Your Future IN FINANCE

Techniques in Finance & Valuation
What is Valuation?

Valuation: *Methods of quantifying how much money something should be exchanged for today, considering future benefits.*

We will teach 4 valuation methods:

- Trading Comparables
- Transaction Comparables
- Sum-of-the-Parts Valuation
- Discounted Cash Flow Analysis (DCF)
Why is Valuation important?

- **Acquisitions:** How much should we pay for the company?
- **Divestitures:** How much should we sell our company for?
- **Sell-side Research:** Should our clients buy, sell or hold a given stock (fixed income security, option etc.)?
- **Hostile defense:** Is our company undervalued/vulnerable to a hostile bidder?
- **Debt offerings:** What is the value of the company against which debt is being issued? (collateral)
- **Initial Public Offering (IPO):** How much is the company worth? (price per share)
Trading Comparables
Relative Valuation Technique
Agenda

- Multiples: Comparables Trading (transaction comparables will be covered by Mike)
- Theory: Similar companies (all else equal) should have similar valuations
- Defining a Peer Group (“similar companies”)
- Picking the right multiples
- Calculating CLX’s multiples
- Spreading Peer Group multiples
- Calculating CLX’s implied value
First day on the job... (potential interview question)

- Your boss thinks shares of Clorox Co. (“CLX”) might be a good investment:
  - She asks you: “How much do you think they are worth?”

- One common approach is Multiples Based Valuation Technique
What are multiples?

Examples:
- Price / Earnings (P/E)
- Firm Value / Revenues
- Firm Value / EBITDA

Earnings per share:
- $4.24
- $2.90

Calculations:
- $67 / $4.20 ≈ 15.8x
- $67 / $3.00 ≈ 23.1x
Trading Comparables: The Theory

- Basic Assumption: Similar companies should have similar valuations
- Employing multiples is a relative valuation technique
Trading Comparables – Selecting the right peer group

- It is important to select the best peer group possible (“similar companies”)
  - How?

<table>
<thead>
<tr>
<th>Operational Filters</th>
<th>Financial Filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry / Sub-Sectors</td>
<td>Size (e.g. Market Capitalization, Revenue etc.,)</td>
</tr>
<tr>
<td>Product</td>
<td>Profit Margins</td>
</tr>
<tr>
<td>Markets</td>
<td>Leverage (e.g. Debt / Capital)</td>
</tr>
<tr>
<td>Customers</td>
<td>Shareholder base (influence of a large shareholder)</td>
</tr>
<tr>
<td>Seasonality</td>
<td></td>
</tr>
<tr>
<td>Cyclicality</td>
<td></td>
</tr>
</tbody>
</table>

**Clorox Peer Group**

- Kraft – “KFT”
- Procter & Gamble – “PG”
- Colgate – “CL”
- Kimberly-Clark – “KMB”
- **Clorox Corporation** – “CLX”
Next Step: Choosing the right multiples

- It is important to chose the RIGHT multiples

**Examples: Multiples**

<table>
<thead>
<tr>
<th>Multiple</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Price/earnings</strong></td>
<td>• Important telecom ratio</td>
<td>• Assumes same profitability for all comps</td>
</tr>
<tr>
<td><strong>Firm value/EBITDA</strong></td>
<td>• Good for more mature situations</td>
<td>• Difficult to use in high growth situations</td>
</tr>
<tr>
<td><strong>P/E to growth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Price/cash flow</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Generally, it is appropriate to use the multiples which are being used in the market.
  - Check sell-side research reports
- It is also important to understand WHY the market is using certain multiples

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<td>• Important telecom ratio</td>
<td>• Assumes same profitability for all comps</td>
</tr>
<tr>
<td></td>
<td>• Good for more mature situations</td>
<td>• Difficult to use in high growth situations</td>
</tr>
<tr>
<td><strong>Price/book value</strong></td>
<td>• Useful for capital intensive industries and financial institutions</td>
<td>• Distorted by accounting differences</td>
</tr>
<tr>
<td><strong>MetLife</strong></td>
<td>• Reflects long-term profitability outlook</td>
<td>• Need profitability cross-check</td>
</tr>
<tr>
<td>Firm value/sales</td>
<td>• Most often used with high growth companies that do not have earnings</td>
<td>• Need profitability cross-check</td>
</tr>
<tr>
<td><strong>Price / click rate (?)</strong></td>
<td>• Useful for companies without revenues or earnings (?)</td>
<td>• Is not a good predictor of long-term return to shareholders</td>
</tr>
</tbody>
</table>
Our multiples

