Disclaimer: This resource package is for studying purposes only
Chapter 6: Valuing stocks

Bond Cash Flows, Prices, and Yields
- **Maturity date**: Final payment date
- **Term**: Time remaining until repayment date
- Types of payments:
  - **Coupons**: Promised interest payments paid until maturity date
  - **Face value**: Notional amount used to compute coupon payment and is repaid at maturity date
- **Zero coupon bond**: Bond that doesn’t make coupon payments. Investor just receives the face value at the maturity date
- **Yield-to-maturity**: The IRR of an investment in a bond. The discount rate that sets the PV of the bond = the current market price of the bond

**Yield to Maturity of an n-Year Zero-Coupon Bond**

\[ YTM_n = \left( \frac{FV}{P} \right)^{1/n} - 1 \]

- **Coupon bonds**: Bonds that pay the face value at maturity and regular coupon interest payments

**Yield to Maturity of a Coupon Bond**

\[
P = CPN \times \left( \frac{1}{YTM_n} \left( 1 - \frac{1}{1 + YTM_n} \right)^n \right) + \frac{FV}{\left( 1 + YTM_n \right)^n}
\]

- Example of the YTM of a coupon bond: 5 year $1000 bond with a 5% coupon rate (Semiannual) has a price of $957.35
  - Solution:
    \[
    \text{Nper} = 10, \ PV = -957.35, \ PMT = 25, \ FV=1000
    \]
    Using the RATE formula on excel:
    \[
    =\text{Rate}(10,25,-957.35,1000) = 3\% \text{ or } 6\% \text{ (APR semi annual compounding)}
    \]

**Dynamic Behaviour of Bond Prices**
- A coupon bond can trade at a discount, premium or at par
  - **Discount**: “Below Par”. YTM > Coupon rate (Price below face value)
  - **Premium**: “Above Par” YTM < Coupon rate (Price above face value)
  - **At Par**: Coupon rate = “At par” YTM rate (Price = Face Value)
- As interest rates and bond yields rise, bond prices fall
Bonds with higher coupon rates have higher cash flows paid upfront and are therefore less sensitive than those with lower coupon rates.

**Duration**: A bond price's sensitivity to interest (The higher it is, the more sensitive)

The yield curve and bond arbitrage

- We can use the Law of One price to compute the price of a coupon bond from the prices of zero coupon bonds.
- Since the coupon bond cash flows are identical to the cash flows of the portfolio of zero-coupon bonds, the Law of One Price states that the price of the portfolio of zero-coupon bonds must be the same as the price of the coupon bond.
- Example: By the Law of One Price, the three-year coupon bond must trade for a price of $1153.

![Coupon and Zero-Coupon Bond Cash Flows](image)

<table>
<thead>
<tr>
<th>Zero-Coupon Bond</th>
<th>Face Value Required</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>$100</td>
<td>$96.62</td>
</tr>
<tr>
<td>2 years</td>
<td>100</td>
<td>92.45</td>
</tr>
<tr>
<td>3 years</td>
<td>1100</td>
<td>$1153.00</td>
</tr>
</tbody>
</table>

We can also use the zero-coupon bond yields (spot rates of interest) to determine the price of a bond.

**Price of a Coupon Bond Using Spot Rates**

\[
P = PV(\text{Bond Cash Flows}) = \frac{CPN}{1 + r_1} + \frac{CPN}{(1 + r_2)^2} + \cdots + \frac{CPN + FV}{(1 + r_n)^n}
\]

- Coupon bond yields:
  - YTM of a coupon bond is the weighted average of the zero coupon bond yields.
- When the yield curve is positively sloping, the YTM decreases with the coupon rate of the bond
- When the yield curve is negatively sloping, the YTM will increase with the coupon rate
- When the yield curve is flat, all Zero coupon and coupon paying bonds have the same yield, independent of maturities and coupon rates

