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

ASA/AICPA Joint Business Valuation Conference

Las Vegas – November 14, 2005

Scott A. Nammacher, ASA, CFA

Managing Director
Empire Valuation Consultants, LLC
Email: ScottN@Empireval.com

Agenda

- ◆ 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

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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)

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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 <u>cash flow</u>

- ◆ 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

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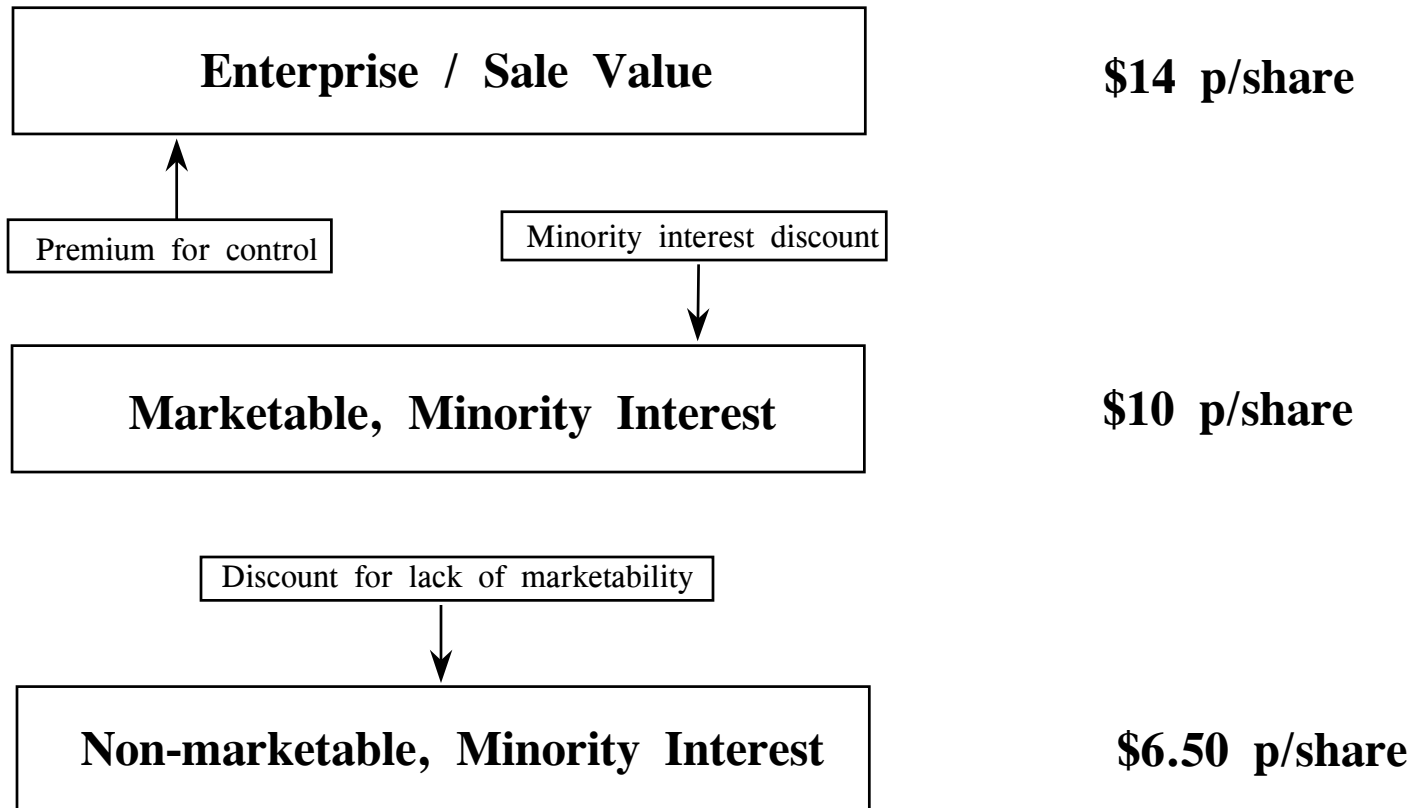
Two Main Standards of Value

◆ **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.