**Price / Earnings Per Share (EPS)**
- Companies **have** earnings (relatively stable vs -> e.g. tech.)
- Widely Used (illustration power)
- Illustrates need for earnings forecasts

**Firm Value / EBIT**
- Impact of Leverage (debt + interest expense)
- Debt can be good and bad (efficiently used?)
- Important Distinction: Firm Value vs. Equity Value

**Firm Value / Revenue**
- High fixed costs + economies of scale
  - Small change in sales = Large Change in Earnings
- Illustrates need for revenue forecasts

1) Calculate CLX’s Price to Earnings Per Share
2) Calculate CLX’s Firm Value to EBIT
3) Calculate CLX’s Firm Value to Revenue
Our multiples

Price / Earnings Per Share (EPS)

- The companies have earnings (stable but cyclical)
- Widely Used
- Illustrates need for earnings forecasts

1) Calculate CLX’s Price to Earnings (aggregates)

Price -> Market Capitalization (price x shares)

Yahoo Finance: $9.5 billion USD

Earnings -> Consensus (average) sell-side estimates – Bloomberg Machine –

Year-End 2010E: $600m

Price to Earnings: $9500m/$600m = 15.8x

Which is the same as earlier example: $67 / $4.24 ≈ 15.8X
Our multiples

- Impact of Leverage (debt + interest expense)
- Debt can be good and bad
  - Important Distinction: Firm Value vs. Equity Value

1) Calculate CLX’s Firm Value

Assets

Liabilities and Shareholders’ Equity

Firm value

Equity Value (Common Stock)

Debt (Net Debt)
Net Debt . . .

- Long Term Debt -> $2,151m
- Current Portion of Long Term Debt -> $577m
- Short Term Debt -> $421m

( - )

- Cash & Cash Equivalents -> $206m

Net Debt -> $2,943
Our multiples

1) Calculate CLX’s Firm Value

Firm Value $12,443

Liabilities and Shareholders’ Equity

Equity Value $9,500m
Debt (net debt) $2,943m

1) Calculate CLX’s Firm Value to EBIT

EBIT YE2010E -> Consensus sell-side $1,305

FV / EBIT = 9.5x
Our multiples

Firm Value / Revenue

- High fixed costs + economies of scales
  - Small change in sales = Large Change in Earnings
- Illustrates need for revenue forecasts

1) Calculate CLX’s Firm Value to Revenues

Why is a revenue multiple a Firm Value Multiple?

Firm Value -> $12,443
Revenues -> Consensus sell-side
Year-End 2010E: $5,579

Firm Value to Revenue: $12,443m/$5,579m = 2.2x
Trading Comparables: Remember This is a Relative Valuation Method

- Now we know where CLX is trading TODAY - but our boss/interviewer asked what the VALUE is
# Spreading the Trading Comparables

<table>
<thead>
<tr>
<th>Company Comp Set</th>
<th>Firm Value Multiples</th>
<th>Equity Value Multiples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company Name</strong></td>
<td>Price / Earnings Per Share (EPS)</td>
<td>Firm Value / Revenues</td>
</tr>
<tr>
<td>Church &amp; Dwight - &quot;CHD&quot;</td>
<td>17.55x</td>
<td>2.10x</td>
</tr>
<tr>
<td>Colgate-Palmolive - &quot;CL&quot;</td>
<td>18.23x</td>
<td>2.56x</td>
</tr>
<tr>
<td>Kimberly-Clark - &quot;KMB&quot;</td>
<td>21.00x</td>
<td>3.30x</td>
</tr>
<tr>
<td>Energizer Holdings - &quot;ENR&quot;</td>
<td>17.20x</td>
<td>3.80x</td>
</tr>
<tr>
<td>Kraft Foods - &quot;KFT&quot;</td>
<td>17.43x</td>
<td>1.80x</td>
</tr>
<tr>
<td>Procter &amp; Gamble - &quot;PG&quot;</td>
<td>16.98x</td>
<td>2.52x</td>
</tr>
<tr>
<td>Clorox Corp - &quot;CLX&quot;</td>
<td>15.8x</td>
<td>2.2x</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>18.07x</td>
<td>2.68x</td>
</tr>
</tbody>
</table>
## Trading Comparables – Current Price $67 / share “CLX”

