VALUATION OVERVIEW
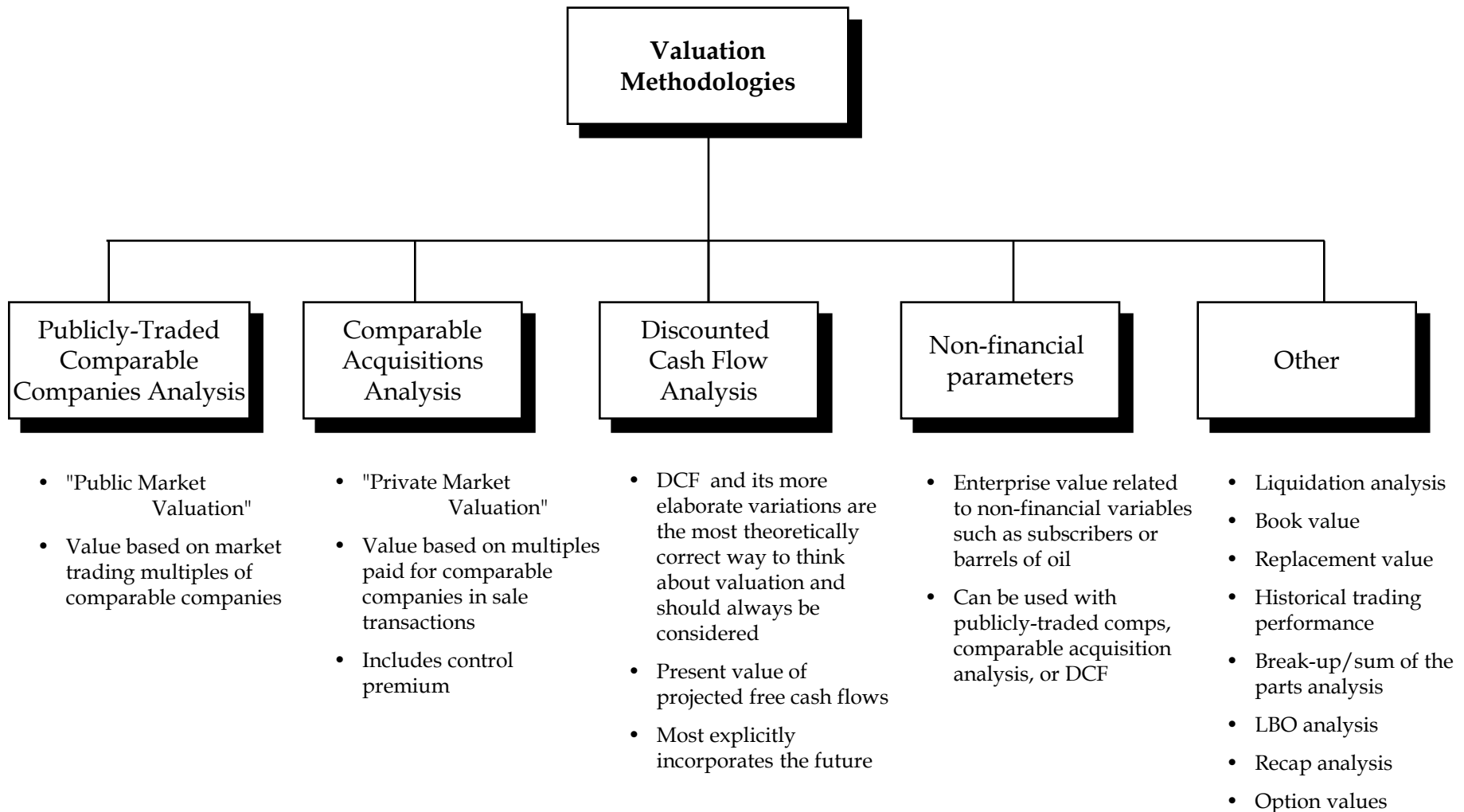
Summer 2007

Merrill Lynch
Investment Banking Division
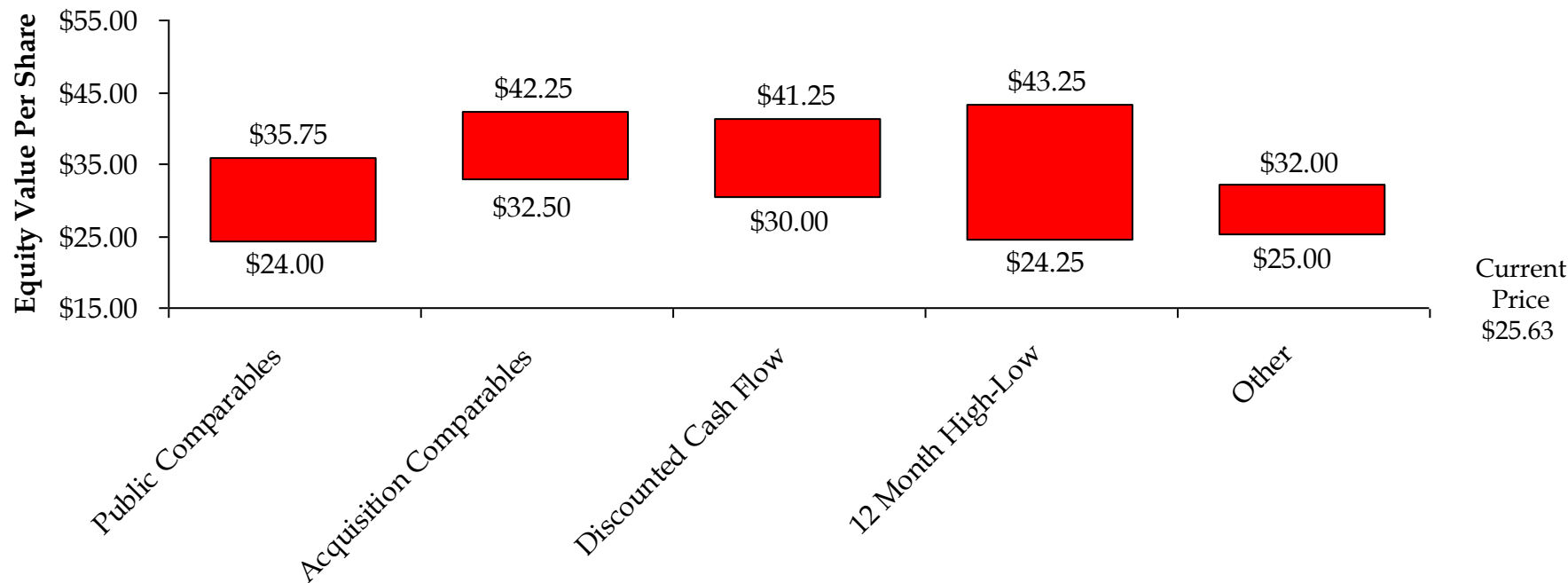## Analyst Training

VALUATION OVERVIEW

Valuation Methodologies

```
                        ┌─────────────────────┐
                        │     Valuation       │
                        │   Methodologies     │
                        └─────────────────────┘
```

Publicly-Traded Comparable Companies Analysis	Comparable Acquisitions Analysis	Discounted Cash Flow Analysis	Non-financial parameters	Other
• "Public Market Valuation" • Value based on market trading multiples of comparable companies	• "Private Market Valuation" • Value based on multiples paid for comparable companies in sale transactions • Includes control premium	• DCF and its more elaborate variations are the most theoretically correct way to think about valuation and should always be considered • Present value of projected free cash flows • Most explicitly incorporates the future	• Enterprise value related to non-financial variables such as subscribers or barrels of oil • Can be used with publicly-traded comps, comparable acquisition analysis, or DCF	• Liquidation analysis • Book value • Replacement value • Historical trading performance • Break-up/sum of the parts analysis • LBO analysis • Recap analysis • Option values

SUMMARY VALUATION OF TARGET
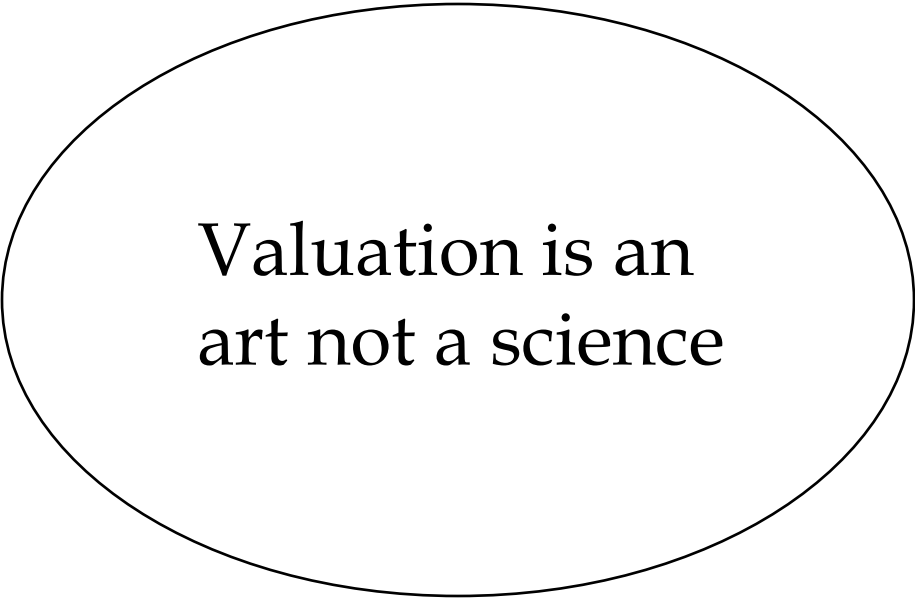
Equity Valuation

Implied Multiples:					
LTM EPS	8.7x - 12.9x	11.7x - 15.3x	10.8x - 14.9x	8.8x - 15.6x	9.0x - 11.6x
1997 EPS	8.5 - 12.6	11.5 - 14.9	10.6 - 14.6	8.6 - 15.3	8.8 ? 11.3
1998 EPS	7.3 - 10.8	9.8 - 12.8	9.1 - 12.5	7.3 - 13.1	7.6 ? 9.7
LTM EBIT	6.2 - 8.6	8.0 - 10.0	7.4 - 9.8	6.3 - 10.2	6.4 ? 7.9
LTM EBITDA	5.0 - 7.0	6.5 - 8.1	6.1 - 7.9	5.1 - 8.3	5.2 ? 6.4

VALUATION OVERVIEW

Practitioner's World View

Valuation is an
art not a science

VALUATION OVERVIEW

"I guess I should warn you, if I turn out to be particularly clear, you've probably misunderstood what I said."