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Basic Levels of Value for Equity Interests

| Enterprise / Sale Value | $14 p/share |

Premium for control → Minority interest discount ↓

| Marketable, Minority Interest | $10 p/share |

Discount for lack of marketability ↓

| Non-marketable, Minority Interest | $6.50 p/share |

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Core Valuation Concept

◆ Value is a Function of <u>Expected Future Economic Returns</u> = <u>FORWARD LOOKING</u>

➢ 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 <u>Similar</u> 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

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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

- 1,000X1.07=1,070X1.07=1,144.90

➤ Willing to pay present value of $1,000 <u>today</u> 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

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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 <u>today</u>
> g = long-term expected growth in income/cash flows
> **$(k - g)$ = referred to as "Capitalization Rate"**

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Agenda

- ◆ Overview
- ◆ Paths to Value
  - ➢ Direct to Equity
  - ➢ Debt Free
- ◆ Capitalization of Income Method
- ◆ Discounted Cash Flow Method
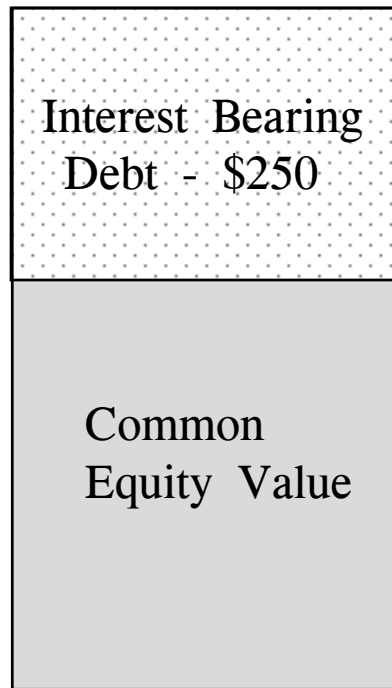- ◆ Premiums & Discounts

Appendix

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Two "Paths" to Value: Building Example

♦ **Difference Between <u>Sale Price</u> and <u>Equity Value</u>**

Sale Price in Total
<u>Based on Op CF</u>

Value Equity Directly based
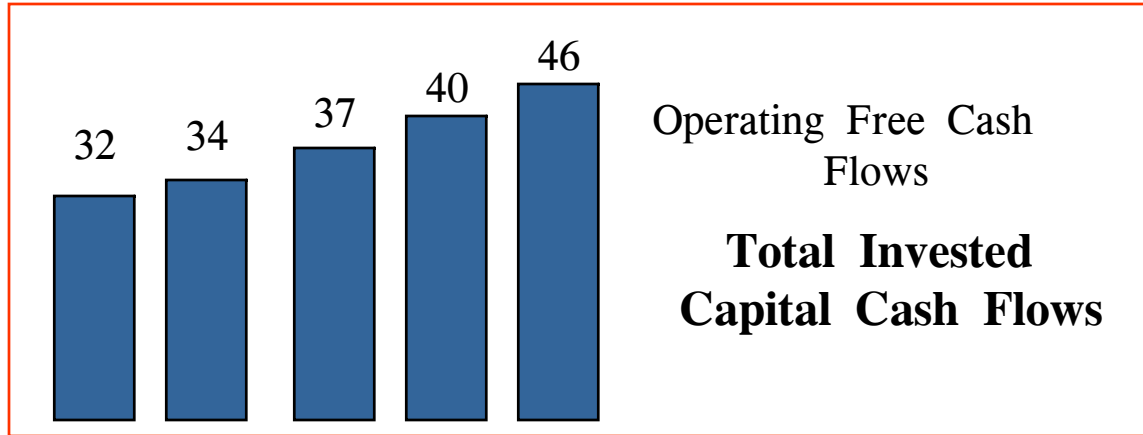<u>On Net Equity Cash Flow</u>

