USING THE REAL OPTIONS FRAMEWORK IN STRATEGIC FINANCIAL MANAGEMENT — A DISCUSSION

DR. N R PARASURAMAN*

THE CONVENTIONAL TOOLS OF PROJECT EVALUATION

In recent years, the role of a CFO has become increasingly strategic thanks to the wide-ranging restructuring and re-engineering processes that corporate entities are going through; and the fact that Financial theory has been able to provide a number of models and innovative tools to meet the strategic challenges. There has been a discernible increase in the number of mergers, takeovers and divestitures in the last decade. In India, stock analysts and financial institutions have shown an increased keenness to arrive at “right” numbers in respect of these strategic initiatives.

In all these corporate actions, other decision-makers look to the CFO to attribute values to the alternative courses of action. Conventional measures of evaluation like the DCF approach used in isolation are unlikely to give a true picture given the complexity of the issues in hand. Recently financial analysts have started using a number of sensitivity models and Monte Carlo simulation techniques to fine-tune the conclusions. But these measures, by themselves, have not proved adequate in giving numeric value to uncertain scenarios, which call for unique strategic actions. Let us briefly look at the conventional methodology and connected problems.

First, we have the difficulty in measuring a sustainable growth percentage. Even the growth attainable in the first few years of projections would involve some subjectivity. Then, when the cash flows for the period of the planning horizon have been drawn up, there is the question of the terminal value, which is the attributed worth of the firm at the end of the planning period. While there are several methods for arriving at the terminal value like the equity cash flow approach, the free cash flow approach, and the capital cash flow approach, the final projections and results would only be as reliable as the estimations.

CFOs, over the years have been able to introduce variants of the base-DCF model. These include drawing up decisions trees of various possible scenarios, and arriving at the NPVs under each branch of the tree. When a probability is assigned for each branch, these result in giving us the expected NPV. Alternatively, the base-case NPV could be sensitized for small changes in important variables and the extent of consequent change in NPV could be estimated. These would reassure the decision-maker that the extent of change in the critical variable would not adversely affect the NPV profile. Alternatively, the NPV approach would split up the relevant cash flows into strategic components and evaluate each component separately.

But by far, the most useful technique of fine-tuning capital budgets is that of simulation. By drawing up probability distributions of important variables and then simulating various components over a large number of runs, sufficient focus would be there to see the effect of changes of more than one variable at the same time. The resultant expected NPV and the standard deviation thereof would tell us enough about the viability of the project and its most likely outcome.

THE CHALLENGE

But the challenge before the CFO comes when the scenario is not only unclear but cannot be quantified at all. These are typical strategic situations where the happening of one series of events might result in a set of figures and the happening of a different set of events might change the set of variables altogether. In fact, coping with uncertainty is such a raging topic now that

* LLB., FCS, FICWA, DBF, PH.D., Professor Finance, SDM Institute for Management Development, Mysore.
a number of theories have been propagated and scores of articles written on it. One impressive piece - Strategy under Uncertainty by Courtney, Kirkland and Vigueri-. suggests a methodology for determination of a specific level of uncertainty for each situation and then to form generic strategies for it. For this the author divides the levels of uncertainty into the following categories:

- Clear enough future - where the relevant facts are already available or capable of being gathered
- Alternative futures - consisting of a set of discrete scenarios of future uncertainty
- Range of futures - where the uncertainty does not fall into a clear bracket but might assume a range of events
- True ambiguity - wherein the scenario is uncertain and needs to be blindly forecasted

The paper suggests a number of generic postures and actions to counter these levels of uncertainty. These would involve 1) shaping the future - whereby the company aggressively launches a course of action which would hopefully herald the way the industry functions in future; 2) adapt to the future - whereby the company sizes up the situation and plans its actions to suit the role model; and 3) reserve the right to play - whereby the company steps in for the purpose of keeping an option to be a participant in the future. As regards specific actions or moves, the paper suggests no-regret moves, options and big bets for various levels of uncertainty depending on the strategic posture of the company.

Until recently, most companies were merely following strategic initiatives and not fully translating their expectations into numbers. Thus, a decision say to introduce a new sub-brand at a lower cost segment and launch it by a strong advertising campaign might be taken without necessarily looking at the scenarios of possible sales and possible benefits from the strategy. The reason why financial projections did not form part of a strategic working paper could be attributed to the fact that the uncertainties were so high that to quantify these into any form would have been highly difficult. Further, Finance did not have enough models and risk reduction measures to counter uncertainties, in any case. Things have changed dramatically in recent years. The paradox for a CFO now lies in the fact that it is the uncertainty that would be the greatest opportunity for a strategic advantage. Presently, he has enough ammunition like tools of quantitative estimation, models of value determination and a plethora of customized derivative instruments, which could considerably bring down the risk of specific transactions and also act as a means of asset value enhancement. Simultaneously, thanks to improved regulatory mechanism markets have become more and more efficient, thereby resulting in quick corrective arbitrage to prevent market imbalances.

REAL OPTIONS

Among all the tools in his control, the CFO would be well advised to use the Option Theory the most in uncertain situations. An O ption contract derives value from uncertainty. If the outcome is more or less certain, there is no great value in holding an option to use it. But if the outcome is highly uncertain, the option assumes significance in that it could be used if the conditions are favorable or otherwise it should be simply discarded.

