

Risk Analysis and Appraisal of Projects

*Dr. D. N. S. Kumar

Risk is inherent in almost every business decision. It is more in industrial investment projects as it involves costs & benefits extending over a long period of time during which many variables can change in an unanticipated way.

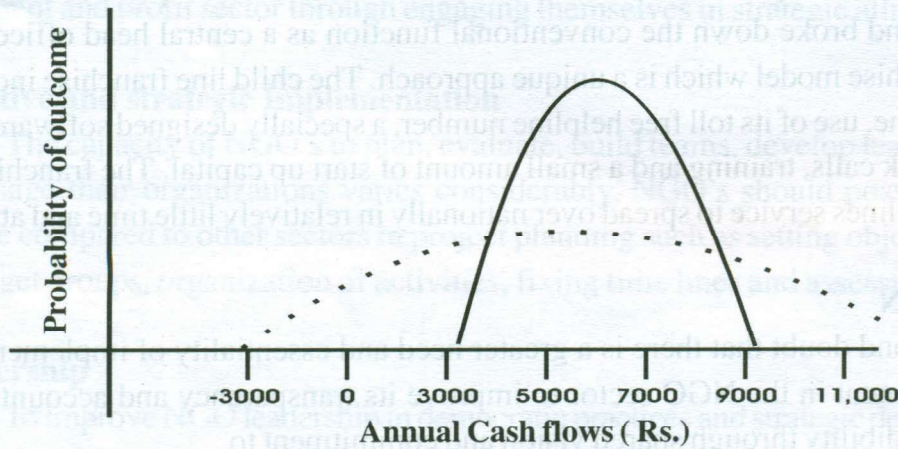
Investment proposals can be invited at all levels of an organisation. These are the most crucial business decisions, for they determine the future of the firm. Decisions, once made, may be irreversible, or at least costly to amend. For their feasibility and adherence to the goals of the firm, projects need to be appraised, before they take-up and risk analysis is one of the most complex, slippery and significant aspect of decision related to such decisions.

Investment Project different in risk

- i) Diversification - High risk
- ii) Expansion - Moderate risk
- iii) Replacement/Modernisation - Limited risk

Professor, KLS IMER, Belgaum.

Risk is associated with the deviation of actual outcomes.



On the stand alone basis a project may be risky but its returns are not highly correlated, or even better, negatively correlated with the returns on the projects of the firm, its corporate risk tends to be low. Ex. HLL. For HLL it has helped in reducing the firm's overall risk expo-

SAFE



* Professor : KLS, IMER, Belgaum.

Probability distribution provides the basis for measuring the risk of project

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Rule

“the tighter the probability distribution of expected future neture, the smaller the risk of a given project and vice - versa”

Techniques of Risk Analysis

1.Sensitivity Analysis (one variable) :

an uncertain future, it is to draw a line of results, to know when happens to the variability of a project when some variable like sales or investment deviates from its expected value.

That is, “What if”

- Ex**
- i) What happens to Nov if sales are only 50,000 ynits vather 65,000
 - ii) What happens to ROI for the year 2006-07 if Sugarcane is crushed for sixmonths only with Rs. 1207 as price of sugar -cane, instead 8 months with Rs. 1450 as price per ton ?

2. Scenario Analysis :

If variables are inter-related, as they are most likely to be, it is helpful to look at some plausible scinarios

Procedure :

- i) Select Strong variables.
- ii) Estimated value of such variables
- iii) Calculate NPV / IRR / ROI.

Ex : Jet enterprise to evaluate a project to a cequire Air-Sahara at Rs. 1450 crores. Depending on the response of the market potential and achievable share-the factor which is the largest source of uncertainty for the success of the project - the management of jet has indentified three scenorios.

- S-i : Acquisition will have modevate appeal to customers across the bond at a modest price.
- S-ii : Acquisition will strongly appeal to a large segment of the market which is highly price - Sensitive.
- S-iii : Acquisition will appeal to a small segment of the market which will be willing to pay a high price.

3. Break - Even - Analysis :

NPV for the above Scenario Rs. in crores

	S -1	S -2	S -3
Initial Investment	1450.00	1,450.00	1,450.00
Unit Selling Price (Rs. average)	3,000.00	2,000.00	400.00
Demand (p.a. flight person)	67,95,000.00	1,08,72,000	36,24,000
Ravenue	2,038.50	2,174.40	1,449.96
Fixed Cost	400.00	400.00	400.00
Depreciation	210.00	210.00	210.00
Pre-tax Profit	205.40	151.40	114.98
PAT	126.93	92.88	70.71
Annual Cash flow	336.93	302.00	280.71
Project life	15yrs.	15 yrs	15 yrs
Salverge Value	200.00	200.00	200.00
NPU at 12% discount	871.43	649.51	498.51

How much should be produced & sold so that the project doesn't "Lose money". It focuses on single/multiple variable and unable to achieve the set target results. It becomes a functionally integrated guideline for effective results with good management control system.

