REAL OPTION ANALYSIS IN MERGERS & ACQUISITIONS IN INDIAN CONTINENT

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ABSTRACT:

Aim and Method: The preliminary objective of the study is to verify the strategies used by acquirers in target companies in Indian continent just before recession hit. This will enable us to understand strategies used in recession hit countries and formulate the investments options to expand the scope and scale in country's top businesses. Moreover, this study helps to highlights the various types of real options encountered in merger and acquisitions. **Result and conclusion:** It is the analytical cum descriptive study in which various trading options will be thoroughly evaluated on its cumulative impact rate on Indian economy. Researcher found that there are mainly six types of real options are available based on the factors like time, growth, abandonment, expansion scale, input and output switches and contract scales. Furthermore, it has found that timing options are important in all resource extraction in industrial real estate development and paper products. Therefore, researcher conclude that the managing options will be truly depends on factors like when to invest, where to invest and at what stage we should invest.

Keywords: Timing Option, Growth Option, Abandonment, Maturity and volatility.

INTRODUCTION

An option gives the holder the right but not the obligation, to buy or sell designated assets at a pre-determined price. A call option gives the holder the rights to buy the underlying asset by a certain date for a certain price. A put option gives the holder the right to sell the underlying asset by a certain date for a certain price. The contract price is known as strike price or exercise price, the date in the contract is known as expiration date. Options can be further classified into financial and real option. When the underlying asset of the option contract is a stock, a stock index, a foreign currency, a debt instrument or a commodity, it

is termed as a financial asset in the case of real option is real asset

IMPORTANCE OF THE STUDY:

This study will help to understand various real option that are widely prevalent in corporate finance. We will discuss the identification and valuation of real option in this section. Subsequently, we will focus on real option in M&A. This study believes that a thorough understanding of application of real options in corporate finance will facilitate out appreciation of the real option framework in M&A.

REVIEW OF LITERATURE

Most companies implicitly hold real options. The Example: of a business that has the option to defer the investment is one type of real option. The first account of a real option is found in the writings of Aristotle. Thales, a sophist philosopher, divined form some tea leaves that there would be a bountiful olive harvest during the following season. He bought the right to rent out olive presses form the owners of olive presses for a normal rent. When the bountiful harvest arrived, others did not have the pressing capacity. So, Thales rented out the presses to them at an above market rate and pocketed a profit. What Thales had purchased is an option but not the obligation to rent out the presses. If the harvest were to be poor, he could have simply walked away losing just a small premium in the process.

METHODOLOGY OF THE STUDY:

This is an analytical cum descriptive study. The complete study will discuss various types of real options especially following three in detail to understand the financial instruments in details

There are three types of real option commonly used in business finance. They are

1. Timing option
2. Growth option
3. Abandonment option.

Analysis and interpretation of the terminologies

The first steps in real options analysis are to recognize them following table:

Table No. 1 Typical real options by sector

Aerospace	Valuing options in customer contracts
Pharmaceuticals	Growth options embedded in R&D projects.
Energy	
	Timing the Development of oil and gas field / switching inputs.
Chemicals	
Automotives	Timing of investment
Banking and securities	Decisions to modify new designs.
	Valuing real estate leases.

(Source: - Proposed by the researcher)

Timing OPTION:

In the first stage real option commonly used in capital projects are like call options in the sense that both involve the right but not the obligation to acquire an asset at specified price on or before a certain date. The analogy between project characteristics and call option is give in following table no. 2

Table No. 2 Project Features and option variables

Project features		Call option
Expenditure required for acquiring the asset	X	Exercise price
PV of Cash flows	S	Stock price
Length of time decision may be deferred	T	Time of expiration
Riskiness of underlying operation Operating assets	d^2	Variance of returns from stock
Time value of money	r_1	Risk free rate of return

(Source:- Proposed by the researcher)

The amount spent on the project is the exercise price. The present value of cash flows from the project is the stock price. The length of time the company can defer the investment decision without losing the investment opportunity corresponds to time to maturity.

