RISK ANALYSIS IN CAPITAL BUDGETING

SUMMARY

Types of decision making

- When CF's are certain
- CF involve risk but, probability can be assigned
- CF are uncertain probability-cannot be assigned

Probability Distribution of CF

- Known → Risk
- Unknown → Uncertainty

Risk

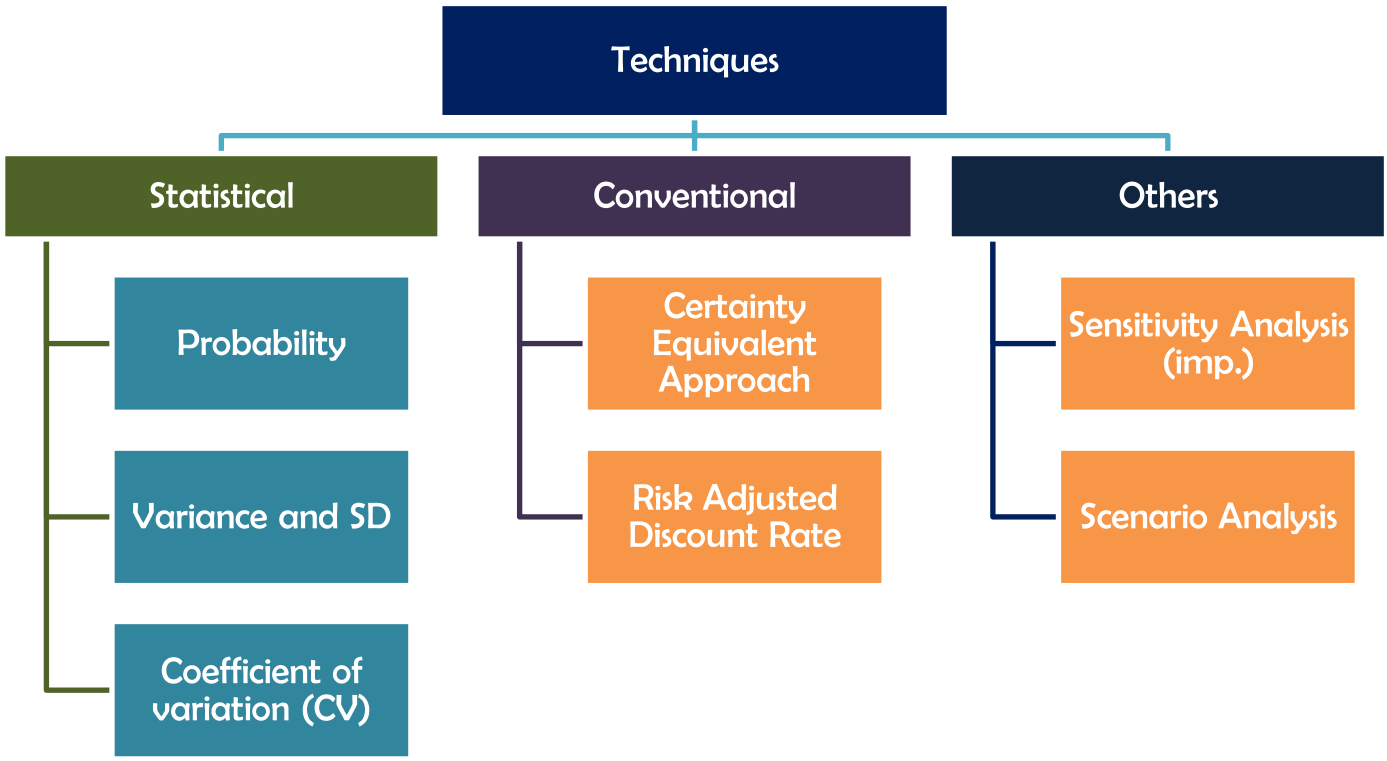
- Business risk
- Financial risk

➢ Why Risk Analysis in Capital Budgeting

- Opportunity cost involved
- To know the real value of CFs

➢ Sources of risk

- Project specific risk — *(Affects a particular project)*
- Company specific risk — *(Factors affecting CF of an entity and its access to Funds for capital Investment)*
- Industry specific risk — *(Affects the whole industry in which the company operates in)*
- Market risk — *(Market related condition like demand etc.)*
- Competition risk — *(Entry, Exit, Dynamism)*
- Risk due to economic conditions — *(Macro factors)*
- International risk — *(Global economic conditions)*