<table>
<thead>
<tr>
<th>($ in millions, USD)</th>
<th>Peer Group Mean</th>
<th>“CLX”</th>
<th>Valuation</th>
<th>Net Debt</th>
<th>Equity Value</th>
<th>Shares Outstanding</th>
<th>Implied Value</th>
<th>Buy? Sell? Hold?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18.1x Price / Earnings</td>
<td>$600m</td>
<td>$10,860</td>
<td>$2,943</td>
<td>$10,860</td>
<td>140m</td>
<td>$77.60</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>2.7x FV / Revenue</td>
<td>$5,579</td>
<td>$15,063</td>
<td>$2,943</td>
<td>$12,120</td>
<td>140M</td>
<td>$86.57</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>11.3x FV / EBIT</td>
<td>$1,305</td>
<td>$14,746</td>
<td>$2,943</td>
<td>$11,803</td>
<td>140M</td>
<td>$84.31</td>
<td>?</td>
</tr>
</tbody>
</table>

**Valuation Range:** $77 - $87 per share
The **SCIENCE** is performing the valuation, the **ART** is interpreting the results in order to arrive at the “right” price. **TECHNOLOGY** can help you do this more efficiently.
Transaction Comparables
Step 1: Locate Comparable Transactions

- Equity research reports
- Merger proxies for similar transactions
  - Fairness opinions of financial advisors disclose the comparable transactions used in their valuations of the target
- Company press releases, shareholder presentations, conference call transcripts and SEC filings
- Bloomberg transaction description (TICKER<EQUITY>CACS) – Click on deal
Step 2: Select *Comparable* Transactions

- Remember that some transactions are more relevant than others when selecting a range of multiples for a valuation
  - The *situation* surrounding the acquisition is crucial:
    - Bankruptcy-related acquisition

  **Televisa to Take Stake in Univision**
  - “Servicing the company’s $10 billion debt load left Univision reeling…”
  - Televisa is buying into the company at a valuation about 40% below its original takeover price…”

- Hostile transaction
- Recent deals are typically a more accurate reflection of value
Let’s Pull Transaction Comparables for Clorox...

($ in Millions)

<table>
<thead>
<tr>
<th>Date</th>
<th>Target / Acquiror</th>
<th>Transaction Value</th>
<th>EV / LTM Revenue</th>
<th>EV / LTM EBITDA</th>
<th>EV / LTM EBIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/12/2010</td>
<td>Silpada / Avon</td>
<td>$650</td>
<td>2.8x</td>
<td>10.9x</td>
<td>11.8x</td>
</tr>
<tr>
<td>1/14/2010</td>
<td>Bare Escentuals / Shiseido</td>
<td>$1,828</td>
<td>3.4x</td>
<td>11.1x</td>
<td>12.3x</td>
</tr>
<tr>
<td>12/21/2009</td>
<td>Chattem / Sanofi Aventis</td>
<td>$2,156</td>
<td>4.5x</td>
<td>13.1x</td>
<td>13.5x</td>
</tr>
<tr>
<td>12/14/2009</td>
<td>Simple skin care / Alberto Culver</td>
<td>$396</td>
<td>3.7x</td>
<td>11.0x</td>
<td>12.0x</td>
</tr>
<tr>
<td>12/11/2009</td>
<td>Ambi Pur (Sara Lee) / P&amp;G</td>
<td>$470</td>
<td>2.6x</td>
<td>12.5x</td>
<td>13.5x</td>
</tr>
<tr>
<td>5/11/2009</td>
<td>Edge (SC Johnson) / Energizer</td>
<td>$275</td>
<td>1.8x</td>
<td>9.2x</td>
<td>9.8x</td>
</tr>
<tr>
<td>4/1/2008</td>
<td>Orajel / Church &amp; Dwight</td>
<td>$380</td>
<td>3.8x</td>
<td>13.6x</td>
<td>15.8x</td>
</tr>
<tr>
<td>1/25/2008</td>
<td>Frederik Fekkai / P&amp;G</td>
<td>$440</td>
<td>3.5x</td>
<td>16.0x</td>
<td>17.6x</td>
</tr>
</tbody>
</table>

**AVERAGE**  

<table>
<thead>
<tr>
<th></th>
<th>$824</th>
<th>3.9x</th>
<th>11.7x</th>
<th>12.6x</th>
</tr>
</thead>
</table>

**CLX Financials**  

<table>
<thead>
<tr>
<th></th>
<th>$6,000</th>
<th>$1,500</th>
<th>$1,300</th>
</tr>
</thead>
</table>

**Implied Value**  

<table>
<thead>
<tr>
<th></th>
<th>$23,200</th>
<th>$17,600</th>
<th>$16,380</th>
</tr>
</thead>
</table>
Sum of the Parts Valuation
### Sum of The Parts Valuation Example: *Time Warner, Inc. (TWX)*