**Corporate Bonds**

- **Corporate bond**: Bonds issued by corporations, so there’s risk that the issuer may default
- **Credit risk of bond**: Risk of default that the bond’s cash flows are not known with certainty
- **Corporate bond yields**:  
  - Investors pay less for bonds with credit risk, so the yield of these bonds are higher than the default free bonds  
  - Bond’s prices lower and YTM rises with the likelihood of default
- **Bond Ratings**:  
  - Bonds in the top three categories (AA, A, BBB) are **investment grade bonds**: have low default risk  
  - Bonds in the bottom five categories (BB, B, CCC, CC, C, D) are **speculative/junk/high yield bonds**: have high default risk  
  - Bond ratings are based on risk of bankruptcy and the bondholder’s ability to claim assets if bankruptcy occurs
- **Corporate yield curve**:  
  - **Default spread / Credit spread**: Difference between the yields of various bonds and the government of Canada bond yields  
    - Higher for bonds with low ratings and greater likelihood of default

**Sovereign Bonds**

- **Sovereign Bonds**: Bonds issued by the government
- Not always default free in every country
- Since most sovereign bonds are risky, they behave similar to corporate debt
- Unlike corporations, countries can “inflate away” debt by printing more currency. However, this results in extreme inflation
Chapter 7: Valuing Stocks

The Dividend Discount Model

- **A One Year Investor**
  - \( P_0 \): The price of 1 share of the stock today
  - \( P_1 \): The price of 1 share of the stock 1 year from today

\[
\begin{array}{c|c|c}
& 0 & 1 \\
\hline
- P_0 & Div_1 + P_1 \\
\end{array}
\]

- \( Div_1 \): Dividends (per share) paid to owners of the stock over the year
- An investor with a 1-year horizon would be willing to pay a price today \( P_0 \) up to the point where NPV = 0
- Calculating the future cash flows are risky, so we cannot calculate
  - Instead, we use the the **equity cost of capital**
- The expected return available for other investments of similar risk

\[
P_0 = \frac{Div_1 + P_1}{1 + r_E}
\]

- If the equity cost of capital is \( r_E \), then:
  - If the current stock price < the \( P_0 \) amount, it is a positive NPV investment opportunity (investors will buy it)
  - If the stock price > the \( P_0 \) amount, selling it would have a positive NPV

**Total Return**

\[
r_E = \frac{Div_1 + P_1}{P_0} - 1 = \frac{Div_1}{P_0} + \frac{P_1 - P_0}{P_0}
\]

- **Dividend Yields, Capital Gains, and Total Returns**
  - The expected total return = the equity cost of capital, \( r_E \)
  - If the stock offered a higher return that other securities with the same risk, investors would sell those other investments and buy the stock instead
    - Stock price will increase, dividend yield + capital gain rate will decrease
  - If stock offered a lower expected return, investors would sell the stock
    - Stock price will decrease, dividend yield + capital gain rate will increase
- **A Multiyear Investor**
  - A two-year investor will not value the stock different than a one-year investor

**Dividend-Discount Model**

\[
P_0 = \frac{Div_1}{1 + r_E} + \frac{Div_2}{(1 + r_E)^2} + \cdots + \frac{Div_n}{(1 + r_E)^n} + \frac{P_n}{(1 + r_E)^n}
\]

- **Dividend-Discount Model**
  - The stock price today is the PV of all of the expected future dividends that it will pay

**Applying the Dividend-Discount Model**

- **Constant Dividend Growth**
  - A common approximation used to estimate future dividends is to assume a long-run constant growth rate \( g \)

**Constant Dividend Growth Model**

\[
P_0 = \frac{Div_1}{r_E - g}
\]

\( \rightarrow \) Implies that the firm’s share price increases with its current dividend \( Div_1 \) and its long run growth rate

- **Dividends vs. Investment and Growth**
  - **Tradeoff**: Investment is needed to pay for growth, but money spent on investment cannot be used to pay current dividends

\[
Div_i = \frac{\text{Earnings}_i}{\text{Shares Outstanding}_i} \times \frac{\text{Dividend Payout Rate}}{\text{EPS}_i}
\]

- **Dividend Payout Rate**: The fraction of earnings paid out as dividends
- **3 ways** to increase dividends per share:
  - Increase earnings
- Increase dividend payout rate
- Reduce # of shares outstanding
- Cutting the firm’s dividend to increase investment will raise the stock price if, and only if, the new investments have a positive NPV
- If firm keeps # of shares outstanding constant and all investments are made with
  \[ \text{R/E}_1 \rightarrow \text{Earnings Growth Rate} \quad g = \text{Retention Rate} \times \text{Return on New Investment} \]
  - Retention rate is the fraction of current earnings kept by the firm for investment

