Workshop I: Financial Markets

- Financial Markets
- Time Value of Money
- NPV and IRR
- Return and Cost of Capital
- Efficient Markets
- Risk / Return Tradeoff
- Questions
Financial Markets

- Financial Market: Connects Buyers and Sellers of Financial Assets
  - Companies need to raise capital
    - Growth, Acquisition, R&D, Working Capital
  - Investors need to change positions
    - Liquidity, Diversification, Savings

Financial Markets

- Financial Assets
  - Equity
    - Common
    - Preferred
  - Debt
    - Bonds (Capital Markets Funded) – callable, convertible, fixed, floating
    - Loans (Bank Funded) – fixed, floating
  - Other
    - Derivatives (Forwards, Futures, Options), Index Funds, Collateralized Debt Obligations, Asset Backed Securities, Mortgage Securities, Swaps, Swaptions

- Other Investments:
  - Commodities (oil and gold), Currencies,
Time Value of Money

Choice of $100 today or $100 in one year?

Choice of $100 today or $120 in one year?

_Time Value of Money_

'A dollar today is worth more than a dollar tomorrow because that dollar can be invested to earn interest or put to use immediately'  

Note: How much more a dollar today is worth depends on individual preferences among other things and is reflected in something known as a 'discount rate'

NPV

- Present Value vs Future Value: Present value is how much the total cash flows are worth to us today; future value is how much the total cash flows are worth to us in the future

Consider the following example:
(a) Today: $100
(b) One year from Today: $120

With a 10% 'discount rate'  
$PV_a = $100 \hspace{1cm} FV_a = \frac{100}{(1+10\%)^1} = $110$
$PV_b = \frac{120}{(1+10\%)^1} = $109 \hspace{1cm} FV_b = $120$

Note: Analyzing both PV and FV results give us the same preference: we prefer (b)
NPV

- Net Present Value: Present Value of all future cash flows

Consider the following:

\[ t=0 \text{ (today)} \quad -$1,000 \]
\[ t=1 \quad $500 \]
\[ t=2 \quad $500 \]
\[ t=3 \quad $500 \]

Using a 10% discount rate:

\[
\text{NPV} = -$1,000 + \frac{$500}{(1+10\%)^1} + \frac{$500}{(1+10\%)^2} + \frac{$500}{(1+10\%)^3}
= $243.43
\]

Using a 25% discount rate:

\[
\text{NPV} = -$1,000 + \frac{$500}{(1+25\%)^1} + \frac{$500}{(1+25\%)^2} + \frac{$500}{(1+25\%)^3}
= -$24
\]

NPV results matter on both the cash flow stream as well as the discount rate!

IRR

- Internal Rate of Return: IRR represents the discount rate that sets the NPV = 0

Consider the following:

\[ t=0 \text{ (today)} \quad -$1,000 \]
\[ t=1 \quad $500 \]
\[ t=2 \quad $500 \]
\[ t=3 \quad $500 \]

\[ 0 = -$1,000 + \frac{$500}{(1+\text{IRR}\%)^1} + \frac{$500}{(1+\text{IRR}\%)^2} + \frac{$500}{(1+\text{IRR}\%)^3} \]

IRR = 23.38%

Note: Depending on the cash flow stream, an IRR may not exist. There may be:

- Multiple IRR’s
- Imaginary IRR’s

We will return to these special cases if time permits; if you are curious, please ask us!
NPV and IRR

IRR and NPV are similar concepts yet not identical

Similarities:
- They explain the time value of money
- Both useful in capital budgeting and investment valuation

Differences:
- IRR is a relative value (to project size), NPV is an absolute value.
- IRR assumes that all cash flows are invested at the IRR

Return and Cost of Capital

- Cost of Capital – The cost of acquiring capital to finance projects
  - Explicit – Interest paid to a bank, common with debt
    - For example: Borrow $100 and promise to pay $105 in 1 year
  - Implicit – Opportunity cost, common with equity
    - For example: $100 could have been invested elsewhere and be worth $110 in 1 year
  - Can be defined in different ways: Cost of Equity, Cost of Debt, Weighted Average Cost of Capital
- Return on Capital – Profit divided by total invested
  - Can be defined in different ways: Return on Equity, Return on Capital
- A good investment has higher return on capital than cost of capital
Efficient Markets

The idea that all information which should affect the price of a security is already incorporated in the price of that security.

Weak Form – All relevant information on historical price movements that could affect future prices

Semi-Strong Form – All information about a company’s financials or future prospects which are publicly known

Strong Form – All information about a company, even that known by insiders

Markets are mostly efficient, most of the time for most people.

In general, markets are made efficient by people looking for inefficiencies.

eg: January Effect

Risk / Return Tradeoff

Investors demand higher returns for riskier investments:

Game A: Dan flips a coin. If the coin comes up heads, he receives $5 and if he flips a tails, he pays out $5

Game B: Dan flips the same coin. If the coin comes up heads, he receives $100,000 and if he flips a tails, he pays out $100,000

If you were Dan, which game would you play?

This risk and return tradeoff can be measured!
Questions?

Workshop II: Financial Accounting
Workshop III: Market Based Valuation
Workshop IV: Intrinsic Discounted Cash Flow Valuation
Workshop V: Analyzing Companies
Workshop VI: Effective Presentations

Additional Workshops: Options, Alternative Investments, Excel Modeling, Efficient Markets, Investing Strategies