A Really Big Deal!

ABInBev (The Acquirer)
- Incorporated in US
- Largest beer company in the world with revenues of $46 billion
- Strongest in Latin America (Brazil) and US
- History of growing with acquisitions

Motives for merger
1. Global Complementarity
   - Grow AB in Africa
   - Grow SAB in Latin America
2. Consolidation
   - Cost cutting (in Latin America)

SABMiller (The Target)
- Incorporated in UK
- Second largest brewer in the world with revenues of $22 billion
- Strongest in Africa and Latin America (other than Brazil)
- Owns 58% of MillerCoors, a JV with Molson Beer and other associates.

First News Story
September 15, 2015

Market Capitalization
ABInBev: $175 billion
SABMiller: $75 billion

Deal Reached
October 13, 2015

Consequences
- Sell stake in MillerCoors
- Sell Chinese segment of SAB

Market Capitalization
ABInBev: $183 billion
SABMiller: $100 billion
The Acquirer (ABInBev)

<table>
<thead>
<tr>
<th>Capital Mix</th>
<th>Operating Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest-bearing Debt</td>
<td>Revenues</td>
</tr>
<tr>
<td>$51,504</td>
<td>$45,762.00</td>
</tr>
<tr>
<td>Lease Debt</td>
<td>Operating Income (EBIT)</td>
</tr>
<tr>
<td>$1,511</td>
<td>$14,772.00</td>
</tr>
<tr>
<td>Market Capitalization</td>
<td>Operating Margin</td>
</tr>
<tr>
<td>$173,760</td>
<td>32.28%</td>
</tr>
<tr>
<td>Debt to Equity ratio</td>
<td>Effective tax rate</td>
</tr>
<tr>
<td>30.51%</td>
<td>18.00%</td>
</tr>
<tr>
<td>Debt to Capital ratio</td>
<td>After-tax return on capital</td>
</tr>
<tr>
<td>23.38%</td>
<td>12.10%</td>
</tr>
<tr>
<td>Bond Rating</td>
<td>Reinvestment Rate =</td>
</tr>
<tr>
<td>A2</td>
<td>50.99%</td>
</tr>
</tbody>
</table>

Revenue Breakdown (2014)

- North America: 36%
- Latin America: 42%
- Europe: 11%
- Asia Pacific: 11%
- Africa: 0%
### The Target (SABMiller)

#### Capital Mix

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Interest-bearing Debt</td>
<td>$12,550</td>
</tr>
<tr>
<td>Lease Debt</td>
<td>$368</td>
</tr>
<tr>
<td>Market Capitalization</td>
<td>$75,116</td>
</tr>
<tr>
<td>Debt to Equity ratio</td>
<td>17.20%</td>
</tr>
<tr>
<td>Debt to Capital ratio</td>
<td>14.67%</td>
</tr>
<tr>
<td>Bond Rating</td>
<td>A3</td>
</tr>
</tbody>
</table>

#### Operating Metrics

| Revenues               | $22,130.00                        |
| Operating Income (EBIT)| $4,420.00                         |
| Operating Margin       | 19.97%                            |
| Effective tax rate     | 26.40%                            |
| After-tax return on capital | 10.32%                          |
| Reinvestment Rate      | 16.02%                            |

#### Revenue Breakdown (2015)

- Latin America: 35%
- Africa: 31%
- Asia Pacific: 14%
- Europe: 19%
- North America: 1%
Setting up the challenge

- SAB Miller’s market capitalization was $75 billion on September 15, 2015, the day ABInBev announced its intent to acquire SABMiller.
- The deal was completed (pending regulatory approval) a month later, with ABInBev agreeing to pay $104 billion for SABMiller.
- Can ABInBev create $29 billion in additional value from this acquisition and if so where will it find the value?
  - The market seems to think so, adding $33 billion in market value to the combined company.
The Three (Value) Reasons for Acquisitions

- **Undervaluation**: You buy a target company because you believe that the market is mispricing the company and that you can buy it for less than its "fair" value.

- **Control**: You buy a company that you believe is badly managed, with the intent of changing the way it is run. If you are right on the first count and can make the necessary changes, the value of the firm should increase under your management.

- **Synergy**: You buy a company that you believe, when combined with a business (or resource) that you already own, will be able to do things that you could not have done as separate entities. This synergy can be:
  - Offensive synergy: Higher growth and increased pricing power
  - Defensive synergy: Cost cutting, consolidation & preemptioning competitors.
  - Tax synergy: Directly from tax clauses or indirectly through dent
Four numbers to watch

1. **Acquisition Price**: This is the price at which you can acquire the target company. If it is a private business, it will be negotiated and probably based on what others are paying for similar businesses. If it is a public company, it will be at a premium over the market price.

2. **Status Quo Value**: Value of the target company, run by existing management.

