Valuation: Closing Thoughts

All good things come to an end…

Updated: September 2011
Back to the very beginning:
Approaches to Valuation

- **Discounted cashflow valuation**, where we try (sometimes desperately) to estimate the intrinsic value of an asset by using a mix of theory, guesswork and prayer.

- **Relative valuation**, where we pick a group of assets, attach the name “comparable” to them and tell a story.

- **Contingent claim valuation**, where we take the valuation that we did in the DCF valuation and divvy it up between the potential thieves of value (equity) and the potential victims of this crime (lenders).
DISCOUNTED CASHFLOW VALUATION

Cash flows
Firm: Pre-debt cash flow
Equity: After debt cash flows

Expected Growth
Firm: Growth in Operating Earnings
Equity: Growth in Net Income/EPS

Firm is in stable growth: Grows at constant rate forever

Terminal Value

Discount Rate
Firm: Cost of Capital
Equity: Cost of Equity

Value
Firm: Value of Firm
Equity: Value of Equity

Length of Period of High Growth

CF1 CF2 CF3 CF4 CF5 ........ CFn

Forever
Dante meets DCF: Nine layers of valuation hell.. And a bonus layer..

- The Wasserstein-Perella bonus layer
- From aggregate to per share value?
- No garnishing allowed!!
- The terminal value: It's not an ATM
- Debt ratios change, don't they?
- Are you paying for growth?
- What's in your discount rate?
- High growth for how long?
- Death and taxes
- Base year and accounting fixation
You are valuing Exxon Mobil, using the financial statements of the firm from 2008. The following provides the key numbers:

- Revenues: $477 billion
- EBIT (1-t): $58 billion
- Net Cap Ex: $3 billion
- Chg WC: $1 billion
- FCFF: $54 billion

The cost of capital for the firm is 8% and you use a very conservative stable growth rate of 2% to value the firm. The market cap for the firm is $373 billion and it has $10 billion in debt outstanding.

- How under or over valued is the equity in the firm?
- Would you buy the stock based on this valuation? Why or why not?
Layer 2: Taxes and Value

Assume that you have been asked to value a company and have been provided with the most recent year’s financial statements:

- EBITDA: 140
- DA: 40
- EBIT: 100
- Interest exp: 20
- Taxable income: 80
- Taxes: 32
- Net Income: 48

Assume also that cash flows will be constant and that there is no growth in perpetuity. What is the free cash flow to the firm?

a) 88 million (Net income + Depreciation)
b) 108 million (EBIT – taxes + Depreciation)
c) 100 million (EBIT (1-tax rate)+ Depreciation)
d) 60 million (EBIT (1- tax rate))
e) 48 million (Net Income)
f) 68 million (EBIT – Taxes)
Layer 3: High Growth for how long…

Assume that you are valuing a young, high growth firm with great potential, just after its initial public offering. How long would you set your high growth period?

- < 5 years
- 5 years
- 10 years
- >10 years

![Graph showing median of new issues from 1965 to 2005.](source)

Source: Andrew Metrick

The terminal value: It’s not an ATM

Are you paying for growth?

Death and taxes

Base year and accounting fixation

The Wasserstein-Perella bonus layer

From aggregate to per share value?

No garnishing allowed?

Debt ratios change, don’t they?

What’s in your discount rate?

High growth for how long?
Layer 4: The Cost of Capital

The cost of capital for Chippewa Technologies, a US technology firm with 20% of its revenues from Brazil, has been computed using the following inputs:

Cost of equity = Riskfree Rate + Beta * (ERP) + Small firm premium
= 5% + 1.20 * (5%) + 3%
= 14%

Both from Ibbotson data base, derived from 1926-2008 data
ERP: Stocks - T.Bonds (Arithmetic average)
Small firm: Small stocks - Overall market

Cost of capital = Cost of equity (Equity/ (Debt + Equity)) + Cost of debt (1- tax rate) (Debt/ (Debt + Equity))
= 14% (1000/2000) + 3% (1-.30) (1000/2000)
= 8.05%

Company is not rated and has no bonds. Used book interest rate = Int exp/ BV of debt
Used effective tax rate of 30%
## The Correct Cost of Capital for Chippewa

