Executive Summary: Improving Capital Budgeting Decisions with Real Options

The process of evaluating long-term investment proposals is referred to as ‘capital budgeting’. Making optimal capital budgeting decisions requires recognizing and correctly accounting the flexibilities associated with the project. These flexibilities associated with the project are formally termed as ‘real options’. Real options can be viewed as an extension of DCF methods and can be exercised only if they increase the value of Capital Investment Project. The article uses an example of rental car company management, trying to decide whether to buy a gas-powered or hybrid car.

There are some assumptions regarding this investment decision. First, assume that the company plans to keep either car for four years, after which time the car will be sold for an estimated salvage value. Second, management believes that there is a 40% chance that the bill will be passed and income-tax credit for operating commercial hybrid vehicles will start one year. Third, the hybrid car annual after-tax cash flows, if the bill is passed would be $10,000 and if the bill is not passed would be $4,000 respectively. The net salvage value for hybrid car would be $5,000 with and $4,000 without bill. The gas powered car annual after-tax cash flows, regardless of whether new bill passes is $6,000. The net salvage value for gas-powered car would be $3,000 with and $4,000 without bill.

Conventional analysis indicates that the company should invest in gas powered vehicle since the NPV for gas-powered car is greater and positive. The flexibility to choose between alternatives; the two types of cars; is called an asset flexibility option. The investment-timing option is flexibility offered in the timing of the capital budgeting decision. If the project is delayed, more accurate information will be available that can avoid getting stuck with a suboptimal choice. However this delay has its costs too. Since money has time value, the after-tax cash flows forgone during the coming year will reduce the expected NPV of project.

If the project is delayed and bill is passed, the calculation shows that expected NPV of Hybrid Car is much higher making it the optimal choice. However if the project is delayed but the bill is not passed the expected NPV of hybrid car would be a significant loss and therefore the gas powered car is a sensible choice. The deferring of decision results in NPV higher than investing now. This indicates that investment timing option adds value of $2400 to the project.

Other types of real options include growth options, expansion options and abandon option. Growth option refers to the flexibility to increase the investment's scale. Many companies tend to build facilities with a certain amount of "cushion" because it will provide room to grow. Expansion option is similar to growth option. Abandonment option gives buyer an option to return a product for a percentage of selling price if the customers are not satisfied.

Real options also have a flip side which relates to the complexity of the decision process that will result in a less reliable analysis. The incorporation of real options into the analysis requires many probability estimates which include scenarios and outcomes for all of them. For example, we assume a 40% probability that energy bill would pass. Realistically, this assessment may have the larger source of uncertainty which will make the result less accurate. Regardless of the flip sides, real option analysis is a great tool for managers and accounting professionals to evaluate long term investment projects.