3. **Restructured Value**: Value of the target company, with changes to investing, financing and dividend policies.

4. **Synergy value**: Value of the combined company (with the synergy benefits built in) – (Value of the acquiring company, as a stand alone entity, and the restructured value of the target company)

**The Acid Test**

- **Undervaluation**: Price for target company < Status Quo Value
- **Control**: Price for target company < Restructured Value
- **Synergy**: Price for target company < Restructured Value + Value of Synergy
# SAB Miller Status Quo Value

<table>
<thead>
<tr>
<th></th>
<th>SAB Miller</th>
<th>+ Coors JV</th>
<th>+ Share of Associates</th>
<th>SAB Miller Consolidated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$22,130.00</td>
<td>$5,201.00</td>
<td>$6,099.00</td>
<td></td>
</tr>
<tr>
<td>Operating Margin</td>
<td>19.97%</td>
<td>15.38%</td>
<td>10.72%</td>
<td></td>
</tr>
<tr>
<td>Operating Income (EBIT)</td>
<td>$4,420.00</td>
<td>$800.00</td>
<td>$654.00</td>
<td></td>
</tr>
<tr>
<td>Invested Capital</td>
<td>$31,526.00</td>
<td>$5,428.00</td>
<td>$4,459.00</td>
<td></td>
</tr>
<tr>
<td>Beta</td>
<td>0.7977</td>
<td>0.6872</td>
<td>0.6872</td>
<td></td>
</tr>
<tr>
<td>ERP</td>
<td>8.90%</td>
<td>6.00%</td>
<td>7.90%</td>
<td></td>
</tr>
<tr>
<td>Cost of Equity</td>
<td>9.10%</td>
<td>6.12%</td>
<td>7.43%</td>
<td></td>
</tr>
<tr>
<td>After-tax cost of debt</td>
<td>2.24%</td>
<td>2.08%</td>
<td>2.24%</td>
<td></td>
</tr>
<tr>
<td>Debt to Capital Ratio</td>
<td>14.67%</td>
<td>0.00%</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Cost of capital</td>
<td>8.09%</td>
<td>6.12%</td>
<td>7.43%</td>
<td></td>
</tr>
<tr>
<td>After-tax return on capital</td>
<td>10.33%</td>
<td>11.05%</td>
<td>11.00%</td>
<td></td>
</tr>
<tr>
<td>Reinvestment Rate</td>
<td>16.02%</td>
<td>40.00%</td>
<td>40.00%</td>
<td></td>
</tr>
<tr>
<td>Expected growth rate</td>
<td>1.65%</td>
<td>4.42%</td>
<td>4.40%</td>
<td></td>
</tr>
<tr>
<td>Number of years of growth</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

### Value of firm

| PV of FCFF in high growth | $11,411.72 | $1,715.25 | $1,351.68 |
| Terminal value           | $47,711.04 | $15,094.36 | $9,354.28 |

### Value of operating assets today

| Value of operating assets today | $43,747.24 | $12,929.46 | $7,889.56 | $64,566.26 |
| + Cash                      |           |           |           | $1,027.00  |
| - Debt                      |           |           |           | $12,918.00 |
| - Minority Interests        |           |           |           | $1,183.00  |
| Value of equity             |           |           |           | $51,492.26 |

Price on September 15, 2015: $75 billion > $51.5 billion
<table>
<thead>
<tr>
<th></th>
<th>SABMiller</th>
<th>ABInBev</th>
<th>Global Alcoholic Beverage Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-tax Operating Margin</td>
<td>19.97%</td>
<td>32.28%</td>
<td>19.23%</td>
</tr>
<tr>
<td>Effective Tax Rate</td>
<td>26.36%</td>
<td>18.00%</td>
<td>22.00%</td>
</tr>
<tr>
<td>Pre-tax ROIC</td>
<td>14.02%</td>
<td>14.76%</td>
<td>17.16%</td>
</tr>
<tr>
<td>ROIC</td>
<td>10.33%</td>
<td>12.10%</td>
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</tr>
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<td>16.02%</td>
<td>50.99%</td>
<td>33.29%</td>
</tr>
<tr>
<td>Debt to Capital</td>
<td>14.67%</td>
<td>23.38%</td>
<td>18.82%</td>
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</tbody>
</table>
## SABMiller: Value of Control