Probability

- Expected Value
- Mean = ΣPx
- $\overline{X}$

Variance and SD

- $SD - \sqrt{Variance}$
- $SD = \sqrt{\Sigma P\left(X - \overline{X}\right)^2}$

Coefficient of variation (CV)

- $CV = \frac{SD}{Mean} \times 100$
- Why CV?
- **When :** Expected NPV $\rightarrow \uparrow$ SD $\rightarrow \uparrow$

Certainty Equivalent Approach :

Step 1 : Expected CF of each year $\left[\overline{CF}\right]$

Given   Calculate ΣPx

Step 2 : Certainty equivalent = $\infty \times \overline{CF}$

Where,

∞ = Certainty equivalent coefficient

Step 3 : Use R_f to derive NPV

Note :

- *Higher the risk – lower the ∞*
- *Higher the level of risk aversion – lower the ∞*

RADR

Step 1 : Expected CF

Step 2 : Use RADR to discount

Use RADR to discount

- **Case 01 RADR** — gives
- **Case 02 RADR** — K_C + Differential risk premium
- **Case 03 RADR** — R_f + Risk Premium
- **Case 04 RADR** — Based on COV
- **Case 05 RADR** — $R_f + (K_c - R_f) R_I$ Where R_I = Risk Index

Note :

Lower the ∞ , higher RADR should be used

Other Technique

Sensitivity Analysis : Find out sensitivity of NPV wrt each risk factors

STEPS

Step 1 : Calculate Expected NPV

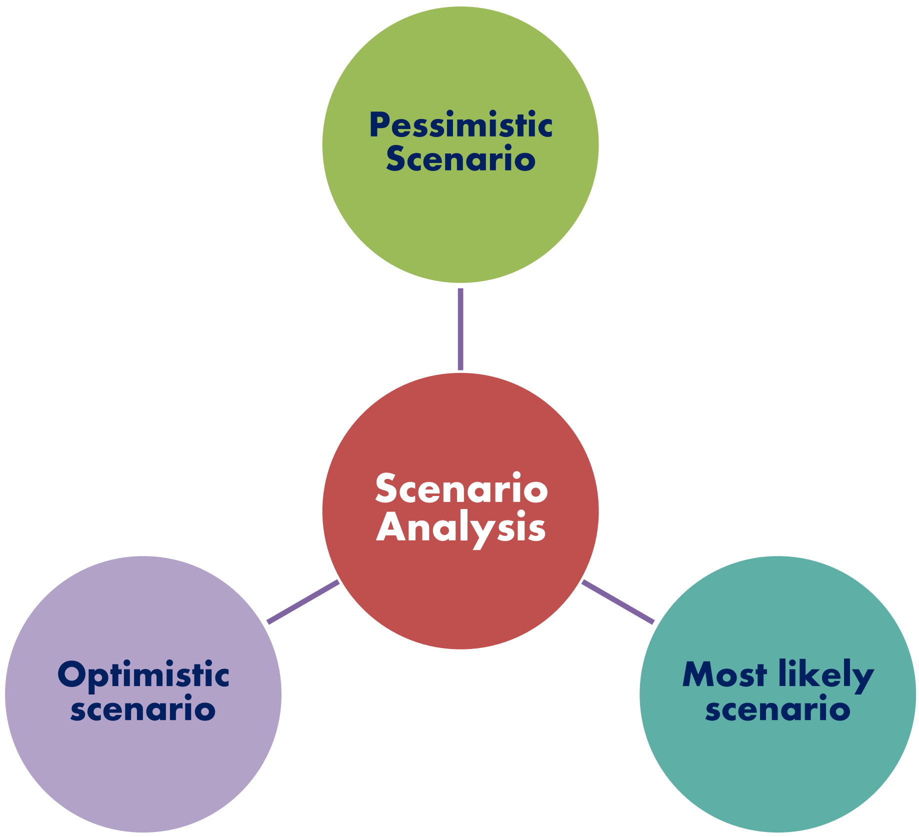
Step 2 : Shock each risk factor in the adverse direction in a certain percentage and find percentage fall in NPV

Step 3 : Conclusion :

Maximum percentage fall in NPV → Critical factor

Certain Factors – Shock in the direction :

- Annual CF → ↓
- K_c → ↑
- Initial Investment → ↑
- Number of unit sold/produced → ↓
- Selling price → ↓
- VC p.u. → ↑
- FC p.a. → ↑
- Discounting Rate → ↑
- Life(n) → No shock



- **Find NPV in each Scenario.**
- **Management can suggest different combinations of CF, life, Kc and initial investment from different Scenario**