Interest Bearing
Debt - $250

Common
Equity Value

$720

Common
Equity Value

$470

Total Invested Capital

Direct to Equity
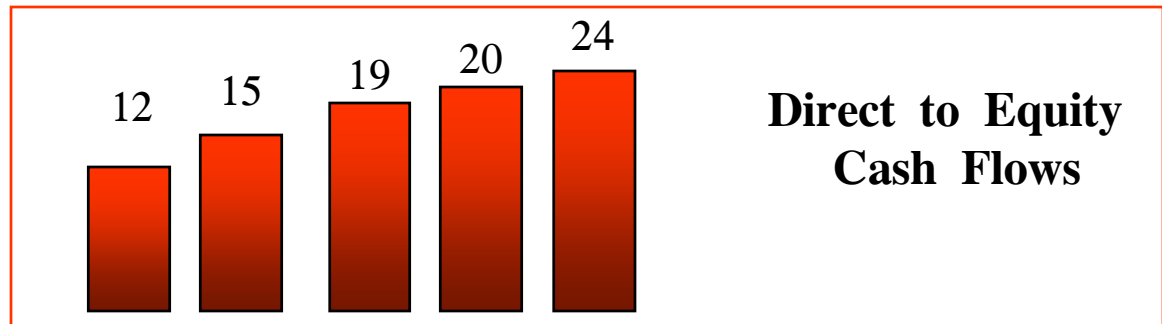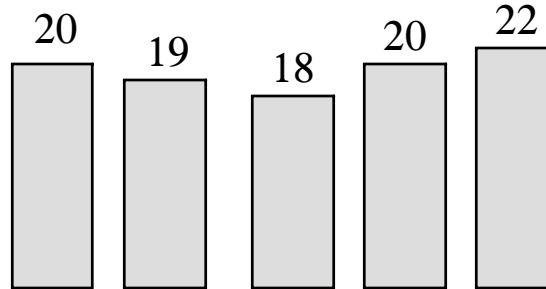
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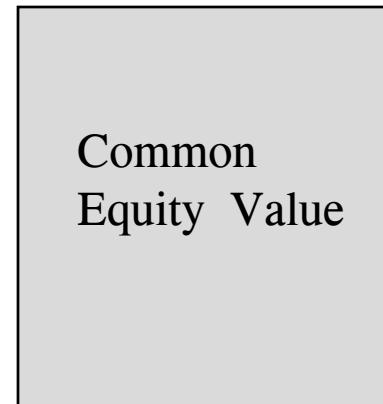
Annual Cash Flows By "Path"

Value of Annual Operating Free Cash Flows

TIC or "MVIC Value"

Debt Value

Equity Value

Operating Free Cash Flows

Total Invested Capital Cash Flows

32 34 37 40 46

Cash Flows to Debt Holders
(total debt service)

20 19 18 20 22

Direct to Equity Cash Flows

12 15 19 20 24

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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!

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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

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Agenda

- ◆ 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

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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"

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Capitalization Example: Direct to Equity

	2003	2004	2005
Sales	$625.0	$650.0	$676.0
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			**$67.6**

Historical Financials
Income Statement
(Net of Interest &
Taxes)

Weighed Avg. Depreciation Exp.	$53.2
Cap. Exp. Normalized (107%)	($56.9)
Working Cap. Normalized to 4% Growth	($3.0)
Projected Principal Growth (4%)	$10.8
	$71.6

Cash Flow Items
Based On Calculated
Estimates

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 X (1+g) / (k-g)

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Cash Flow Base

- ◆ 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)

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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 <u>owner-officer</u> 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.

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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.

