Advanced Valuation Methods

Economic Profit Model

Economic Profit (aka EVA)

- EVA represents economic value added
- Reorders cash flows to allow shareholders to relate company operating performance directly to shareholder value
- Adjusts capital to eliminate distortions
  - Financing perspective
    Capital = Debt + equity
  - Operating perspective
    Capital = Fixed assets + working capital.
Components of EVA

- NOPLAT
  - Net operating profit after tax
- Capital
  - Net working capital, net PP&E, goodwill, and other assets
- Cost of capital
  - Weighted average cost of capital
- Capital charge
  - Cost of capital * capital
- Economic value added
  - NOPLAT less the capital charge.

What is NOPLAT?

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>150,000</td>
</tr>
<tr>
<td>Cost of sales</td>
<td>135,000</td>
</tr>
<tr>
<td>Depreciation</td>
<td>2,000</td>
</tr>
<tr>
<td>SG&amp;A</td>
<td>7,000</td>
</tr>
<tr>
<td>Net Operating profit</td>
<td>6,000</td>
</tr>
<tr>
<td>Taxes @ 40%</td>
<td>2,400</td>
</tr>
<tr>
<td>NOPLAT</td>
<td>3,600</td>
</tr>
</tbody>
</table>

Excludes financing charges
**What is Capital?**

- **Capital:** Net operating assets adjusted for certain accounting distortions
  - Asset write-downs, restructuring charges, ...
- **Net operating assets:**
  - Cash, receivables, inventory, prepaids
  - Trade payable, accruals, deferred taxes
  - Net property, plant, and equipment
- **Non-operating assets:**
  - Marketable securities, investments,...

**What is the Capital Charge?**

- Represents a rental charge for the use of the operating capital
- Minimum rate of return the operating capital should earn
- Calculated as the firm’s weighted average cost of capital.
Calculating EVA

- Two methods lead to the same answer

**Method 1:**
- EVA = (ROIC% - WACC%) * Invested operating capital
  - Profitability captured by the spread: ROIC% - WACC%
  - Growth captured by the invested operating capital
- ROIC = NOPLAT / net operating invested capital

**Method 2:**
- EVA = Operating profits after taxes - (WACC% * Invested operating capital)
  - Similar to the economist’s definition of profit.

Calculating EVA: An Operating Approach

Net operating profit after tax (NOPLAT) - Capital charge (= WACC * Capital) = Economic value added (EVA)
Calculating EVA: A Financing Approach

\[
\text{NOPLAT/Average capital} = \text{Return on invested operating capital (ROIC)} - \text{Weight average cost of capital (WACC)}
\]
\[
= \text{Spread (ROIC - WACC)} \\ * \text{Capital}
\]
\[
= \text{Economic value added (EVA)}
\]

What’s Affecting EVA?

Sales
- Operating expenses
- Taxes

= NOPLAT
- Capital charge

= EVA

Evaluate the many assumptions
Valuation Text

- Look at Exhibits 8.9 & 8.11
  - Pages 141 and 145 of text.

EVA & Shareholder Value

- What is the best way to measure shareholder value?
  - Fortune 500 sales?
  - Earnings per share?
  - Business Week survey of market value of equity?
  - Stock market share price?
  - Market value added?
Defining Shareholder Value

Total market value

Premium

Debt & equity capital

Market value added

Investment

MVA = Present value of all future EVA

Expected improvement in EVA

Current level of EVA
EVA & Market Value

- Market value of a company reflects:
  - Value of invested capital
  - Value of ongoing operations
  - Present value of expected future economic profits
    - Captures improvement in operating performance
- EVA related to market value by:
  - Measuring all the capital
  - Seeing what the firm is going to do with the capital
  - Turn those free cash flow forecasts into EVA forecasts
  - Discount EVA.

Relationship Between EVA & MVA

\[
\text{Market value} = \frac{\text{EVA}_{\text{Year 1}}}{1+r} + \frac{\text{EVA}_{\text{Year 2}}}{(1+r)^2} + \frac{\text{EVA}_{\text{Year 3}}}{(1+r)^3} + \ldots + \frac{\text{EVA}_{\text{Year n}}}{(1+r)^n}
\]

Market value is based on establishing the economic investment made in the company (capital), making a best guess about what economic profits (EVA) will happen in the future, and discounting those EVAs to the present to get market value added.
**EVA Drives MVA**

Companies that consistently earn profits in excess of their required return ...

<table>
<thead>
<tr>
<th>NOPLAT</th>
<th>Charge</th>
<th>EVA</th>
</tr>
</thead>
</table>

... are typically valued at premiums to book value.

<table>
<thead>
<tr>
<th>Market Value</th>
<th>Capital</th>
<th>MVA</th>
</tr>
</thead>
</table>

**Growth**

<table>
<thead>
<tr>
<th>Growth</th>
<th>Quadrant 2: Diminish value</th>
<th>Quadrant 1: Create value</th>
<th>Quadrant 3: Protect value</th>
<th>Quadrant 4: Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Growth: A double edged sword

<table>
<thead>
<tr>
<th>0</th>
<th>ROIC - WACC</th>
</tr>
</thead>
</table>
Management Implications

- **Quadrant 1: Create value**
  - NPVs > 0, but require investment that may payoff in the distant future

- **Quadrant 2: Diminish value**
  - NPVs < 0. These businesses consume investment funds. Priority: decrease investment

- **Quadrant 3: Protect value**
  - NPVs < 0. These businesses address the problem by shrinking their asset base. Priority: increase returns

- **Quadrant 4: Limit value**
  - NPVs > 0. These businesses decrease investment. Priority: increase investment while maintaining returns.