The option way of thinking could be brought into management and specific decision-situations could be thought of as options. If it were sufficiently worthwhile to have an option to play, then it would be a much better alternative for the CFO than taking the full plunge. The price one has to pay for keeping the option will then become the only important consideration. These options in capital budgeting decisions could be in the form of the O ption to Abandon, Option to Wait and Option to Time. An O ption to abandon gives the company the right to go all out on a project and back out if the going is not good enough. The payoff, if such abandonment does take place after a brief period of time, when reckoned with the other flows, will tell us how important the right to back away is. As a corollary, the more valuable this option, the more we may be prepared to pay for having the option. Thus, an abandonment analysis will help the CFO in deciding upon the amounts to be foregone in order to retain the choice. The O ption to Wait gives the company more time to decide whether to plunge into the project. Obviously this will apply only to cases where the circumstances of business would not change dramatically in the interim. For example, in specific mining contracts, if a company is given some time to decide whether to take up a contract or not, that would enable it to study the market conditions and environment before taking the plunge. The C FO would be prepared to pay a price for the right to wait and this could then be thought of as the option premium. The O ption to time is not necessarily one that is given by the counter party. Based on a study of the market conditions the company can decide the best period to strike. But for this the infrastructure and other wherewithal must be in place. This is brought about by the option for which the CFO will be prepared to part with a premium.
While conceptually, Real Options are a very interesting possibility in corporate capital budgeting, difficulties have been experienced on two counts - valuation of such options and the question of maximum investment in such options. Valuation of Real Options cannot be as straightforward as the valuation of an equity option. This is because inherently a corporate decision-making situation involves a number of other levels of uncertainty than contemplated by the five inputs to the share option model. Attempts have been made by academics in recent years to correlate the inputs of a share option with that of the real option. In the process, the following similarity could be reached:

<table>
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<tr>
<th><strong>INPUTS IN SHARE OPTIONS</strong></th>
<th><strong>SIMILAR INPUTS IN REAL OPTIONS</strong></th>
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<tbody>
<tr>
<td>Time to Maturity</td>
<td>The time that can be taken before exercising the right to option. For instance if an option to plunge ahead could be deferred for a maximum of two years and could be exercised any time in that period, this would tantamount to an American call option for two years.</td>
</tr>
<tr>
<td>Share Price</td>
<td>This is the value of the investment - its NPV if undertaken now. Obviously, if the NPV is already good, we have nothing to discuss, but if the NPV is not quite good or even negative now, but likely to turn positive on the happening of specific set of incidents, then we have a real option on hand. The present NPV is the equivalent here of the current share price</td>
</tr>
<tr>
<td>Risk Free return</td>
<td>Academics are divided as to whether one should take the risk free return itself for the purpose of analysis of real options or should take the WACC of the firm. Either way, this is easily determinable.</td>
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<tr>
<td>Exercise Price</td>
<td>The investment that the company will have to finally make to embark upon the project or capital budgeting decision</td>
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<tr>
<td>Variance of returns</td>
<td>This can be easily substituted with the variability of the NPV under various scenarios. Again, it has to be borne in mind that the higher the variability, the better the value of the option.</td>
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If data analysis could be done on the above lines, the Black – Scholes Model itself could be directly used to give a first estimate of the value of the option. Alternatively, in case the uncertainty boils down to the happening of one of only two possible events, the Binomial Option Pricing Model could be used to determine the right price of the option.

But, importantly, it is the question identification of the existence of Options that is of greater significance to the CFO. Once identified, these options could be valued by using one or more of the above models. But how do we spot an option-like situation from the strategic perspective?

Luehrman in his paper Investment Opportunities as Real Options gives a framework for identifying whether a real option exists at all in a given situation. According to this framework, the two principal requisites for a situation to be called an option are the existence of a modified NPV (called NPVq) and the presence of considerable cumulative variance of returns. The modified NPV (NPVq) is calculated as the NPV of inflows divided by the PV of outflows. In other words, the expected inflows are not discounted but the outflows are. If the NPVq > 1, it shows that the project is having a positive potential. Both NPVq and cumulative variance must be present together for a real option to be worthwhile. If the modified NPV is greater than 1, but there is no cumulative variance present, it means that the outcome is more or less certain, which in turn makes the option unattractive. Similarly, if there is considerable cumulative variance, but this is not accompanied with a NPV q > 1, it means that although there is considerable uncertainty, this does not work out to the favour of the organization, because whatever the circumstances, the NPV cannot be positive. The author also highlights specific situations wherein there could be a borderline case where either the modified NPV or the cumulative variance is not presently attractive, but could be strategically nurtured to become so. This is so when a major technological change is expected to take place, or the opening up of an economy is likely to result in an uncertain demand scenario in the future.

All in all, Real Option theory presents a very exciting opportunity to the CFO to give financial meaning to
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strategic alternatives. The only factor that has to be kept in mind is that too much of investment into these options would result in a definite erosion of capital, unless some of them fructify. The analogous situation is an investment in share options continuously. The company must have a positive strategy for these options and also have a rough upper ceiling of amounts that could be locked up in these ventures.

In India, there have been a number of recent examples of corporate strategy like the purchase of L& T shares by Grasim; the merger of Tata Chemicals with Hindustan Lever Chemicals, and the enormous R & D expenses indulged in by the pharmacy sector. These strategic initiatives could be translated into the Real Options framework by the CFO so that the financial imperatives and consequences of the moves could be better understood. We have to, of course, remember that the theory of Real Options is still young and as more and more empirical studies are undertaken, new models would emerge. There is no doubt, however, that the Options way of Financial Management does give the CFO new vistas of strategic planning and companies would be richer for it.

REFERENCES