[Academic Script]

Conventional Tools to Handle Risk

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1. Introduction

In this session we are going to discuss the concept of risk and conventional tools to handle risk in projects. Any entity will assess and evaluate return on their investment, which is based on inherent risk of the investment. Since long, many individuals, businessmen and companies have been adopting project based risk management system. Different tools, risk approaches and models have been utilized for risk assessment and evaluation. Project risk management takes a broad perspective on identifying the risk that could cause a project to fail to meet its requirement. There are several techniques for identifying risks. These techniques can be classified as conventional and statistical. For any project prime issue is to identify root cause or factors which determine risk element. For any project manager's key challenging task is to manage dual responsibility of growing business and managing risk. Jeffrey Immelt, Chairman and CEO at General Electric Co., described his position at GE, as : "My job is to figure out how to grow and manage risk and volatility at the same time."

Before discussing the conventional tools to handle risk, **Let us first clarify the concept of RISK**

Risk can be understood as an exposure to potential danger or loss. When any investment project remains unplanned associated uncertainty with it converted in to risk for the project. If such risk is affected to profitability, solvency and liquidity which is related with financial aspect in any company it is known as financial risk.

A risk associated with an asset can be explained in two ways.

- On a standalone basis
- On a portfolio basis

In business world, one can neither control nor predict future events. The outcome of investment decision can be better or worse than expected. Therefore, it is vital to consider the diverse implications of plans and projects while undertaking an investment project.

"In the context of project appraisal, the terms 'risk' and 'uncertainty' are usually used synonymously. Risk describes a situation where there is not just one possible outcome but there is a possibility of occurrence of an array of potential returns." (Brealey and Myers 2006)

A project is always appraised by making certain basic assumptions prior to incorporating. These appraisals always welcome or keep in mind various types of risk yielding results that may deviate from reality. All projects are usually prone to some kind of risk or other.

Do you know what are risks associated with a project?.

Risks associated with a project are:

Project risk

Debtor's credit risk

Sovereign credit risk

Commercial risk

Political risk

Force measure

There are various tools to handle project risks. These tools are Conventional tools and statistical tools. Let us discuss Conventional tools to handle risk associated to a project.

Conventional tools to handle risk are (i) Risk Adjusted Discount Rate (ii) Certainty Equivalent and (iii) Sensitivity Analysis.

Let us first discuss Risk Adjusted Discount Rate method:

Introduction:

In this method generally sum of risk free rate and risk premium is calculated which is related with the project. To know risk adjusted discount rate risk free rate and risk premium both factors are taken in to consideration. The variation of risk premium is depending on the risk aversion of investor and the perception of investor about the size of property's investment risk.

The risk-adjusted discount rate method, where differential project risk is dealt with by changing the discount rate. Average-risk projects are discounted at the firm's corporate cost of capital, above-average-risk projects are discounted at a higher cost of capital, and below-average-risk projects are discounted at a rate below the corporate cost of capital. While evaluating investments, individuals and businesses will find it necessary to adjust expectations based on the inherent risk of the investment. It is possible to use tools, such as risk modeling in evaluating risk.

It is widely accepted that investors require a return in excess of the risk free rate as compensation for implementing a risky investment. **An estimation of the present value of cash for high risk investments is known as risk-adjusted discount rate**. A very common example of risky investment is the real estate. Risk adjusted discount rate is representing required periodical returns by investors for pulling funds to the specific property. It is generally calculated as a sum of risk free rate and risk premium. The variation of risk premium is depending on the

risk aversion of investor and the perception of investor about the size of investment risk.

Risk-adjusted discount rate = Risk free rate + Risk premium

This concept is used in both portfolio theory and the capital asset pricing model. The amount of risk premium expected by an investor increases with the increase in the risk factor.

Determination of the project risk is a difficult process and computing the discount rate for different risk classes is yet another problem. An alternative way of dealing with this situation would be to presuppose that the average risk of the current business is taken as the average risk of new investment projects. All the investment projects can be discounted using a single overall rate, which would usually be the weighted average cost of capital.

Advantages of this method are:

(i) It is very popular and is commonly applied in practice due to its simplicity and convenience.

(ii) It is easier to manage the discount rate that considers both risk and time.

Limitations of this method are:

(i) It is difficult to estimate the risk adjusted discount rate for a project consistently. It is determined in an ad hoc and arbitrary manner.