<table>
<thead>
<tr>
<th>Input</th>
<th>What was used...</th>
<th>What should have been used...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riskfree Rate</td>
<td>Corrected treasury bond rate = 5%</td>
<td>Actual treasury bond rate = 3%</td>
</tr>
<tr>
<td>Beta</td>
<td>Bloomberg adjusted beta = 1.20</td>
<td>Sector average adjusted beta = 1.60 (Based on small cap companies in sector)</td>
</tr>
<tr>
<td>Equity Risk Premium</td>
<td>Ibbotson premium = 5%</td>
<td>Updated implied ERP = 6.5%</td>
</tr>
<tr>
<td>Other adjustments to cost of equity</td>
<td>Small cap premium = 3%</td>
<td></td>
</tr>
<tr>
<td>Cost of equity</td>
<td>5% + 1.2 (5%) + 3% = 14%</td>
<td>3% + 1.6 (6.5%) + 2.28% = 15.68%</td>
</tr>
<tr>
<td>Cost of debt (pre-tax)</td>
<td>3%</td>
<td>3% + 6% (based on synthetic rating) = 9%</td>
</tr>
<tr>
<td>Tax rate</td>
<td>Effective tax rate = 30%</td>
<td>Marginal tax rate = 40%</td>
</tr>
<tr>
<td>Cost of debt (after-tax)</td>
<td>3% (1-.3) = 2.1%</td>
<td>9% (1-.4) = 5.4%</td>
</tr>
<tr>
<td>Debt ratio</td>
<td>Book ratio: Liabilities=50%</td>
<td>Market ratio: Interest bearing debt = 30%; Equity= 70%</td>
</tr>
<tr>
<td></td>
<td>Equity=50%</td>
<td></td>
</tr>
<tr>
<td>Cost of capital</td>
<td>14% (.5) + 2.1% (.5) = 8.05%</td>
<td>15.68% (.7) + 5.4% (.3) = 12.60%</td>
</tr>
</tbody>
</table>

Aswath Damodaran
Layer 5: The price of growth..

- You are looking at the projected cash flows provided by the management of the firm, for use in valuation

<table>
<thead>
<tr>
<th>Year</th>
<th>Current</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate</td>
<td></td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Revenues</td>
<td>$100.00</td>
<td>$110.00</td>
<td>$121.00</td>
<td>$133.10</td>
<td>$146.41</td>
</tr>
<tr>
<td>EBIT (1-t)</td>
<td>$30.00</td>
<td>$33.00</td>
<td>$36.30</td>
<td>$39.93</td>
<td>$43.92</td>
</tr>
<tr>
<td>+ Depreciation</td>
<td>$15.00</td>
<td>$16.50</td>
<td>$18.15</td>
<td>$19.97</td>
<td>$21.96</td>
</tr>
<tr>
<td>- Cap Ex</td>
<td>$18.00</td>
<td>$19.80</td>
<td>$21.78</td>
<td>$23.96</td>
<td>$26.35</td>
</tr>
<tr>
<td>- Chg in WC</td>
<td>$3.00</td>
<td>$3.30</td>
<td>$3.63</td>
<td>$3.99</td>
<td>$4.39</td>
</tr>
<tr>
<td>FCFF</td>
<td>$24.00</td>
<td>$26.40</td>
<td>$29.04</td>
<td>$31.94</td>
<td>$35.14</td>
</tr>
</tbody>
</table>

What questions would you raise about the forecasts?
Layer 6: The “fixed debt ratio” assumption

You have been asked to value Hormel Foods, a firm which currently has the following cost of capital:

Cost of capital = 7.31% (.9) + 2.36% (.1) = 6.8%

a. You believe that the target debt ratio for this firm should be 30%. What will the cost of capital be at the target debt ratio?

b. Which debt ratio (and cost of capital) should you use in valuing this company?
Layer 7: The Terminal Value

- The best way to compute terminal value is to
  - Use a stable growth model and assume cash flows grow at a fixed rate forever
  - Use a multiple of EBITDA or revenues in the terminal year
  - Use the estimated liquidation value of the assets

You have been asked to value a business. The business expects to $120 million in after-tax earnings (and cash flow) next year and to continue generating these earnings in perpetuity. The firm is all equity funded and the cost of equity is 10%; the riskfree rate is 3% and the ERP is 7%. What is the value of the business?

- Assume now that you were told that the firm can grow earnings at 2% a year forever. Estimate the value of the business.
Layer 8. From firm value to equity value: The Garnishing Effect...

- For a firm with consolidated financial statements, you have discounted free cashflows to the firm at the cost of capital to arrive at a firm value of $100 million. The firm has
  - A cash balance of $15 million
  - Debt outstanding of $20 million
  - A 5% holding in another company: the book value of this holding is $5 million. (Market value of equity in this company is $200 million)
  - Minority interests of $10 million on the balance sheet

- What is the value of equity in this firm?

- How would your answer change if you knew that the firm was the target of a lawsuit it is likely to win but where the potential payout could be $100 million if it loses?
You have valued the equity in a firm at $200 million. Estimate the value of equity per share if there are 10 million shares outstanding.

How would your answer change if you were told that there are 2 million employee options outstanding, with a strike price of $20 a share and 5 years left to expiration?
Layer 10. The final circle of hell...