- **Changing Growth Rates**
  - Cannot use the constant dividend growth model to value the stock of firms that do not pay dividends for some periods or whose dividends may grow at a high rate in the short-run
  - We can use the model to value the firm after it matures and its expected growth rate stabilizes:

\[
\begin{align*}
0 & \quad 1 \quad 2 \quad \ldots \quad n \quad n+1 \quad n+2 \quad n+3 \quad \ldots \\
\text{Div}_1 & \quad \text{Div}_2 & \quad \ldots & \quad \text{Div}_n & \quad \text{Div}_{n+1} & \quad \text{Div}_{n+1} \times (1+g) & \quad \text{Div}_{n+1} \times (1+g)^2 \\
+ P_n & \quad & \quad & \quad & \quad & \quad & \\
\end{align*}
\]

- **Limitations of the Dividend-Discount Model**
  - Dividends are hard to forecast
  - Estimated values are sensitive to the growth rate
  - Forecasting dividends per share requires forecasting:
    - **Earnings** - depends on how much firms borrows and future interest rates
      \[ P_n = \frac{\text{Div}_{n+1}}{r_E - g} \]
      since they will determine interest rates
  - **# of Shares/Payout Rate** - depends on whether earnings are used to repurchase shares
    - Subject to management discretion

**Total Payout and Free Cash Flow Valuation Models**
- **Share Repurchases and the Total Payout Model**
  - When firms use excess cash to buy back its own stock
    - Cash cannot be used to pay dividends
    - # of shares outstanding decreases, earnings/dividends increases
  - \[ P_0 = \text{PV(Future Dividends per Share)} \]
- **Total Payout Model** estimates the value of all the firm’s equity, not just a single share

\[ P_0 = \frac{PV(\text{Future Total Dividends and Repurchases})}{\text{Shares Outstanding}_0} \]

- **Discounted Free Cash Flow Model**

  \[
  \text{Free Cash Flow} = \frac{\text{Unlevered Net Income}}{\text{Unlevered Net Income}}
  \]

  \[= EBIT \times (1 - \tau_i) + \text{Depreciation} - \text{Capital Expenditures} - \text{Change in Net Working Capital} \]

  - Estimates the enterprise value of the firm (both equity and debt)
  - \( V_0 = PV(\text{Future Free Cash Flow of Firm}) \)

  ← Ignores interest income and expenses but adjusts for cash and debt

\[
P_0 = \frac{V_0 + \text{Cash}_0 - \text{Debt}_0}{\text{Shares Outstanding}_n}
\]

- To calculate \( V_0 \), we use the weighted average cost of capital, \( r_{WACC} \), which is the average cost of capital paid to all investors (debt and equity)

\[
V_0 = \frac{FCF_1}{1 + r_{wacc}} + \frac{FCF_2}{(1 + r_{wacc})^2} + \cdots + \frac{FCF_n}{(1 + r_{wacc})^n} + \frac{V_n}{(1 + r_{wacc})^n}
\]

- If there is a constant long run growth rate \( g_{FCF} \),

**Valuation Based on Comparable Firms**

- Uses the value of other similar firms to estimate the value of a given firm

**Valuation Multiples**

- **Price-Earnings Ratio**

  - Since difference in the scale of earnings are likely to persist, investors should be willing to pay more for firms with higher current earnings
Forward P/E: \[ \frac{P_0}{EPS_1} = \frac{\text{Div}_1/EPS_1}{r_E - g} = \text{Dividend Payout Rate} \]

- Forward P/E: Uses expected earnings over the next year
- P/E ratios depend on earnings growth, payout rate, and risk

- **Enterprise Value Multiples**
  - Better for comparing firms with different amounts of leverage

\[ \frac{V_0}{EBITDA_1} = \frac{FCF_1/EBITDA_1}{r_{wacc} - g_{FCF}} \]

← This valuation model is higher for firms with high growth rates and low capital requirements

- **Limitations of Multiples**
  - The usefulness depends on how comparable the firms really are
  - Does not account for important differences across firms (exceptionally good management, new product development)
  - Only gives us information about relative values to the related firms
  - Multiples are based on prices of actual firms, not possibly unrealistic forecasts of future cash flows