<table>
<thead>
<tr>
<th></th>
<th>Status Quo Value</th>
<th>Optimal value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost of Equity =</strong></td>
<td>9.10%</td>
<td>9.37%</td>
</tr>
<tr>
<td><strong>After-tax cost of debt =</strong></td>
<td>2.24%</td>
<td>2.24%</td>
</tr>
<tr>
<td><strong>Cost of capital =</strong></td>
<td>8.09%</td>
<td>8.03%</td>
</tr>
<tr>
<td><strong>After-tax return on capital =</strong></td>
<td>10.33%</td>
<td>12.64%</td>
</tr>
<tr>
<td><strong>Reinvestment Rate =</strong></td>
<td>16.02%</td>
<td>33.29%</td>
</tr>
<tr>
<td><strong>Expected growth rate =</strong></td>
<td>1.65%</td>
<td>4.21%</td>
</tr>
</tbody>
</table>

### Value of Firm

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<tr>
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<th>Optimal value</th>
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<tbody>
<tr>
<td><strong>PV of FCFF in high growth =</strong></td>
<td>$11,411.72</td>
<td>$9,757.08</td>
</tr>
<tr>
<td><strong>Terminal value =</strong></td>
<td>$47,711.04</td>
<td>$56,935.06</td>
</tr>
<tr>
<td><strong>Value of operating assets today =</strong></td>
<td>$43,747.24</td>
<td>$48,449.42</td>
</tr>
<tr>
<td>+ Cash</td>
<td>$1,027.00</td>
<td>$1,027.00</td>
</tr>
<tr>
<td>+ Minority Holdings</td>
<td>$20,819.02</td>
<td>$20,819.02</td>
</tr>
<tr>
<td>- Debt</td>
<td>$12,918.00</td>
<td>$12,918.00</td>
</tr>
<tr>
<td>- Minority Interests</td>
<td>$1,183.00</td>
<td>$1,183.00</td>
</tr>
<tr>
<td><strong>Value of equity</strong></td>
<td><strong>$51,492.26</strong></td>
<td><strong>$56,194.44</strong></td>
</tr>
</tbody>
</table>

### Value of Control

- **Price on September 15, 2015:** $75 billion > $51.5 + $4.7 billion

...
## The Synergies?

<table>
<thead>
<tr>
<th></th>
<th>Inbev</th>
<th>SABMiller</th>
<th>Combined firm (status quo)</th>
<th>Combined firm (synergy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levered Beta</td>
<td>0.85</td>
<td>0.8289</td>
<td>0.84641</td>
<td>0.84641</td>
</tr>
<tr>
<td>Pre-tax cost of debt</td>
<td>3.0000%</td>
<td>3.2000%</td>
<td>3.00%</td>
<td>3.00%</td>
</tr>
<tr>
<td>Effective tax rate</td>
<td>18.00%</td>
<td>26.36%</td>
<td>19.92%</td>
<td>19.92%</td>
</tr>
<tr>
<td>Debt to Equity Ratio</td>
<td>30.51%</td>
<td>23.18%</td>
<td>29.71%</td>
<td>29.71%</td>
</tr>
<tr>
<td>Revenues</td>
<td>$45,762.00</td>
<td>$22,130.00</td>
<td>$67,892.00</td>
<td>$67,892.00</td>
</tr>
<tr>
<td>Operating Margin</td>
<td>32.28%</td>
<td>19.97%</td>
<td>28.27%</td>
<td>30.00%</td>
</tr>
<tr>
<td>Operating Income (EBIT)</td>
<td>$14,771.97</td>
<td>$4,419.36</td>
<td>$19,191.33</td>
<td>$20.368</td>
</tr>
<tr>
<td>After-tax return on capital</td>
<td>12.10%</td>
<td>12.64%</td>
<td>11.68%</td>
<td>12.00%</td>
</tr>
<tr>
<td>Reinvestment Rate =</td>
<td>50.99%</td>
<td>33.29%</td>
<td>43.58%</td>
<td>50.00%</td>
</tr>
<tr>
<td>Expected Growth Rate</td>
<td>6.17%</td>
<td>4.21%</td>
<td>5.09%</td>
<td>6.00%</td>
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</tbody>
</table>
The value of synergy

<table>
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<tr>
<td>Cost of capital =</td>
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<td>7.51%</td>
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**Value of firm**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PV of FCFF in high growth =</td>
<td>$28,733</td>
<td>$9,806</td>
<td>$38,539</td>
<td>$39,151</td>
</tr>
<tr>
<td>Terminal value =</td>
<td>$260,982</td>
<td>$58,736</td>
<td>$319,717</td>
<td>$340,175</td>
</tr>
<tr>
<td>Value of operating assets =</td>
<td>$211,953</td>
<td>$50,065</td>
<td>$262,018</td>
<td>$276,610</td>
</tr>
</tbody>
</table>

Value of synergy = 276,610 – 262,018 = 14,592 million
Passing Judgment

- If you add up the restructured firm value of $56.2 billion to the synergy value of $14.6 billion, you get a value of about $70.8 billion.
- That is well below the $104 billion that ABInBev is planning to pay for SABMiller.
- One of the following has to be true:
  - I have massively under estimated the potential for synergy in this merger (either in terms of higher margins or higher growth).
  - ABInBev has over paid significantly on this deal. That would go against their history as a good acquirer and against the history of 3G Capital as a good steward of capital.
VALUE ENHANCEMENT AND THE EXPECTED VALUE OF CONTROL: BACK TO BASICS
The market gives... And takes away....

