**Equity Valuation**

* Intrinsic Value
  + The PV of a firm’s expected future net cash flows discounted by a risk-adjusted required rate of return
  + The cash flows of a stock are:
    - Dividends (Dt)
    - The future sale price (Pt)
  + The required rate of return is the market capitalization rate (k)
* Example: Intrinsic Value and Market Price
  + You expect the price of VZ stock to be $59.77 per share a year from now. Its current market price is $50, and you expect it to pay a dividend of $2.15 per share one year from now. You’ve calculated its market capitalization rate to equal 15.2%. What is the intrinsic value?
  + This is higher than the current market price, so the stock is currently undervalued in the market
* Extending the model
  + Before, we defined the price today as the discounted sum of next period’s dividend and price
    - We can extend this data to those future prices as well
    - Each subsequent price is just the discounted sum of the subsequent dividend and price
  + So the price today would be:
* Dividend Discount Model
  + Taking this idea, when the firm pays a stream of dividends, the intrinsic value of the firm is:
  + Making a big assumption: used a single discount rate that is constant forever
* Smoothing dividends
  + We need to “smooth out” the dividends themselves to go any further
    - Generally make one of two assumptions
  + If the firm pays a constant dividend (the dividend never changes):
    - No growth dividend discount model
  + If the dividend grows at a constant rate g (growth rate never changes):
    - Constant growth dividend discount model
* Example: Dividend Discount Model
  + ARC just paid a $0.50 per share dividend. Investors demand a 20% return on the shares. Suppose that the firm’s dividends are expected to remain constant. What should its share price be?
  + Suppose that the firm’s dividends are expected to grow at a constant 10% rate going forward. What should its share price be?
* Determining the Growth Rate
  + Firms generate earnings each year. They can do 2 things with this:
    - Pay it out as a dividend or repurchase
    - Retain the cash
  + Define the retention (plowback) and payout ratios:
  + The firm earns a return on equity (ROE) from the project it invests in:
  + The growth rate is driven by the return the firm earns on the portion of earnings plowed back into the firm
* Multistage DDM
  + May be unrealistic to assume that growth rates are constant forever
    - Earnings and ROE likely to change as the firm progresses
    - DDM can be modified to accommodate:
    - Where:
      * g1 is the first growth rate
      * g2 is the second growth rate
      * T is the number of periods of growth at g1
* Example: Multistage Model
  + Java Corp just paid a dividend of $1 per share. The firm is currently growing at 20% per year, which you expect to continue for 2 years. After 2 years, you believe that the firm’s growth will slow to 5% per year and remain there forever. If you require a 10% return, what’s the value of Java’s stock?
* Valuing Growth Opportunities
  + The value of a firm is the sum of the:
    - Value of the assets in place
    - The PV of growth opportunities (PVGO)
  + To find PVGO:
    - Find the value of the stock with growth opportunities
    - Find the value of the stock assuming no growth
    - Find the difference between 1 and 2
* Example: PVGO
  + Dox IT solutions is considering acquiring its competitor TabCo. TabCo currently pays a $1 per share dividend, which represents 100% of its earnings. Investors currently demand a 15% return on the stock. Dox believes it could acquire TabCo and retain 30% of its earnings, leading to 10% annual growth. This would mean reducing next year’s dividend to $0.70, but it would grow from that point. Dox expects the cost of equity to rise to 20% as a result of its plan. What would its per share profit be on this investment?
