



# Income Approach: Basic Concepts and Do's & Don'ts

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**ASA/AICPA Joint Business Valuation  
Conference**

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# Agenda

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- ◆ Overview

- Approaches
- Standards, Levels and Core Premises of Value

- ◆ Methods and Paths To Value
- ◆ Capitalization of Income Method
- ◆ Discounted Cash Flows Method
- ◆ Premiums & Discounts

## Appendix

# Primary Approaches

## ◆ Income Approach

- Capitalization of Historical Income/Cash Flows
- Discounted Future Income/Cash Flows (DCF)

## ◆ Market Approach

- Guideline Companies
- Guideline Transactions/M&A Method

## ◆ Asset Approach

- Asset by Asset Revaluation
- Collective Revaluation (Excess Earnings Method)

# Income Approach Methods

- ◆ Capitalization of Normalized Income/Cash Flows
  - Converts a single “normalized” base economic income number to a value by dividing it by a “capitalization rate”
  - Focus should be on cash flow
  
- ◆ Discounted Future Income/Cash Flows (DCF)
  - Explicitly projects economic income/cash flow into the future until can “normalize” and capitalize a final year’s base number
  - Focus on cash flow – full financial projections best

# Two Main Standards of Value

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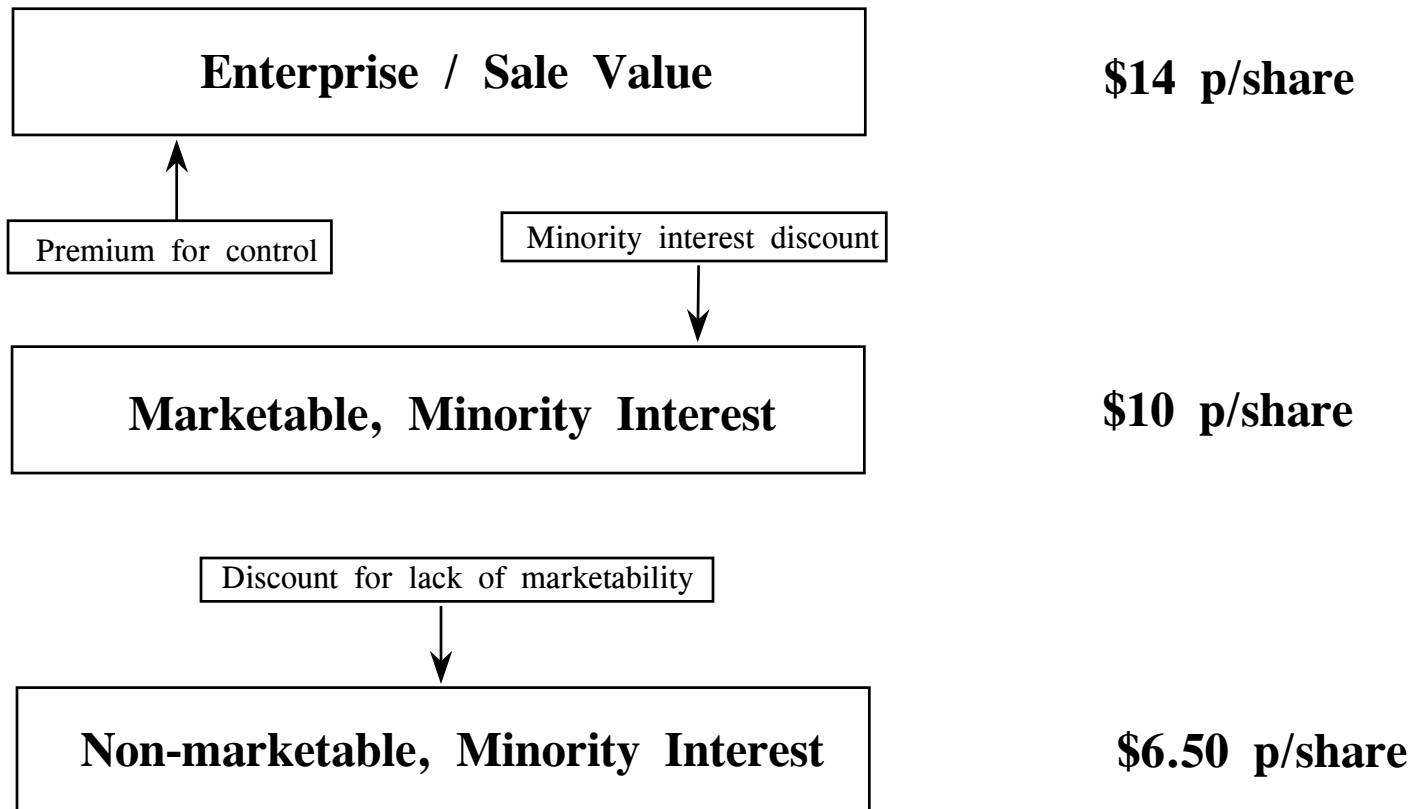
## ◆ Fair Market Value

“The price at which the property would change hands between a willing buyer and a willing seller when neither is acting under any compulsion to buy or sell and both have reasonable knowledge of the relevant facts.”

## ◆ Fair Value

- GAAP accounting: FMV at 100% control value.
- Litigation: The pro rata share of the enterprise value or asset value, with or without consideration for marketability of the asset/interest. Definition varies from state to state in litigation situations.

# Basic Levels of Value for Equity Interests



# Core Valuation Concept

- ◆ Value is a Function of Expected Future Economic Returns = FORWARD LOOKING
  - Timing of These Returns (assume annual)
  - Size of Returns (\$ measure and growth)
  - Risk Related to Returns (required rate of return)
  
- ◆ Future Returns are Discounted to a Present Value
  - Time Value of Money Concept
    - Implicitly by Capitalization Method
    - Explicitly by DCF Method
  
- ◆ Should Generate Similar Values
  - DCF should be close to other capitalization models, market and asset (except in liquidation) models, all things being consistent
  - Wide divergences of value should prompt revisiting inputs for potentially inconsistent assumptions across methods

# Core Concept: Time Value of Money

## ◆ Basic Example:

- Investor puts \$1,000 in bank for 2 years
- \$1,000 grows at rate of interest of 7%/year
- Investor gets \$1,144.90 back after 2 years
  - $1,000 \times 1.07 = 1,070 \times 1.07 = 1,144.90$
- Willing to pay present value of \$1,000 today to get \$1,145 in 2 years if the risk of getting it is fairly priced at 7%

