Economic Value Added (EVA) Valuation Tutorial
Index

1. Introduction to valuation: valuation of bond
2. Company valuation
   - Determining the cost of capital
   - Calculating EVA
3. Detailed examples of EVA-valuation
4. Live Examples of EVA-valuation
5. EVA and DCF analogy
"The price paid for any asset should reflect the cash flows that asset is expected to generate". E.g. an ordinary government bond, with 5 years to maturity and a 5% coupon rate is valued in a following manner as the market interest rate is 5%:

<table>
<thead>
<tr>
<th>Year</th>
<th>Coupon</th>
<th>Discount Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5%</td>
<td>0.95</td>
<td>4.76</td>
</tr>
<tr>
<td>2</td>
<td>5%</td>
<td>0.91</td>
<td>4.53</td>
</tr>
<tr>
<td>3</td>
<td>5%</td>
<td>0.86</td>
<td>4.31</td>
</tr>
<tr>
<td>4</td>
<td>5%</td>
<td>0.82</td>
<td>4.11</td>
</tr>
<tr>
<td>5</td>
<td>5%</td>
<td>0.78</td>
<td>82.27</td>
</tr>
</tbody>
</table>

Bond nominal value 100

Bond face value 100 returned (after 5 yr. maturity)
Valuation of a bond 2/3

Example of how the bond value changes as interest rate rises from 5% (previous page) to 10%.

Interest rate 10%
Coupon rate 5%

Bond coupon rate < market interest rate

Discounting: change future values to present values

Discount factor for cash flow occurring next year: $1/(1,05) = 0.95$

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupon 5</td>
<td>Coupon 5</td>
<td>Coupon 5</td>
<td>Coupon 5</td>
<td>Coupon 5</td>
</tr>
<tr>
<td>/0.91</td>
<td>/0.83</td>
<td>/0.75</td>
<td>/0.68</td>
<td>/0.62</td>
</tr>
<tr>
<td>4.55</td>
<td>4.13</td>
<td>3.76</td>
<td>3.42</td>
<td></td>
</tr>
<tr>
<td>65.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bond face value 100 returned (after 5 yr. maturity)
Valuation of a bond 3/3 (EVA approach)

- Interest rate: 10%
- Coupon rate: 5%

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>/0.91</td>
<td>/0.83</td>
<td>/0.75</td>
<td>/0.68</td>
<td>/0.62</td>
</tr>
<tr>
<td>-4.5</td>
<td>-4.1</td>
<td>-3.8</td>
<td>-3.4</td>
<td>-3.1</td>
</tr>
</tbody>
</table>

The same bond market value can be calculated by focusing on the difference between annual coupon (5) and the capital cost per year (10% x 100 = 10).

As we discount these differences: (5 - 10 = -5 each year) to the present, we see how much the market value will be below (or above) capital invested i.e. bond nominal value.
Analogy between bond and company valuation

• In principle, the valuation of a bond and valuation of a company are the same:
  – You discount the future cash-flows into the present, sum them up and thus get the bond/company value
  – OR: you calculate how much the bond/company earns above or below its opportunity cost (cost of capital), discount these values to the present and add this to or subtract this from the book value

• The following pages will demonstrate how to use the latter method in theory and in practice in company valuation

• The difference between company’s return and its capital costs is called Economic Value Added, EVA which is often called also Residual Income or Economic Profit
Cost of capital

- The cost of capital of a company is the average cost of equity and debt
- The cost of debt should be defined as the (long term) risk free rate + company premium, e.g. 5% + 0,5% = 5,5%
- Cost of equity -> average return on similar risky investment
  – Cost of Equity: (long term) risk free rate + beta x equity risk premium =>
  – 5% + 1,3 x 6% = 12,8%
- Cost of capital (with target solvency): (45% * 12,8%) + (55% * 5,5%)$^1$ ≈ 9%

$^1$Tax-schield of debt not included here

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed assets</strong></td>
<td><strong>Equity</strong></td>
</tr>
<tr>
<td>Land</td>
<td>Share capital 200</td>
</tr>
<tr>
<td>Real estate</td>
<td>Retained earnings 250</td>
</tr>
<tr>
<td>Machinery</td>
<td></td>
</tr>
<tr>
<td><strong>Working capital</strong></td>
<td><strong>Debt</strong></td>
</tr>
<tr>
<td>Inventories</td>
<td>long-term 250</td>
</tr>
<tr>
<td>Sales receivables</td>
<td>short-term 200</td>
</tr>
<tr>
<td>Cash and bank</td>
<td>other 100</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>Total liabilities</strong></td>
</tr>
<tr>
<td>1000</td>
<td>1000</td>
</tr>
</tbody>
</table>

WACC 9,0%  

Cost 12,8%  

Cost 5,5%
Calculating EVA

**Income Statement**
- Net sales
  - Variable costs
  - Fixed costs
- Gross profit
  - Depreciation
- Operating profit
  - fixed assets x WACC
  - Materials x WACC
  - Finished goods x WACC
  - Sales receivables x WACC
  + Accounts payable x WACC
- Taxes

**Assets**
- Land
- Buildings
- Machinery and equip.
- Material
- WIP-inventory
- Finished goods
- Sales receivables
- Cash and bank

**Liabilities**
- Share capital
- Retained earnings
- Excess depreciation
- Long-term debt
- Short-term debt
- Advances received
- Accounts payable
- Deferred items

**EVA**

**In a nutshell:**

\[
EVA = \text{Net Operating profit after taxes} - \text{Total cost of capital, or} \]

\[
EVA = \text{NOPAT} - \text{WACC} \times \text{Total Capital}
\]
EVA valuation of a company

Finance theory:
The value of the company = Book value of equity + the value of expected future EVA

Profitable company

Market value added

Future EVA-values are discounted to present

\[ EVA_{y+1} + EVA_{y+2} + EVA_{y+3} + \ldots \]

Capital Invested in the company

(we can use Book value of Equity if we assume that book value and market value of debt is the same)

Unprofitable company

Market value lost

\[ (-EVA_{y+1}) + (-EVA_{y+2}) + \ldots \]

Market value of unprofitable company

Capital Invested in the company

(or book value of equity)
In this case the analyst has estimated NOPAT, total cost of capital, and WACC% for next 6 years and the terminal value of EVA.