* Alternatives to DDM
  + Some firms may pay no dividends
  + Some may pay outsized or (more commonly) tiny dividends relative to their cash flows
  + Some firms may not be profitable at all so we need some way to value them
* Free Cash Flow Valuation
  + Reasons to use:
    - Company doesn’t pay dividends
    - Dividends aren’t in line with their earnings
    - Company’s FCF from equity doesn’t align with its profitability
    - The investor takes a control perspective
  + Reasons not to use:
    - FCF must be computed
    - Forecasting FCF is much more complicated/a very volatile measure for most firms
* Versions of FCF Model
* Fundamental Multiples
  + If neither models are appropriate, we might not be able to reply on a single absolute measure of value
  + Instead we may need to use relative valuation techniques
  + Common multiples:
    - Price/BV
    - Price/Sales
    - Price/Cash Flows
    - EV/EBITDA
    - Price/Earnings
* Price/BV
  + Advantages/uses:
    - BV per share is always positive
    - BV tends to be more stable
    - Best for firms primarily composed of liquid assets
      * Also used for firms that are not expected to continue as going concerns
  + Disadvantages:
    - Ignores important non-balance sheet factors
    - Problems comparing asset-related business models
    - Affected by accounting rules
* Price/Sales
  + Advantages/uses:
    - Sales have minimal distortions, are always positive, and tend to be more stable than some measures
    - Used for mature, cyclical, and zero-income firms
  + Disadvantages:
    - Misleading in isolation—eventually, the firm has to generate earnings
    - Share prices reflect more than simply sales
    - Ignores differences in cost structures
    - Distortions can arise from revenue recognition choices
      * Earnings management
* Price/CF
  + Advantages/uses:
    - Less subject to manipulation than some measures
      * Not an accounting measure
    - Tends to be more stable than EPS
  + Disadvantages
    - Not all definitions of cash flows are worthwhile—CF from operations would differ depending on whether the firm files under GAAP or IFRS
    - FCFE is the most appropriate, but it is also the most volatile CF measure
* EV/EBITDA
  + Advantages/uses:
    - Most appropriate for comparing companies with differing financial leverage
    - EBITDA captures differences in capital intensiveness
    - EBITDA is usually positive, even when EPS is negative
  + Disadvantages:
    - Overstates cash flow from operations if investment in working capital and net investment are positive
* P/E Ratio and Growth Opportunities
  + The P/E ratio depends on two factors:
    - Required rate of return (k)
    - Expected growth rate in dividends
  + We can use it to estimate the intrinsic value of stocks
    - Conceptually equivalent to DDM
    - Used extensively by analysts and investors
* P/E and DDM
  + Rearrange expression for stock price
  + To get an interpretation of the P/E ratio
  + This is known as the justified P/E ratio
* Example: Justified P/E Ratio
  + You have just completed an analysis of Books R Us and you predict that the firm will post earnings of $2.40 for the upcoming year. The firm usually pays out 75% of its earnings as a dividend, and you expect it to grow at a 20% rate. Investors usually demand a 25% return on the stock. What’s the P/E ratio and the price?
* P/E Depends On…
  + Expected plowback (or dividend payout) ratio
    - Higher plowback increases P/E only if ROE>k
    - Based on earning power being a key component of investment value
  + Required rate of return
    - Riskier stocks have lower P/E ratios
  + Expected growth rate of dividends
    - Higher expected growth leads to a higher P/E ratio
* Pitfalls in Using P/E Ratios
  + Earnings management is a serious problem
    - Firms can often manipulate their earnings to some degree to make them look better
  + Model can lose meaning if EPS is small relative to price, if it is zero, or if it is negative
  + A high P/E implies high expected growth
    - Not necessarily high stock returns
    - “bad quality” growth
  + It’s simplistic
* Trailing P/E Ratio
  + A final problem is that the P/E ratio should be calculated using pro forma earnings (E1)
    - Typically we only have E0
    - Forecasts of all the needed info may not be possible/available
  + We can use the trailing P/E ratio instead:
  + Note: the justified P/E is a better way to do this if we have info. It’s better to use a forward-looking measure for forward-looking applications
* Example: Trailing P/E Ratio
  + Squarebreaker Video just posted earnings of $1.50 per share. The firm plans to retain 20% of its earnings in order to grow at a 10% rate going forward. If the market requires a 20% return on this stock, what is its trailing P/E ratio? Price?