

OPTIMIZATION OF ROI FOR A CONSTRUCTION FIRM THROUGH PORTFOLIO ANALYSIS

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ABSTRACT

Working capital plays an important role in any organization and to raise working capital, investments are to be made. To make such investments in any sector knowledge of portfolio is necessary as it not only predicts returns on investment but also it evaluates the associated risk with the investment. People / companies are investing lot of money on construction industry to gain more and more profit on the investment but at the same time they have to bare some high risk which causes loss or at worst case heavy loss. This study identifies those risk elements of investment and gives appropriate ideas to investor whether to invest or not, and if yes then how much to invest? The key ingredients for Portfolio analysis are period for which an investment is to be made, risk, investment amount, rate of return and market condition. This portfolio analysis gives range of returns to investor so that they can predict returns on investment made. Through this analysis one can arrive at the decision whether to invest in single asset or in multiple assets.

Keywords: NPV, Portfolio, Risk Return Characteristics, Risk Quantification, ROI.

I. INTRODUCTION

Portfolio management for product innovation has surfaced as one of the most important senior management functions. As we move into the next century, we face rapid change in technologies, shorter product life cycles, and heightened global competition, more than ever, how your business spends its technology dollars and resources is paramount to your future prosperity and even your survival. Indeed portfolio management is the manifestation of the business's strategy – it dictates where and how to invest for the future for profit maximization. Portfolio management treats R&D investments much like a fund manager in the stock market and also treats financial investments.

It deals with issues such as maximizing the value of the portfolio, return on R&D spending, appropriately balanced portfolio and a portfolio investment strategy that is aligned with the company's overall business strategy. How do companies decide where and how to spend their R&D funds? And how are senior managements dealing with the issue of portfolio management? This article reports the results of a large sample best practices study into portfolio management. The goals of the study are to.

- Learn about the role of portfolio management - for example whether or not it is endorsed by senior management; and the reasons why or why not;
- Determine what types of portfolio management techniques are used, their relative popularities, and which method appears to dominate the decision process;
- Probe the details of some of the portfolio methods descriptions of each and how they are used;
- Identify the best performers - those businesses with enviable portfolios and assess what distinguishes the best from the rest.

The study's overall goals are to study industry current and best practices in portfolio management, and to gain insights to guide for designing and implementing superior portfolio management methods.

II. DATA COLLECTION

The source of data for the purpose of study will be both primary and secondary:

2.1 Primary Data:

The data is collected from the firm (SWAGAT BIULDCON). The data consists of the residential and commercial projects done by the firm in last 5 years. The data is analyzed by using investment year and portfolio interest rate which determines the net risk return characteristics.

2.2 Secondary Data:

The data that is used in this study is of secondary nature. The data is to be collected from secondary sources such as various websites, banks etc. The analysis used in this study has been done using tools viz. net present value (NPV) and two asset portfolio technical tools. Risk on 5 point scale is analyzed and trading decisions are taken on basis of technical analysis.

III. DATA ANALYSIS AND RESULTS

3.1 Evaluation of risk involved

Based on questionnaire survey risk is identified on 5 point scale considering various parameter mentioned below in table no. 1

Table 3.1 Identifying critical risk elements based on its Impact and Occurrence on a 5 point scale

Sr. No.	Parameter	Impact	Occurrence	Combined Score
1. For real estate residential projects	A. Delays in selling	4	3	12
	B. Extra cost required due to rework, major changes in drawing, etc.	3	2	6
	C. Buying TDR	5	3	15
	D. Development of that particular area, locality and surrounding.	3	3	9
2. For real estate	A. Delays in selling	5	3	15
	B. Extra cost required due to rework, major	3	2	6

commercial projects	changes in drawing, etc.			
	C. Buying TDR	5	4	20
	D. Development of that particular area, locality and surrounding.	4	2	8

