**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?