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Cash Flow Base: Normalizing Cash Flow

♦ **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 <u>may not be in perpetuity</u>

➢ 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

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Cap. Exp. vs Depreciation vs Growth

◆ Capital Exp. vs Depreciation Calculator
  ➢ Based on MACRS depreciation schedule

Ratio of Capital Expenditures to Depreciation at Equalibrium

Five year Assets   **Seven year Assets**

Assumed LT Growth	Ratio	Reciprocal*	Assumed LT Growth	Ratio	Reciprocal*
3.0%	105%	95%	3.0%	108%	93%
4.0%	107%	93%	4.0%	110%	91%
5.0%	109%	92%	5.0%	113%	88%
6.0%	111%	90%	6.0%	116%	86%
7.0%	112%	89%	7.0%	118%	85%
8.0%	114%	88%	8.0%	121%	83%
9.0%	116%	86%	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.

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Working Capital "Calculator"

◆ Normalizing Working Capital Charge

HISTORICAL INPUTS:

	2000	2001	2002	2003	2004
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 AVG	ANALYST CONCLUDED
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(PATH TO EQUITY ONLY)							
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 ($74.8)

HYPOTHETICAL PRIOR YEAR SALES
  ASSUMING GROWTH ASSUMPTION: $624.00 ($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

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Capitalization Example: GROWTH RATE

	2003	2004	2005	**Historical Financials**
Sales	$625.0	$650.0	$676.0	Income Statement
Operating Inc. 19.9%	$124.7	$129.6	$134.8	(Net of Interest &
A/Tax Net Inc.	$64.1	$66.6	$69.3	Taxes)
Weightings	1.0	2.0	3.0	
Weighted Average NI			**$67.6**	

Weighed Avg. Depreciation Exp.	$53.2	
Cap. Exp. Normalized (107%)	($56.9)	Cash Flow Items
Working Cap. Normalized to 4% Growth	($3.0)	Based On Calculated
Projected Principal Growth (4%)	$10.8	Estimates
	$71.6	

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 X (1+g) / (k-g)

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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

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Long-term Growth Rate: Impact

x <u>Growth</u> in Earnings or CF Impacts Value in Major Way

  » <u>Subtraction from Discount Rate to Derive Multiples</u>

  » Impacts Income Approach and Market Approach

x Gordon Growth Model Example:

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

Examples:

<table>
<tr><td><u>3% Growth</u></td><td><u>6% Growth</u></td></tr>
<tr><td>$\dfrac{\$100 \ * \ 1.03}{(20\% - 3\%)} = \$606$</td><td>$\dfrac{\$100 \ * \ 1.06}{(20\% - 6\%)} = \$757$</td></tr>
<tr><td>17% = 6.1 X Multiple</td><td>14% = 7.6 X</td></tr>
</table>

25% Increase in Value

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Capitalization Example: DISCOUNT RATE

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

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 X $(1+g) / (k-g)$

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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

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Determining an Equity Rate

◆ 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

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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**

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Capitalization Model Calculation

Direct to Equity Path:

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

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

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

Gordon Growth Model

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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

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WACC is a Bit More Complicated

- Determine appropriate equity rate

- Determine appropriate <u>fixed-rate</u> 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)

  WACC = Equity Rate X Weighting +
  A/tax Long-term Debt Cost X Weighting

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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

$$14.47\% = 20\% \text{ X } 65\% + ((1\text{-}40\%) \text{ X } 7.0\% \text{ X } 35\%)$$

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Capitalization Example: "Debt-free Path"

	2003	2004	2005
Sales	$625.0	$650.0	$676.0
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			**$78.8**

Historical Financials

Income Statement
(No Interest Subtracted)

Weighed Avg. Depreciation Exp.	$53.2
Cap. Exp. Normalized (107%)	($56.9)
Working Cap. Normalized to 4% Growth	($3.0)
Projected Principal Growth (4%)	$0.0
	$72.1

Cash Flow Items
Based On Calculated
Estimates (no debt adj)

Weighted Avg. Debt-free Cash Flow: **$72.1**   "Normalized" Cash Flow Base

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

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

Value of TIC [1]:	**$716**
Less Debt:	**($250)**
Net Equity (b/Adjustments)	**$466**

