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Financial Management

Corporate Strategy and Value Creation

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Value Creation

- We have seen how to construct financial models to evaluate projects or companies.
- NPV (or DCF) is a trustworthy model - it tells us directly how much value a project can generate for the company's shareholders.
- But, we shouldn't just come up with an NPV based on the most likely or average scenario and just stop there!

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More careful analysis

- How sure are you of the input assumptions?
 - Sensitivity Analysis
 - Adjust one input assumption at a time
 - Scenario Analysis
 - Look at a few combinations of alternative input assumptions
 - Simulation Analysis
 - Generate thousands of possible combinations of inputs, and examine the resulting distribution
- Have all the responses to different scenarios been properly captured in the model?
 - Decision tree analysis; real options analysis

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Sensitivity Analysis

- How sensitive is the value to changes in:
 - discount rate
 - growth rate of sales
 - profit margin
 - market share
- Use best, optimistic, pessimistic (“bop”) analysis
 - Mean +/- one standard deviation
 - A “Tornado Analysis” provides a graphical presentation of results (software: Crystal Ball)
- What are the Key Value Drivers (KVD)?

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“Expectations Investing”

- Sensitivity analysis examines the effect of a variable on the resulting valuation. What if we work in the opposite direction?
- Observe the market value, and ask yourself what input assumptions would be required to generate that value
 - What terminal growth rate needs to be assumed? Is this plausible given the growth rate of the economy, the competition in the industry and the company’s market share?
- This approach is detailed in a recent book by Mike Mauboussin and Al Rappaport, called “Expectations Investing”

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Scenario and Simulation Analysis

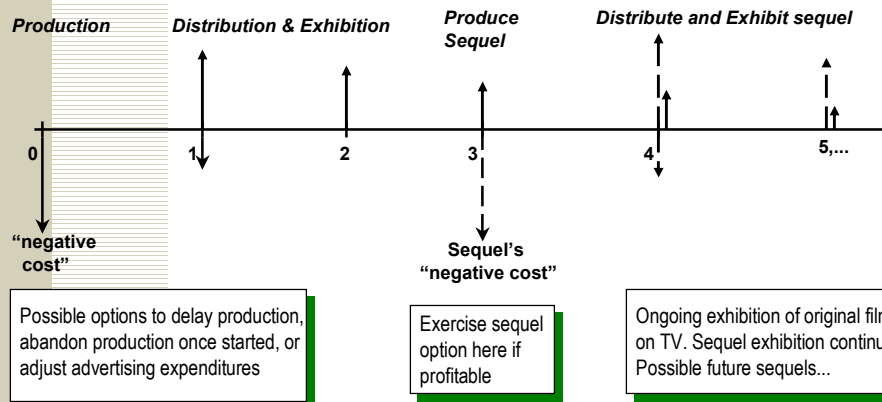
- A shortcoming of sensitivity analysis is that it isolates the impact of one variable at a time, and in reality some of the uncertainties may be related and, as a result, have a larger impact.
 - Scenario analysis picks out specific scenarios that may be of interest to management - in particular, worse case scenarios (drop in GDP, lower market share, profit margin squeeze, etc.)
 - Simulation analysis looks at the combined impact of all possible scenarios (taking into account the correlation between different variables), yielding a distribution of NPVs. Special spreadsheet packages have been developed for this purpose (e.g., @Risk, Crystal Ball)