## ◆ Formula for Stream of Economic Income (for a specific number of years):

$$PV = \sum_{i=1}^n \frac{E_i}{(1+k)^i}$$

$PV$  = Present value

$k$  = Required rate of return

$n$  = Last period returns expected

$E_i$  = Economic income in each period

$i_n$  = Time periods return is expected

$\sum_{i=1}$  = Sum of returns over n periods

# Time Value of Money (cont'd)

- ◆ Perpetual, Flat Income Stream Formula (preferred stock dividend)

- Prior Formula Converts to:

$$PV = E_1 / k$$

Where:  $k$  = discount rate (required return) on  $E$   
 $E_1$  = next year's economic income

- ◆ Where Growth in Income Expected

- Subtract Growth Factor from Denominator
- Converts to “Gordon Growth” Model:

$$PV = E_0 (1+g) / (k - g)$$

Where:  $E_0$  = Earnings base today  
 $g$  = long-term expected growth in income/cash flows  
 $(k - g)$  = referred to as “Capitalization Rate”

# Agenda

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- ◆ Overview

- ◆ Paths to Value

- Direct to Equity
- Debt Free

- ◆ Capitalization of Income Method

- ◆ Discounted Cash Flow Method

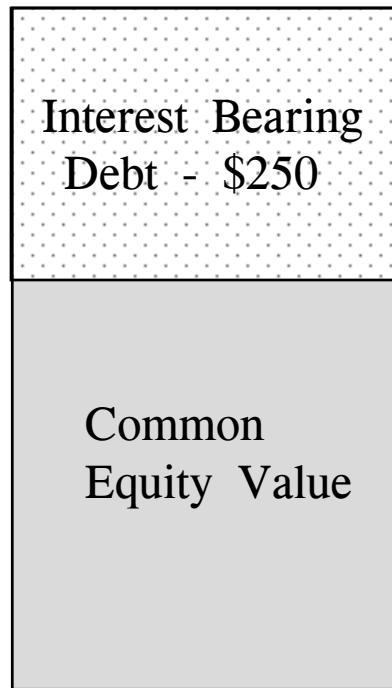
- ◆ Premiums & Discounts

## Appendix

# Two "Paths" to Value: Building Example

## ◆ Difference Between Sale Price and Equity Value

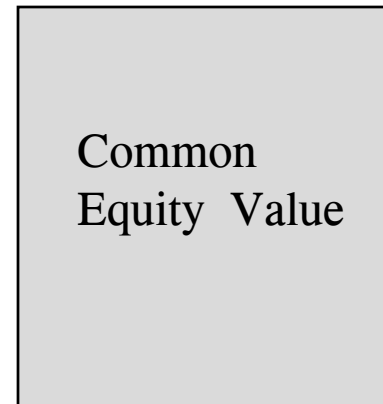
Sale Price in Total  
Based on Op CF



\$720

Total Invested Capital

Value Equity Directly based  
On Net Equity Cash Flow

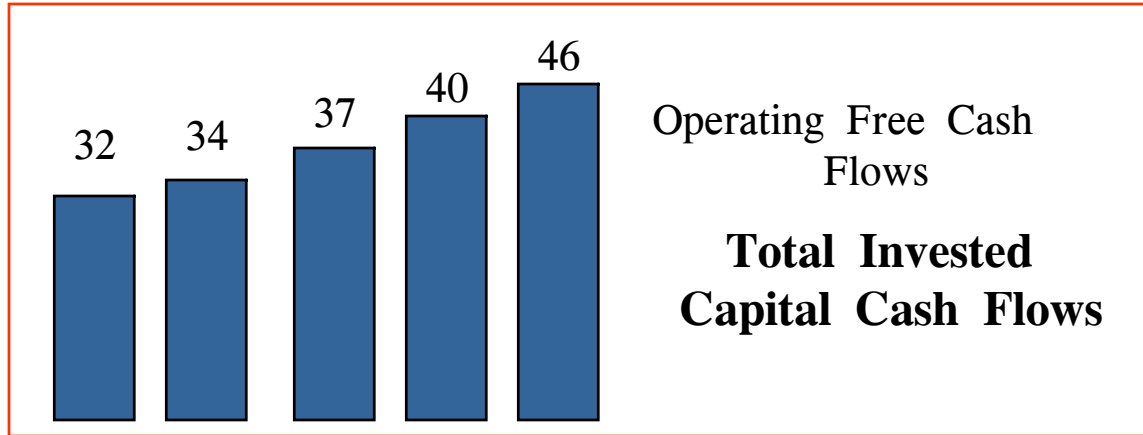


\$470

Direct to Equity

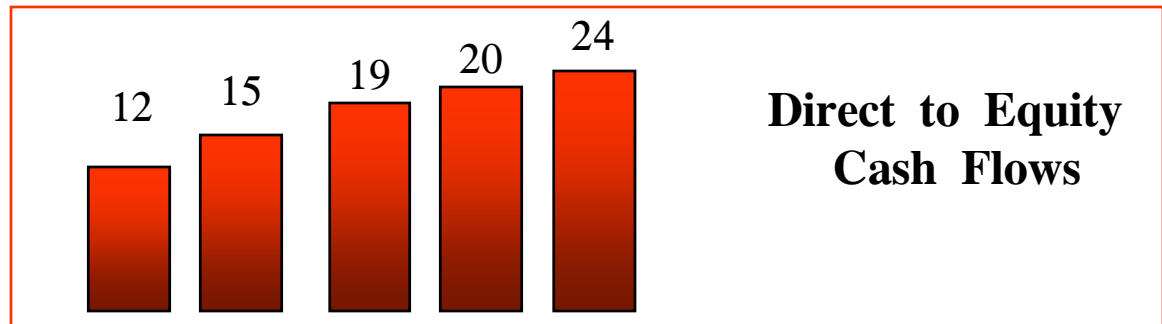
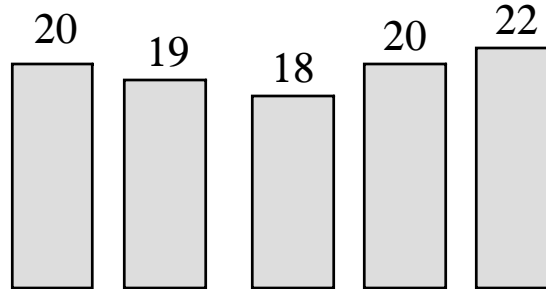
# Annual Cash Flows By "Path"

Value of Annual  
Operating Free  
Cash Flows



TIC or "MVIC Value"

Debt Value  
Equity Value



# Example: Net Cash Flow to Equity

## ◆ Traditionally:

Net income (after interest exp. & taxes)

- Plus: deprec., amort., & non-cash charges
- Less: working capital changes +/-
- Less: capital expenditures
- Plus: new debt incurred
- Less: principal repayments
  - Note: If assume growth in total value in future and a constant debt to total value ratio – debt grows too and provides net positive cash flow!