**Figure 1: Cumulative abnormal returns earned around the announcement date by firms changing their names to .com names**

**New Markets, New Names**
In the bull market, adding dot-com to a company name made a stock soar. Lately those zippy new monikers are disappearing.

**New Name, Higher Price**
But the stocks still get a bounce when dot-com goes away. Chart shows returns in the days before and after the name change.

Sources: Thomson Datastream, P. Raghavendra Rao, Michael J. Cooper, Igor Osobov, Purdue Univ., Ajay Koomar, Virginia Univ., Ajay Patel, Wake Forest Univ.
Using the DCF framework, there are four basic ways in which the value of a firm can be enhanced:

- The cash flows from existing assets to the firm can be increased, by either
  - increasing after-tax earnings from assets in place or
  - reducing reinvestment needs (net capital expenditures or working capital)
- The expected growth rate in these cash flows can be increased by either
  - Increasing the rate of reinvestment in the firm
  - Improving the return on capital on those reinvestments
- The length of the high growth period can be extended to allow for more years of high growth.
- The cost of capital can be reduced by
  - Reducing the operating risk in investments/ assets
  - Changing the financial mix
  - Changing the financing composition
Value Creation 1: Increase Cash Flows from Assets in Place

- More efficient operations and cost cutting: Higher Margins
- Divest assets that have negative EBIT
- Reduce tax rate
  - moving income to lower tax locales
  - transfer pricing
  - risk management

Revenues
* Operating Margin
= EBIT
- Tax Rate * EBIT
= EBIT (1-\(t\))
+ Depreciation
- Capital Expenditures
- Chg in Working Capital
= FCFF

- Live off past over-investment
- Better inventory management and tighter credit policies
Value Creation 2: Increase Expected Growth

**Pricing Strategies**

*Price Leader versus Volume Leader Strategies*

Return on Capital = Operating Margin * Capital Turnover Ratio

Game theory

How will your competitors react to your moves?
How will you react to your competitors’ moves?
Value Creating Growth... Evaluating the Alternatives..

Modes of organic growth vary in value creation intensity—consumer goods industry

- **New-product market development**: Shareholder value created for incremental $1 million of growth/target acquisition size: 1.75–2.00 $ billions
- **Expanding an existing market**: 0.30–0.75
- **Maintaining/growing share in a growing market**: 0.10–0.50
- **Competing for share in a stable market**: -0.25–0.40
- **Acquisition (25th to 75th percentile result)**: -0.5–0.20

Revenue growth/acquisition size necessary to double typical company’s share price: 5–6

- **5–6**: 13–33
- **20–100**: n/m–25
- **n/m–50**:
III. Building Competitive Advantages: Increase length of the growth period

- **Increase length of growth period**
  - Build on existing competitive advantages
  - Find new competitive advantages
    - Brand name
    - Legal Protection
    - Switching Costs
    - Cost advantages
Value Creation 4: Reduce Cost of Capital

Cost of Equity \( \frac{E}{(D+E)} \) + Pre-tax Cost of Debt \( \frac{D}{(D+E)} \) = Cost of Capital

- Change financing mix
  - Match debt to assets, reducing default risk
    - Swaps
    - Derivatives
    - Hybrids
  - More effective advertising
- Make product or service less discretionary to customers
  - Changing product characteristics
- Reduce operating leverage
  - Flexible wage contracts & cost structure
- Outsourcing
  - Flexible wage contracts & cost structure
SAP: Status Quo

Current Cashflow to Firm

| EBIT(1-t) | 1414 |
| Nt CpX | 831 |
| Chg WC | -19 |
| = FCFF | 602 |
| Reinvestment Rate = 812/1414 = 57.42% |

Reinvestment Rate 57.42%

Expected Growth in EBIT (1-t)

\[ 0.5742 \times 1.93 = 1.144 \]

11.44%

Return on Capital 19.93%

Stable Growth

\[ g = 3.41\%; \quad \text{Beta} = 1.00\%; \quad \text{Debt Ratio} = 20\% \]

\[ \text{Cost of capital} = 6.62\% \]

\[ \text{ROC} = 6.62\%; \quad \text{Tax rate} = 35\% \]

Reinvestment Rate = 51.54%

Terminal Value

\[ 1717 / (0.0662 - 0.0341) = 53546 \]

Op. Assets 31,615
+ Cash: 3,018
- Debt 558
- Pension Lian 305
- Minor. Int. 55
=Equity 34,656
-Options 180
Value/Share 106.12