<table>
<thead>
<tr>
<th>Segment</th>
<th>Segment EBITDA</th>
<th>Target EV/EBITDA</th>
<th>Implied Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movies</td>
<td>$1,500</td>
<td>7.0x</td>
<td>$10,500</td>
</tr>
<tr>
<td>Cable Networks</td>
<td>$3,900</td>
<td>10.0x</td>
<td>$39,000</td>
</tr>
<tr>
<td>Publishing</td>
<td>$450</td>
<td>5.0x</td>
<td>$2,250</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$5,850</strong></td>
<td></td>
<td><strong>$51,750</strong></td>
</tr>
</tbody>
</table>

- What is the “**Conglomerate Discount**”?
  - Full value of TWX cannot be realized unless we unlock it
  - Sometimes SOTP does not equal the value whole company
  - $51,750 * (90%) = $46,675 (Implied Multiple: 8.0x)
Time Warner, Inc. (TWX) – Spin-offs

**Cable Spin**

*“Simpler, Leaner, Better & More”*

- “The company will finally, fully separate its cable operations creating a near-pure content company enabling better investor focus.”

  Source: Collins Stewart (1/30/2009)

**AOL Spin**

*“AOL Exit Clarified…”*

- “Cable networks eventually become the focus. Over the long-term, we think investors will appreciate Time Warner’s leading content-centric assets and streamlined strategic approach focused on generating high-quality and popular programming.”

  Source: Goldman Sachs (5/28/2009)
Discounted Cash Flows – “DCF”
DCF Analysis

Discounted cash flow analysis is based upon the theory that the value of a business is the sum of its expected future free cash flows, discounted at an appropriate rate.

- Three key drivers:
  - Free cash flow projections
  - Terminal value at the end of the projection period
  - Discount Rate (weighted average cost of capital or “WACC”)
## Free Cash Flow

<table>
<thead>
<tr>
<th>Levered Free Cash Flow</th>
<th>Unlevered Free Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBITDA</td>
<td>EBITDA</td>
</tr>
<tr>
<td>(-) Interest Expense</td>
<td>(-) Capital Expenditures</td>
</tr>
<tr>
<td>(-) Capital Expenditures</td>
<td>(-) Cash Taxes</td>
</tr>
<tr>
<td>(-) Cash Taxes</td>
<td>(-) Changes in Working Capital</td>
</tr>
<tr>
<td>(-) Changes in Working Capital</td>
<td>Unlevered Free Cash Flow</td>
</tr>
</tbody>
</table>

Levered Free Cash Flow

Let’s setup a DCF Model....
Calculating WACC

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

- Let's look at two capital structures: (1) 100% debt (2) 100% equity

\[
\frac{D}{D + E} = 100\% \quad \text{vs.} \quad \frac{E}{D + E} = 100\%
\]

- There is a cost associated with debt and equity used to fund business initiatives
  - There is a rate charged for debt issued
  - There is a rate charged for equity issued

\[
\left[ r_d * \left( \frac{D}{D + E} \right) \right] + \left[ r_e * \left( \frac{E}{D + E} \right) \right]
\]

- The rate used for debt should be reduced to account for the tax shield

\[
\text{WACC} = \left[\left( r_d * (1 - T) \right) * \left( \frac{D}{D + E} \right) \right] + \left[ r_e * \left( \frac{E}{D + E} \right) \right]
\]
Cost of Equity – “CAPM”

“CAPM” = Capital Asset Pricing Model

\[ R_f + \beta * (r_m - r_f) \]

- “The $10 Question”

- As the perceived risk of a company increases, an equity investor will require a higher rate of return
  - Risk free rate of return (“\( r_f \)” ) – the minimum return an investor should expect to receive
  - \( R_f + (r_m - r_f) \)

\[ 10\% + (1000\% - 10\%) = 1000\% \]

- Treasury securities are a good proxy for \( r_f \)

\[ 3\% + (10\% - 3\%) = 10\% \]
Cost of Equity - Beta

Question: If the stock market were to fall 50% next year, would you prefer to have been invested in a mature and stable company or an early stage technology software growth company?

- CAPM says an investor should be rewarded more for investing in a stock that fluctuates more with stock market performance.
- Beta provides a method to estimate the riskiness of a stock with the overall stock market.
  - Beta of 1.0 is “as risky” as the overall stock market.
  - Beta of 2.0 should see returns on its equity rise or drop twice as fast as the overall market.

\[ R_f + \beta \times (r_m - r_f) \]

- Question: What are the limitations of WACC?