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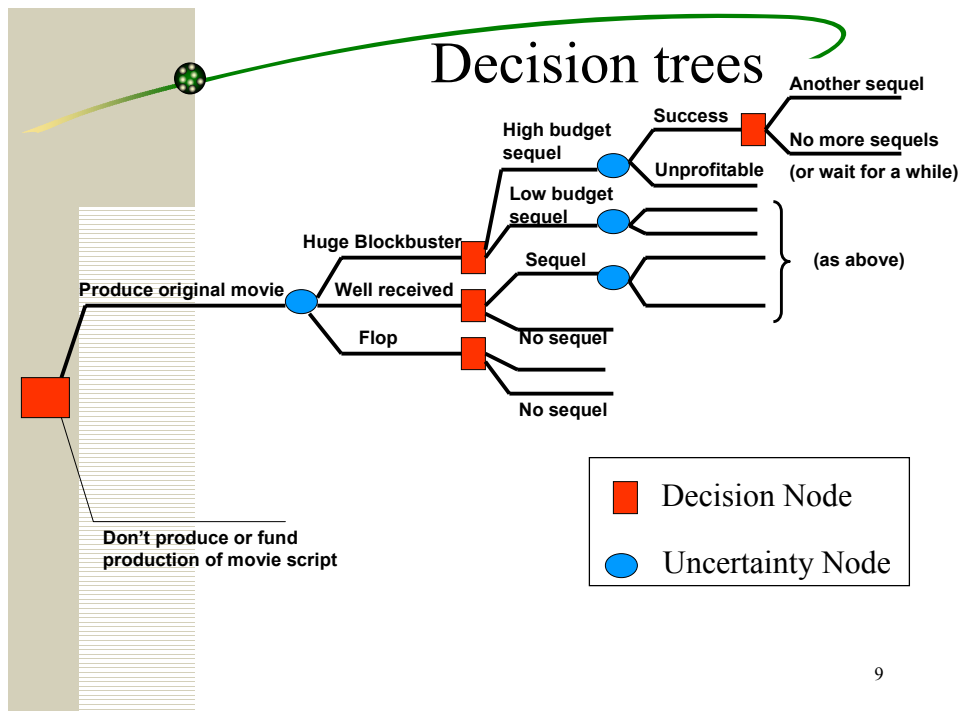
Are managers active or passive?

- When we come up with cash flow projections for future time periods, what do these really represent?
 - most likely case (best estimate)
 - average of possible scenarios (of best, optimistic, pessimistic)
- Decision Trees explicitly recognize, however, that depending on how uncertainty resolves over time (i.e. new information available in the future), managers can make decisions that can (positively) impact the future cash flows of a project.
 - Shut down or abandon when cash flows become negative
 - Expand when demand greater than expected
 - Change mix of products on same production line
 - Follow-on investments (new products under brand name)

Movie Production



Decision trees



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Simple example of abandonment

- Next G Computing has developed a new hand-held device with voice recognition capabilities. The PDA is called "Talk to the Hand".
- The product's life cycle will be two years. Demand during each of the two years is known for sure at the beginning of that year.
 - In the first year, the company knows that it will sell 200,000 units.
 - Demand during the second year will be known for sure in one year's time. As of now, demand in the second year is still uncertain. It is projected to be:
 - 100,000 with a probability of 25%
 - 500,000 with a probability of 50%
 - 2,000,000 with a probability of 25%
- Each unit will sell for \$300 and will cost \$100 to manufacture.
- There is a fixed overhead cost of \$100 million/year to operate the manufacturing plant and for other general expenses. If Next G were to decide to cease operations after the first year, this overhead cost would be avoided. However, they have committed to operation during the first year.
- Assume no taxes, no working capital requirements, no depreciation. ¹⁰

Will this device add value to Next G?

- In the first year, the cash flow will be $200,000 * \$(300 - 100) = \40 Million, minus the \$100 Million fixed cost, for a net loss of \$60 Million.
- In the second year:
 - Based on the most likely estimate (500,000 units):
 - Zero cash flow $((300-100) * 500,000 - 100 \text{ M} = 0)$
 - Based on the average forecasted sales of (775,00 units = $.25 * .1 + .5 * .5 + .25 * 2$ Million units) - i.e. the “expected value of sales”
 - \$155 Million - \$100 Million (fixed cost) = \$55 MM
 - But since first year loss exceeds second year profit, overall the venture will have a negative NPV!
 - Allowing for Next G to abandon in year 2
 - Will only produce if sales go to 2 Million, in which case cash flow will be \$300 MM. Thus, the “expected” cash flow is \$75 MM $(=300 * .25)$. Assuming that there are no taxes, and assuming that the discount rate is less than 25%, the Talk-to-the-Hand project will have a + NPV! 11

Conclusions

- NPV (or DCF) is a powerful model that can help assess where value is being created in the future, and how sensitive this value is to certain key assumptions about future conditions.
- Decision Tree Analysis helps to better model future cash flows, taking into account the actions of management in the future. (The book briefly discusses other examples.)
- We will soon examine how to obtain estimates of discount rates. To do this, we have to understand the relationship between risk and the return that investors require in financial markets.