Cost of Capital (WACC) = 8.77% (0.986) + 2.39% (0.014) = 8.68%

Cost of Equity 8.77%

Cost of Debt

\[ (3.41\% + 0.35\%)(1 - 0.3654) = 2.39\% \]

Weights

\[ E = 98.6\%; \quad D = 1.4\% \]

Riskfree Rate: Euro riskfree rate = 3.41%

Beta 1.26

Risk Premium 4.25%

Unlevered Beta for Sectors: 1.25

Country Equity Prem 0.25%

Mature risk premium 4%

On May 5, 2005, SAP was trading at 122 Euros/share
## SAP : Optimal Capital Structure

<table>
<thead>
<tr>
<th>Debt Ratio</th>
<th>Beta</th>
<th>Cost of Equity</th>
<th>Bond Rating</th>
<th>Interest rate on debt</th>
<th>Tax Rate</th>
<th>Cost of Debt (after-tax)</th>
<th>WACC</th>
<th>Firm Value (G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>1.25</td>
<td>8.72%</td>
<td>AAA</td>
<td>3.76%</td>
<td>36.54%</td>
<td>2.39%</td>
<td>8.72%</td>
<td>$39,088</td>
</tr>
<tr>
<td>10%</td>
<td>1.34</td>
<td>9.09%</td>
<td>AAA</td>
<td>3.76%</td>
<td>36.54%</td>
<td>2.39%</td>
<td>8.42%</td>
<td>$41,480</td>
</tr>
<tr>
<td>20%</td>
<td>1.45</td>
<td>9.56%</td>
<td>A</td>
<td>4.26%</td>
<td>36.54%</td>
<td>2.70%</td>
<td>8.19%</td>
<td>$43,567</td>
</tr>
<tr>
<td>30%</td>
<td>1.59</td>
<td>10.16%</td>
<td>A-</td>
<td>4.41%</td>
<td>36.54%</td>
<td>2.80%</td>
<td>7.95%</td>
<td>$45,900</td>
</tr>
<tr>
<td>40%</td>
<td>1.78</td>
<td>10.96%</td>
<td>CCC</td>
<td>11.41%</td>
<td>36.54%</td>
<td>7.24%</td>
<td>9.47%</td>
<td>$34,043</td>
</tr>
<tr>
<td>50%</td>
<td>2.22</td>
<td>12.85%</td>
<td>C</td>
<td>15.41%</td>
<td>22.08%</td>
<td>12.01%</td>
<td>12.43%</td>
<td>$22,444</td>
</tr>
<tr>
<td>60%</td>
<td>2.78</td>
<td>15.21%</td>
<td>C</td>
<td>15.41%</td>
<td>18.40%</td>
<td>12.58%</td>
<td>13.63%</td>
<td>$19,650</td>
</tr>
<tr>
<td>70%</td>
<td>3.70</td>
<td>19.15%</td>
<td>C</td>
<td>15.41%</td>
<td>15.77%</td>
<td>12.98%</td>
<td>14.83%</td>
<td>$17,444</td>
</tr>
<tr>
<td>80%</td>
<td>5.55</td>
<td>27.01%</td>
<td>C</td>
<td>15.41%</td>
<td>13.80%</td>
<td>13.28%</td>
<td>16.03%</td>
<td>$15,658</td>
</tr>
<tr>
<td>90%</td>
<td>11.11</td>
<td>50.62%</td>
<td>C</td>
<td>15.41%</td>
<td>12.26%</td>
<td>13.52%</td>
<td>17.23%</td>
<td>$14,181</td>
</tr>
</tbody>
</table>
SAP: Restructured

Current Cashflow to Firm

| EBIT(1-t) | 1414 |
| Nt CpX   | 831  |
| Chg WC   | -19  |
| FCFF     | 602  |

Reinvestment Rate = 812/1414 = 57.42%

Expected Growth in EBIT (1-t)

0.70 * 0.1993 = 0.1144
13.99%

Return on Capital

19.93%

Stable Growth

g = 3.41%; Beta = 1.00;
Debt Ratio = 30%
Cost of capital = 6.27%
ROC = 6.27%; Tax rate = 35%
Reinvestment Rate = 54.38%

Terminal Value

10 = 1898 / (0.0627 - 0.0341) = 66367

Cost of Capital (WACC) = 10.57% (0.70) + 2.80% (0.30) = 8.24%

On May 5, 2005, SAP was trading at 122 Euros/share

Use more debt financing.