A Case Analysis :

Amrita Tea of darjeeling had always sold its products through a sole selling agency. The Government Started devising schemes to eliminate middlemen and Amrita wanted to respond to the new public policy towards private distribution.

This year, Amrita had made a net profit before tax (NPBT) of 10% on a sale of Rs. 20 lakhs. It is feared, that elimination of the sole selling agency and selling directly to retailers would result in a 40% drop in sales next year. Fixed expenses would increase from the present figure of Rs. 2.00 lakhs to Rs. 3.00 lakhs owing to the additional warehousing, distribution, and other marketing efforts. Elimination of middlemen would, of course, save Amrita a substantial chunk of variable costs. They were not willing to give the details of their sole selling agency agreement and how much variable cost they would eliminate by one switch-over. Instead, they want to know,

- a) How much the variable losses need to be reduced next year in order to make the same NPBT (not in terms of percentage, but in absolute amount), under the new scheme as they make this year.
- b) If they are likely to make a NPBT of Rs. 1.8 lakhs next year under the new arrangement what do you think is happening to their break - event?
(By prof. K. Balakrishna, IIM, theme aobad).

Analysis :

Variable Cost	=	Sales -(Fixed cost + Profit) ... (i)
	=	20.00 - (2.00 + 2.00)
	=	16.00
Contribution	=	Sales - Variable Cost ... (ii)
	=	20.00 - 16.00
	=	4.00
P/V ratio	=	$\frac{\text{Contribution}}{\text{Sales}} \times 100$... (iii)
	=	$\frac{4.00}{20.00} \times 100$
	=	20%

a) Variable cost to be reduced to make :

a profit of rs. 2.00 lakhs
 16.00 - (40% 16,00,000)
 9.60 lakhs (As production would be reduced to the extent)

b) Sales mto make a profit of Rs. 1.80 lakhs :

		V. C. + Profit + K. Cost ... (iv)
		9.60 + 1.80 + 3.00
	=	Rs. 14.40 lakhs
Contribution	=	14.40 - 9.60
	=	4.80 lakhs
P/V ratio	=	$\frac{4.80}{14.40} \times 100$
	=	33.33%
BES	=	$\frac{3.00}{4.80} \times 100 - 62.50\%$
i.e.,	=	90 lakhs

Variable Cost Reduction : From 80% to 66.67% i.e. **13.34 %**

4. Hiller Model

Knowledge of NPV and σ (NPV) to project manager is very useful for evaluating the risk characteristics of a project.

Illustrate : NPV and σ (NPV) of a project are the NPV will be less than 0 is,

Standardised difference , ... (i)

$$\frac{0 - 1,20,000}{80,000}$$

The Cumulative probability up to $Z = -1.5$ is 0.66 ... (ii)

That is, there is a 6.6 percent chance that NPV will be equal to or less than 0.

Project Appraisal Critario :

The principal issues consiared and the critaria employed in Investment project appraisal by IDBI, ICICI, SFCS etc. are

I. Market Apraisal :

The inportance of the potential market and the need to develop a suitable marketing strategy cannot be over - emphasised.

- * Examine the reasonableness of the demand projetions by utilizing the bindings of available surveys, industry association projections, planning commission projects and independents surveys.
- * Access the adequaly of the marketing infrastructure in terms of promotional effort, distribution network, transport facilities, stock level etc.
- * Judge the knowledge, experience and competence of the key marketing personnel.

II. Technical Appraisal

- * Product Mix
- * Capacity Utilization
- * Process of Manufacture
- * Engineering know - how & technical collaboration
- * Raw material & Consumable - source & availability with substitutes
- * Locational advantage and Sixe
- * Plant and Equipment. - pollution problems, employment generation, technical manywer required.
- * Total manpower requirement
- * Break - even - point

III. Financial appraisal :

The financial appraisal seeks to assess the following ;

- i) Reasonableness of the estimate of capital cost
- ii) Reasonableness of the estimate of working results
- iii) Adequary of the rateof return, and
- iv) Appropriateness of the financing pattern.

IV. Economic Appraisal :

- i) Effective rate of profection
- ii) Domestic resource cost

V. Managerial Appraisal :

- * How resourceful are the promoters ?
- * How sound is the understanding of the project by the promoters ?
- * How Committed are the promoters ?

In the past, non/ poor analysis and appraisal of projects not only endangued the projects but make lemders to face libigation and so much so to suffer financial loss. It is always in the good tasbe of enterprise and stafeholders to do the same .