The impact of an increase in each of option in each of options variables on the value of the option is shown in Following Table No. 3

Table No. 3 Impact of changes in option variables on the value of real option

Variables	Value of real option
Increase in the PV of the project	Increase
A higher investment cost	Decrease
A longer time to maturity	Increase
Increase in uncertainty	Increase
Increase in risk free rate	Increase
Increase in cash flow lost	Decrease

(Source:- Proposed by the researcher)

In above that the Net present Value of project = Present value of cash inflows – Initial investment

=S-X

Timing option enables mangers to defer investment for a certain period of time without losing the opportunity. In other words managers would always want to spend later rather than sooner. If an investment can be deferred for one year, one could deposit the money in a bank for one year an withdraw it when the time is ripe to invest.

That is the proceeds of X would be available after one year. Since the money was deposited at r_1 for one year. The present value of X discounted at r_1 represent the amount to be

deposited now.

$PV(X)=X/(1+r_1)T$

Since out objectives is to refine NPV to incorporate other option variables like r_1 t and delta. Let us redefine NPV as S-PV (X) as with financial options, this can be expressed as a ratio =S/PV(X)

We can use these two values to estimate the value of the option as percentage of the value of underlying assets. An illustration follows.

An oil company has investment opportunity to develop some reserves. The PV of future cash flows is currently US$ 100 million. The firm can lock in the investment now by incurring an expenditure of US$ 80 million. Alternatively, it may wait for two years by paying an upfront fee of US$ 6 million and then make an investment of US$ 90 million to develop the reserves, Based on the volatility of the price of oil, the annual standard deviation of return for the oil field is 35 per cent. Interest rate is 8 percent..

The value of the first alternative is US$ 20 million. That is NPV=US$20 Million.

The value of the second alternative is:

X=90,S=100

PV(exercise price)=$90/1.08^2$ =77.16

Value of operating assets/PV(X)=100/77.16=1.296

Delta $(\sqrt{t})=0.35*\sqrt{2}=0.50$

The value of flexibility, therefore, is US$ 25 million –US$20 million=US$5million. It obviously makes sense to wait and then invest.

Timing options are important in all resource extraction industries real estate development, farming and paper products.

GROWTH OPTION

The growth option is charateriesed by an early investment in research and development which lead to a chain of inter related projects opening up future new generation products and processes, access to new markets, oil reserves and so on. Any investment that creates new investment opportunities can be characterized as a growth option. Companies derive their value form two sources assets-in-place and present value of growth opportunities. Stock markets realize it when pricing securities. The estimated values of growth option for some well known American companies are presented in Table: 4

Table No. 4 Values of growth option reflected by stock prices

Company	M.V of Equity (US$ Million)	Estimated values of growth option (US$ Million)	%of market values represented by growth option
Motorola	5,250	3,850-4,410	73-84
Apple computer	2,000	1,340-1,604	67-80
Digital Equipment	5,690	3,740-4,550	67-80
IBM	72,890	36,457-51,030	50-70
Union Carbide	4,350	2,483-3,230	57-74
Goodyear	2,520	520-1,320	21-52

General foods	2,280	167-1,012	7-44

(Source:- Taken form the web)

As can be seen from Table: 4 up to 80 % of apple computer's market value in 1984 came from future growth opportunities.

To evaluate the growth option embedded in the project:

- Segregate discretionary expenditure and its associated cash flows pertaining to phase 2 projects from phase 1.
- Find the NPV of phase 1 using the traditional DCF approach .
- Find the present value of cash flows ,net of inflows and routine expenditure on working capital and fixed assets, using WACC this is S.
- Find the value of the call option and add it to the NPV of phase 1.
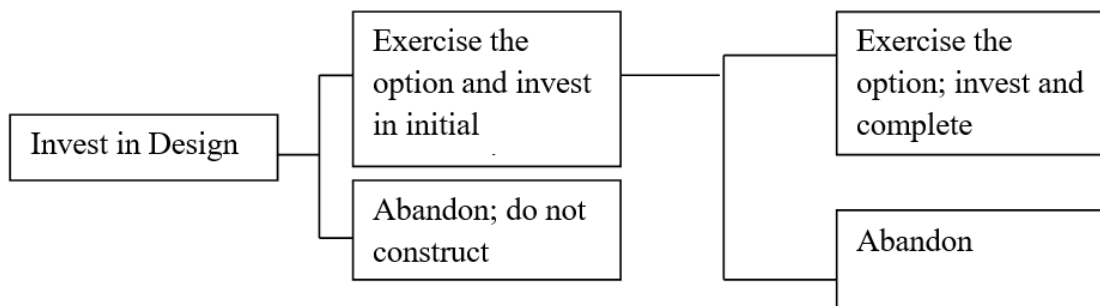

Figure 1 Investing design for options

(Source:- Proposed by the researcher)

Abandonment Option:

If market conditions deteriorate severely , management can abandon operations and realize the resale value of project assets in second hand markets. Abandonment options are important in capital intensive industries, financial services and new product introduction in uncertain markets

Exp: a mining company is considering opening up a gold mine for two years. If gold prices go up, revenues would go up; whereas if gold prices go down, revenues would go down. The NPV analysis is based on the assumption that the company will continue digging even if revenues are down. The company might choose to abandon if gold prices happen to go down in both the years. The NPV calculation does not recognize this possibility.