Alan Greenspan

"A little inaccuracy sometimes saves tons of explanations."

H. H. Munro

"The stock is definitely undervalued. It's worth $30 per share and it is currently trading for $28.75."

Comment from an equity analyst

VALUATION OVERVIEW

Key Points to be Considered

- **Valuation is inherently imprecise.** It is appropriate to think about a range of values as opposed to a single "correct" value.

- **Look to the future not the past**. The past is relevant only as a guide to the future; it is often a good indicator of the future.

- **Working backwards can be a valuable exercise**. What do you have to believe to justify a certain DCF value. Is it reasonable?

- **Valuation is not just a numbers game**. You cannot appropriately value a business without a real understanding of the business and its environment.

- **Triangulate**. Look at all your methodologies.

- **Think like an investor.** Don't be afraid to use judgment. Use common sense. Think about your "answer."

VALUATION OVERVIEW

Other Points to Keep in Mind

- **Think DCF for M&A, comparables for IPOs.** As a general matter, DCF is the primary technique used in M&A with comparables used as a confirming methodology. The reverse is true in IPOs.

- **Don't forget synergy**. In the M&A world, businesses may have different values to different buyers because of the different synergies each may have. Synergy is the driver of M&A.

- **Pay attention to markets!** They are usually the best information we have. Never forget supply and demand.

- **Be consistent.**

- **Value and price may not be the same.** Do not confuse value and price. Value is value, price is what we have to pay. We are looking for situations where intrinsic value and price vary.

VALUATION OVERVIEW

Equity Value vs. Enterprise Value

In valuing a business, two measures of value are relevant:

- **Equity Value**

    ▸ Represents value attributable to the "owners" of the company after all debt and preferred stock obligations have been satisfied

   ▸ Typically the market value of a company's common equity (Shares Outstanding x Current Stock Price)

- **Enterprise Value (sometimes known as Firm or Transaction Value)**

    ▸ Represents the market value of all capital invested in a business

    ▸ The value of the Total Enterprise: Market Value of Equity + Minority Interest + Preferred Stock + Net Debt

    ▸ Net Debt = Short-Term Debt + Long-Term Debt + Capitalized Leases - (Excess Cash and Equivalents)

VALUATION OVERVIEW

Equity Value vs. Enterprise Value – a Simplified Visual Perspective

In the world of theoretical finance, book value does not matter!!

| Market Basis | | | | Book Basis | | |
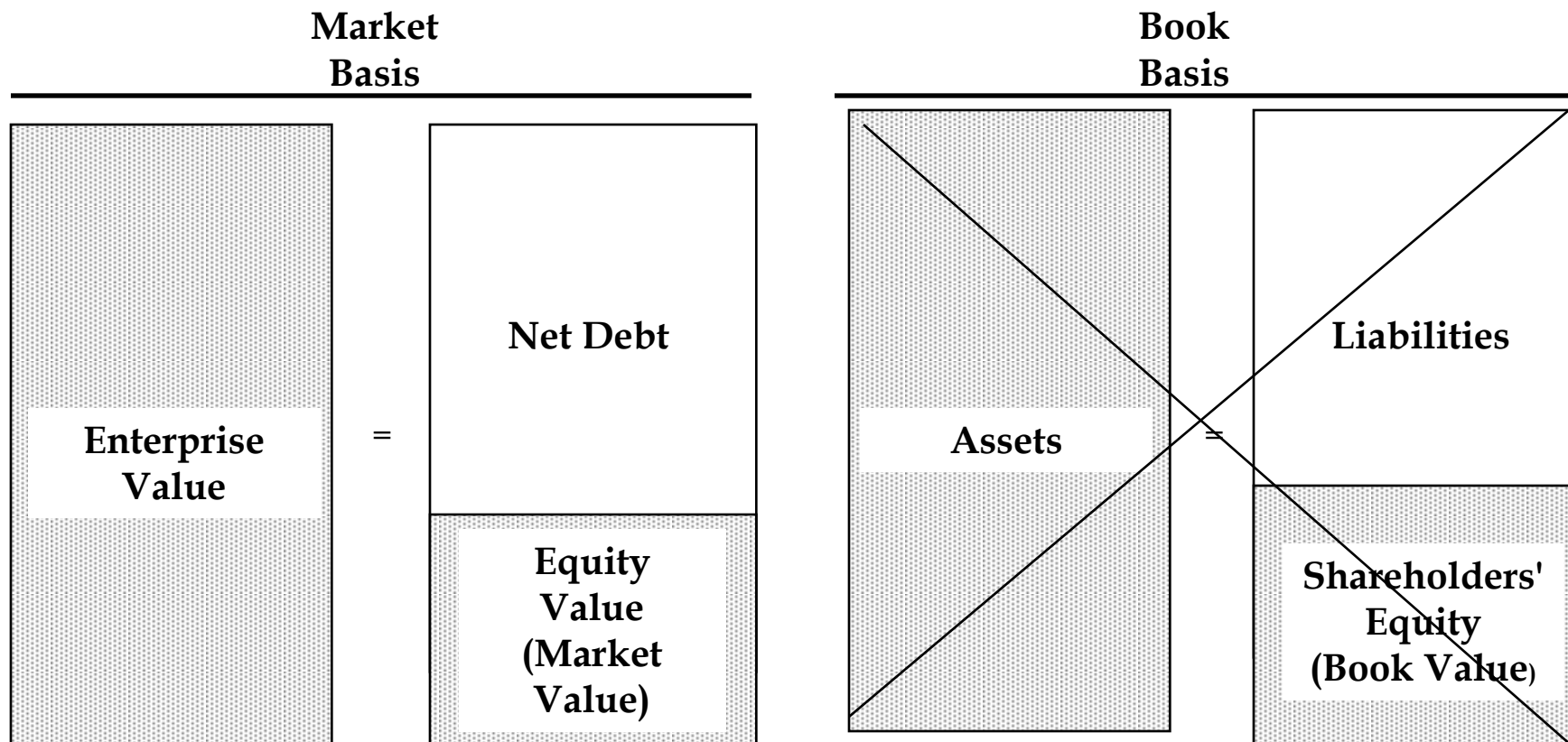
Other items may be includable in enterprise value, such as minority interests, convertible securities, preferred stock, options, off balance sheet leases, and pensions.

DISCOUNTED CASH FLOW ANALYSIS

"The DCF is the grand-daddy of all crocks of sh--."
Rolfe and Troob, *Monkey Business*

DCF METHODOLOGY

Overview

- Discounted cash flow ("DCF") analysis is a method to value a business based on the net present value of projected cash flows. These cash flows include:

    ▸ Net cash flows generated over the forecast period

    ▸ A continuation or terminal value at the end of the forecast period.

- These future cash flows are discounted to the present at a discount rate commensurate with their risk.

- DCF's are forward looking since the derived values are based on forecasted results.

- There are three basic ways to do DCF analysis. The values generated are equivalent <u>provided </u>the same underlying assumptions are used.

DCF METHODOLOGY – THREE EQUIVALENT TECHNIQUES

| Technique	Cash Flows	Discount Rate	Usage
Traditional WACC based approach (discounts to enterprise value)	Free cash flows **before** deduction of financing costs	WACC (using a cost of equity determined by CAPM and a leveraged beta)	By far the most widely used. Assumes capital structure is constant
Adjusted present value approach (discounts to enterprise value)	Operating cash flows and interest tax shields valued separately	Cost of unleveraged equity for operating cash flows; pre-tax debt cost for interest tax shields	Used when capital structure is expected to vary greatly over the forecast period
Flows to equity approach i.e. flows to equity (discounts to equity value)	Free cash flows **after** deduction of financing costs	Cost of equity determined by CAPM and a leveraged beta	Typically used in financial services due to the complexity in distinguishing operating vs. financial interest expense

DCF METHODOLOGY: THE PROCESS

Step 1

Projections Project the operating results and free cash flows of a business over the forecast period, typically five or ten years.

Step 2
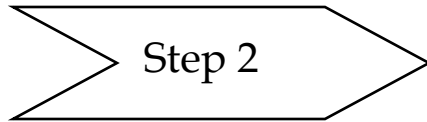
Discount Rate Use the weighted average cost of capital to determine the appropriate discount rate range.

