• **Business Unit**	• Across trading desks	• Business mgrs monitor risky outliners, large exposure & yield curve positions
• **Trading Desk**	• Across accounts	• Traders require detailed risk summaries, hedging , marginal risk analysis

Limitations of Risk Reporting

- Not an end, just a means to the end of value maximization to shareholders
- Objectives of reporting might change due to eco./legal/social/political environment
- Basically a post-mortem activity
- Usually is very technical in nature

Major Types of Risk Reports

(I) OPERATIONAL REPORTS

(a) Control Reports: Actual vs. standard performance; Purpose: Early detection of variances & assessment of causes. Based on responsibility centres. Reports could be weekly, monthly, quarterly or annual.

(b) Information Reports: Larger scope – tracking trends, doing comparative analysis

(c) Venture measurement Report: operational results of a particular venture for a specified period.

(II) FINANCIAL REPORTS

- Financial position of firm on specific date
- Help tracking cash flows
- Useful to internal & external stakeholders
- Depict evolving financial position of the firm.

(III) ROUTINE REPORTS

- Clear & routine account of monthly production & cost activities such as overheads, sales, credit collection, bad debts, etc.
- Submitted different levels of mgt. as per fixed time schedule

(IV) SPECIAL REPORTS

- To look in depth at some specified period as mandated by top mgt.
- Could cut across a no. of depts. & functions such as industrial engineering & marketing, etc.

(V) INVESTIGATIVE REPORTS

- Assessing the cause & remedy of specified problems
- Identifying loopholes in the system
- Will result in a verdict & actionable outcome

(VI) BUDGET PROPOSAL REPORTS

- Assesses the impact of a problem, revealed by the investigative report, on production plan as well profits & performance
- Part of correctional phase of the mgt. control cycle
- Prepared by unit heads & serve as feedback as well as feed-forward.