Research Paper　　　　　　　　　　**Commerce**

Break Even Analysis and Decision Tree Analysis of Pelican Rotoflex Pvt. Ltd.

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ABSTRACT　*The Financial manger of Pelican Rotoflex Pvt. Ltd. is considering setting up a new branch near Bangalore based on Pelican previous experience.*

The success parameters for any project are in time completion, within a specific budget and with

Requisite performance means technical requirement. The main barriers in achieving these are changes that occur in the project environment.

Here we assume that the manager can list the events and estimate their probabilities. The manager has less information than with decision making under certainty but more information than with decision making under uncertainty. For this intermediate situation, the expected value decision rule is widely used. The expected value for an alternative is found by weighting each payoff with its associated probability. The alternative with the best expected value (highest for profits and lowest for costs) is chosen.

KEYWORDS: Risk Management with B.E.P Analysis and Decision Tree Analysis

Introduction

Pelican Rotoflex Pvt. Ltd. was established in the year 1920 by shree Jamanadas P. Shrimanker. It provides for its on modern facilities and has always been adopting new techniques in printing machine to manufacture the best quality output. They manufacture kinds of lamination machine and other rewinding machine as consumer's requirement.

Today Pelican is a leading name in Indian market for printing and lamination machine items having a very good brand reputation for it s quality and innovated protects.

"Company generally focus on the risks that they can see"
 -stere matthesen

The Pelican Rotoflex Pvt. Ltd. Is produce printing machine in large scale and export into 20 different countries like Nigeria, South Africa, Kenya, Zambia, Columbia, Saudi Arabia, Kuwait etc? Main product of the company is Printing machine, lamination machine, and Rewinding machine namely roto gravure printing machine, flexo graphic printing machine, coating and laminating machine, sitting and rewinding machine. Company used "ISO:9002" quality controlling system. Company is having sufficient administrative staff.

Objective of Study

The objective of risk management is understood by analysis of risk. The risk management is proper protection of company's assets and profitability against loss from pure risk. This is accomplished by systematic analysis of risk and the employment of various techniques aimed at reducing potential loss from these risk.

The risk management analyses risk in given data like techniques of risk analysis, sources measure and perspective on risk, project selection under risk, and decision tree analyses with Break Even Analysis. Company is trying to give data as much as possible from them.

Techniques of Risk Analysis

[A] Analysis of Stand along Risk

(i)　Sensitivity Analysis
(ii)　Simulation Analysis
(iii)　Scenario Analysis
(iv)　Break Even Analysis

The financial manager of pelican Rotoflex pvt. Ltd. Is considering setting up a new branch near Bangalore. Based on pelican's previous experience, the project staff of pelican has developed the figures show in table. The ratio of variable costs to sales is (12/18)0.667. This means that every rupee of sales makes a contribution of Rs. 0.333 put differently; the contribution marginal ratio is 0.333. Hence, the break even level of sales will be

Fixed costs + depreciation
Contribution margin ratio
= 1 + 2　　　　**=Rs. 9 crores.**
**　0.333**

Cash flow forecast for pelican's project

Serial no.	Particular	Year 1 - 10
1.	Investment(year 0-20,00,000)	-
2.	sales	1800000
3.	Variable costs(66 2/3 % of sales)	1200000
4.	Fixed costs	100000
5.	Depreciation	200000
6.	Pre-tax profit	300000
7.	Taxes	100000
8.	Profit after tax	200000
9.	Cash flow operation	400000
10.	Net cash flow	400000

By way of confirmation, you can verify that the break even level of sales is indeed Rs.900000 crores

Serial no.	Particular	In crores
1.	Sales	9
2.	Variable costs	6
3.	Fixed costs	1
4.	Depreciation	2
5.	Profit before tax	0
6.	Tax	0
7.	Profit after tax	0

A project that breaks even in accounting terms is like a stock that gives you a return of 0%, in both case you get back your original investment but you are not compensated for the time value of money or the risk that you bear. You had foregone the opportunity cost of your capital. Hence a project that merely breaks even in accounting terms will have a negative NPV.

Financial break even analysis.

Financial break even analysis focuses on NPV and not on accounting profit. At what level of sales will the project have a zero NPV? To know how the financial break even level of sales is calculated, let us go back to the pelican project depends on sales as follows.

Serial no.	Particular	Year 1 – 10
1.	Variable costs	66.67% of sales
2.	Contribution	33.33% of sales
3.	Fixed costs	1 lac. crore
4.	Depreciation	2 lac. crore
5.	Pre-tax profit	(0.333 * sales)-Rs.300000 crore
6.	Tax (at 33.3%)	0.333(0.333 * sales)-Rs.300000 crore
7.	Profit after tax	0.667(0.333 * sales)-Rs.300000 crore
8.	Cash flow operation	Rs. 200000 crore + 0.667(0.333 * sales)-Rs.300000 crore=0.222 sales

Since the cash flows lasts for 10 years, its present value at a discount rate of 12% is,

PV [cash flow]　　　=0.222 sales * PVI (10 years, 12%)
　　　　　　　　　　=0.222 sales * 5.650
　　　　　　　　　　=1.254 sales

The project breaks even in NPV terms when the PV of these cash flow equals the initial investment of Rs.20,00,000 crore. Hence, the financial break – even occurs when,

PV(cash flows)	=
investment 1.254 sales	= Rs.20 lac. Crore.
Sales	= Rs.15.95 crore.