# Example: To Total Invested Capital - TIC

## ◆ Net Income

- Plus: deprec., amort., & non-cash charges
- Less: working capital changes +/-
- Less: capital expenditures
- Plus: interest expense (after tax cost)
- Note: Can also tax effect EBIT to get “debt-free” NI

◆ Equals: cash flow available to debt & equity holders (or net operating cash flows)

◆ To determine equity...subtract debt

# Agenda

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- ◆ Overview
- ◆ Paths to Value
- ◆ Capitalization of Income Method
  - Cash flow base
  - Working Capital & Depreciation Issues
  - Growth
  - Discount Rates
- ◆ Discounted Cash Flow Method
- ◆ Premiums & Discounts

Appendix

# Income Approach - Capitalization Method

- ◆ Capitalization Method Converts a Single Normalized Cash Flow “Base” ( $E$ ) into a Value for All Future Cash Flows
  
- ◆ Process
  - Determine Normalized Base ( $E$ )
  - Determine Expected Long-term Growth in Cash Flows ( $g$ )
  - Determine Required Rate of Return by Investors ( $k$ )
  - Apply Valuation Model - “Capitalization Model”

# Capitalization Example: Direct to Equity

|                                      | <u>2003</u> | <u>2004</u> | <u>2005</u>   | <b>Historical Financials</b>                                  |
|--------------------------------------|-------------|-------------|---------------|---|
| Sales                                | \$625.0     | \$650.0     | \$676.0       | <b>Income Statement<br/>(Net of Interest &amp;<br/>Taxes)</b> |
| Operating Inc. 19.9%                 | \$124.7     | \$129.6     | \$134.8       |   |
| A/Tax Net Inc.                       | \$64.1      | \$66.6      | \$69.3        |   |
| Weightings                           | 1.0         | 2.0         | 3.0           |   |
| Weighted Average NI                  |             |             | <b>\$67.6</b> |   |
| Weighted Avg. Depreciation Exp.      |             |             | \$53.2        |   |
| Cap. Exp. Normalized (107%)          |             |             | (\$56.9)      | <b>Cash Flow Items<br/>Based On Calculated<br/>Estimates</b>  |
| Working Cap. Normalized to 4% Growth |             |             | (\$3.0)       |   |
| Projected Principal Growth (4%)      |             |             | <u>\$10.8</u> |   |
|                                      |             |             | <b>\$71.6</b> |   |

Weighted Avg. Cash Flow: **\$71.6** “Normalized” Cash Flow Base

Long-term Growth Rate (g): **4%** Growth Rate

Cost of Equity (k): **20%** Discount Rate

Value of Equity [1]: **\$466** Unadjusted Value

[1] Capitalization Model: Gordon Growth Model:  $CF \times (1+g) / (k-g)$

# Cash Flow Base

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- ◆ Determines 100% of value (before adjustments)
- ◆ Base should be “normalized” and adjusted to level of value being determined (control vs minority)
- ◆ Non-operating assets/liabilities impacts (expense/income) removed if treated separately
- ◆ Tax effecting
- ◆ Historical fluctuations if not properly normalized have major impacts on value
  - Income base (to match “Path to Value”)
  - Depreciation to capital expenditures
  - Working capital needs
  - Debt service (if appropriate)

# Cash Flow Base: Level of Value Adj.

- ◆ **Minority interest level of value adjustments**
  - Normalize for historical items that will not continue/recur in future
  - Normalize for excessive owner-officer compensation (if appropriate)
  
- ◆ **Controlling interest level adjustments**
  - All of the above adjustments
  - Streamlining of operations (if appropriate)
  - Synergistic Adjustments (if appropriate)
    - Consolidation savings
    - Lower financing costs
    - Wider or deeper product sales channels, etc.

# Cash Flow Base: Historical Weightings

- ◆ Determine appropriate weightings for adjusted historical years' performances
  - Cyclical or unpredictable businesses – consider average of history
  - Growing/declining businesses – consider weighted average historical method or latest 12 months
    - High growth – consider DCF or two-tier model
  - Judgment call based on character of business, outlook, predictability, etc.

# Cash Flow Base: Normalizing Cash Flow

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- ◆ Adjustments needed if long-term growth expected to be different than recent years
  - Profitability impact of change in growth
  - Confirm proper treatment of tax amortization benefits or other cash flow benefits that may not be in perpetuity
  - Determine correct relationship between capital expenditures and depreciation (never permanently a positive number if growing)
  - Determine correct relationship between growth and working capital charge to cash flow

# Cap. Exp. vs Depreciation vs Growth

## ◆ Capital Exp. vs Depreciation Calculator

- Based on MACRS depreciation schedule

### Ratio of Capital Expenditures to Depreciation at Equilibrium

#### Five year Assets

| Assumed<br>LT Growth | Ratio | Reciprocal* |
|----------------------|-------|-------------|
| 3.0%                 | 105%  | 95%         |
| 4.0%                 | 107%  | 93%         |
| 5.0%                 | 109%  | 92%         |
| 6.0%                 | 111%  | 90%         |
| 7.0%                 | 112%  | 89%         |
| 8.0%                 | 114%  | 88%         |
| 9.0%                 | 116%  | 86%         |

#### Seven year Assets

| Assumed<br>LT Growth | Ratio | Reciprocal* |
|----------------------|-------|-------------|
| 3.0%                 | 108%  | 93%         |
| 4.0%                 | 110%  | 91%         |
| 5.0%                 | 113%  | 88%         |
| 6.0%                 | 116%  | 86%         |
| 7.0%                 | 118%  | 85%         |
| 8.0%                 | 121%  | 83%         |
| 9.0%                 | 123%  | 81%         |

\* Reciprocal = Depreciation as % of Capex

Example: If Depreciation=\$100 in terminal year then Capex should =\$107, if mostly 5-year assets with 4% growth assumed.