Step 3
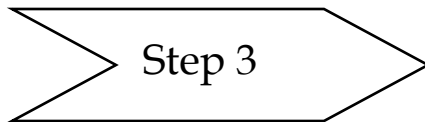
Continuing or Terminal Value Estimate the terminal value of the business using either comparable trading multiples, acquisition multiples, and/or the perpetuity method. **It is typical for the terminal value to make up the majority of the value in DCF analysis. Take great care here.**

Step 4
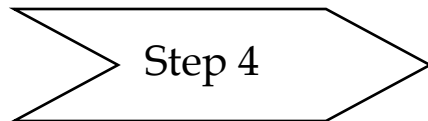
Present Value Determine a range of values for the enterprise using a range of discount rates and projection assumptions.

Step 5

Adjustments Adjust the valuation for all assets and liabilities not accounted for in the cash flow projections e. g. excess real estate, unconsolidated operations, investments, other liabilities.

DCF METHODOLOGY – FOCUS ON THE WACC-BASED DCF

- **Unleveraged Cash Flow Projections:** The cash flows used in this approach differ from the cash flows in the financial statements in that they are unleveraged; that is, they disregard the effect of capital structure. The focus is on cash flow, not accounting net income.

- **Enterprise Value:** Discounting unleveraged free cash flows with the WACC leads to enterprise value. Debt needs to be subtracted to derive equity value.

- **Reasonableness of Projections:** DCF results are highly sensitive to cash flows and terminal values. Cash flow and terminal value assumptions must be reasonable.

- **Projection Horizon:** The theoretically correct projection horizon is not necessarily when growth slows and stabilizes. It is when the return on incremental investment declines to the WACC. At this point, no matter what the growth is, the business ceases to generate incremental value. Longer projection horizons reduce the importance of terminal values in the analysis.

- **Sensitivity Analysis:** DCF valuations are based on many assumptions and it is best to sensitize the key ones. The best variables to sensitize are sales, margins, the WACC, and terminal value multiple and/or perpetuity growth rates.

DCF METHODOLOGY

Unleveraged Free Cash Flow

Unleveraged free cash flow can be derived from a business' financial projections, even if these projections include the effects of debt. You simply exclude interest income and interest expense and tax-effect EBIT (1) The value of the interest tax shield is included as part of the tax-effected cost of debt in the WACC.

Start: EBIT (1)
   Less: Taxes (at the marginal tax rate) (2)

Equals: Tax-Effected EBIT (which also = NOPAT = EBIAT = Net income + after tax interest expense)

   Plus: Depreciation and amortization (1)
   Plus (Less): Increases (decreases) in deferred tax liabilities (3)
   Less (Plus): Increases (decreases) in adjusted working capital (4)
   Less: Capital expenditures

Equals: Unleveraged Free Cash Flow

---

(1)   Assumes that all depreciation and amortization is tax deductible. This is typically the case now that goodwill (typically not tax deductible) is no longer subject to periodic amortization.
(2)   This is probably not the same number as in the financial statements. Note the interest tax shield is being excluded from cash flow.
(3)   In a DCF you only want to include cash taxes. Look to the cash flow statement to see if the company reports any deferred taxes.
(4)   Working capital = current assets – current liabilities. However, for DCF purposes we need to adjust working capital to exclude excess cash and equivalents from current assets and short-term borrowings and current maturities from current liabilities to calculate an adjusted working capital.

DCF METHODOLOGY

Continuing (Terminal) Value Calculation: Terminal Multiple Method

<u>Assumption:</u> The business will be sold at the end of year N.

<u>Usage:</u> This is the most commonly used terminal value approach by practitioners because of the difficulty in forecasting a perpetual g rate.

<u>Exit Multiple</u> [1]: The terminal value is generally determined as a multiple of EV/EBITDA OR EV/EBIT. This value will be discounted to the present. Use EV multiples, not P/E multiples, to be consistent with the fact that this methodology leads to enterprise value, not equity value.

Generally the terminal multiple is derived from trading comparables. Usually it is appropriate to take some <u>discount</u> from current comparable company trading levels to reflect the fact that, all things being equal, the multiple in future years should be less as growth slows over time. You will almost never use a multiple higher than the company's current multiple. Acquisition comparables may be useful depending on the purpose of the valuation.

---

(1)   Note that the terminal year results may be misleading if the industry is cyclical. If it is one could use a rolling average and make other adjustments as needed.

DCF METHODOLOGY

Continuing (Terminal) Value Calculation: Terminal Multiple Method Continued

Exit Multiple [1]: There is no absolutely correct answer for this but I recommend basing your terminal multiple on <u>trailing</u> results. This is in contrast to what we normally emphasize when looking at comps which is to look forward.

Rationale: The reason for this is that you typically apply the discounted version of your multiple to the final year of the forecast, in effect looking back. To be consistent we should use the trailing multiple from the comps for this purpose. If for some reason the trailing multiple is not representative adjust as appropriate.

How much of a discount: Again there are no rules. Generally I am thinking 15-20% but I can't tell you why! It would seem logical to use even deeper discounts for longer forecasts, again under the expectation that growth and returns decline over time in the standard company life cycle.

DCF METHODOLOGY

Terminal (Continuing) Value Calculation: Perpetuity Growth Method

- Assumption: This method assumes you will own the business in perpetuity and that the business will grow at a stable long-term rate.

- Theoretically sound: This is the most theoretically sound approach to terminal values. Using multiples really bastardizes the valuation process by mixing in comparables analysis.

- Perpetuity Formula: The perpetuity growth method takes the free cash flow in the last year of the forecast period, N, and grows it one more year to year N+1. This free cash flow is then capitalized at a rate equal to the discount rate minus the perpetual growth rate.

$$\text{Terminal Value} = \frac{FCF_N *(1+g)}{(r-g)}$$ where   FCF = free cash flow in period N

g = perpetual growth rate

r = discount rate (WACC)

Remember this is the value in year N which must then be discounted to the present value at the WACC.

DCF METHODOLOGY

Terminal (Continuing) Value Calculation: Perpetuity Growth Method

- <u>Normalized Cash Flow in Final Year:</u>   If the free cash flow in year N does not represent a steady state normalized cash flow for the future, then adjustments will need to be made.

- <u>Nominal vs. Real:</u> Keep in mind that financial statements are usually stated in nominal terms, including inflation. You must be aware of inflation when forecasting terminal g. For example, if your forecast terminal g at 3% you are in effect assuming real g at zero since long term inflation in the US is around 3%. It is okay to forecast 3% or even lower; many companies will have negative real g. However, you need to be aware of what you are doing and explain it. Don't be mislead by the fact that GDP growth data is typically stated in real terms.

- <u>Limits to g:</u> Avoid having terminal g exceed growth in the outer years of your forecast. Remember terminal g refers to free cash flow, not sales or earnings, although in the terminal state all of these variables should be converging on the same g rate. Growth in excess of the 6% long term nominal growth of the economy is generally viewed as unsustainable in perpetuity BUT remember that world growth is higher than the US by about 2% now. Also, the average S&P 500 company gets 40% of its revenue and 25% of its profit outside the US. This could temper the 6% limit a bit.

- <u>R-g spread:</u> The spread between these two variables has an enormous impact on the terminal value. Keep in mind this formula is really a multiple. For example, if r = 10% and g = 5%, then effectively the terminal multiple of FCF is 20 times. Low interest rates generally lead to huge terminal values.

DCF METHODOLOGY

Terminal (Continuing) Value Calculation: Perpetuity Growth Method Problem Areas

- <u>The cliff:</u>   This refers to the fall off in growth often observed in DCF models. For example, the company may be growing at 15% during the forecast period. The problem is we can't use terminal g that high, maybe 6% maximum. However, it seems ridiculous to assume that a company enjoying good growth is suddenly going to start growing at 5-6% just to solve our modeling problem!

  ↙ Possible solution – longer forecasting period to allow g to phase down over time

- <u>Cap ex/depreciation relationship:</u> These variables should be in approximate balance in your perpetual forecast. If your perpetual g is 3% or less perhaps they can be equal and you can assume that productivity increases and inflation net out. If your g is greater than 3% nominal then I would suggest that cap ex should exceed depreciation by some small amount – maybe 10-20%. Again there is no science here.

- <u>Taxes:</u> Many companies have low cash tax rates (high deferred taxes) during the forecast period. However, it is probably unreasonable to forecast this in perpetuity. You might want to consider bumping the tax rate up to the marginal tax rate in perpetuity as having material deferred taxes in perpetuity seems very unlikely.

OTHER PROBLEMS WITH TERMINAL VALUES

Terminal (Continuing) Value Calculation: More Problem Areas

- <u>Forecast length:</u> This is a particular problem for the perpetuity approach where we need to make a perpetual growth assumption.

- Five years is often too short to capture all of the value

- The competitive advantage period, the time during which the return on capital for incremental investments is believed to exceed the WACC, is estimated to be 12 –15 years for the stock market as a whole

  - ↙ Longer forecasts will certainly be "wrong" but they may yield more accurate answers than premature terminal value assumptions

  - ↙ Remember the time period of our valuation is perpetuity in all cases. What is open to question is only the length of the explicit forecast period. If for example you are afraid of adding a second five year period to your forecast but fear the likely increase in errors involved, KEEP IN MIND THAT TO IMPROVE THE QUALITY OF YOUR OVERALL ANSWER ALL THAT IS REQUIRED IS THAT THE SECOND FIVE YEAR FORECAST BE MORE ACCURATE THAN THE RESULTS OF YOUR TERMINAL GROWTH ASSUMPTION FOR THIS PERIOD! REMEMBER THE CLIFF PROBLEM.