Op. Assets 38045
+ Cash: 3,018
- Debt 558
- Pension Lian 305
- Minor. Int. 55
= Equity 40157
- Options 180
Value/Share 126.51

Cost of Equity 10.57%

Riskfree Rate:
Euro riskfree rate = 3.41%

Beta 1.59

Risk Premium 4.50%

Unlevered Beta for Sectors: 1.25

Mature risk premium 4%

Country Equity Prem 0.5%

Weights
E = 70% D = 30%

Use more debt financing.
**Current Cashflow to Firm**

- EBIT(1-t): 163
- Nt CpX: 39
- Chg WC: 4
- FCFF: 120
- Reinvestment Rate: 26.46%

**Expected Growth in EBIT (1-t)**

\[ \text{Expected Growth} = 0.2645 \times 0.0406 = 0.0107 \]

**Stable Growth**

- \( g = 3\% \)
- Beta = 1.00
- Cost of capital = 6.76%
- ROC = 6.76%; Tax rate = 35%
- Reinvestment Rate = 44.37%

**Terminal Value**

\[ \text{Terminal Value} = \frac{104}{0.0676 - 0.03} = 2714 \]

**Discount at Cost of Capital (WACC)**

\[ \text{Discount} = 8.50\% \times 0.486 + 3.97\% \times 0.514 = 6.17\% \]

**Op. Assets:** 2,472
- Cash: 330
- Debt: 1847
- Equity: 955
- Options: 0
- Value/Share: $5.13

**Cost of Equity:** 8.50%

**Cost of Debt:**

\[ (4.10\% + 2\%) \times (1 - 0.35) = 3.97\% \]

**Weights**

- \( E = 48.6\% \)
- \( D = 51.4\% \)

**Riskfree Rate:**

- Riskfree rate = 4.10%

**Beta:**

- Beta = 1.10

**Risk Premium:**

- 4%

**Unlevered Beta for Sectors:** 0.80

**Firm's D/E Ratio:** 21.35%

**Mature risk premium:** 4%

**Country Equity Prem:** 0%
Blockbuster: Restructured

Current Cashflow to Firm
- EBIT(1-t) : 249
- Net CapX 39
- Chg WC 4
= FCFF 206
Reinvestment Rate = 43/249 = 17.32%

Reinvestment Rate
17.32%

Expected Growth in EBIT (1-t)
\[ .1732 \times .0620 = .0107 \]
1.07%

Return on Capital
6.20%

Stable Growth
- g = 3%
- Beta = 1.00
- Cost of capital = 6.76%

Expected Growth
- ROC = 6.76%
- Tax rate = 35%
- Reinvestment Rate = 44.37%

Terminal Value
5
\[ \frac{156}{.0676-.03} = 4145 \]

Discount at Cost of Capital (WACC)
- 8.50\% \times .486 + 3.97\% \times (0.514) = 6.17\%

EBIT (1-t)
- Year 1: $252
- Year 2: $255
- Year 3: $258
- Year 4: $264
- Year 5: $272
- Reinvestment
- Year 1: $44
- Year 2: $44
- Year 3: $59
- Year 4: $89
- Year 5: $121
- FCFF
- Year 1: $208
- Year 2: $211
- Year 3: $200
- Year 4: $176
- Year 5: $151

Term Yr
- Year 280
- Year 124
- Year 156

Op. Assets
3,840
+ Cash: 330
- Debt 1847
= Equity 2323
- Options 0
Value/Share $ 12.47

Cost of Equity
8.50\%

Cost of Debt
\[ (4.10\% + 2\%) \times (1 - .35) = 3.97\% \]

Discount at Cost of Capital (WACC) = 8.50\% \times .486 + 3.97\% \times (0.514) = 6.17\%

Cost of Equity
8.50\%

Cost of Debt
3.97\%

Weights
- E = 48.6\%
- D = 51.4\%

Riskfree Rate
- Riskfree rate = 4.10\%

Risk Premium
- 4\% + 4\% = 8\% 4\% + 4\% = 8\%

Risk Premium
4\%

Unlevered Beta for Sectors: 0.80

Beta
1.10

Country Equity Prem
0\%

Mature risk premium 4\%
The Expected Value of Control

The Value of Control

Probability that you can change the management of the firm

\[ \times \]

Change in firm value from changing management

- Takeover Restrictions
- Voting Rules & Rights
- Access to Funds
- Size of company

Value of the firm run optimally

Value of the firm run status quo
Why the probability of management changing shifts over time...

- Corporate governance rules can change over time, as new laws are passed. If the change gives stockholders more power, the likelihood of management changing will increase.

- Activist investing ebbs and flows with market movements (activist investors are more visible in down markets) and often in response to scandals.

- Events such as hostile acquisitions can make investors reassess the likelihood of change by reminding them of the power that they do possess.
You can estimate the probability of management changes by using historical data (on companies where change has occurred) and statistical techniques such as probits or logits.