**Information, Competition, and Stock Prices**

- **Information in Stock Prices**
  - A valuation model connects the firm’s future cash flows, its cost of capital and its share price
  - For publicly traded firms, the market price incorporates the views of a large number of investors, many who are professionals making informed judgements
  - If we have better information, then it may be appropriate to conclude that the market price is incorrect

- **Competition and Efficient Markets**
  - Suggests that markets will incorporate available information into security prices
  - **Efficient Market Hypothesis**: Implies that competition will eliminate all positive NPV trading opportunities based on currently available information
  - If information is widely available and easy to interpret, the market price will react fully and almost instantly

- **3 versions of the EMH**:
  - Weak Form - No positive NPV trading opportunities based on the history of stock prices
  - Semi-Strong Form - No one can find positive NPV trading opportunities based on any publicly available information
- Strong-Form - No positive NPV trading opportunities based on any available information, public or private
Chapter 8: Investment Decision Rules

NPV Revisited
- **NPV rule**: the firm should compare the NPV of investing in the project to zero (the NPV of not investing in it), and make the investment if the project’s NPV is positive
- **NPV profile**: a plot of its NPV vs. the discount rate \( r \)
- **Alternative Rules**:  
  - surveys indicate that the majority of firms use the NPV rule for analyzing investment projects  
  - many firms also use other rules besides the NPV rule and a significant minority (\( \approx 25\% \)) do not use the NPV rule  
  - in many cases, these alternatives give the same recommendations as the NPV rule, but there are also cases where they do not  
  - following a rule which conflicts with the NPV rule implies that we are not taking a positive NPV project, so we are not maximizing shareholder wealth

IRR Rule
- **IRR Rule**: the intuition that a firm should take a project if it offers a rate of return that is greater than the opportunity cost of capital  
- firms should not invest in projects which offer a lower rate of return than the cost of capital  
- for a stand-alone project, the IRR rule will give the same conclusion as the NPV rule as long as all of the project’s negative cash flows occur before any of its positive cash flows  
- **Unconventional cash flows** = the normal IRR rule must be revered for these projects; hence, projects should be accepted if their IRR is less than the cost of capital

Payback Rule
- **Payback rule**: assumes that a project which pays back its initial cost quickly is a good investment  
- a project is accepted if the payback period is less than a specified cut-off period  
- Flaws with the payback rule:  
  - it ignores the time value of money and the project’s cost of capital  
  - does not account for cash flows after the cut-off period  
  - specifying the cut-off period is somewhat arbitrary

Mutually Exclusive Projects
- in some cases firms must select one from several possible projects  
- with mutually exclusive projects, the NPV rule ranks projects according to their NPVs and selects the project with the highest NPV  
- **IRR for Mutually Exclusive Projects**  
  - the **Incremental IRR** is the IRR of the difference in cash flows between two projects (i.e. the IRR of switching from one project to another)  
  - Flaws with Incremental IRR rule:
You must keep track of which project is the incremental project and ensure that the incremental cash flows are initially negative and then become positive. Otherwise, the incremental IRR rule will have the unconventional cash flow problem and will give the wrong answer.

- The incremental IRR need not exist.
- Many incremental IRRs could exist. the likelihood of multiple IRRs is greater with the incremental IRR rule than with the regular IRR rule.

**Two additional problems include:**
- When the incremental IRR rule indicates that one of the two projects is better, it does not imply that the better project should be accepted.
- The incremental IRR rule assumes that the riskiness of the two projects is the same.
- Timing differences can also exist.
- **Projects with Different Risk** - in addition to scale and timing problems, it can also be complicated to compare IRRs for projects with different risk.
- **IRR and Project Financing**
  - another situation of mutually exclusive projects relates to how a project is paid for.

**Summary on IRR with Mutually Exclusive Projects**
- differences in scale, timing, or risk between mutually exclusive projects can make it complicated to use IRR.
- how a project is financed can also affect the IRR decision.
- the incremental IRR approach can be used to handle some of these issues, but it can be problematic:
  - unconventional cash flows can easily occur.
  - the incremental IRR may not exist, or there could be many incremental IRRs.
  - the approach indicates which of two investments is better, but this could just mean that a bad investment looks good in comparison to a worse one.
  - it is not obvious how to handle cases with different project risk, since the cost of capital for the incremental cash flows is not clearly defined.