**Debt Subtraction
To Get Equity**

[1] Gordon Growth Model: DFCF X (1+g) / (WACC-g)

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Discount Rates - Common Errors:

♦ Mismatches of discount rate with definition of projected cash flow streams (e.g., apply after-tax cash flow discount rate to pretax income)

♦ Use <u>floating rate</u> cost of debt for company as a surrogate for the fixed-rate borrowing costs

♦ Use <u>book value</u> 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 <u>minority interest</u> situation
  ➢ Consider an <u>iterative process</u> (see DCF section)

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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

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Agenda

- 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

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Discounted Cash Flow: Overview

- ◆ **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**

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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)

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DCF Overview: When to Use DCF?

- ◆ **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.

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Overview: Key DCF "Components"

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

					878.7 [1]	**Terminal Value**
Debt Free CF:	**75.6**	**78.6**	**81.8**	**85.1**	**967.2**	**& Cash Flows**

WACC Rate: (Year end discounting)	**14.5%**	**WACC Rate**
Long-term Growth Rate	**4.0%**	**Growth Rate**

Net Present Value Debt Free CF:	**$722.3**	**Debt-free Value**
Less Long-term Debt:	**$250.0**	**Less Debt and**
Net Equity Value:	**$472.3**	**Other Adjs.**

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

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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% X 65% +((1-40%) X 7.0% X 35%)

- ◆ Minority Interest Situations
  - ➢ First Guess Usually Not Correct

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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!
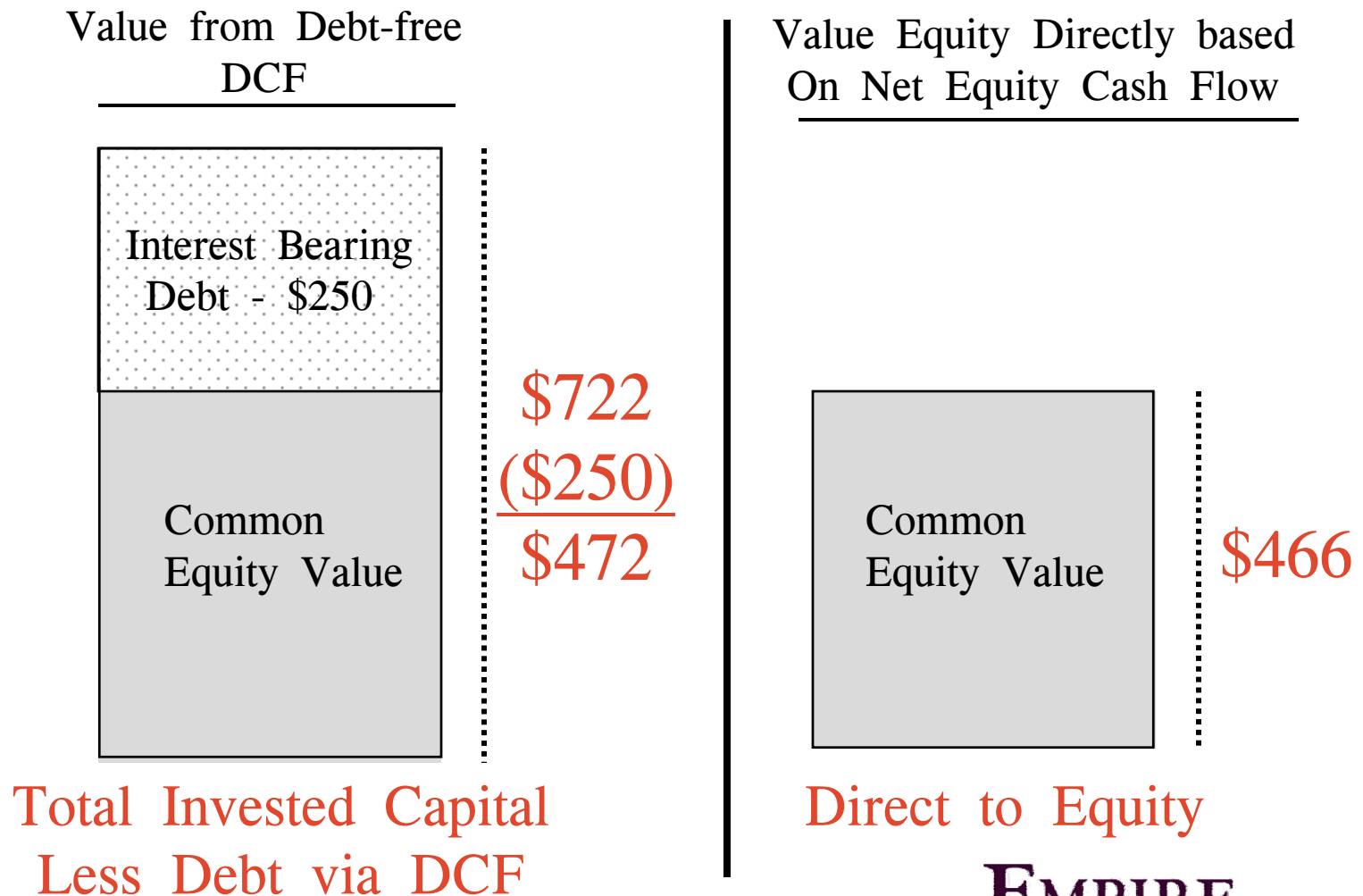
Iteration	Initial WACC Debt/Cap	TIC Value	Revised Debt/Cap [1]
#1	30/100	$671	37/100
#2	37/100	$745	34/100
#3	34/100	$711	35/100
#4	35/100	$722	35/100