Calculating EVA

<table>
<thead>
<tr>
<th></th>
<th>Y-1</th>
<th>Y+0</th>
<th>Y+1</th>
<th>Y+2</th>
<th>Y+3</th>
<th>Y+4</th>
<th>Y+5</th>
<th>Y+6</th>
<th>TERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOPAT</td>
<td>97.7</td>
<td>113</td>
<td>136</td>
<td>152</td>
<td>173</td>
<td>193</td>
<td>202</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Total cost of capital</td>
<td>113.4</td>
<td>129.5</td>
<td>131.1</td>
<td>132.8</td>
<td>133.6</td>
<td>134.4</td>
<td>140.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Capital</td>
<td>1419</td>
<td>1 621</td>
<td>1 641</td>
<td>1 662</td>
<td>1 672</td>
<td>1 682</td>
<td>1 757</td>
<td>1 775</td>
<td></td>
</tr>
<tr>
<td>WACC %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
<td>8.0 %</td>
</tr>
<tr>
<td>= EVA</td>
<td>-15.7</td>
<td>-16.5</td>
<td>4.9</td>
<td>19.2</td>
<td>39.4</td>
<td>58.6</td>
<td>61.6</td>
<td>1474.6</td>
<td></td>
</tr>
</tbody>
</table>
EVA valuation of Company X 2/2

**Market value of Company A**

- **1 800 Million EUR**
- **18.00 EUR/share**

<table>
<thead>
<tr>
<th>Added Value of Company A</th>
<th>960 mEUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital invested</td>
<td>800 mEUR</td>
</tr>
<tr>
<td>8 EUR/share</td>
<td></td>
</tr>
</tbody>
</table>

**Added Value of** 960 mEUR 9.6 EUR/share

Capital invested 800 mEUR 8 EUR/share

- **In this case the analyst has estimated that the company will decrease shareholder value for years Y+0 and Y+1. After this the company will add shareholder value.**
- **The company’s added value for a shareholder is 9.6 EUR.**
- **If capital invested + Added value doesn’t equal the market value/share, then the share is either overvalued or undervalued.**
- **In this case the market value/share is 18.00 EUR and capital invested + estimated added value = 17.6 EUR => the share is overvalued by 0.40 EUR/share.**

### Calculating Present Value of EVA

<table>
<thead>
<tr>
<th>TERM</th>
<th>Y+0</th>
<th>Y+1</th>
<th>Y+2</th>
<th>Y+3</th>
<th>Y+4</th>
<th>Y+5</th>
<th>Y+6</th>
<th>EVA</th>
<th>Discount Factor</th>
<th>Present value of EVA</th>
<th>Sum of discounted EVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-15.7</td>
<td>-16.5</td>
<td>4.9</td>
<td>19.2</td>
<td>39.4</td>
<td>58.6</td>
<td>61.6</td>
<td>1474.6</td>
<td>1.00</td>
<td>-15.7</td>
<td>-15.3</td>
</tr>
<tr>
<td></td>
<td>1.00</td>
<td>0.93</td>
<td>0.86</td>
<td>0.79</td>
<td>0.74</td>
<td>0.68</td>
<td>0.63</td>
<td>0.58</td>
<td>0.93</td>
<td>0.86</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Sum of discounted EVA: 957.2

*Here you can find 50 real life examples of EVA valuation and market capitalization.*
EVA and DCF-valuation

Two different expressions from the same thing:

- EVA-valuation produces exactly the same valuation (fair value) as DCF.
- Actually in EVA valuation the book value of equity is off no meaning: the bigger book value, the bigger capital costs and thus the smaller EVA (what is left and what only has meaning to valuation is cash-flow).
- EVA is only another way (a more illustrative way) to calculate DCF valuation.

![Diagram showing the relationship between DCF value, Net earnings, Discount rate, Economic Value Added, Book value (of equity), and EVA.](image)

(To be precise: in DCF-valuation you do not discount Net earnings but cash flow, but here we assume that investments are exactly as big as depreciation and working capital does not change and thus Net Earnings = FCFF.)
EVA and DCF-valuation

• EVA-valuation has theoretically nothing new, but...
  
  – It is very illustrative, especially with traditional companies with slow growth
  
  – Easy to calculate straight from the EBIT, even one individual year describes often the situation well, unlike cash-flow of one individual year
  
  – At its best it forces to take the invested capital into account. Especially the sell-side analysts tend to focus on the income statement and not on the balance sheet. As you calculate the value of the company without the required attention to capital requirements in the long run, you normally overestimate the value of the company...
Further information

This tutorial is made by Valuatum Ltd, a software company specialized in equity research solutions.

We provide services to stockbrokers, investment banks, private equity companies and asset managers worldwide. Our software services are also used by universities and other educational institutions.

If you got interested in our services, please contact us:

contact@valuatum.com

For further information, please visit our webpages:

www.valuatum.com
Thank you!