**Project Selection With Resource Constraints**
- sometimes different projects require different amounts of a resource.
- if that resource is in fixed supply, and not all desirable projects can be taken, then choosing the project with the highest NPV might not be the best decision.

**Profitability Index**
- Rank projects according to it.
we then pick the project with the highest PI, then the project with the second highest PI, etc. until the entire resource is consumed

Capital Rationing
- a situation where the resource constraint is the amount of money available to make investments

Chapter 9: Fundamentals of Capital Budgeting

Capital budget
- the projects that a firm plans to invest in during the coming year

Capital budgeting
- the process of analyzing possible projects and selecting which ones to take
- the first step in capital budgeting is forecasting the effects of a project on the firm’s cash flows

Incremental earnings
- starts with forecasting the project’s impact firm’s earnings
- forecasted free cash flows are then determined by adjusting forecasted incremental earnings
- project NPV is calculated by discounting expected free cash flows at the cost of capital
- the standard convention is to list revenues and costs in the year in which they occur for the forecast

Capital Cost Allowance (CCA)
- deducts a fraction of the cost of each item for tax purposes. This is the CRA’s version of depreciation
- Tax year - when purchase takes place
- Asset class must be determined to find the correct CCA rate
- “Half-year rule” allows only half of CapEx to be used for claiming CCA in the first year
- When an asset is bought, half of its initial cost is added to the undepreciated capital cost (UCC) for the firm’s asset pool
- UCC_t denotes the incremental UCC for an asset in tax year t before CCA is deducted for year t
- CCA deduction that can be claimed at the end of the tax year is equal to the incremental undepreciated capital cost associated with that asset rate, d

\[ \text{CCA}_t = \text{UCC}_t \times d \]

<table>
<thead>
<tr>
<th>Year ( t )</th>
<th>Incremental UCC Used for Calculating the CCA for Tax Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t = 1 )</td>
<td>( \text{UCC}_1 = 0.5 \times \text{CapEx} )</td>
</tr>
<tr>
<td>( t \geq 2 )</td>
<td>( \text{UCC}_t = \text{CapEx} \times \left(1 - \frac{d}{2}\right) \times (1 - d)^{t-2} )</td>
</tr>
</tbody>
</table>
Taxes and Unlevered Net Income
- Marginal corporate tax rate $T_c$ - the tax rate that it will pay on an incremental dollar of pre-tax income
- income tax

\[ \text{Income Tax} = \text{EBIT} \times T_c \]

Unlevered Net Income = $\text{EBIT} \times (1 - T_c)$
\[
= (\text{Revenues} - \text{Costs} - \text{CCA}) \times (1 - T_c)
\]
- Unlevered net income - does not include interest expenses associated with leverage

Indirect Effects of Incremental Earnings
- Opportunity cost - the best alternative use of using a resource
  - project externalities are indirect effects of the project on other activities of the firm
    - cannibalization refers to reduced sales by a firm of existing products when it introduces a new product
- Sunk costs - any unrecoverable cost for which the firm is already liable
- Overhead expenses are associated with activities that are not directly attributable to a single business activity but instead affect many different areas of the corporation.
  - if overhead costs are fixed and will be incurred regardless of whether the project is taken, they are not incremental to the project and they should not be included when analyzing it
  - lost sales due to cannibalization should be excluded if those sales would have been lost to new products from competitors

Free Cash Flow
- its effect on the firm’s available cash
- earnings forecasts need to be adjusted to calculate FCF
- the first adjustment to unlevered net income is to add back CCA since it is deducted when calculating earnings although it is not a cash expense
- the second adjustment is to subtract CapEx because this is a cash expense that is excluded from earnings
the final adjustment is to incorporate net working capital (NWC) effects

- projects may require that the firm hold a minimum cash balance for contingencies, or inventories of raw materials or finished goods
- projects may also involve extending credit to customers (receivables) or receiving credit from suppliers (payables)
- an increase in NWC implies a reduction in FCF
- the increase in NWC in year t over the prior year t − 1 is:

\[ \Delta NWC_t = NWC_t - NWC_{t-1} \]

**Calculating Free Cash Flow Directly**

**Unlevered Net Income**

\[
\text{Free Cash Flow}_t = \left( \text{Revenues}_t - \text{Costs}_t - \text{CCA}_t \right) \times (1 - \tau) + \text{CCA}_t - \text{CapEx}_t - \Delta NWC_t
\]