3.2 Risk Quantification on 5 point scale

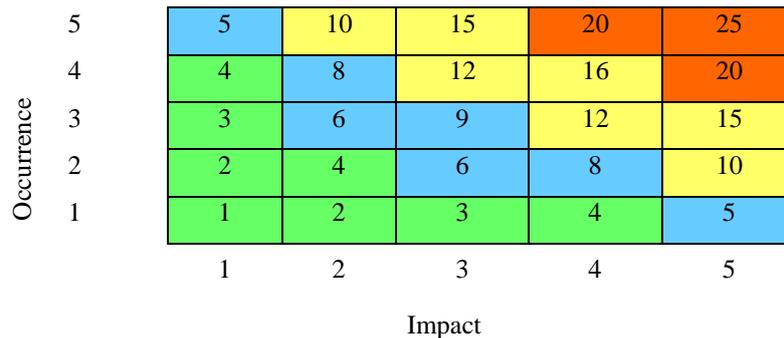


Fig. 3.1 Risk on 5 point scale

Table 3.2 Risk identification for SWAGAT BUILDCON

Combined Risk	Percentage	Significance
20 to 25	75 to 100	High risk
10 to 19	50 to 74	Medium risk
5 to 9	25 to 49	Low risk
1 to 4	1 to 24	Very low risk

The maximum risk for residential and commercial project is 15% and 20% respectively. Total investment in both the projects is 261.41 lakh out of which 129.62 lakh spent for residential and 131.79 lakh spent for commercial projects.

Table 3.3 Risk return characteristics for SWAGAT BUILDCON

Projects	Risk	Return	Proportion
Residential	15%	28.544	0.495
Commercial	20%	7.238	0.505

- Combined risk = $W_A \times \delta_A + W_B \times \delta_B$
 $= 0.495 \times 15 + 0.505 \times 20 = 17.525\%$
- Net returns = $W_A \times E(R_A) + W_B \times E(R_B)$
 $= 0.495 \times 28.544 + 0.505 \times 7.238 = 17.784$

To find the strategy for the future investments; for varied proportions the combined risk and net returns is calculated in the table below

Table 3.4 Combined risk and net returns

Varied proportion of		Risk	Returns
Residential	Commercial		
0.1	0.9	19.5	9.37
0.2	0.8	19	11.49
0.3	0.7	18.5	13.63
0.4	0.6	18	15.76
0.5	0.5	17.5	17.89
0.6	0.4	17	20.02
0.7	0.3	16.5	22.15
0.8	0.2	16	24.28
0.9	0.1	15.5	26.41

3.3 Net Present Value (NPV) calculation

NPV- it is also known as Net Present Value. It is a difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyze the profitability of a projected investment or project. Net present value or NPV is one of the calculation which business managers use to evaluate capital projects. A capital project is a long-term investment or improvement, such as building a new store. The NPV calculation determines the present value of the project's projected future income. In the calculation, the present value of the project's cost is subtracted from the present value of future income. A positive net present value usually means you should accept or implement the project. Business owners who compare two or more projects tend to favour the one with the higher net present value.

Table 3.5 Trading of SWAGAT BUILDCON for residential projects

Sr. No.	Year	Discounted Rate	Residential projects (in lakh)	
			Spent	Gained
1	2011	12	12	13.5
2	2012	13	13	17.6
3	2013	12.5	12.5	9.2
4	2015	14	14	23.25
5	2016	13	13	16.64

All NPV calculations below are based on the table 3.1 above

NPV is calculated as

$$NPV = \sum \text{cash inflow} / (1+r)^n - \text{Initial investment}$$

where, r = Rate of return and n = years

3.3.1 NPV calculation for residential projects

$$\sum \text{cash inflow} / (1+r)^n - \text{Initial investment}$$

$$\text{Average discounted rate} = \frac{12+13+12.5+14+13}{5} = 12.9\%$$

$$N.P.V = \left(\frac{40.5}{1+0.129^1} + \frac{52.8}{1+0.129^2} + \frac{27.6}{1+0.129^3} + \frac{69.75}{1+0.129^4} + \frac{49.92}{1+0.129^5} \right) - \left(\frac{30}{1+0.129^1} + \frac{42.6}{1+0.129^2} + \frac{19.5}{1+0.129^3} + \frac{55.5}{1+0.129^4} + \frac{40.2}{1+0.129^5} \right) = 166.62 - 129.62 = 37$$

Identifying best strategy to adopt in future based on NPV calculations. Here, NPV coming out from the calculations is positive hence there is no loss to the firm. Also it measures the profitability. It uses all cash flows occurring over the entire life of the project in calculating its worth. Hence, it is a measure of project's true profitability.