Empirically, the following seem to be related to the probability of management change:

- Stock price and earnings performance, with forced turnover more likely in firms that have performed poorly relative to their peer group and to expectations.
- Structure of the board, with forced CEO changes more likely to occur when the board is small, is composed of outsiders and when the CEO is not also the chairman of the board of directors.
- Ownership structure, since forced CEO changes are more common in companies with high institutional and low insider holdings. They also seem to occur more frequently in firms that are more dependent upon equity markets for new capital.
- Industry structure, with CEOs more likely to be replaced in competitive industries.
Manifestations of the Value of Control

- Hostile acquisitions: In hostile acquisitions which are motivated by control, the control premium should reflect the change in value that will come from changing management.

- Valuing publicly traded firms: The market price for every publicly traded firm should incorporate an expected value of control, as a function of the value of control and the probability of control changing.
  - Market value = Status quo value + (Optimal value – Status quo value) \* Probability of management changing

- Voting and non-voting shares: The premium (if any) that you would pay for a voting share should increase with the expected value of control.

- Minority Discounts in private companies: The minority discount (attached to buying less than a controlling stake) in a private business should be increase with the expected value of control.

Aswath Damodaran
1. Hostile Acquisition: Example

- In a hostile acquisition, you can ensure management change after you take over the firm. Consequently, you would be willing to pay up to the optimal value.

- As an example, Blockbuster was trading at $9.50 per share in July 2005. The optimal value per share that we estimated as $12.47 per share. Assuming that this is a reasonable estimate, you would be willing to pay up to $2.97 as a premium in acquiring the shares.

- Issues to ponder:
  - Would you automatically pay $2.97 as a premium per share? Why or why not?
  - What would your premium per share be if change will take three years to implement?
2. Market prices of Publicly Traded Companies: An example

- The market price per share at the time of the valuation (May 2005) was roughly $9.50.
  - Expected value per share = Status Quo Value + Probability of control changing * (Optimal Value – Status Quo Value)
  - $9.50 = $5.13 + Probability of control changing ($12.47 - $5.13)

- The market is attaching a probability of 59.5% that management policies can be changed. This was after Icahn’s successful challenge of management. Prior to his arriving, the market price per share was $8.20, yielding a probability of only 41.8% of management changing.

<table>
<thead>
<tr>
<th></th>
<th>Value of Equity</th>
<th>Value per share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Quo</td>
<td>$955 million</td>
<td>$5.13 per share</td>
</tr>
<tr>
<td>Optimally managed</td>
<td>$2,323 million</td>
<td>$12.47 per share</td>
</tr>
</tbody>
</table>
Value of stock in a publicly traded firm

- When a firm is badly managed, the market still assesses the probability that it will be run better in the future and attaches a value of control to the stock price today:

\[
\text{Value per share} = \frac{\text{Status Quo Value} + \text{Probability of control change (Optimal - Status Quo Value)}}{\text{Number of shares outstanding}}
\]

- With voting shares and non-voting shares, a disproportionate share of the value of control will go to the voting shares. In the extreme scenario where non-voting shares are completely unprotected:

\[
\text{Value per non-voting share} = \frac{\text{Status Quo Value}}{\#\text{ Voting Shares} + \#\text{ Non-voting shares}}
\]

\[
\text{Value per voting share} = \text{Value of non-voting share} + \frac{\text{Probability of control change (Optimal - Status Quo Value)}}{\#\text{ Voting Shares}}
\]

Aswath Damodaran
3. Voting and Non-voting Shares: An Example

To value voting and non-voting shares, we will consider Embraer, the Brazilian aerospace company. As is typical of most Brazilian companies, the company has common (voting) shares and preferred (non-voting shares).

- Status Quo Value = 12.5 billion $R for the equity;
- Optimal Value = 14.7 billion $R, assuming that the firm would be more aggressive both in its use of debt and in its reinvestment policy.

There are 242.5 million voting shares and 476.7 non-voting shares in the company and the probability of management change is relatively low. Assuming a probability of 20% that management will change, we estimated the value per non-voting and voting share:

- Value per non-voting share = Status Quo Value/ (# voting shares + # non-voting shares) = 12,500/(242.5+476.7) = 17.38 $R/share
- Value per voting share = Status Quo value/sh + Probability of management change * (Optimal value – Status Quo Value) = 17.38 + 0.2* (14,700-12,500)/242.5 = 19.19 $R/share

With our assumptions, the voting shares should trade at a premium of 10.4% over the non-voting shares.