OTHER PROBLEMS WITH TERMINAL VALUES

Multiples are a good valuation alternative BUT THEY HIDE IMPORTANT ASSUMPTIONS. We have to break multiples down to see what they are hiding from us. For example, there is an equivalence between the terminal multiple approach and the terminal growth approach

- Assumptions regarding exit multiples are often checked for reasonableness by calculating the growth rates in perpetuity that they imply (and *vice versa*)

  <u>To go from the exit-multiple approach to an implied perpetuity growth rate:</u>

  $$g = [(\text{WACC}*\text{terminal value}_n) - \text{FCF}_n] / [\text{FCF}_n + \text{terminal value}_n]$$

  <u>To go from the growth-in-perpetuity approach to an implied exit multiple:</u>

  $$\text{multiple} = [\text{FCF}_n * (1 + g)] / [\text{EBITDA}_n * (\text{WACC} - g)]$$

- Note this calculation uses TV, FCF and EBITDA *from the terminal year undiscounted*

OTHER PROBLEMS WITH TERMINAL VALUES

Terminal values ALSO HIDE IMPORTANT ASSUMPTIONS REGARDING ROIIC, the return on incremental invested capital.

• Microeconomic theory tells us that returns cannot exceed the cost of capital forever because this state will encourage new entrants who will compete and drive returns down. Therefore, we want to make sure that we have reasonable assumptions regarding ROIIC in our models.

• Remember g only creates value if ROIIC > WACC! If there is an equivalency than g can be anything without changing the terminal value. I know it seems unbelievable so see Mauboussin's article "Common Errors in DCF Models" – the algebra is in the appendix. http://www.leggmasoncapmgmt.com/pdf/CommonErrors.pdf

•**IF ROIIC = WACC then according to Mauboussin this follows:**

$$\frac{FCF_{N+1}}{WACC - g} = \frac{NOPAT_{N+1} * (1 - g/ROIIC)}{WACC - g} = \frac{NOPAT}{WACC}$$

NOTE: NOPAT = EBIAT = (EBIT) * (1 – t) = Net income + after tax interest expense

OTHER PROBLEMS WITH TERMINAL VALUES

How can we use this information?

• If we know what the terminal value "is" from our traditional FCF perpetuity approach, we can use these formulas to solve for ROIIC

• If we have an EBITDA terminal multiple value, we can first find out what the embedded g is and then solve for ROIIC. There will be various combos of possible gs and ROIICs.

• We can try and see if we have a ROIIC problem by doing a crude calculation. We can look at the delta in NOPAT year to year divided by the delta in investment (which equals the change in working capital + cap ex – depreciation) from the previous year. This should give us a crude measure of ROIIC. Alternatively we can what NOPAT/(Total Investment approximates Net Plant plus Working Capital) is and how it is changing over time.

$$\frac{FCF_{N+1}}{WACC - g} \quad = \quad \frac{NOPAT_{N+1} * (1 - g/ROIIC)}{WACC - g} \quad = \quad \frac{NOPAT}{WACC}$$

DISCOUNTED CASH FLOW ANALYSIS

Adjustments to your analysis may be required

Key examples of adjustments include:

- ↙ Excess cash and equivalents – should be added to enterprise value via netting against debt. We often have to guess how much cash is excess.

    - Be sure to exclude interest income from EBITDA. Otherwise you are double counting. You can't include the value of excess cash and its return.

- ↙ Investments – another good candidate for adding back

    - Add values for unconsolidated subsidiaries and long term investments; subtract minority interests. Estimate the values or use balance sheet carrying amounts as a default guess if you have no other information.

        - Be sure to exclude earnings and dividends from these items from EBITDA. Otherwise you are double counting.

    - These operations are not consolidated and therefore not reflected in the consolidated cash flow forecasts

- ↙ Look for other redundant and non-cash producing assets not reflected in the cash flows to add back i.e. excess real estate

    - Money losing operations should be considered separately if possible

    - They may have some value. Including them in the DCF analysis implicitly gives them a negative value

WEIGHTED AVERAGE COST OF CAPITAL

Overview

- The weighted average cost of capital (WACC) includes an estimate of the required rate of return for debt and equity investors, given the uncertainty of future cash flows based on the risk profile of the business, the industry and the company's capital structure.

- In the M&A context, the appropriate WACC for valuation purposes is the WACC of the target company, not the acquirer. The target's WACC is the best indicator of the required rate of return for that particular investment, barring some anticipated change in the capital structure of the target.

WEIGHTED AVERAGE COST OF CAPITAL

WACC Formula

- Companies use a combination of debt and equity to fund their operations. The cost of capital is the weighted average of the cost of debt and the cost of equity. This is a simplified approach. In the real world you might have to account for items such as convertible securities, preferred stock, and leasing.

$$\text{WACC} = r_d \times (1-t) \times \frac{D}{D+E} \quad + \quad r_e \times \frac{E}{D+E}$$

E = Market Value of Equity
D = Market Value of Debt (D refers to borrowed money only NOT all liabilities)
t = Marginal Tax Rate
r_e = Cost of Equity (from CAPM)
r_d = Cost of Debt (assumed to be the current cost of debt[1])

- Because interest expense is tax deductible, the true cost of debt is the after tax cost. The tax rate used should be the marginal tax rate for each specific company.

- Theory calls for the <u>market value</u> of equity and debt to be used in the WACC. However, for class room purposes using debt from the financial statements is adequate.

- Don't forget there may be other layers in the capital structure like convertible debt and preferred stock that need to be included

---

(1) Estimate the <u>current</u> market cost of debt by either i) determining the average yield to maturity on existing public bonds or ii) estimating bond rating based on credit statistics of comparable companies and referencing yields on recent offerings of comparable securities.
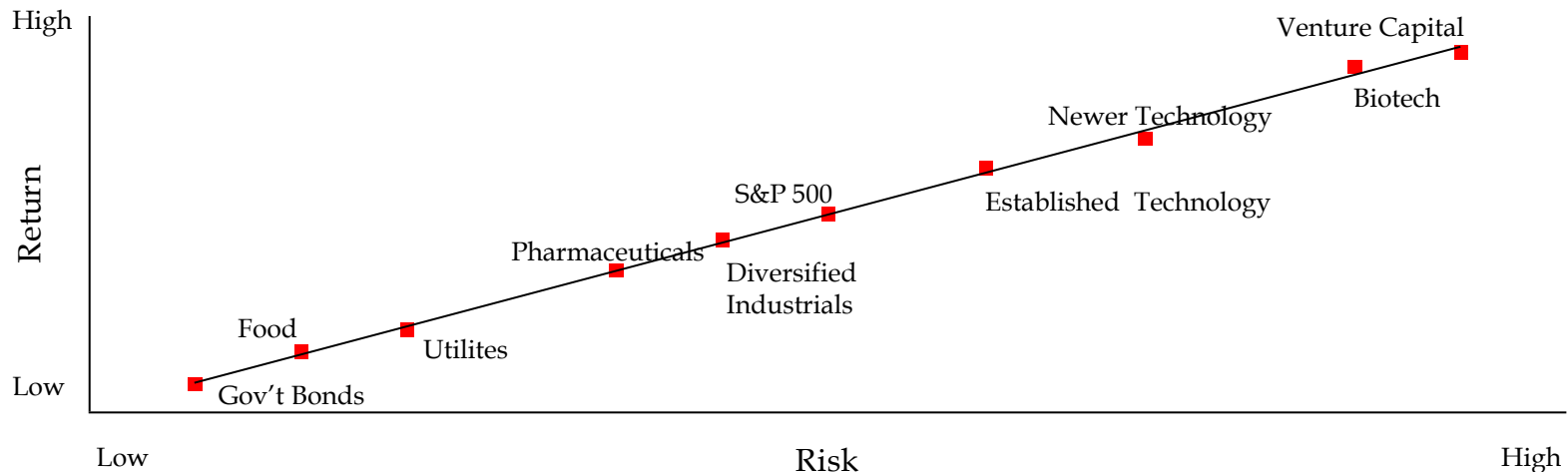
WEIGHTED AVERAGE COST OF CAPITAL

Debt Cost of Capital

- The cost of debt or required return on debt, "r_d", is observable in the market and is best approximated by the current yield-to-maturity on the applicable debt securities.

- Remember that the yield represents the market's expectation of future returns.

- The required return on debt will increase as the debt/capital ratio increases and EBITDA/interest ratio decreases.

- When using the after-tax cost of debt, we are assuming that our target company is profitable and has enough pre-tax profit to take full advantage of the tax deductibility of interest expense.

- Debt is typically understood to be liabilities with an explicit interest component. ALL LIABILITIES ARE NOT DEBT for this purpose. Unless there is some reason to suspect that short-term debt is seasonal or temporary, you should include it and current maturities as part of debt. Debt should also be calculated net of excess cash. The general practice is to use one cost of debt for all senior debt i.e. short, long, leases etc.

- The most common treatment for convertible securities in a WACC is to divide the convertibles into their debt and warrant/option components and add each part to either debt or equity.

- Preferred stock is not debt but a separate class of capital, a third category of capital in our WACC illustrations. Remember regular preferred dividends are not tax deductible.

WEIGHTED AVERAGE COST OF CAPITAL

Equity Cost of Capital

- Equity investors have a residual claim on the assets (value) of a company, subordinate to that of all classes of debt and preferred stockholders. Therefore, both the risks and expected returns to equity holders are greater.

- The cost of equity or required return on equity (r_e) represents an investor's expected rate of return including dividends and capital appreciation.