# Working Capital “Calculator”

## ◆ Normalizing Working Capital Charge

### HISTORICAL INPUTS:

|                   | <u>2000</u> | <u>2001</u> | <u>2002</u> | <u>2003</u> | <u>2004</u> |
|-------------------|-------------|-------------|-------------|-------------|-------------|
| HISTORICAL SALES: | \$500.0     | \$550.0     | \$600.0     | \$600.0     | \$650.0     |
| RECEIVABLES:      | \$60.0      | \$55.0      | \$80.0      | \$75.0      | \$60.0      |
| INVENTORY:        | \$70.0      | \$80.0      | \$60.0      | \$70.0      | \$70.0      |
| PAYABLES:         | \$55.0      | \$70.0      | \$70.0      | \$65.0      | \$65.0      |
| OTHER CURRENT A.  | \$10.0      | \$20.0      | \$10.0      | \$25.0      | \$10.0      |
| OTHER CURRENT L.  | \$10.0      | \$9.0       | \$11.0      | \$8.0       | \$12.0      |

### CALCULATIONS:

|  |        |        |        |        |        | HIST<br><u>AVG</u> | ANALYST<br><u>CONCLUDED</u> |
|--|--------|--------|--------|--------|--------|--------------------|-----------------------------|
| DAYS REC   | (43.8) | (36.5) | (48.7) | (45.6) | (33.7) | (41.7)             | (40.0)                      |
| DAYS INVENTORY   | (51.1) | (53.1) | (36.5) | (42.6) | (39.3) | (44.5)             | (40.0)                      |
| DAYS PAYABLE   | 40.2   | 46.5   | 42.6   | 39.5   | 36.5   | 41.0               | 40.0                        |
| DAYS OTHER A. (SLS)                                      | (7.3)  | (13.3) | (6.1)  | (15.2) | (5.6)  | (9.5)              | (8.0)                       |
| DAYS OTHER L. (SLS)                                      | 7.3    | 6.0    | 6.7    | 4.9    | 6.7    | 6.3                | 6.0                         |
| WORKING CAP LINE<br><small>(PATH TO EQUITY ONLY)</small> | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | <u>0.0</u>         | <u>0.0</u>                  |
| NET DAYS IN SALES  |        |        |        |        |        | (48.3)             | (42.0)                      |

LONG TERM SALES GROWTH ASSUMPTION: **4.00%**

WORKING CAPITAL  
AT SALES VOL

BASE SALES VOLUME: \$650.00  
HYPOTHETICAL PRIOR YEAR SALES  
ASSUMING GROWTH ASSUMPTION: \$624.00

(\$74.8)  
(\$71.8)

**Sensitivities:**

3% Growth: \$2.2  
4% Growth: \$3.0  
5% Growth: \$3.7

**BASE WORKING CAPITAL INVESTMENT AT ASSUMED GROWTH RATE: (\$3.0)**

APPLICABLE IN CAPITALIZATION OF CASH FLOWS AND TERMINAL  
VALUE CAPITALIZATION MODELS IN DCF

# Capitalization Example: **GROWTH RATE**

|                                      | <u>2003</u> | <u>2004</u> | <u>2005</u>   | <b>Historical Financials</b>                               |
|--------------------------------------|-------------|-------------|---------------|--|
| Sales                                | \$625.0     | \$650.0     | \$676.0       | <b>Income Statement</b><br>(Net of Interest & Taxes)       |
| Operating Inc. 19.9%                 | \$124.7     | \$129.6     | \$134.8       |  |
| A/Tax Net Inc.                       | \$64.1      | \$66.6      | \$69.3        |  |
| Weightings                           | 1.0         | 2.0         | 3.0           |  |
| Weighted Average NI                  |             |             | <b>\$67.6</b> |  |
| Weighted Avg. Depreciation Exp.      |             |             | \$53.2        | <b>Cash Flow Items</b><br>Based On Calculated<br>Estimates |
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|                                      |             |             | <b>\$71.6</b> |  |

Weighted Avg. Cash Flow: **\$71.6** “Normalized” Cash Flow Base

Long-term Growth Rate (g): **4%** Growth Rate

Cost of Equity (k): **20%** Discount Rate

Value of Equity [1]: **\$466** Unadjusted Value

[1] Capitalization Model: Gordon Growth Model:  $CF \times (1+g) / (k-g)$

# Long-term Growth Rate

- ◆ Captures value – PERPETUITY CASH FLOWS
  - Forever is long time
  - Must be sustainable on average
  
- ◆ Typically modest
  - Inflation/GDP – 3% to 4% recently
  - Population changes (if applicable)
  - Minor productivity improvements (if applicable)
  - Ignore Anticipated Business/Asset Acquisitions
  
- ◆ Impact is significant

# Long-term Growth Rate: Impact

- x Growth in Earnings or CF Impacts Value in Major Way
  - » Subtraction from Discount Rate to Derive Multiples
  - » Impacts Income Approach and Market Approach
- x Gordon Growth Model Example:

$$\frac{\text{Dividends (1 + growth)}}{(\text{Equity Rate} - \text{growth})}$$

Examples:

3% Growth

$$\frac{\$100 * 1.03}{(20\% - 3\%)} = \$606$$

$$17\% = 6.1 \text{ X Multiple}$$

6% Growth

$$\frac{\$100 * 1.06}{(20\% - 6\%)} = \$757$$

$$14\% = 7.6 \text{ X}$$

**25% Increase in Value**

# Capitalization Example: DISCOUNT RATE

|                                      | <u>2003</u> | <u>2004</u> | <u>2005</u>   | <b>Historical Financials</b>                               |
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| Projected Principal Growth (4%)      |             |             | <u>\$10.8</u> |  |
|                                      |             |             | <b>\$71.6</b> |  |

|                          |               |                                    |
|--------------------------|---------------|------------------------------------|
| Weighted Avg. Cash Flow: | <b>\$71.6</b> | <b>“Normalized” Cash Flow Base</b> |
|--------------------------|---------------|------------------------------------|

|                            |           |                    |
|----------------------------|-----------|--------------------|
| Long-term Growth Rate (g): | <b>4%</b> | <b>Growth Rate</b> |
|----------------------------|-----------|--------------------|

|                     |            |                      |
|---------------------|------------|----------------------|
| Cost of Equity (k): | <b>20%</b> | <b>Discount Rate</b> |
|---------------------|------------|----------------------|

|                      |              |                         |
|----------------------|--------------|-------------------------|
| Value of Equity [1]: | <b>\$466</b> | <b>Unadjusted Value</b> |
|----------------------|--------------|-------------------------|

[1] Capitalization Model: Gordon Growth Model:  $CF \times (1+g) / (k-g)$

# Cost of Equity – Spectrum of Returns

## ◆ Spectrum of Returns from Financial Markets:

- Risk-free Government Debt Yields: 4% to 5%
- Preferred Stock Div. Yields 5% to 8%
- Corporate Bond Yields 5% to 10% +
- S&P 500 Size Company Returns\* 12% to 14%
- Small Public Co. Equity Returns\* 17% to 25%
- Venture Capital Investments\* 25% to 70%

\* Long-term averages with many exceptions

# Determining an Equity Rate

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- ◆ Build-up Method\*
- ◆ Capital Asset Pricing Model – See Appendix
  - Numerous versions\*
- ◆ S&P's (Now Duff & Phelps') Risk Premium Studies – See Appendix
- ◆ Others – Arbitrage Pricing Theory

