

## Security prices are forward-looking

- Prices now are determined by **the future** of a company/creditor/etc.
  - I.e. Microsoft comes up with a promising new product due for launch in 5 years = prices of stock goes up now

## Bonds:

- IOU, bought and sold
- Price changes
  - Credit risk
    - Is the company credible (bankrupt? Ability to repay?)
    - Changes in **interest rate** (extra money repaid on loan, the **rental price of money**)
      - If interest rates increase, value of bond decrease
      - You can understand why rental prices go up and down
        - Rental price of cars vary
          - Supply and demand → how many want to rent, how many cars are there
            - Spring = high demand, school time = less demand
          - Similar effect w/ money
            - **Certain periods where high demand/ supply**
              - **Strong economy = more borrowing**
  - E.g. Value of 1 mil in 1987 is now 3 mil in current time
    - Invest 1 mil, 3 mil returned over period of 30 years
    - Fair deal

## Stocks:

- E.g. stock certificate of Disney (a share of Disney)
- Value comes in **good return**, share of **company's profit**
  - Comes down to company giving **dividends**
- Can determine "piece" each share is via **market cap / price of one stock**
  - Microsoft →  $484.83B / 62.3 = \sim 8$  million shares total
- Intent, haggle:
  - Buy = want high return in future
  - Sell = needs money now
  - Based on consensus on company's future profits/ cash flow
    - **Value of share represents profit on company** now, and forevermore
      - Represents what will happen in the **future of a company**

## Volatility

- Stocks are much more volatile
  - Determined by many factors: company, economy, etc.
- Bond prices determined by ability of creditor to repay
  - Less volatile

## Present Value:

- Central problem in finance determined by value of something (stock, bond, etc.) (cash flow) in the future
- Value determined by **time** and **uncertainty** (risk)
  - Focus on time in this lecture
- Assess value of cash flow in different time

## Valuing Cash Flow

- **Is it worthwhile or not to \_\_\_\_\_?**
  - **Pay money now to \_\_\_\_\_ later**
- ^essence of most business decisions
  - I.e. stocks/bonds, investment in factories, buy division from competitor, etc.
- **Value** of possible project is **PV of all expected future cash flows** that will happen **from the project**
  - Value of stock/bond is PV of all expected future cash flows received by owner of security
- PV depends on size and timing of future cash flows and the **risk of future cash flows**
  - I.e. will people want to buy what the factory is producing?

## Goal of Firm: Value Maximization

- Objective of manager and corp is to **maximize current value of shareholders' wealth**
  - **Create wealth**
- Achieved by **taking on projects that create value**
- **Net Present Value = Project Value - Project Cost > 0**
  - Value of building a factory = value the factory brings (products, outputs) - how much the factory costs should be **> 0** → good decision
  - I.e. **profit = 500k** → **value of shares go up by 500k / number of shares**
    - Value of company goes up overall by 500k
    - **Value of stock goes up now, as soon as people know about it**, not after the factory is built
- Current share price = all future cash flows the shareholder gets
- Maximizing share price = maximizing as much short term + long term cash flow as possible
  - Example: 2 strategies w/ Ford
    - Build poor quality cars now, save money (materials, labour) = short term profit
      - In long run, people will not continue to invest
    - Build high quality cars, spend more money = long term profit
      - Costs more now, but sells more in future
    - The right answer is not B, but the **option that maximizes current stock price**
      - **It depends on the numbers, determine criteria for finding answer**

## Future Value:

$$FV = P(1+r)^n$$

$$FV = P + rP = P(1+r)^{\text{(number of years)}}$$

P=how much you have now

r=interest rate AKA the **discount rate**

rP = how much you are earning over the course of 1 year

- **Rule of 72 approximation for doubling**
  - Look at interest rate and # of years
    - If multiple = 72, you will probably double your money

## Present Value:

$$PV = P (1+r)^{-n}$$

$$(1+r)^{-n} = \text{Discount Factor}$$

Convention is to always use present value when determining cost

## Time value of money:

- Sooner money is more valuable than later money
- If **market value of stock is higher than PV** determined using your “r” value, then “r” is **too high**
  - Discount rates *discount* FV

## Discounted Cash Flow