- Since the cost of equity is not readily observable in the market, it is more difficult to estimate.

- Fundamentally, the cost of equity should be correlated with the perceived risk of an investment (which generally increases with leverage).

WEIGHTED AVERAGE COST OF CAPITAL

Capital Asset Pricing Model

- The Capital Asset Pricing Model (CAPM) is a tool to estimate required equity returns.

- CAPM classifies risk into two parts: systematic risk and unsystematic risk. Unsystematic risk is that portion of risk that can be avoided through diversification by the investor and therefore merits no premium return.

- CAPM assumes that systematic risk is unavoidable and should be rewarded with a risk premium, which is an expected return above the risk-free return.

  ↙ The size of the risk premium is linearly proportional to the amount of risk taken.

- The formula follows

    Cost of Equity = Risk free Rate + Beta(leveraged)* Market Risk Premium

    NOTE: There is no PE ratio in the formula. Under CAPM, PE ratios have nothing to do with the cost of equity

WEIGHTED AVERAGE COST OF CAPITAL

Capital Asset Pricing Model

↙ The risk free rate is typically measured as the yield on the ten year Treasury Note, currently the benchmark security. Some use the 30 year bond or even treasury bills.

↙ Market risk premium represents the expected market return minus the risk free rate of return. The market risk premium has averaged about 7% over time. Many observers believe the current premium is no more than 3-4%. The market risk premium has proven to be surprisingly volatile over time. In practice **this is one of the most important assumptions of a DCF analysis.**

↙ Sometimes practitioners add an additional premium of 1-3% for small cap companies as they are widely believed to offer greater risk and return.

– NOTE: This is another way of saying that larger companies, all else being equal, are worth more. Various studies support this assertion.

WEIGHTED AVERAGE COST OF CAPITAL

Beta

- Beta provides a method to measure the degree of an asset's systematic (non-diversifiable) risk. The beta measures the degree to which a company's returns vary with the return of the overall market.

- A company whose stock has a beta of 1.0 is as risky as the overall stock market and should therefore be expected to provide market returns to investors equal to that of the market.

- Since the cost of capital is an expected value, the beta value should be an expected value as well. Generally, however, we use historical betas in the classroom.

- The appropriate beta to use in the CAPM calculation is the leveraged beta. Typically betas reported on popular websites like Yahoo are leveraged betas. Unless otherwise specified, it is safe to assume that betas you are given are leveraged betas.

WEIGHTED AVERAGE COST OF CAPITAL

CAPM Formula

- Use Bloomberg or other reputable source to determine the company beta. Focus on the beta for the company you are valuing BUT It is useful check to:

  a. Impute unleveraged betas from public comparables.

  b. Re-lever the average comparables unleveraged beta based on the company's target Debt/Capital ratio.

  c. Make a judgment as to the appropriate beta for your analysis. If you have some reason to suspect your company's beta, adjust, or at the very least, sensitize.

- Betas are a difficult assumption as they can vary greatly from one information provider to another and are often at great variance with commonsense observations about business risk. Less liquid trading markets provide problematical data for beta calculations.

CAPM RIP?

- The cornerstone theory of modern financial market analysis is under attack.

- Key idea is that increased risks are accompanied by higher returns i.e. higher beta stocks are riskier but have higher returns

- Recent studies show that this is NOT TRUE over the long run.
  - Fama and French 2004 study discredits the model
  - CAPM woefully under predicts the returns of low beta stocks and massively overstates the returns of high beta stocks
  - Over the long run there has been essentially no relationship between beta and return
  - Fama and French concluded that the theory's empirical track record was so poor that its use in applications was probably invalid

BIG OOPS

WEIGHTED AVERAGE COST OF CAPITAL

An Example : Black Mountain Beer's Cost of Equity

- Assume the following:

    Black Mountain Beer's Beta = 1.2

    Risk Free Rate = 6.0%

    Equity Risk Premium = 7.5%

- What is the cost of equity for Black Mountain Beer?

    $r_e = r_f + \beta_L (r_m - r_f)$

    $r_e = 6.0\% + 1.2 (7.5\%)$

    $r_e = 6.0\% + 9.0\%$

    $r_e = 15.0\%$

WEIGHTED AVERAGE COST OF CAPITAL

An Example: Black Mountain Beer Company

- Black Mountain Beer ("BMB") has 8,000,000 million common shares outstanding trading at $12.50 per share on the Asheville Exchange. BMB also has outstanding bank debt of $150 million at a 10% interest rate [1].

- Black Mountain Beer has a marginal tax rate of 38%. What is BMB's weighted average cost of capital?

$$\text{WACC} = \left[r_d \times \frac{D(1-T)}{D+E} \right] + \left[r_e \times \frac{E}{D+E} \right]$$

$$\text{WACC} = [10\% \times \tfrac{150}{250} \times (1 - .38)] + [15\% \times \tfrac{100}{250}]$$

$$\text{WACC} = [10\% \times 60\% \times (1 - .38)] + [15\% \times 40\%]$$

$$\text{WACC} = 3.7\% + 6.0\%$$

$$\text{WACC} = 9.7\%$$

---

(1) For purposes of this example, assume that 10% is also the current market cost of debt, as if Black Mountain Beer issued debt today. Furthermore, it is better to use 10 or 15 year debt, which better approximates the cost of funding the business.

WEIGHTED AVERAGE COST OF CAPITAL

Delevering and Relevering Beta

- Beta values measured in the market include the effect of leverage of the individual companies. When estimating an appropriate beta for a specific company, you may want to estimate the appropriate range of unlevered betas or asset betas.

- The Formula follows:

$$\beta_u = \beta_L/(1 + (1 - T) \; x \; (Debt/Equity))$$

Where: β_u = unlevered or asset beta

β_L = levered beta

T = Marginal tax rate

- To relever the beta at a target capital structure:

$$\beta_L = \beta_u * [1 + \underline{Debt \; (1\text{-}T)}]$$
$$Equity$$

WEIGHTED AVERAGE COST OF CAPITAL

An Example : BMB's Unlevered & Levered Returns

Black Mountain Beer's levered Beta was 1.2; however, that was based on a leveraged balance sheet. What is BMB's unlevered Beta?

$$\beta_u = B_L \div \left[1 + \frac{D}{E} (1 - T)\right]$$

$$\beta_u = 1.2 \div \left[1 + \frac{150}{100} (1 - .38)\right]$$

$$\beta_u = 1.2 \div 1.93$$

$$\beta_u = .62$$

As shown above, without a highly leveraged balance sheet, expected returns on Black Mountain Beer's equity are much less volatile.

WEIGHTED AVERAGE COST OF CAPITAL

An Example: Estimating Beta based on Similar Companies

- Assume Black Mountain Beer were a privately owned business and no estimate for its Beta existed. To estimate its WACC, we could look at similar publicly-traded companies and estimate an average unleveraged Beta for companies like Black Mountain Beer. We could then lever this average Beta to BMB's capitalization level and calculate an implied equity return and a WACC for BMB.

Comparable Companies	Levered Beta	Debt/ Equity	Tax Rate	Unlevered Beta [a]
Clingman's Dome Beer	1.45	60%	38%	1.06
Grandfather Mountain Beer	1.25	25%	40%	1.09
Average Beta	1.35			1.07

- Note that on a leveraged basis, the companies Beta's differ more due to their different capital structures.

(a) Unlevered Beta = B_L : [1+(Debt/Equity) x (1-Tax Rate)].

WEIGHTED AVERAGE COST OF CAPITAL

An Example: Estimating Beta Based on Similar Companies (cont'd)

- Assuming an unlevered Beta for Black Mountain Beer of 1.07 and given its debt to equity of 150%, we can estimate a levered Beta for BMB as follows:

$$\beta_L = B_u \times \left[\left(1 + \frac{Debt}{Equity} \times (1 - \text{Tax Rate})\right)\right]$$

$$\beta_L = 1.07 \times \left(1 + \frac{150}{100} \times (1 - .38)\right)$$

$$\beta_L = 1.07 \times 1.93$$

$$\beta_L = 2.07$$

- Based on this estimate we can calculate an estimated return on equity and WACC for BMB:

$$r_e = r_f + \beta (r_m - r_f)$$

$$WACC = r_d \times (1 - t) \times \frac{D}{TotalCap} + r_e \times \frac{E}{TotalCap}$$

$$r_e = 6.0\% + 2.07 (7.5\%)$$

$$WACC = 10\% \times (.62) \times \frac{150}{250} + 21.53\% \times \frac{100}{250}$$

$$r_e = 21.53\%$$

$$WACC = 12.33\%$$

DCF METHODOLOGY

Present Value Calculations

- **Present Value of Cash Flow Stream:** The present value takes into account the time value of money by placing greater value on those cash flows generated earlier in the forecast period rather than later:

$$\text{Present Value} = \frac{UFCF_1}{(1+r)^1} + \frac{UFCF_2}{(1+r)^2} + \frac{UFCF_3}{(1+r)^3} + \text{-----} + \frac{UFCF_N}{(1+r)^N}$$

- **Mid-Year Convention:** A mid-year convention can also be used which assumes the cash flows occur in the middle of the period which often better approximates the time the cash is actually received. Discounting using a mid-year convention simply requires each years cash flow being discounted by a period of one-half a year less [1] :

$$\text{Present Value} = \frac{UFCF_1}{(1+r)^{0.5}} + \frac{UFCF_2}{(1+r)^{1.5}} + \frac{UFCF_3}{(1+r)^{2.5}} + \text{-----} + \frac{UFCF_N}{(1+r)^{N-.5}}$$

UFCF	=	Unlevered Free Cash Flow
r	=	Discount Rate
N	=	Period

---

[1] This method will result in a higher valuation of the cash flows.