Top-Down, Bottom-Up

- Growth
- Diminish value
- Create value
- Protect value
- Limit value
- ROIC - WACC
- Cash flow
- ROIC
- Investment
- Revenue
- Expenses
- Cap. expend.
- Working capital

Top Down Set Direction & Goals
Manage the Business Bottom Up
**Advantages of EVA**

- Annual EVA is easy to interpret
- Correlations between market value and various measures:
  - Standardized EVA 0.50
  - ROE 0.35
  - Fortune’s “Most admired firms” 0.24
  - Cash flow growth 0.22
  - EPS growth 0.18
  - Dividend growth 0.16
  - Sales growth 0.09
- 50% of change in market value explained by standardized EVA (Standardized EVA = EVA / Capital).

**Uses of EVA**

- Capital of the company + PV of expected EVAs
  - The sum equals total firm value
- Capital budgeting
  - EVA streams = NPV of a project
- Performance review
  - Common language for communicating performance & goals.
EVA & Other Measures of Performance

Four Fundamental Strategies

EVA = \left( \frac{\text{NOPLAT}}{\text{Capital}} - \text{Cost of capital} \right) * \text{Capital}

Operate: Improve the return on existing capital

Build: Invest as long as returns exceed the cost of capital

Harvest: Redeploy capital when returns fail to achieve the cost of capital.

Decrease: WACC
Focus on the Improvement in EVA

- A positive change in EVA is better than a positive yet unchanging base level of EVA
  - Why?
- Positive changes in EVA are consistent with shareholder value added -- whether from a positive or negative base
- Positive changes in EVA are consistent with the managerial notion of continuous improvement in performance.

EVA & Capital Budgeting

- EVA is the reward from investing in projects that return above the cost of capital
  \[ \text{EVA} = (\text{ROIC} - \text{WACC}) \times \text{Operating Capital} \]
- Each project’s expected return must exceed its cost of capital to be justified.
Investment Schedule

%  

Create value  

WACC  

Destroy value  

Net Assets

---

Why Use EVA & Not NPV?

- Present value of EVA = Present value of NPV
- Provides insight into any single period
- Is a direct link to performance
- More useful for future project audits.
Assumptions:

<table>
<thead>
<tr>
<th></th>
<th>Yr. 0</th>
<th>Yr. 1</th>
<th>Yr. 2</th>
<th>Yr. 3</th>
<th>Yr. 4</th>
<th>Yr. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOPLAT</td>
<td>$0</td>
<td>$84</td>
<td>$324</td>
<td>$324</td>
<td>$324</td>
<td>$324</td>
</tr>
<tr>
<td>Capital</td>
<td>1500</td>
<td>1340</td>
<td>1080</td>
<td>820</td>
<td>560</td>
<td>0</td>
</tr>
<tr>
<td>Investment</td>
<td>1500</td>
<td>-160</td>
<td>-260</td>
<td>-260</td>
<td>-260</td>
<td>-560</td>
</tr>
<tr>
<td>WACC</td>
<td>12%</td>
<td>12%</td>
<td>12%</td>
<td>12%</td>
<td>12%</td>
<td>12%</td>
</tr>
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</table>

Investment of $1500 has a $0 salvage value after 5 years.

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FCF Valuation

<table>
<thead>
<tr>
<th></th>
<th>Yr. 0</th>
<th>Yr. 1</th>
<th>Yr. 2</th>
<th>Yr. 3</th>
<th>Yr. 4</th>
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<td>$324</td>
<td>$324</td>
</tr>
<tr>
<td>- Capital</td>
<td>1500</td>
<td>-160</td>
<td>-260</td>
<td>-260</td>
<td>-260</td>
<td>-560</td>
</tr>
<tr>
<td>= FCF</td>
<td>-1500</td>
<td>244</td>
<td>584</td>
<td>584</td>
<td>584</td>
<td>884</td>
</tr>
<tr>
<td>x PV Factor</td>
<td>1.00</td>
<td>0.89</td>
<td>0.80</td>
<td>0.71</td>
<td>0.64</td>
<td>0.57</td>
</tr>
<tr>
<td>= PV of FCF</td>
<td>-1500</td>
<td>218</td>
<td>466</td>
<td>416</td>
<td>371</td>
<td>502</td>
</tr>
</tbody>
</table>

Cumulative PV of FCF = $472
EVA Valuation

<table>
<thead>
<tr>
<th></th>
<th>Yr. 0</th>
<th>Yr. 1</th>
<th>Yr. 2</th>
<th>Yr. 3</th>
<th>Yr. 4</th>
<th>Yr. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOPLAT</td>
<td>$0</td>
<td>$84</td>
<td>$324</td>
<td>$324</td>
<td>$324</td>
<td>$324</td>
</tr>
<tr>
<td>- [Beg. Capital x Cap. Chg]</td>
<td>0 1500 1340 1080 820 560</td>
<td>0 180 161 130 98 67</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>= EVA</td>
<td>0 -96   163 194 226 257</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x PV Factor</td>
<td>1.00 0.89 0.80 0.71 0.64 0.57</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>= PV of EVA</td>
<td>0 -86 130 138 143 146</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Cumulative PV of EVA = $472

The End