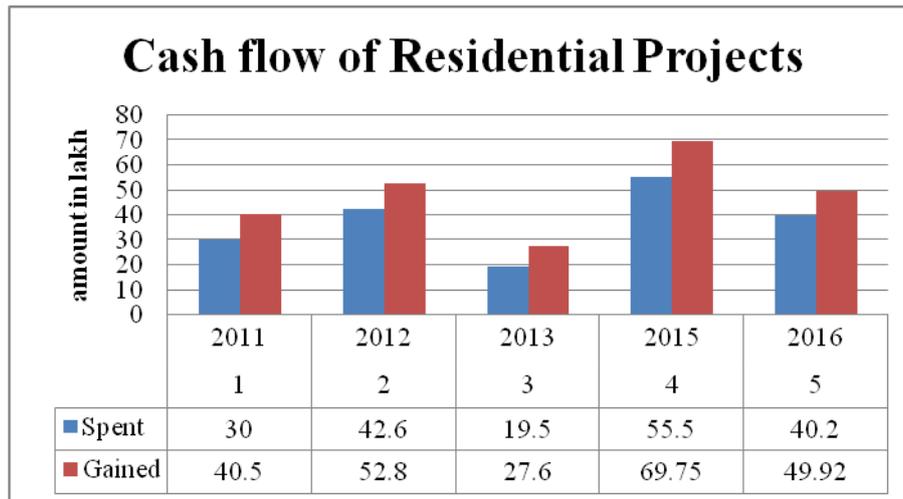


Fig. 3.2 Cash flow of residential projects

From the above graph it is clearly seen that the firm is making profit in every investment made by the firm. The net profit is varying for each of the projects on an average the firm making profit of Rs. 10.554 lakh every year.

Table 3.6 Trading of SWAGAT BUILDCON for commercial projects

Sr. No.	Year	Discounted Rate	Residential projects (in lakh)	
			Spent	Gained
1	2011	13	55.7	64.8
2	2012	12.5	33.78	37.65
3	2013	14	48.87	45.2
4	2015	13	36.7	38.35

All NPV calculations below are based on the table 3.2 above

3.3.2 NPV calculation for commercial projects

$$\text{Average discounted rate} = \frac{13+12.5+14+13}{4} = 13.13\%$$

$$N.P.V = \left(\frac{64.8}{1+0.1313^1} + \frac{37.65}{1+0.1313^2} + \frac{45.2}{1+0.1313^3} + \frac{38.35}{1+0.1313^4} \right) - \left(\frac{55.7}{1+0.1313^1} + \frac{33.78}{1+0.1313^2} + \frac{48.87}{1+0.1313^3} + \frac{36.7}{1+0.1313^4} \right) = 141.33 - 131.79 = 9.54$$

Identifying best strategy to be adopted in future based on NPV calculations.

Here, NPV values coming out from the calculations is positive hence there is no loss to the firm. Also it measures the profitability. It uses all cash flows occurring over the entire life of the project in calculating its worth. Hence, it is a measure of project's true profitability.