DCF ANALYSIS – Perpetuity Method

(dollars in millions, except per share)

($ millions, except per share)	Actual FY Ended 12/31			Projected FY Ended 12/31					Assumptions:	
	2003	**2004**	**2005**	**2006E**	**2007E**	**2008E**	**2009E**	**2010E**		
Sales	$400.0	$440.0	$484.0	$532.4	$585.6	$644.2	$708.6	$779.5	Sales Growth	10.0%
EBITDA	80.0	88.0	96.8	106.5	117.1	128.8	141.7	155.9	EBITDA Margin	20.0%
Less: Depreciation	-12.0	-13.2	-14.5	-16.0	-17.5	-19.3	-21.2	-23.4	Increase in Depreciation	10.0%
EBIT	68.0	74.8	82.3	90.5	99.6	109.5	120.5	132.5	Marginal Tax Rate	40.0%
Less: Taxes	-27.2	-29.9	-32.9	-36.2	-39.8	-43.8	-48.2	-53.0	CAPEX Growth	10.0%
Tax-Effected EBIT	40.8	44.9	49.4	54.3	59.7	65.7	72.3	79.5	Increase in NWC	-20.0%
Plus: Depreciation	12.0	13.2	14.5	16.0	17.5	19.3	21.2	23.4	Shares Outstanding (millions)	40.0
Plus (Less): Increase (Decrease) in Deferred Tax Liability				0.0	0.0	0.0	0.0	0.0		
Less: CAPEX				-20.0	-22.0	-24.2	-26.6	-29.3		
Less (Plus): Increase (Decrease) in NWC				-10.0	-8.0	-6.4	-5.1	-4.1		
Free Cash Flow (FCF)				$40.3	$47.3	$54.4	$61.8	$69.5		
FCF Growth Rate					*17.5%*	*15.1%*	*13.5%*	*12.5%*		

=((2010E FCF*(1+c))/(Discount Rate-c))/(1+Discount Rate)^5

	A	+	B				=	C		
	Discounted Cash Flows (2006E-2010E)		**PV of Terminal Value at a Perpetual Growth Rate of [c]**					**Firm Value**		
Discount Rate:			**2.5%**	**3.5%**	**4.5%**			**2.5%**	**3.5%**	**4.5%**
7.0%	$220.1		$1,128.7	$1,465.4	$2,071.3			$1,348.8	$1,685.4	$2,291.4
7.5%	216.9		992.4	1,252.7	1,686.3			1,209.3	1,469.5	1,903.2
8.0%	213.8		881.5	1,087.9	1,412.3			1,095.3	1,301.7	1,626.0
8.5%	210.7		789.6	956.8	1,207.5			1,000.3	1,167.5	1,418.2
9.0%	207.7		712.3	850.0	1,049.0			920.0	1,057.8	1,256.7

	-	D	+	E	=	F				Value per Share		
		Net Debt a/o 12/31/05		**Equity Investments**		**Total Equity Value**						
Discount Rate:						**2.5%**	**3.5%**	**4.5%**		**2.5%**	**3.5%**	**4.5%**
7.0%		$200.0		$0.0		$1,148.8	$1,485.4	$2,091.4		$28.72	$37.14	$52.28
7.5%		200.0		0.0		1,009.3	1,269.5	1,703.2		$25.23	$31.74	$42.58
8.0%		200.0		0.0		895.3	1,101.7	1,426.0		$22.38	$27.54	$35.65
8.5%		200.0		0.0		800.3	967.5	1,218.2		$20.01	$24.19	$30.46
9.0%		200.0		0.0		720.0	857.8	1,056.7		$18.00	$21.44	$26.42

Reference these from the balance sheet

DCF ANALYSIS: EBITDA Multiple Method

(dollars in millions, except per share)

($ millions, except per share)	Actual FY Ended 12/31			Projected FY Ended 12/31					Assumptions:
	2003	2004	2005	2006E	2007E	2008E	2009E	2010E	Sales Growth
Sales	$400.0	$440.0	$484.0	$532.4	$585.6	$644.2	$708.6	$779.5	EBITDA Margin
EBITDA	80.0	88.0	96.8	106.5	117.1	128.8	141.7	155.9	Increase in Depreciation
Less: Depreciation	-12.0	-13.2	-14.5	-16.0	-17.5	-19.3	-21.2	-23.4	Marginal Tax Rate
EBIT	68.0	74.8	82.3	90.5	99.6	109.5	120.5	132.5	CAPEX Growth
Less: Taxes	-27.2	-29.9	-32.9	-36.2	-39.8	-43.8	-48.2	-53.0	Increase in NWC
Tax-Effected EBIT	40.8	44.9	49.4	54.3	59.7	65.7	72.3	79.5	Shares Outstanding (millions)
Plus: Depreciation	12.0	13.2	14.5	16.0	17.5	19.3	21.2	23.4	
Plus (Less): Increase (Decrease) in Deferred Tax Liability				0.0	0.0	0.0	0.0	0.0	
Less: CAPEX				-20.0	-22.0	-24.2	-26.6	-29.3	
Less (Plus): Increase (Decrease) in NWC				-10.0	-8.0	-6.4	-5.1	-4.1	
Free Cash Flow (FCF)				$40.3	$47.3	$54.4	$61.8	$69.5	
FCF Growth Rate					*17.5%*	*15.1%*	*13.5%*	*12.5%*	

=(2010E EBITDA*c)/(1+ Discount Rate)^5

	A	+	B			=	C		
	Discounted Cash Flows (2006E-2010E)		PV of Terminal Value as a Multiple of 2010E EBITDA [c]				Firm Value		
Discount Rate:			13.0x	14.0x	15.0x		13.0x	14.0x	15.0x
7.0%	$220.1		$1,445.0	$1,556.1	$1,667.3		$1,665.0	$1,776.2	$1,887.3
7.5%	216.9		1,411.7	1,520.3	1,628.9		1,628.6	1,737.2	1,845.7
8.0%	213.8		1,379.3	1,485.4	1,591.5		1,593.1	1,699.2	1,805.3
8.5%	210.7		1,347.8	1,451.5	1,555.2		1,558.5	1,662.2	1,765.9
9.0%	207.7		1,317.2	1,418.5	1,519.8		1,524.9	1,626.2	1,727.6

	-	D	+	E	=	F				Value per Share		
		Net Debt a/o 12/31/05		Equity Investments		Total Equity Value				Value per Share		
Discount Rate:						13.0x	14.0x	15.0x		13.0x	14.0x	15.0x
7.0%		$200.0		$0.0		$1,465.0	$1,576.2	$1,687.3		$36.63	$39.40	$42.18
7.5%		200.0		0.0		1,428.6	1,537.2	1,645.7		$35.71	$38.43	$41.14
8.0%		200.0		0.0		1,393.1	1,499.2	1,605.3		$34.83	$37.48	$40.13
8.5%		200.0		0.0		1,358.5	1,462.2	1,565.9		$33.96	$36.56	$39.15
9.0%		200.0		0.0		1,324.9	1,426.2	1,527.6		$33.12	$35.66	$38.19

Reference these from the balance sheet

GROWTH EQUIVALENCE OF EBITDA

What Is Happening at $37.48 – the Midpoint of the Summary?

$$g = [(WACC * EBITDA\ TV_n)- FCF_n]/\ [FCF_n+EBITDA\ TV_n]$$

WACC = 8%

FCF_n = 69.5

EBITDA TV_n at multiple of 14.0x = 2182.6

g = 4.7% as compared to 3.5%

Not too bad – it can be much more out of line very easily

WHAT ABOUT ROIIC?

- This looks very suspicious here. For example, in 2008 incremental investment is $6.4 million from working capital and $4.9 million from net cap ex, a total of $10.3 million. In 2009 NOPAT increases by $6.6 million. Life isn't this simple, but as a very crude measure, the ROIIC in 2009 is 6.6/10.3 = 64%! We get an even more alarming number in 2010 – 69%. Better look deeper.

- We believe the FV of the TV in 2010 using the perpetuity method is 69.5 * 1.035 = 71.9/(.08 - .035) = 1,598. Therefore, using our formula to solve for ROIIC:

$$1{,}598 = \frac{NOPAT_{N+1} * (1 - g/ROIIC)}{WACC - g}$$

Solving for ROIIC yields ROIIC = 27.8%

Not as bad as I thought it might be but still way too high compared to a WACC of 8%. If we drop the ROIIC to 8%, the FV of the TV declines to 1,028 as compared to 1,598. That in turn reduces the per share value from $27.54 to $17.83. Basically the projection assumptions are flawed. Looking at the EBITDA approach with the derived 4.7% g rates yields a ROIIC of 37.4%!

DISCOUNTED CASH FLOW ANALYSIS

Important Reminders

- Remember to insure that depending upon the free cash flows being used that you use the appropriate discount rate:

    ↙ Unleveraged cash flows ⟵⟶ Weighted Averaged Cost of Capital

- Ensure that the projections make sense and be sure to create sensitivity tables to determine which factors truly drive the valuation.

- Focus attention on your terminal value assumptions as they are typically by far the most important assumptions you will make in your analysis.

- Remember DCF analysis using a WACC for the discount rate and unleveraged cash flows leads to an enterprise value. To determine equity value, the <u>initial period</u> net debt (total debt minus excess cash) needs to be deducted. DCF analysis using the cost of equity as the discount rate and leveraged cash flows to equity leads to an equity value.