\*See Ibbotson Associates Publications

# Cost of Equity = $k$ : “Build-up Method”

## ◆ Basic Rates from Ibbotson Associates SBBI Guides:

- Current Risk Free Rate (20-Year) 4.8%
- Large Cap Equity Premium 7.2 (1926 to 2004)
- Small Cap Equity Premium 6.4 (1926 to 2004)
- **Basic Small Cap Stock Rate: 18.4%**

## ◆ Company Adjustments:

- Additional risk for size, product mix, geographic limitations, customer risk, and/or other factors 2.0%
- **Company specific equity rate ( $k_e$ ): 20.4% or 20% for examples**

# Capitalization Model Calculation

## Direct to Equity Path:

$$PV_0 = \frac{E_0 * (1 + g)}{(k - g)}$$

$$PV_0 = \frac{\$71.6 * (1 + .04)}{(.20 - .04)}$$

$$= \$465.7 \text{ (equity)}$$

Gordon Growth Model

# Cap Model: Gordon Growth Model

## Direct to Equity Path

$$PV_t = \frac{ECF_t * (1 + g_n)}{(k_e - g_n)}$$

## To Invested Capital:

$$V_t = \frac{DFCF_t * (1 + g_n)}{(WACC - g_n)}$$

- $V_t$  = Value at time t  
 $ECF_t$  = Equity Cash Flow  
 $DFCF$  = Debt-free Cash Flow  
 $K_e$  = Cost of Equity  
 $WACC$  = Weighted Average Cost of Capital  
 $g_n$  = Long-term normal growth rate

# WACC is a Bit More Complicated

- ◆ Determine appropriate equity rate
- ◆ Determine appropriate fixed-rate cost of debt
- ◆ Determine appropriate weighting to give to the debt as % of total capital mix
  - Look to industry levels in control situations
  - Look to company historical levels - “iterative method”
  - Discuss leverage outlook with management
- ◆ Generate a Weighted Average Cost of Capital (WACC)

$$\text{WACC} = \text{Equity Rate} \times \text{Weighting} + \text{A/tax Long-term Debt Cost} \times \text{Weighting}$$

# WACC Calculation – Example

## ◆ Inputs

- Cost of Equity: 20% (at this level of debt)
- Cost of Debt: 7.0% (fixed-rate, long-term)
- Tax Rate: 40% (marginal)
- Debt to Capital Ratio: 35% (per examples)

WACC = Eq. Rate X Weighting + A/tax Debt Cost X Weighting

$$14.47\% = 20\% \times 65\% + ((1-40\%) \times 7.0\% \times 35\%)$$

# Capitalization Example: “Debt-free Path”

|                                      | <u>2003</u> | <u>2004</u> | <u>2005</u>   |  |
|--------------------------------------|-------------|-------------|---------------|--|
| Sales                                | \$625.0     | \$650.0     | \$676.0       | <b>Historical Financials</b><br><b>Income Statement</b><br><b>(No Interest Subtracted)</b> |
| Operating Inc. 19.9%                 | \$124.7     | \$129.6     | \$134.8       |  |
| A/Tax Net Inc.                       | \$74.8      | \$77.8      | \$80.9        |  |
| Weightings                           | 1.0         | 2.0         | 3.0           |  |
| Weighted Average NI                  |             |             | <b>\$78.8</b> |  |
| Weighted Avg. Depreciation Exp.      |             |             | \$53.2        | <b>Cash Flow Items</b><br><b>Based On Calculated</b><br><b>Estimates (no debt adj)</b>     |
| Cap. Exp. Normalized (107%)          |             |             | (\$56.9)      |  |
| Working Cap. Normalized to 4% Growth |             |             | (\$3.0)       |  |
| Projected Principal Growth (4%)      |             |             | <u>\$0.0</u>  |  |
|                                      |             |             | <b>\$72.1</b> |  |

Weighted Avg. Debt-free Cash Flow: **\$72.1** “Normalized” Cash Flow Base

Long-term Growth Rate: **4%** Growth Rate

**WACC at 35% D/Capital: 14.5%** Discount Rate

|                            |                |   |
|----------------------------|----------------|---|
| Value of TIC [1]:          | <b>\$716</b>   | <b>Debt Subtraction</b><br><b>To Get Equity</b> |
| Less Debt:                 | <b>(\$250)</b> |   |
| Net Equity (b/Adjustments) | <b>\$466</b>   |   |

[1] Gordon Growth Model:  $DFCF \times (1+g) / (WACC-g)$

# Discount Rates - Common Errors:

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- ◆ Mismatches of discount rate with definition of projected cash flow streams (e.g., apply after-tax cash flow discount rate to pretax income)
- ◆ Use floating rate cost of debt for company as a surrogate for the fixed-rate borrowing costs
- ◆ Use book value of equity to determine debt to total capital (debt + equity) instead of market levels
- ◆ Use debt to total capital ratio that reflects control, in a minority interest situation
  - Consider an iterative process (see DCF section)

# Cap Models: Two-Stage Growth Models

Direct to Equity:

$$V_t = \frac{NCF_{tEq} * (1 + g_n)}{(k_e - g_n)} + \frac{NCF_{tEq} * H * (g_h - g_n)}{(k_e - g_n)}$$

To Invested Capital:

$$V_t = \frac{NCF_{tIC} * (1 + g_n)}{(WACC - g_n)} + \frac{NCF_{tIC} * H * (g_h - g_n)}{(WACC - g_n)}$$

H = half-life of high growth phase (5yrs=2.5)

$g_h$  = high growth rate

$g_n$  = long-term normal growth rate

# Agenda

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- ◆ Overview
- ◆ Paths to Value
- ◆ Capitalization of Income Method
- ◆ Discounted Cash Flow Method

- Overview/Review
- Projections
- Discount Rate and Terminal Value
- Common Errors

- ◆ Premiums & Discounts

Appendix

# Discounted Cash Flow: Overview

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- ◆ Most Versatile of Methods
  - Can explicitly forecast future cash flows of almost any financial asset or liability
- ◆ Applied Across Many Types of Valuations
  - Key in Financial Reporting Valuations
  - Tax Reporting
  - Transactions and Litigation
- ◆ Large Potential for Error or Manipulation, and Misunderstandings as to Impacts of Assumptions

# Discounted Cash Flow: Overview

## ◆ DCF Process

- Projected near-term cash flows (until stabilized)
- Determine horizon value (value beyond proj. period)
  - Capitalize last year's cash flows w/**Gordon Growth Model**
  - Many other methods
- Discount cash flows & horizon value to present, at appropriate discount rate (based on “path” to value)

# DCF Overview: When to Use DCF?

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## ◆ DCF Method Useful When:

- Business in industry amenable to forecasting
  - Non-commodity
- When future cash flows expected to be materially different than recent past
  - Otherwise redundant with capitalization method
- When history difficult to determine or get
  - Divestiture of subsidiary
  - Turnaround or startup situations
  - Transactions with changed assumptions, etc.