Abandonment options exist in most business and are more valuable when uncertainty is high. An option to abandon is a put option. The value of the put option can be found by replicating the pay off from the put option. It is possible to construct a portfolio consisting of a fraction of project and lending an amount B at the risk free rate r that replicates the pay-off on the put.

Findings and conclusion

The managing real options is depends on the value of the real option depends on the underlying variables like present value of operating cash inflows, outflows, and time to

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maturity volatility of cash flows, risk free rate of interest and cash flows lost due to competition. The value of the option can be managed by increasing the present value of cash inflows, decreasing the PV of cash outflows. A company may classify projects on an option space as here

S/PV(X)

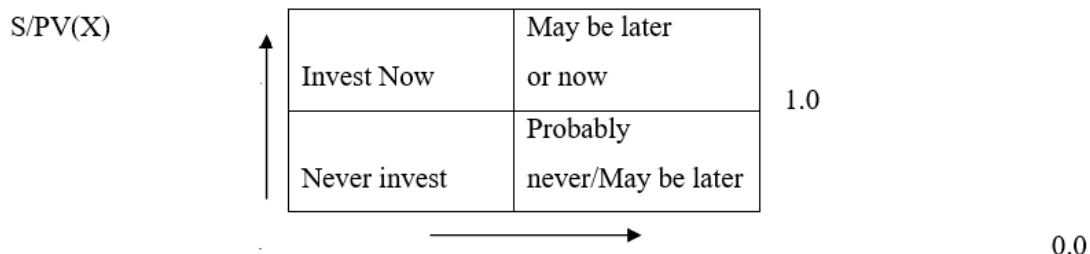|		
Invest Now	May be later or now	1.0
Never invest	Probably never/May be later	

0.0

Fig 2 Investment Matrix

(Source: Proposed by the researcher)

Those project that have low volatility but high S/PV(X) should be exercised immediately. That is the company must invest immediately.

Hence , it is inappropriate to treat projects with multiple stages of expansion as simple call option. These are call options on call options or call options on put option, or put options on put options and so on. Since compound options are more complex.

Furthermore it has found that timing options are important in all resource extraction in industrial real estate development and paper products. Therefore researcher conclude that the managing options will be truly depends on factors like when to invest, where to invest and at what stage we should invest.

REFERENCES

1. Aaronovitch, s. and M.C Sawyer, Big Business (London: Macmillan, 1975).
2. Bhatia, N.L. and Jagruti Sampat, Takeover Games and SEBI Takeover Regulations (New Delhi: Taxman Allied Services Private Ltd., 2002)
3. Gaugham, Patric, Readings on Mergers and Acquisitions (UK: Basil Blackwell Ltd., 1994)
4. Gupta., L.C Corporate Financial Health: Building Reliable Corporate Indicators (New Delhi: Manas publications,1993)
5. Mujumdar. A.K and Dr. G.K Kapoor, Company Law and Practice (New Delhi: taxman Publications,2002)
6. Mueller,D.C., Determinants And Effects of Mergers: An International Comparison (Cambridge: Gunn & Hain Publishers Inc., 1980)
7. Kuchn, Douglas, Takeovers and Theory of the Firm(UK: Macmillan, 1975)
8. Newbound , G.D., Management andMerger Activity(U.K.: Guthstead Ltd., 1970)
9. Milton,L.rock, The Mergers and Acuqisitons Handbook (U.K McGraw Hills, 1987)
10. Samuels, J.M., Readings on Mergers and Takeovers (London: Paul Eleck Books Ltd., 1972)
11. Weton ,FredJ., Kwang S. Chung an Susan E. Hoah Mergers, Restructuring and corporate Control (New Delhi: Prentice Hall of India Pvt. Ltd., 1998)