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

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

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Two "Paths" to Value: Review Comparison

◆ **Difference Between <u>DCF</u> and <u>Cap of CF</u> Values**

<u>Value from Debt-free DCF</u>

Interest Bearing Debt - $250

Common Equity Value

$722
($250)
$472

<u>Value Equity Directly based On Net Equity Cash Flow</u>

Common Equity Value

$466

Total Invested Capital Less Debt via DCF

Direct to Equity

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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

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DCF: What to Forecast?

- ◆ 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

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Beware of the "Hockey Stick" Forecast

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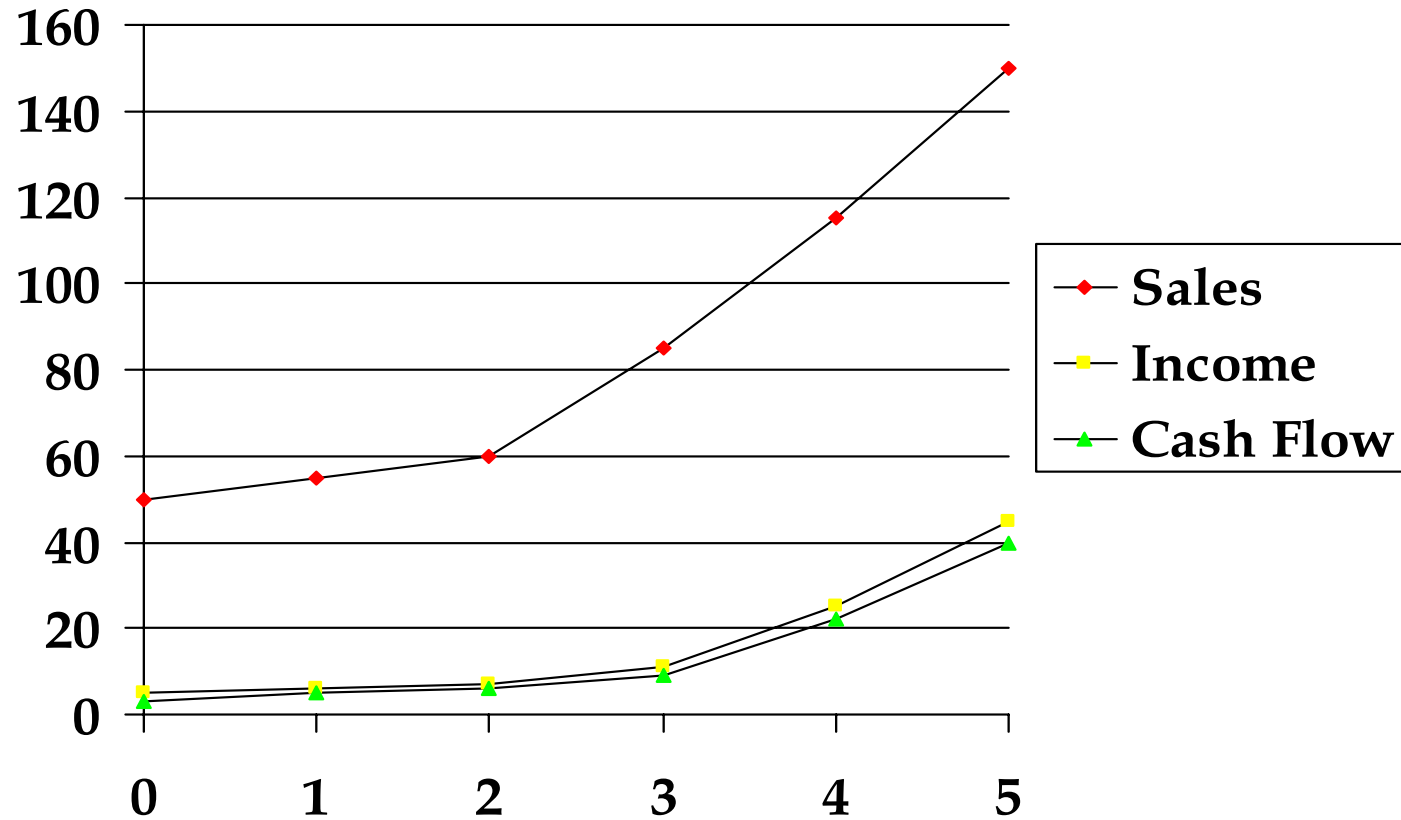
Projected Operating Income

- ◆ 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

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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

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Balance Sheets – Function in Valuation

- 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

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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**
SALES/NET PP&E		**5.26**	**6.74**	**8.80**	**11.59**	**15.38**	**18.87**

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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

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Cash Flow Statement Projections

♦ Ties projections together so all are functioning properly

♦ Easy place to spot anomalies in cash flows and trouble shoot unbalanced balance sheet forecasts/histories

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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)

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Terminal Value

- ◆ 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

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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

  "FREE GROWTH"
  Problem
  Overstates Value

- ◆ Improper add backs for level of value being considered

- ◆ Non-operating asset/liability impacts on earnings not eliminated from income or expenses

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Balance Sheets – Common Errors

- Depreciate PP&E to negative or insupportably low numbers given growth in revenues over projection period
  - Look at <u>NET PP&E to sales ratio</u> 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

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Agenda

- ◆ Overview

- ◆ Methods and Paths To Value

- ◆ Capitalization of Income Method

- ◆ Discounted Cash Flows Method

- ◆ Premiums & Discounts

  Appendix

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Role of Premiums and Discounts

- 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

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Premiums and Discounts

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

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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)

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Premiums and Discounts (cont.)

- ◆ 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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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

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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	Book Value of Equity
5-Year Average Net Income	Market Value of Inv. Capital
Total Assets	5-Year Average EBITDA
Sales	Number of Employees

  - ➤ Useful and available through Ibbotson Associates

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

ASA/AICPA Joint Business Valuation Conference

Las Vegas – November 14, 2005

Scott A. Nammacher, ASA, CFA

Managing Director
Empire Valuation Consultants, LLC
Email: ScottN@Empireval.com