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## Notes on Lecture 7 (Week 8) – Decision to invest project or not (Capital Budgeting)

### **Option**

- Provides the holder the **right to buy/sell** the underlying asset **at a fixed price** (exercise price or strike) on or before the expiration date.
- Is a right, not an obligation – holder can choose to exercise the option or not
- Call Option (Right to buy at a fixed price)
- Put Option (Right to sell at a fixed price)

Payoff from Call Option

Spot Price (Current) > Exercise Price = Payoff is unlimited potential upside

Exercise Price > Spot Price = Limited downside (choose to not exercise the right)

Payoff from Put Option

Spot Price (Current) > Exercise Price = Limited downside (choose to not exercise the right)

Exercise Price > Spot Price = Payoff is unlimited potential upside

Managers are able to observe actions and future actions, so our decision making in the future may be influenced by our response to the market information that are being released.

### **Real Options**

Standard NPV – if project is  $NPV < 0$ , then won't start or invest the business already

But WHAT IF the business is successful in the future? ← valuable chance

Standard NPV

- Static
- Treats each project decision as 'now-or-never' decision
- Either take it or don't take it
- (Based on information available now)
- Decide now and hope for the best

However, there is often a lot of **uncertainty** revolving around Cash flows, the discount rate, the timing of the project and hence there is **significant flexibility around the decision making**.

The flexibility in the decision making means managers can alter their decision making choices as they know more information or more certain about C,k, timing example.

**Real Option Analysis** – Financial Option (option to buy stocks), Real Option (Option to buy real assets)

- The strategic opportunities or **options embedded in a firm's real investment project (need to identify the options that are 'hidden')**
- Dynamic
- Captures **management's flexibility** to adapt/make future actions in response to future market conditions
- Expands project value by assuming that at each stage in the future, management will improve upside potential and limit downside loss
- 'Wait for uncertainty to be resolved and then decide whether to invest or not'