# Overview: Key DCF “Components”

|                      | <u>2006</u> | <u>2007</u> | <u>2008</u> | <u>2009</u> | <u>2010</u> | <b>Projections</b><br>Income Statement<br>(Op. Income A/Taxes) |
|----------------------|-------------|-------------|-------------|-------------|-------------|--|
| Sales                | 690.0       | 717.6       | 746.3       | 776.2       | 807.2       |  |
| Operating Inc. 19.9% | 137.6       | 143.1       | 148.9       | 154.8       | 161.0       |  |
| A/Tax Net Inc.       | 82.6        | 85.9        | 89.3        | 92.9        | 96.6        |  |
| Depreciation         | 55.0        | 57.2        | 59.5        | 61.9        | 64.3        |  |
| Cap. Exp.            | -58.9       | -61.2       | -63.7       | -66.2       | -68.8       |  |
| Wkg. Cap.            | -3.1        | -3.2        | -3.4        | -3.5        | -3.6        |  |
| Proj. Debt Service   | <u>0.0</u>  | <u>0.0</u>  | <u>0.0</u>  | <u>0.0</u>  | <u>0.0</u>  |  |
|                      | <b>75.6</b> | <b>78.6</b> | <b>81.8</b> | <b>85.1</b> | <b>88.5</b> |  |

|               |             |             |             |             |                             |  |
|---------------|-------------|-------------|-------------|-------------|-----------------------------|--|
| Debt Free CF: | <b>75.6</b> | <b>78.6</b> | <b>81.8</b> | <b>85.1</b> | <b>878.7</b> <sup>[1]</sup> | <b>Terminal Value<br/>&amp; Cash Flows</b> |
|               |             |             |             |             | <b>967.2</b>                |  |

|  |              |                    |
|--|--------------|--------------------|
| <b>WACC Rate: (Year end discounting)</b> | <b>14.5%</b> | <b>WACC Rate</b>   |
| <b>Long-term Growth Rate</b>             | <b>4.0%</b>  | <b>Growth Rate</b> |

|                                 |                       |  |
|---------------------------------|-----------------------|--|
| Net Present Value Debt Free CF: | <b>\$722.3</b>        | <b>Debt-free Value<br/>Less Debt and<br/>Other Adjs.</b> |
| <b>Less Long-term Debt:</b>     | <b><u>\$250.0</u></b> |  |
| Net Equity Value:               | <b>\$472.3</b>        |  |

[1] Terminal Value Model: Gordon Growth Model:  $WACC \times (1+g) / (WACC - g)$   
Assumes approx. 35% D/Capital

# WACC Calculation: Iteration Example

## ◆ Inputs

- Cost of Equity: 20% (at this level of debt)
- Cost of Debt: 7.0% (fixed-rate, long-term)
- Tax Rate: 40% (marginal)
- Debt to Capital Ratio: 35% (per examples)

WACC = Eq. Rate X Weighting + A/tax Debt Cost X Weighting

$$14.45\% = 20\% \times 65\% + ((1-40\%) \times 7.0\% \times 35\%)$$

## ◆ Minority Interest Situations

- First Guess Usually Not Correct

# WACC Iteration Example\*

## Minority Interest Valuation Issue:

Minority interest holder can not impact debt levels so Debt/Cap ratio you start with may not be same as the results the models are giving you!

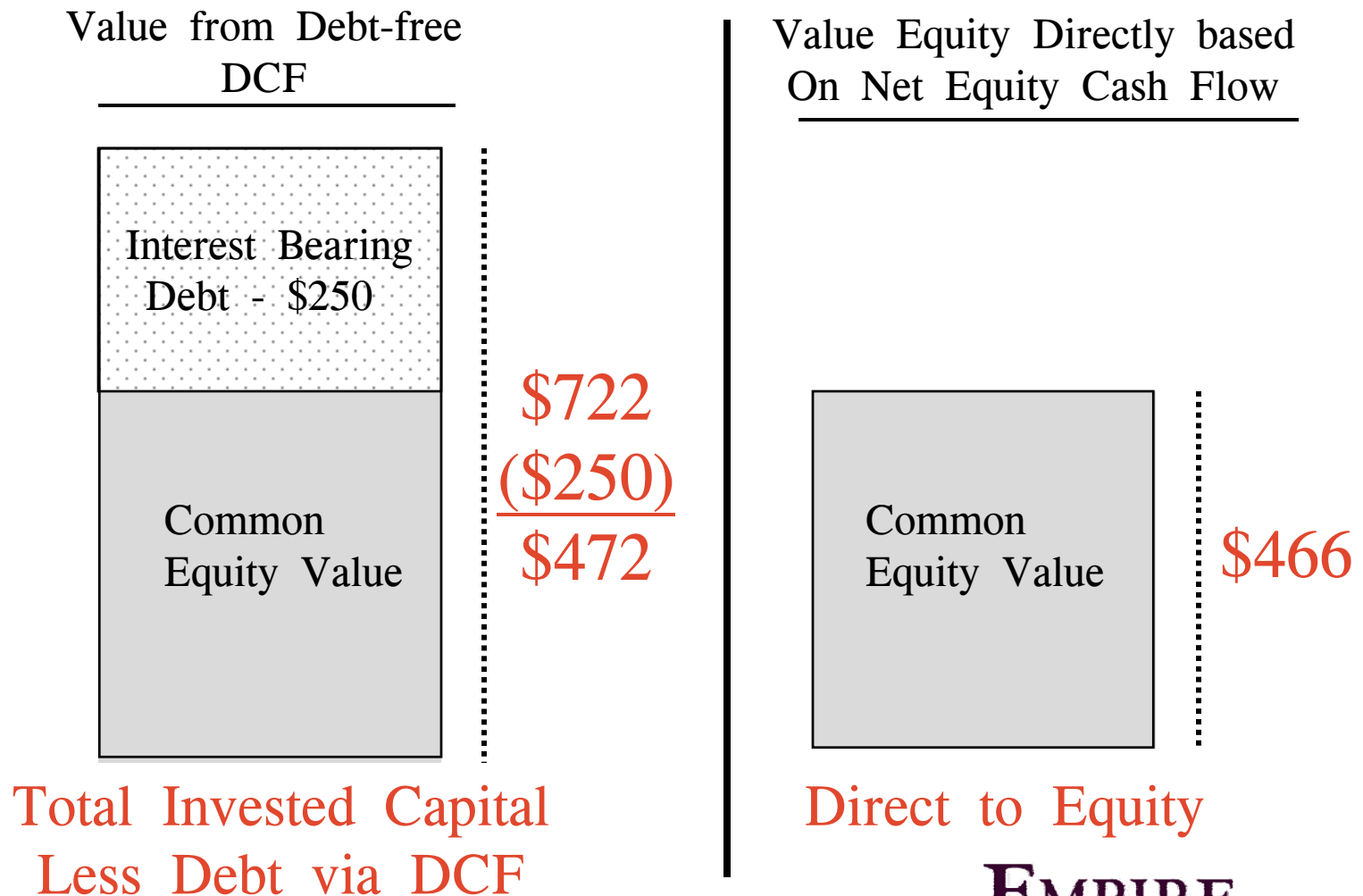
| <u>Iteration</u> | <u>Initial WACC Debt/Cap</u> | <u>TIC Value</u> | <u>Revised Debt/Cap [1]</u> |
|------------------|------------------------------|------------------|-----------------------------|
| #1               | 30/100                       | \$671            | 37/100                      |
| #2               | 37/100                       | \$745            | 34/100                      |
| #3               | 34/100                       | \$711            | 35/100                      |
| #4               | 35/100                       | \$722            | 35/100                      |