(ii) This method wrongly assumes that risk increases at a constant rate with time.

Case study:

A company X is undertaking a project for a period of 3 years. The cash out flow for this project is Rs.1,10,000. The cash inflows for each year are Rs.35,000; Rs.45,200; Rs.50,000 respectively. The risk free rate is 8% and the risk premium rate is 4%.

Consider NPV method

Total rate of discount is rate of discount=8+4

=12%

Year	Cash inflows (Rs.)	Discount factor	PV of cash flow (Rs.)
1	35,000	0.893	31,255
2	45,200	0.797	36,025
3	50,000	0.712	35,600

- Net present value=

   Present value of cash inflow-cash out flow

   PV of sum of all cash inflows=Rs.1,02,880

   NPV=Rs.1,02,880-Rs.1,10,000

   =Rs.-7,120

- If for the above case assume risk free return is 5% and risk premium rate is 2%

The total discounted rate is now 7%

Year	Cash	Discount	PV of cash

	inflows (Rs.)	factor	flow (Rs.)
1	35,000	0.935	32,725
2	45,200	0.873	39,460
3	50,000	0.816	40,800

- PV of sum of all cash inflows=Rs.1,12,985

- NPV=Rs.1,12,985-Rs.1,10,000

    =Rs.2,985

Hence here we can accept the project.

2. The other conventional method of handling risk is Certainty equivalent method

Introduction

In this approach, decision maker first evaluate a cash flow in a project and also specify how much money to be received with certainty bases. A depth study is taken in to consideration between the riskless and risky cash flows.
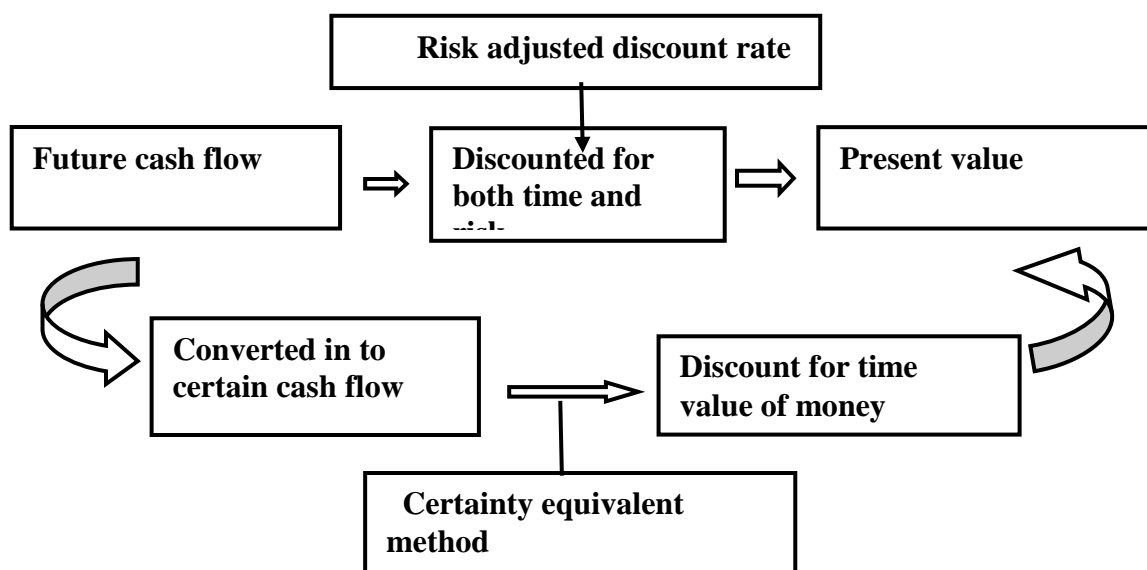
In Certainty equivalent method, the expected cash flows are adjusted to reflect project risk. Risky cash flows are scaled down because the riskier the flows, the lower their certainty equivalent values. The certainty equivalent method says that certain cash flows that are equivalent to risky cash flows are equally attractive to investors.

Certainty equivalent is a guaranteed return that someone would accept, rather than taking a chance on a higher, but indecisive,

return. E.g. If you've ever thought about leaving your job to start your own business and potentially make more money, but decided to stay and continue drawing a salary instead, then the amount of your salary is your certainty equivalent.

The certainty equivalent (CE) method follows directly from the concept of utility theory. Under the CE approach, the decision maker must first evaluate a cash flow's risk and then specify how much money to be received with certainty, will make him or her indifferent between the riskless and the risky cash flows.