- Calculating the NPV

\[
PV(FCF_t) = \frac{FCF_t}{(1 + r)^t} = FCF_t \times \frac{1}{(1 + r)^t}
\]

\[ t \text{-year discount factor} \]

**Additional Adjustments to Free Cash Flow**
- firms should also add back any other non-cash items that are part of incremental earnings in order to calculate FCF (e.g. amortization of intangible assets such as patents)
- it may be necessary to forecast using shorter periods, e.g. quarters or months instead of years
- if an asset is not sold when a project ends, the CCA tax shields can continue forever
- due to the half-year rule, to calculate the PV of CCA tax shields it is useful to think of two separate perpetuities

**Perpetual CCA Tax Shields**
- if an asset is never sold, then the approach given on the previous slide calculates the PV of all CCA tax shields (including those which continue on after the project ends)

\[
P_{CCA \text{ tax shields}} = \frac{CapEx \times d \times \tau_c}{r + d} \times \left(1 + \frac{r}{2}\right) \left(\frac{1 + r}{1 + r}\right)
\]

- Using this approach means that we have to remove the CCA tax shield when calculating FCF:

\[
FCF_{excluding \text{ CCA tax shield}} = (\text{Revenues} - \text{Costs}) \times (1 - \tau_c) - CapEx - \Delta NW\]

**Asset Disposal**
- if an asset is to be sold at the end of a project, then we need to include the sale price when forecasting FCF
- if the sale price of an asset exceeds its initial cost, then the firm will owe capital gains tax of

\[
\text{Capital Gains Tax} = \frac{1}{2} \times (\text{Sale Price} - \text{CapEx}) \times \tau_c
\]

- we will assume that an asset sold at date t is actually sold just at the start of year t + 1, so that any applicable capital gains tax would be deducted from FCF_{t+1}
- a second tax effect from selling an asset is that subsequent CCA tax shields will change
- the post-sale UCC for the asset class is calculated as
Post-Sale $UCC_{t+1} = UCC_{t+1} - \text{Minimum of (Sale Price}_n, \text{CapEx)}$

- The post-sale UCC$_{t+1}$ is used to calculate CCA$_{t+1}$ and subsequent CCA deductions
- the specific way in which this happens depends on whether post-sale UCC for the asset pool is positive or negative, whether the firm has any other assets remaining in the pool, and whether the firm will be buying any other assets in that pool at the same time of the asset sale that have value higher than the expected sale price
- we will assume that other assets remain in the pool and that post-sale UCC is positive **(a continuing pool)**
- we will further assume that in the tax year of the asset sale the firm’s purchases of other assets in the pool will be less than the asset’s expected sale price **(negative net additions)**
- assuming a continuing pool with negative net additions, there will be a reduction in CCA tax shields with a PV of $\text{PV}_{\text{CCA tax shields}} = \frac{\min(Sale \text{ Price}_n, \text{CapEx}) \times d \times \tau_c}{r + d} \times \frac{1}{(1 + r)^t}$

**Combination Value**
- firms sometimes forecast FCF over shorter horizons than a project’s life
- in these cases we estimate the value of the remaining FCF beyond the forecast period by adding an extra one-time cash flow at the end of the forecast period (the **terminal value or continuation value**) 
- some form of constant growth model is often used to do this

**Project Analysis**

**Overall PV of CCA tax shields:**
- the difficult part of capital budgeting is estimating FCF and the cost of capital
- there is often considerable uncertainty associated with these estimates, so it is important to assess the significance of this uncertainty and to understand the key assumptions driving value in a project
- **break-even analysis** is often used to determine the value of a particular input which sets NPV to zero
- one example we have already seen: IRR is the break-even cost of capital
- it is also common to calculate the break-even sales quantity, sales price, cost of goods, etc.

**Sensitivity Analysis**
- **Explores how NPV changes as underlying assumptions are changed**
- this allows us to explore the effects of errors and to learn which assumptions are most important
- a standard procedure is to consider best case and worst case assumptions for each parameter

**Scenario Analysis**
- **Considers the effect of changing multiple parameters simultaneously**
- both break-even analysis and sensitivity analysis consider the effects of changing one parameter at a time