DISCOUNTED CASH FLOW OFTEN UNDERSTATES VALUES

Traditional DCF values <u>expected</u> cash flow and does not capture any value for real options

- In the real world cash flows are contingent on the occurrence of future events

- The ability to postpone or abandon projects or to change strategies has potentially significant value

- The information required to properly value these options is typically not available. Indeed the basic forecasts that are used are already subject to a certainty of error

- Nonetheless our thinking must somehow include the value of these real options

DISCOUNTED CASH FLOW AND OPERATING LEASES

Operating Leases

- Debt numbers on the balance sheet already include capitalized leases so no further adjustment is necessary for them.

- Operating leases are not capitalized but lurk in the financial footnotes.

- If operating leases are material, such as for retailers, they should be discounted at the cost of debt and the discounted amount treated as debt. The common practitioner approach is to multiply current lease expense by eight to estimate this capitalized amount.

- Lease expense is added to EBITDA to come up with EBITDAR for analysis purposes (R = rent).

- Rents are treated like interest expense.

- Similar approach can be used when doing comparable company analysis.

DISCOUNTED CASH FLOW ANALYSIS

Hierarchy of Valuation Techniques

Real options and other complex valuation techniques

Decision tree analysis

Monte Carlo simulation

Scenario DCF

Simple DCF

COMPARABLES ANALYSIS

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Overview

The analysis of publicly-traded comparable companies typically consists of a comparison of several companies' operating and trading statistics. The exact ratios and statistics emphasized will vary from industry to industry. Why do we look at comparables?

- Provides a benchmark to value a company by referring to other "similar" publicly-traded companies with "similar" operating and financial statistics.

- Calculate valuation multiples based on current markets, industry trends and growth.

- Provides insight into key valuation multiples for an industry.

- Serves as a value indicator for a passive, minority investment.

- Relies on the power of market based inputs.

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Issues With Comparables

- **WHAT IF THE COMPS ARE WRONG!!?? i.e.** Yahoo is a good comp for Google but how confident are we about Yahoo's valuation??

    REMEMBER – comps analysis is entirely relativistic. We are assuming that the comparable valuations are correct.

- May not reflect an appropriate value in thinly traded, small capitalization or under-researched stocks.

- It is extremely difficult to find truly comparable companies. The analyst is often making judgments and compromises. In fact, companies often strive to distinguish themselves from others.

    NOTE: All companies do not have publicly traded comparables. We may have to think outside the box.

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Issues With Comparables

- The quality of the "answers" is highly dependent on the quality of the comparables and on the specific comparables chosen.

- Comparable analysis is probably more vulnerable to accounting issues than DCF analysis.

- Comparables analysis does not focus on free cash flow and offers only a limited look into the explicitly forecast future.

- It does not account for "control" premiums or potential synergies realized in an acquisition.

COMPARABLE COMPANY ANALYSIS

What Makes a Company Comparable?

- Comparables analysis is often a highly subjective area where nothing is always true.

- Identifying comparables can be a major challenge. Few companies are truly comparable with one and other.

- By far the most important thing to consider is the nature of the underlying business. Is the industry the same? Is there a high degree of similarity between customer types, products offered, and economic drivers of the business?

- Size can be important. Growth can also be important. These factors are not necessarily determinative in isolation. Margins can be important as well. If none of these things are similar you may not have found a comparable.

- Sometimes there are no true comparables and you may need to think out of the box.

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Other Things to Keep in Mind

- For IPO valuations this analysis yields fully distributed value <u>before the IPO discount</u> (actually this would be true as well if you were using a DCF to value a company for an IPO. DCF is less commonly used in IPO valuations.)

- Multiples are most useful when they look forward e.g. the <u>current stock price divided by forecasted EPS.</u>   The same is true of enterprise multiples i.e. current EV/forecasted EBITDA (or EBIT or Sales.)

  Generally by late spring investors are starting to look forward another year. For example by May 2007 investors will be starting to rely more on Current Price/2008 forecasted EPS. By September 2007, the year 2007 no longer is that much of a forecast and the emphasis will have shifted to a focus on 2008.

COMPARABLE COMPANY ANALYSIS

What are the key ratios?

ENTERPRISE VALUES	**EQUITY VALUES**

ENTERPRISE VALUES

- ENTERPRISE VALUE/EBITDA

- ENTERPRISE VALUE/EBIT

- ENTERPRISE VALUE/REVENUES

- ENTERPRISE VALUE/SUBSCRIBERS OR OTHER METRIC

EQUITY VALUES

- PRICE/EPS

- PE/G ("PEG Ratio")

- PRICE/BOOK VALUE PER SHARE

It is imperative to understand the difference between Equity Value and Enterprise Value and their respective multiples. The difference lies in the treatment of debt and its cost, interest expense. A multiple that has debt in the numerator must have a statistic <u>before</u> interest expense in the denominator.

COMPARABLE COMPANY ANALYSIS

Things to Keep in Mind

- Enterprise ratios minimize the impact of leverage among companies with different capital structures

- Enterprise ratios also eliminate accounting differences related to depreciation and amortization and taxes

- Leverage influences P/E ratios in the following ways:

  ↙ If EBIT/EV > cost of debt then leverage understates P/E

  ↙ If EBIT/EV < cost of debt then leverage overstates P/E

  ↙ If a company has a high P/E ratio it may be "cheaper" from an EPS dilution notion of the cost of equity to sell stock than to issue debt, exactly the opposite of the real economic situation

COMPARABLE COMPANY ANALYSIS

Which Ratios Should You Use?

- All of them! They are easy to calculate and you might learn something.

- Emphasize PEs, EV/EBITDA, EV/EBIT, and PEG ratios. **Focus on forward ratios.**

  ↙ Try and understand why PEs and enterprise ratios give a different answer, if in fact they do.

  ↙ EBIT is generally a better measure than EBITDA but EBITDA is more commonly used. Look at both to be safe.

  – Remember neither EBITDA nor EBIT represents free cash flow.

  – For many companies, capital expenditures > depreciation. Therefore, some prefer EBIT as a better proxy for free cash flow.

  – On the other hand using EBIT does not help minimize the impact of depreciation and amortization differences.

- EV/Revenues is possibly okay depending on circumstances. The key problem is that it ignores profitability. This is typically used for young companies without profits or even EBITDA.

COMPARABLE COMPANY ANALYSIS

PEG Ratios and Price/Book

- PEG ratios are commonly used, **especially** with growth companies.

    ↙ PEG ratios are typically calculated as forward PE/five year or secular growth rate * 100.

    ↙ Slower growth companies often have higher PEGs, perhaps because g is more predictable for them.

    ↙ The concept is what price in terms of PE ratio is an investor paying for a percentage of growth rate.

    ↙ Remember, like everything else in the world of comps, this is a relativistic concept. <u>A PEG ratio of less than one does not mean the stock is necessarily cheap</u>. <u>The PEG for the S&P 500 is about 1.8x</u>.

    ↙ Focus on the comps when thinking about this.

    ↙ PEG ratios have a dubious intellectual validity but are widely used. Note that if the company has zero g it has no value! Ridiculous!

- Price/book is the most dubious of all ratios. It may have more validity when looking at financial services companies. De-emphasize this ratio as a general matter.

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Deriving Valuations

- Once you have calculated relevant multiples for each comparable company, you must then determine which multiples or range of multiples justify a reasonable benchmark for valuation of the specific target.

- Analyze results and decide which companies are most comparable.

  ↙ Exclude outlying multiples; use common sense.

  ↙ Don't make the universe of truly comparable companies greater at the expense of diluting the quality of the information that you have. It is better to focus on one or two really good comps then six or eight sort of comparable companies. This doesn't mean that you want to completely ignore "sort of" comps.

- Look at mean and median multiples, high and low multiples and multiples of specific companies which may be particularly relevant and comparable.

  ↙ **Don't allow yourself to become overly focused on means and medians. These can hide lots of useful information.**

- Use judgment to determine which multiples are most relevant (Net Income, EBIT, EBITDA, Sales, etc.) given the company and the nature of its business.

TRADING MULTIPLES VS. DCF

Pros and Cons

	PROS	*CONS*
Trading Multiples	• Easy to use • No terminal value estimate to worry about • Captures information provided by an efficient market • Good crosscheck for DCF	• Pure comparables rarely exist • Potentially distorted by accounting • Not focused on cash flow • Disguises lots of assumptions made by the market • Are the relative valuations believable? • Limited explicit focus on the future
DCF	• Captures explicit outlook for the business being evaluated • Driven by cash flow, not accounting earnings • Theoretically correct	• Time consuming and complex • Highly sensitive to cost of capital and terminal value assumptions • Wide range of forecasts possible

COMPARABLE ACQUISITION TRANSACTIONS

Overview

■ The comparable acquisition transactions analysis contains information about selected acquisition transactions in the same industry as the company being evaluated. The purpose is similar to that of public comparables analysis except that by looking at prior acquisitions, insight can be gained for the premium paid to gain control (i.e., control premium) of the target company.

■ Typically even more difficult to find true comparables

■ When preparing "acquisition comps", consider the following:

- Time frame is typically five years. This greatly complicates things as valuation parameters like interest rates and stock market values can vary greatly over time.

- Status of deal – Completed? Pending? Withdrawn?

- Consideration: Cash vs. Stock

- Hostile vs. Friendly

COMPARABLE ACQUISITION TRANSACTIONS

Objectives of Comparisons of Acquisition Transactions

- Measures Private Market Value ("Control Value")

- However, does not directly deal with the value of synergies, the primary economic driver of M&A activity.