Aswath Damodaran
4. Minority Discount: An example

- Assume that you are valuing Kristin Kandy, a privately owned candy business for sale in a private transaction. You have estimated a value of $1.6 million for the equity in this firm, assuming that the existing management of the firm continues into the future and a value of $2 million for the equity with new and more creative management in place.
  - Value of 51% of the firm = 51% of optimal value = 0.51 * $2 million = $1.02 million
  - Value of 49% of the firm = 49% of status quo value = 0.49 * $1.6 million = $784,000

- Note that a 2% difference in ownership translates into a large difference in value because one stake ensures control and the other does not.
Maximize a variable that is correlated with the value of the firm. There are several choices for such a variable. It could be:

- an accounting variable, such as earnings or return on investment
- a marketing variable, such as market share
- a cash flow variable, such as cash flow return on investment (CFROI)
- a risk-adjusted cash flow variable, such as Economic Value Added (EVA)

The advantages of using these variables are that they:

- Are often simpler and easier to use than DCF value.

The disadvantage is that the:

- Simplicity comes at a cost; these variables are not perfectly correlated with DCF value.
Economic Value Added (EVA) and CFROI

- The Economic Value Added (EVA) is a measure of surplus value created on an investment.
  - Define the return on capital (ROC) to be the “true” cash flow return on capital earned on an investment.
  - Define the cost of capital as the weighted average of the costs of the different financing instruments used to finance the investment.
  - EVA = (Return on Capital - Cost of Capital) (Capital Invested in Project)

- The CFROI is a measure of the cash flow return made on capital
  - It is computed as an IRR, based upon a base value of capital invested and the cash flow on that capital.
The bottom line...

- The value of a firm is not going to change just because you use a different metric for value. All approaches that are discounted cash flow approaches should yield the same value for a business, if they make consistent assumptions.

- If there are differences in value from using different approaches, they must be attributable to differences in assumptions, either explicit or implicit, behind the valuation.
Assume that you have a firm with a book value value of capital of $100 million, on which it expects to generate a return on capital of 15% in perpetuity with a cost of capital of 10%.

This firm is expected to make additional investments of $10 million at the beginning of each year for the next 5 years. These investments are also expected to generate 15% as return on capital in perpetuity, with a cost of capital of 10%.

After year 5, assume that
- The earnings will grow 5% a year in perpetuity.
- The firm will keep reinvesting back into the business but the return on capital on these new investments will be equal to the cost of capital (10%).
Firm Value using EVA Approach

Capital Invested in Assets in Place = $100

EVA from Assets in Place = \((0.15 - 0.10) \times 100 / 0.10\) = $50

+ PV of EVA from New Investments in Year 1 = \(\frac{(0.15 - 0.10) \times 10}{0.10}\) = $5

+ PV of EVA from New Investments in Year 2 = \(\frac{(0.15 - 0.10) \times 10}{0.10} / 1.1\) = $4.55

+ PV of EVA from New Investments in Year 3 = \(\frac{(0.15 - 0.10) \times 10}{0.10} / 1.1^2\) = $4.13

+ PV of EVA from New Investments in Year 4 = \(\frac{(0.15 - 0.10) \times 10}{0.10} / 1.1^3\) = $3.76

+ PV of EVA from New Investments in Year 5 = \(\frac{(0.15 - 0.10) \times 10}{0.10} / 1.1^4\) = $3.42

Value of Firm = $170.85
### Firm Value using DCF Valuation: Estimating FCFF

<table>
<thead>
<tr>
<th></th>
<th>Base Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Term. Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT (1-t) : Assets in Place</td>
<td>$ 15.00</td>
<td>$ 15.00</td>
<td>$ 15.00</td>
<td>$ 15.00</td>
<td>$ 15.00</td>
<td>$ 15.00</td>
<td></td>
</tr>
<tr>
<td>EBIT(1-t) : Investments- Yr 1</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td></td>
</tr>
<tr>
<td>EBIT(1-t) : Investments- Yr 2</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td></td>
</tr>
<tr>
<td>EBIT(1-t): Investments -Yr 3</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td></td>
</tr>
<tr>
<td>EBIT(1-t): Investments -Yr 4</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td>$ 1.50</td>
<td></td>
</tr>
<tr>
<td>EBIT(1-t): Investments- Yr 5</td>
<td>$ 1.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total EBIT(1-t)</td>
<td>$ 16.50</td>
<td>$ 18.00</td>
<td>$ 19.50</td>
<td>$ 21.00</td>
<td>$ 22.50</td>
<td>$ 23.63</td>
<td></td>
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<tr>
<td>- Net Capital Expenditures</td>
<td>$10.00</td>
<td>$10.00</td>
<td>$10.00</td>
<td>$10.00</td>
<td>$10.00</td>
<td>$11.25</td>
<td></td>
</tr>
<tr>
<td>FCFF</td>
<td>$ 6.50</td>
<td>$ 8.00</td>
<td>$ 9.50</td>
<td>$11.00</td>
<td>$11.25</td>
<td>$11.81</td>
<td></td>
</tr>
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</table>

After year 5, the reinvestment rate is 50% = \( g / \text{ROC} \)