\*Assumes: Debt=\$250, DCF examples shown earlier

[1] Example: \$250 debt /\$671 TIC = 37% ratio

# Two "Paths" to Value: Review Comparison

## ◆ Difference Between DCF and Cap of CF Values



# DCF Projections: Why Do Full Forecasts?

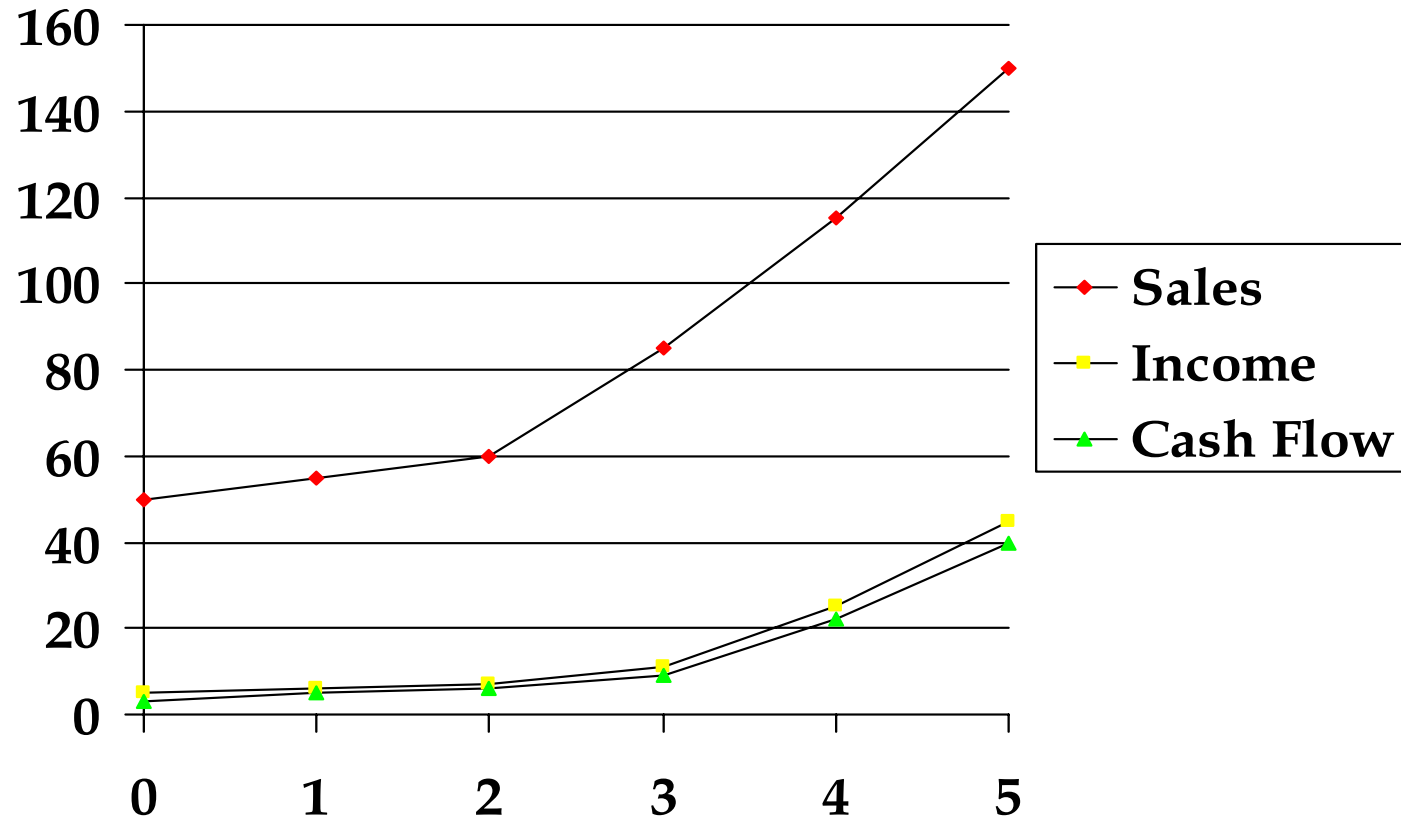
- ◆ Cash Flows are Key Valuation Measure
  - Ibbotson return data relates to cash flows
  - Cleanest measure of economic income to investors
  - Most appraisers underestimate required investment in businesses over time, particularly in the “terminal value” calculations
  - Affords appraisers ability to explicitly examine assumptions and their impact on cash flow

# DCF: What to Forecast?

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- ◆ Type of Analysis Being Done
  - Level of value
    - Control adjustments to financials
    - Minority
  - Paths to value
    - Direct-to-equity – net of debt service
    - Total invested capital

# Beware of the "Hockey Stick" Forecast



# Projected Operating Income

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- ◆ Need solid reasons for rapid changes in revenues and operating income (**margin creep**)
- ◆ Reasonableness Check: Consistent with public company levels or own restated history (particularly if start-up situation with high op. inc. projected later...high tech cos.)
- ◆ Calculate/check depreciation & amortization separately
  - May have to revise as analysis proceeds
- ◆ Know what went into the projections
  - Client projections may intermix key expenses (e.g., int. exp., deprec., owner perks) without breakouts