<table>
<thead>
<tr>
<th></th>
<th>Cost of Equity</th>
<th>Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenecott Corp (Acquirer)</td>
<td>13.0%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Carborandum (Target)</td>
<td>16.5%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
Relative Valuation: The Four Steps to Understanding Multiples

- Anna Kournikova knows PE…. Or does she?
  - In use, the same multiple can be defined in different ways by different users. When comparing and using multiples, estimated by someone else, it is critical that we understand how the multiples have been estimated.

- 8 times EBITDA is not always cheap…
  - Too many people who use a multiple have no idea what its cross sectional distribution is. If you do not know what the cross sectional distribution of a multiple is, it is difficult to look at a number and pass judgment on whether it is too high or low.

- You cannot get away without making assumptions
  - It is critical that we understand the fundamentals that drive each multiple, and the nature of the relationship between the multiple and each variable.

- There are no perfect comparables
  - Defining the comparable universe and controlling for differences is far more difficult in practice than it is in theory.
Value of Stock = \( \frac{\text{DPS}}{k_e - g} \)

\[
\begin{align*}
\text{PE} &= \text{Payout Ratio} \\
&= \frac{1+g}{r-g} \\
&= f(g, \text{payout, risk})
\end{align*}
\]

\[
\begin{align*}
\text{PEG} &= \text{Payout ratio} \\
&= \frac{1+g}{g(r-g)} \\
&= f(g, \text{payout, risk})
\end{align*}
\]

\[
\begin{align*}
\text{PBV} &= \text{ROE (Payout ratio)} \\
&= \frac{1+g}{r-g} \\
&= f(\text{ROE, payout, g, risk})
\end{align*}
\]

\[
\begin{align*}
\text{PS} &= \text{Net Margin (Payout ratio)} \\
&= \frac{1+g}{r-g} \\
&= f(\text{Net Mgn, payout, g, risk})
\end{align*}
\]

**Equity Multiples**

\[
\begin{align*}
\text{V/FCFF} &= f(g, \text{WACC}) \\
\text{V/EBIT(1-t)} &= f(g, \text{RIR}, \text{WACC}) \\
\text{V/EBIT} &= f(g, \text{RIR}, \text{WACC}, t) \\
\text{VS} &= f(\text{Oper Mgn, RIR, g, WACC})
\end{align*}
\]

\[
\begin{align*}
\frac{\text{Value/FCFF}}{(WACC-g)} &= (1+g) \\
\frac{\text{Value/EBIT(1-t)}}{(WACC-g)} &= (1+g)(1-\text{RIR})(1-t)(WACC-g)
\end{align*}
\]

**Firm Multiples**

\[
\begin{align*}
\text{Value/EBIT(1-t)} &= f(g, \text{RIR}, \text{WACC}) \\
\text{Value/EBIT} &= f(g, \text{RIR}, \text{WACC}, t)
\end{align*}
\]

\[
\begin{align*}
\text{Value of Firm} &= \text{FCFF} \frac{1}{(WACC - g)}
\end{align*}
\]
Valuation Models

- **Asset Based Valuation**
  - Liquidation Value
  - Replacement Cost

- **Discounted Cashflow Models**
  - Stable
  - Two-stage
  - Three-stage or n-stage

- **Relative Valuation**
  - Equity
  - Firm
  - Current
  - Normalized

- **Contingent Claim Models**
  - Option to delay
  - Option to expand
  - Option to liquidate
    - Young firms
    - Equity in troubled firm

- **Equity Valuation Models**
  - Patent
  - Undeveloped Reserves

- **Firm Valuation Models**
  - Earnings
  - Book Value
  - Revenues
  - Sector specific

- **Dividends**
  - Cost of capital approach
  - APV approach
  - Excess Return Models

- **Free Cashflow to Equity**

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Aswath Damodaran
Picking your approach

- **Asset characteristics**
  - Marketability
  - Cash flow generating capacity
  - Uniqueness

- **Your characteristics**
  - Time horizon
  - Reasons for doing the valuation
  - Beliefs about markets
What approach would work for you?

- As an investor, given your investment philosophy, time horizon and beliefs about markets (that you will be investing in), which of the approaches to valuation would you choose?
  - Discounted Cash Flow Valuation
  - Relative Valuation
  - Neither. I believe that markets are efficient.
Some Not Very Profound Advice

- Its all in the fundamentals. The more things change, the more they stay the same.
- Focus on the big picture; don’t let the details trip you up.
- Experience does not equal knowledge.
- Keep your perspective. It is only a valuation.
- Luck dominates…
Or maybe you can fly....

WHAT LEMMINGS BELIEVE