To depict it relationship between the certainty equivalent methods and risk adjusted discount rate following figure is taken in to consideration.

Advantages of this method are:

- In this method, certainty equivalent coefficient of every individual year depends on the extent of risk vis-a –vis its cash flow.

- It is a more conceptually sound method than the risk adjusted discount rate method, as it does not presuppose that risk increases at the constant rate with respect to time.

Limitations of this method are:

- The Risk adjusted discount rate method is better than this method.
- Specification of a series of certainty equivalent coefficient is a cumbersome process.

Case Study:

A company is considering an investment proposal whose cost is Rs.2,10,000. Its economic life is 4 years. Risk free rate is 11%. Use IRR method for validating the proposal. The cash flows and certainty equivalent coefficient are as follows:

Year	Cash inflows (Rs.)	Certainty coefficient
1	70,000	0.8
2	90,000	0.9
3	60,000	0.85
4	1,30,000	0.75

- Calculation of cash inflows with certainty

Year	Cash inflow (Rs.)	Coefficient	Risk less cash flow (Rs.)

1	70,000	0.8	56,000
2	90,000	0.9	81,000
3	60,000	0.85	51,000
4	1,30,000	0.75	97,500

- Assuming return of 14% PVs of cash flows:

Year	Cash inflow (Rs.)	Present value factor	Present value (Rs.)
1	56,000	0.877	49,112
2	81,000	0.769	62,289
3	51,000	0.675	34,425
4	97,500	0.592	57,720

- Sum of all present values=Rs.2,03,546.
- Net present value=Rs.2,03,546-Rs.2,10,000

  $$= Rs.-6,454.$$

- Now assuming a return of 10%

Year	Cash in flow (Rs.)	Present value factor	Present value

			(Rs.)
1	56,000	0.909	50,904
2	81,000	0.826	66,906
3	51,000	0.751	38,301
4	97,500	0.683	66,592.5

- Sum of resent values=Rs.2,22,704.
- Net present value=Rs.2,22,704-Rs.2,10,000

  =Rs.12,704.
- There fore IRR= 10+(12,704/12,704+6,454)x4

  =   12.65%

Hence the proposal can be accepted.

3. The last conventional method we are going to discuss is Sensitivity analysis

A sensitivity analysis is a technique which is used to determine how different values of an independent variable will impact a particular dependent variable under a given set of assumptions. An approximate future outcome on an investment project is evaluated by its Net Present Value (NPV). To avoid conditions of improbability, a more comprehensive and practical value of Net Present Value (NPV) is required.   The computation of Net Present Value (NPV) involves the analysis of some critical variables such as the initial investment, cost of labour, hardware etc. It would be interesting to note down that Net Present Value (NPV) is influenced by individual variable and its impact on

sensitivity analysis directly. A comprehensive study of the nature and extend of risk associated with the project can be derived. Sensitivity analysis helps in avoiding negative Net Present Value (NPV) by monitoring the changes in it due to the changes in variables.

Advantages of this method are:

(i) Sensitivity analysis allows decision makers to be more informed about project sensitivity.

(i) They can decide whether they are in a position to accept risk or not.

In Sensitivity analysis some crucial points affect widely on the variable which need more time and research resources to resolve the issues.

During the implementation phase of the investment process, sensitivity analysis may be used to highlight these factors, which makes a greater impact on Net Present Value (NPV).

These factors may be monitored more carefully in order to control major deviation from their project values.

Drawbacks of this method are:

(i)The absence of any formal assignment of probabilities to the variation of crucial parameters is a potential limitation of sensitivity analysis.

(ii) The concept may be best understood in relation to the case under review.

4. Summary

In above all discussion, concept of risk, traditional methods of risk assessment, NPV and risk adjusted discounted rate associated with project is discussed in detail. How risk is affected any project success and its failure with cash return is also

focused. We discussed the concept of risk associated to a project and conventional tools used to handle risk. The conventional tools we discussed are Risk Adjusted Discount Rate, Certainty equivalent and sensitivity analysis. How risk adjusted discount ate affect certainty equivalent model and its affect of decision making also shared in detail. Each traditional tolls pros and cons also discussed with case study so practical enhancement would give proper clarity of the topic. Concept of Net Present Value and how it is important to take decision for any project is been discussed also.