# Sources for Insights into Projections

- ◆ Management estimates or projections
- ◆ Historical performance of subject company
- ◆ Historical performance of public, guideline companies
- ◆ 10-K discussions on industry trends from guideline companies
- ◆ Analyst (e.g., I/B/E/S) estimates for guideline companies or industry
- ◆ Government - industry growth estimates
- ◆ Internally generated growth – self funding ability

# Balance Sheets – Function in Valuation

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- ◆ Allows for analyzing and tracking all working capital accounts (including cash)
  - Historically
  - Projected basis
- ◆ Validates capital exp. and depreciation ratios going forward
  - Explicit forecast of PP&E
- ◆ Tracks other non-current assets/liabilities levels that the company needs to operate
- ◆ Tracks debt assumptions if appropriate

# Balance Sheets – Forecasting Issues

- ◆ Minor misalignments in depreciation and capital expenditures potentially cause major issues
- ◆ Issue occurs with most client projections

## SAMPLE COMPANY

|                           | 1           | 2           | 3           | 4            | 5            | Terminal     |
|---------------------------|-------------|-------------|-------------|--------------|--------------|--------------|
| SALES                     | 1,000       | 1,200       | 1,440       | 1,699        | 1,954        | 2,149        |
| Growth                    |             | 20%         | 20%         | 18%          | 15%          | 10%          |
| PP&E                      | 200         | 190         | 178         | 164          | 147          | 127          |
| CAPITAL EXPENDITURE       | 50          | 60          | 72          | 85           | 98           | 107          |
| % of Sales                |             | 5%          |             |              |              |              |
| DEPRECIATION              | 60          | 72          | 86          | 102          | 117          | 129          |
| % of Sales                |             | 6%          |             |              |              |              |
| NET PP&E                  | 190         | 178         | 164         | 147          | 127          | 114          |
| <b>SALES/NET PP&amp;E</b> | <b>5.26</b> | <b>6.74</b> | <b>8.80</b> | <b>11.59</b> | <b>15.38</b> | <b>18.87</b> |

# Balance Sheets – Forecasting Issues

## ◆ Tricky Areas:

- Debt and working capital
  - Short and long-term debt forecasting
  - “Path to value” determines treatment
- Depreciation/Amortization
- Excess Assets/Liabilities
- Cash balances
  - Requirements of business – rest “distributed” for value
- Terminal (or normalized) year cash flows in high growth to lower growth situations

# Cash Flow Statement Projections

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- ◆ Ties projections together so all are functioning properly
- ◆ Easy place to spot anomalies in cash flows and trouble shoot unbalanced balance sheet forecasts/histories

# Application of the Discount Rate

- ◆ Generally applied consistently across all projected years
  - Can be recalculated annually - where debt expected to fall radically over the projection period
- ◆ Discount factors and cash flows adjusted for partial years, where needed
- ◆ Terminal Value discounted from end of projection period
- ◆ Mid-year convention (vs end-of-year) used by some
  - Assumes cash flows received during year instead of at year end
  - Many companies do not pay out distributions over year (RE: minority interest situation generally)

# Terminal Value

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- ◆ Apply Capitalization Model to Normalized Final Year of Projections
  - Normalizing removes impacts of higher/lower growth in last year for working capital, capital investments, etc. that are larger or smaller than long-term relationships to profit and cash flows
- ◆ See Earlier Discussion for Model Details

# Income Statements – Common Errors

- ◆ “Hockey Stick” projections w/out consideration to history, capital requirements and market realities
  - Revenue Rocket
  - Margin Creep
  - Off the Books Revenue/Income
- ◆ Improper add backs for level of value being considered
- ◆ Non-operating asset/liability impacts on earnings not eliminated from income or expenses

“FREE GROWTH”  
Problem  
Overstates Value

# Balance Sheets – Common Errors

- ◆ Depreciate PP&E to negative or insupportably low numbers given growth in revenues over projection period
  - Look at NET PP&E to sales ratio over time to check
  - Capital expenditures usually understated for depreciation taken
- ◆ Ignore smaller but important working capital accounts (both asset and liabilities)
- ◆ Overly aggressive changes in required current assets or liabilities
  - Reductions in Accts. Rec. from 60+ days to 30 days or vice versa for Accts. Pay, without adequate reasoning
  - Inventory turns adjusted without consideration to margin impacts
- ◆ Ignore long-term net asset investments required
- ◆ Ignore deferred taxes if income statements not on tax basis

# Agenda

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- ◆ Overview
- ◆ Methods and Paths To Value
- ◆ Capitalization of Income Method
- ◆ Discounted Cash Flows Method
- ◆ Premiums & Discounts

Appendix

# Role of Premiums and Discounts

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- ◆ Company Values Derived May Need Adjustments
  - Non-operating Assets, Liabilities, etc.
  - Level of Value
  - Size and Rights of Interest Being Valued
  - State Laws Regarding Purpose of Valuation
  - Other Facts & Circumstances of Situation

# Premiums and Discounts

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- ◆ Types of Adjustments
  - Control Premiums
  - Lack of Control Discounts
  - Marketability Discounts
  - Key Person Discounts
  - Blockage or Restricted Stock Discounts

# Premiums and Discounts (cont.)

- ◆ Control Premium
  - Merger/Acquisition data
  
- ◆ Minority Interest Discount
  - Comparable company valuation equivalent for minority interest
  - Markdown of control premium
    - 25% premium = 20% minority discount  
(25/125)
    - 35% premium = 26% minority discount  
(35/135)

# Premiums and Discounts (cont.)

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- ◆ Lack of Marketability Discount
  - Pre-IPO studies
  - Private placement studies
  - Cost of “going public”
  - Hedging Costs
  
- ◆ Key Man Discount
  
- ◆ Blockage / Restricted Stock Discounts, etc.



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# Appendix

# Capital Asset Pricing Model: Equity Rate

$$E(R_i) = R_f + (B \times RP_m) + RP_s + RP_u$$

$E(R_i)$  = Expected Rate of Return on Common Equity

$R_f$  = Rate of Return on Risk Free Security

$B$  = Beta (many sources all different)

$RP_m$  = Risk Premium (S&P 500) over  $R_f$

$RP_s$  = Risk Premium over  $RP_m$  for size

$RP_u$  = Company specific (unsystematic) Risk

# S&P/Duff & Phelps Risk Premium Studies

## ◆ Grabowski & King Return Studies

- Based on company characteristics for size rather than betas for adjusting size premiums

- Size Measures:

Market Value of Equity

5-Year Average Net Income

Total Assets

Sales

Book Value of Equity

Market Value of Inv. Capital

5-Year Average EBITDA

Number of Employees

- Useful and available through Ibbotson Associates



# Income Approach: Basic Concepts and Do's & Don'ts

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**ASA/AICPA Joint Business Valuation  
Conference**

**Las Vegas – November 14, 2005**

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