- Develop Understanding of M&A Activity in Industry

    a. Relative Activity

    b. Who is buying?

    c. What they are buying (market share, technology, etc.)?

    d. How much are buyers paying?

DO NOT RELY ON ACQUISITION COMPARABLES UNLESS YOU ARE VALUING A COMPANY FOR THAT PURPOSE

COMPARABLE ACQUISITION TRANSACTIONS

Many Factors Influence Price

- Number of buyers

- Synergies – these vary from company to company

- Availability of alternative targets

- Competition among investors

- DCF values

- Comparables

- Non-price issues – i.e. governance

- Transaction structure

- Tax, accounting, and legal issues

APPENDIX

DISCOUNTED CASH FLOW ANALYSIS - SYNERGIES

There are two general approaches to valuing synergies in mergers and acquisitions.

⤙ Analyze the forecast for the target with and without the transaction. The difference can be seen as synergies

⤙ More commonly we analyze the synergies themselves – the additional <u>cash flow</u> anticipated to be created as a result of the mergers. These are typcially broken into two components – revenue synergies and cost synergies. Other common synergies include working capital and capital expenditure savings.

  – Typically we look at a three to five year forecast

  – Tax effect the cost savings and similarly make sure you are dealing with after tax cash flow, not revenues, as relates to the revenue synergies. You may need to reduce revenue estimates to operating income to after tax cash flow.

  – Allow for any incremental investments that may be required to produce the synergies

  – Assign a terminal value based on the perpetuity growth formula

  – Discount to present value using the target's WACC or cost of equity

COMPANIES WITH MULTIPLE BUSINESS LINES ARE OFTEN VALUED ON A SUM OF OF THE PARTS BASIS

- This approach is sometimes referred-to as a "break-up" valuation.
  - Particularly common when the parts have different financial and growth characteristics.
  - Highlights the market discount for diversified companies.

- The methodology requires estimating financial results for each business (EBIT, EBITDA and/or net income), which can then be used with appropriate multiples or growth rates in order to arrive at a value for each part. If sufficient information is available, DCF analysis may also be used for the some or all of the parts.

- Completing a sum-of-the-parts valuation is more challenging than a straightforward (single-business/consolidated) comparable or DCF analysis.
  - Typically less detailed financial data is publicly-available for segments.
  - Often assumptions must be made about how to allocate expenses, especially those that are clearly shared across businesses (like corporate-level SG&A.)
  - The different characteristics of each business segment (betas, terminal value assumptions, etc.) must be considered.

THE ROLE OF P/E RATIOS AND INTEREST PAYMENTS IN EPS DILUTION AND ACCRETION ANALYSIS

- For stock-for-stock deals, accretion or dilution potential will usually be evident by simply comparing the P/E multiples of the acquirer and the target
    - If the acquirer has a higher P/E than the target, the deal will be accretive because the acquirer is buying more EPS than the target shareholders are accepting as consideration
    - If the acquirer has a lower P/E than the target, the deal will be dilutive because the acquirer is buying less EPS than the target shareholders are accepting as consideration
    - Remember to take the premium into account when calculating the target's P/E
    - Utility of comparison will also depend on transaction assumptions regarding goodwill impairment or other asset amortization

- For 100% cash transactions, the cost of debt (interest payments) and cost of acquiring the target's earnings will determine the accretive or dilutive impact of a transaction
    - Where the inverse cost of debt (1/(after-tax cost of debt)) is greater than the P/E of the target, the deal will be accretive
    - Where the inverse cost of debt is lower than the P/E of the target, the deal will be dilutive

DEALING WITH MINORITY INTERESTS AND EQUITY IN UNCONSOLIDATED AFFILIATES

Minority interest

- Minority interest represents the portion of a consolidated subsidiary which you do not own

- Need to make sure the numerator and denominator of a trading multiple are on an apples-to-apples basis
  - Numerator: Add the minority interest (market value if available or book value) to firm value
  - Denominator: Consolidated financial results

- Consider the following example:
  - Market cap of $500MM
  - Debt of $500MM
  - Consolidated EBITDA of $100MM
  - Minority interest of $50MM

- Firm Value = $1050, EBITDA = $100
  - FV / EBITDA = 10.5x

Equity interest

- Equity interest in unconsolidated affiliates represents a minority stake you hold in another company

- Need to make sure the numerator and denominator of a trading multiple are on an apples-to-apples basis
  - Numerator: Subtract the equity interest (market value if available or book value) from firm value (i.e. treat as cash)
  - Denominator: Consolidated financial results (do not include equity interest)

- Consider the following example:
  - Market cap of $500MM
  - Debt of $500MM
  - Consolidated EBITDA of $100MM
  - Equity interest of $50MM

- Firm Value = $950, EBITDA = $100
  - FV / EBITDA = 9.5x

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Imputing Values – Things to Remember

1. Multiply operating results of company to be valued by relevant comparable company multiples.

    – LTM results (LTM = latest twelve months)

    – Projected fiscal year results

    – Select relevant multiple range

2. Convert derived <u>Equity Values</u> to Enterprise Values by adding Net Debt.

    – Net Income/EPS estimates multiples

    – Book Value multiples

3. Convert derived <u>Enterprise Values</u> to Equity Values by subtracting Net Debt.

    – Sales multiples

    – EBITDA multiples

    – EBIT multiples

4. <u>Per Share Values</u> can be obtained by dividing Equity Values by shares outstanding. For an M&A analysis, Net Debt should be adjusted for convertible securities and option/warrant proceeds, and diluted shares outstanding should be used.

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Imputing Values – Formulas

Implied Values

- ▸ EPS — Target EPS x Relevant multiple from set of comparables

- ▸ Net Income — $\dfrac{\text{(Comparable Net Income multiple x Target Net Income)}}{\text{Target Shares Outstanding}}$

- ▸ EBIT — $\dfrac{\text{((Comparable EBIT multiple x Target EBIT) – Target Net Debt)}}{\text{Target Shares Outstanding}}$

- ▸ EBITDA — $\dfrac{\text{((Comparable EBITDA multiple x Target EBITDA) – Target Net Debt)}}{\text{Target Shares Outstanding}}$

- ▸ Sales — $\dfrac{\text{((Comparable Sales multiple x Target sales) – Target Net Debt)}}{\text{Target Shares Outstanding}}$

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Imputing Values – An Example Using Means and Medians

Assume Rookie Enterprises has the following financial information:

	Financial Result	Mean Multiple of Public Comparables
Dec-97 EPS:	$2.83	9.3x
Dec-98 EPS:	$3.31	8.7x
LTM EBITDA:	$87.0 mm	6.2x
LTM EBIT:	$70.7 mm	8.0x
Net Debt:	$88.0 mm	
Diluted Shares Outstanding:	14.6 mm	

What is the implied equity per share value of Rookie Enterprises on a Dec-98 EPS basis?

Dec-98 EPS:	$3.31	
x Mean Multiple:	$8.7x	
= Implied Equity Per Share Value		**$28.80**

What is the implied equity per share value of Rookie Enterprises on an LTM EBITDA?

LTM EBITDA	$87.0	
x Mean Multiple:	6.2x	
= Implied Market Capitalization		**$539.4**
- Net Debt	($88.0)	
= Implied Market Value		**$451.4**
/ Diluted Shares Outstanding	14.6	
= Implied Equity Per Share Value		**$30.92**

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Imputing Multiples

- After determining a range of values under different methodologies, such as DCF, implied multiples should be calculated.

- Implies relevant range of valuation multiples (i.e., how much should someone pay for the target).

- Formulas:

  ▸ EPS   — $$\dfrac{\text{Imputed Value Per Share}}{\text{Target EPS}}$$

  ▸ EBIT   — $$\dfrac{(\text{Imputed Value Per Share x Target Shares Outstanding + Target Net Debt})}{\text{Target EBIT}}$$

  ▸ EBITDA   — $$\dfrac{(\text{Imputed Value Per Share x Target Shares Outstanding + Target Net Debt})}{\text{Target EBITDA}}$$

  ▸ Sales   — $$\dfrac{(\text{Imputed Value Per Share x Target Shares Outstanding + Target Net Debt})}{\text{Target Sales}}$$

PUBLICLY TRADED COMPARABLE COMPANY ANALYSIS

Imputing Multiples – An Example Using Highs and Lows

Recall Rookie Enterprises has the following financial information:

	Financial Result	Mean Multiple of Public Comparables
Dec-97 EPS:	$2.83	9.3x
Dec-98 EPS:	$3.31	8.7x
LTM EBITDA:	$87.0 mm	6.2x
LTM EBIT:	$70.7 mm	8.0x
Net Debt:	$88.0 mm	
Diluted Shares Outstanding:	14.6 mm	

What is the implied 1997 EPS multiple if the low end of the Acquisition Comparables valuation range is $32.50?

Equity Per Share Valuation	$32.50 per share	
/ 1997 EPS	$2.83	
= Implied 1997 EPS Multiple		**11.5x**

What is the implied LTM EBITDA multiple if the high end of the Public Comparables valuation range is $35.75?

Equity Per Share Valuation	$35.75 per share	
x Diluted Shares Outstanding:	14.6	
= Implied Market Value		**$522.0**
+ Net Debt	$88.0	
= Implied Market Capitalization		**$610.0**
/ LTM EBITDA	$87.0	
= Implied LTM EBITDA Multiple		**7.0x**