Thus, the sales for the pelican must be Rs.15.94 lac crores per year for investment to have a zero NPV note that this is significantly higher than Rs. 9 lac crore which represent the accounting break-even sales.

Decision tree analysis

If the firm builds a large plant initially it can cater to the needs of the market when the demand growth is favorable . However, if the demand turns out to be weak , the plant would operate at a low level of capacity utilization. If the firm builds a small plant, to begin with, it need not worry about a weak market and the consequent low level capacity utilization.

Steps in decision tree analysis
The key steps in decision tree analysis are:
1. Identifying the problem and alternative .
2. Delineating the decision tree .
3. Specifying probabilities and monetary out come.
4. Evaluating various decision alternatives.

A simple project of pelican Rotoflex pvt. Ltd.

The firm is ready for production and test marketing. This will cost of Rs.20 lac. Crore and take six months management believe that there is 70 % chance that the production and test marketing will be successful. In case of success, spectrum can build a plant costing Rs.150 lac crores. The plant will be generating an annual cash inflow of Rs.30 lac. Crore for 20 year. If demand is high or an annual cash inflow of Rs.20 lac. Crore. If the demand is low, high demand has a probability of 0.6; low demand has a probability of 0.4. What is the optimal course of action using decision tree analysis. Assume a discount rate of 12%.

The decision tree for the production
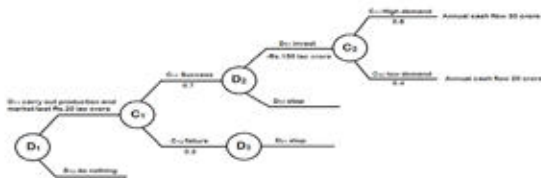
The optimal course of action is determined as follows.

1. Start at the right hand end of the tree and calculate the expected monetary value (EMV) at chance point C2 that comes first as we proceed leftward.
 EMV (C2) = [0.6[30 * PVI(20 year,12%)] + [0.4[20 * PVI (20 year, 12%)]
 = Rs.194.2 lac crore

2. Evaluate the EMV of the decision alternatives at D2 the last stage decision point.

Alternative
EMV
D21 (invest Rs.150 lac crore)
Rs. 44.2 lac crore

D22(stop)
0

3. Select D21 and truncate D22 as EMV (D21) > EMV (D22).
4. Calculate the EMV at chance point C1 that comes next as we roll backwards.
 EMV (C1) = 0.7(44.2) + 0.3 (0)
 = Rs.30.9 lac crore

5. Evaluate the EMV of the decision alternatives at D1 the first stage decision point.

Alternative
EMV
D11 (carry out a production and market test at a cost of 20 lac crore)
Rs. 10.9 lac crore

D12(do nothing)
0

Based on the above evaluation, we find that the optimal decision strategy is as follows:
Choose D11 (carry out production and market test) at the decision point D1 and wait for the outcome at the chance point C1. If the outcome at C1 is C11(success, invest Rs.150 lac crore), is the outcome at C1 is C12 (failure) stop.

1. Sources, measures and perspective on risk.
a. Sources of risk.
There are several sources of risk in a project. The important once are as follows:
I. project – specific risk.
II. competitive risk.
III. industry – specific risk.
IV. market risk.
V. International risk.

b. Measures of risk.
The calculation of these measures, consider a capital investment whose net present value has the following distribution.

Year	NPV	Probability
1	200 lac	0.3
2	600 lac	0.5
3	900 lac	0.2

$\sum$ The probability waited NPV works out to:
E (NPV) = Pi NPVi
 = 0.3 * 200 + 0.5 * 600 + 0.2 * 900
 = 540

(1) Range
"The simplest measure of risk" the range of a distribution is the difference between the highest value and the lowest value. The range of the above distribution is..

900 – 200 = 700

(2) Standard deviation
"Absolute measure of risk"
Standard deviation is the square root of the mean of the squared deviation, the deviation being the difference between an outcome and the expected mean value of all outcomes.

$$\sigma = \sqrt{\sum_{i=1}^{n} Pi \, (Xi - \bar{X})^2}$$

The standard deviation of the NPV distribution presented above is:
= [0.3 (200- 540)2 + 0.5 (600 - 540)2 + 0.2(900 - 540)2]1/2
= [62400] ½
= 249.8
The square of the standard deviation is called variance.

Variationce =

(3) Co – efficient of variation
"A relative measure of risk"
The co-efficient of variation (CV) adjust standard deviation for scale it is define as:

CV = standard deviation
Expected cash flow

The co-efficient of variation for the investment in this is:

CV = 249.8

540

= 0.46

(4) Semi- variance

The semi – variance is computed the way the variance is computed, except that only outcomes below the expected value are taken into account. It is defined as:

$$SV = \sum Pidi'2$$

Where di' is equal to di if di<0 and is equal to '0' if di > 0.
The semi-variance for the investment in this is

SV = 0.3(200 - 540)2

= 34,680

The semi-standard deviation is the square root of semi-variance. The semi-standard deviation for the investment in this is,

Semi-standard deviation	=	(semi-variance)1/2
	=	(34680)1/2
	=	186.2

Suggestions and Conclusion

(1) Apply Break Even Analysis using algebraic approach to evaluate new product and services and different process methods.
(2) Evaluate decision alternatives with preference matrix for multiple criteria,
(3) Construct a pay off table and select the best alternatives by using a decision rules.
(4) Calculate the perfect information.
(5) Draw and analysis of decision tree.

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