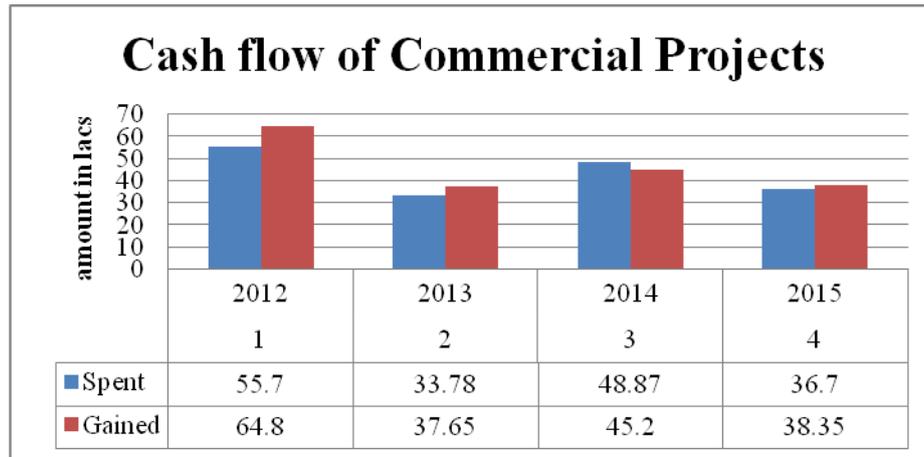


Fig. 3.3 Cash flow of commercial projects

From the above graph it is clearly seen that the firm is making profit in year 2012, 2013 and 2016. Whereas in year 2015, loss occurred to the firm. The net profit is varying for each of the projects on an average the firm making profit of Rs. 2.74 lakh every year.

IV. CONCLUSION

From the above analysis it is seen that the firm is having more profit in residential projects than the commercial projects. This is because, the firm is taking residential projects on development basis. So the firm is having least risk. In all the residential projects whatever amount is being spent is less than the amount gained in the respective projects. This indicates that there is no loss to the firm for any year of any project. Only in the first project the firm is in profit. Whereas for rest of the projects there is negligible profit. The third project is in loss as the amount spent for the projects is more than the amount received for the project. And for the last project there is no any significance profit to the firm.

V. SUGGESTION

From the analysis, it is clearly seen that firm is generating more profit from residential projects. Based on risk returns characteristics, if (SWAGAT BUILDCON) firm increases the amount of investment in residential projects; it will lead to more profit from 17.78 lakhs to 26.41 lakhs which is nearly 10% hike to the firm. Generally high risk gives high returns but here, the risk also reduces from 17.5 to 15.5 %. The firm will get more profit with least risk which is very ideal and preferred condition for investment.

REFERENCES

- [1] D Brandolini, M Pallotta, and R Zenti, Risk Management in an Asset Management Company: A Practical Case, EFMA 2001 Lugano. Available at SSRN: <http://ssrn.com/abstract=252294> (2001).
- [2] D Brandolini and S Colucci, Backtesting Value-at-Risk: a comparison between filtered bootstrap and historical simulation, J Risk Model Validat 6 (2012).
- [3] F Cesarone, S Colucci, and F Tardella, CVaR Equal Risk Contribution model for portfolio selection, Manuscript in preparation (2014).

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- [4] Financial management 7th edition, by M Y Khan, P K Jain; McGraw Hill publication 2014.
- [5] Graves, S.B., Ringuest J.L. and Case, R.H., "Formulating optimal R&D portfolios", *Research-Technology Management*, 43:3, 2000.
- [6] H. M. Markowitz. Portfolio selection. *Journal of Finance*, 7(1):7791, 1952.
- [7] <http://www.investopedia.com/terms/n/npv.asp> Kreps, D. M., P. Milgrom, J. Roberts, and R. Wilson, 1982, "Rational Cooperation in the Finitely Repeated Prisoner's Dilemma," *Journal of Economic Theory*, 27, 245–252.
- [8] Kreps, D. M., P. Milgrom, J. Roberts, and R. Wilson, 1982, "Rational Cooperation in the Finitely Repeated Prisoner's Dilemma," *Journal of Economic Theory*, 27, 245–252.
- [9] Milgrom, P., and J. Roberts, 1982, "Predation, Reputation, and Entry Deterrence," *Journal of Economic Theory*, 27, 280–312.
- [10] Santa-Clara, P., &Valkanov, R. (2003). The presidential puzzle: political cycles and the stock market. *Journal of Finance*, 58, 1841–1872.
- [11] T. M. Cover and E. Ordentlich. Universal portfolios with side information. <http://www.isl.stanford.edu/people/cover/cover-papers.html>