Strategies for Value Creation: Its Formulation and Measurement

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Economic value is only created when the businesses of the firm -- and the firm as a whole -- enjoy profitability levels which exceed that of their respective cost of capital.
The Market-to-Book Value Model (M/B)

M - *The Investor’s Perspective*

An assessment of the present value of the expected cash flow streaming from the assets the firm has already in place and those from investments the firm would have an opportunity to make some time in the future.

B - *The Accountant’s Perspective*

Historical measurement of equity resources contributed by shareholders.
\[
\frac{M}{B} = \frac{\text{Expected future payments}}{\text{Past resources committed}}
\]

- If \(\frac{M}{B}\) is equal to 1, the future payments are expected to yield a fair return on the resources committed. The firm is neither creating nor destroying value.
- If \(\frac{M}{B}\) is greater than 1, there is an excess return. The firm is creating value for the shareholders.
- If \(\frac{M}{B}\) is less than 1, the return is under the benchmark provided by the market. The firm is destroying value for its shareholders.
Stationary Model with Constant Growth $g$

Annual Profit $= \text{ROE} \times B$

- Retained earnings $(P)$
- Dividend payments $(1 - P)$

$P \times \text{ROE} \times B$

$g \times B$

$(1 - P) \times \text{ROE} \times B$

$(\text{ROE} - g) \times B$
Stationary Model with Constant Growth $g$ (cont’d.)

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>...</th>
<th>Year $t$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Book value</strong></td>
<td>$B$</td>
<td>$(1+g)B$</td>
<td>...</td>
<td>$(1+g)^{t-1}B$</td>
</tr>
<tr>
<td><strong>(beginning of year)</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Earnings</strong></td>
<td>$ROE \times B$</td>
<td>$ROE(1+g)B$</td>
<td>...</td>
<td>$ROE(1+g)^{t-1}B$</td>
</tr>
<tr>
<td><strong>Retained Earnings</strong></td>
<td>$g \times B$</td>
<td>$g(1+g)B$</td>
<td>...</td>
<td>$g(1+g)^{t-1}B$</td>
</tr>
<tr>
<td><strong>Dividend Payments</strong></td>
<td>$(ROE-g)B$</td>
<td>$(ROE-g)(1+g)B$</td>
<td>...</td>
<td>$(ROE-g)(1+g)^{t-1}B$</td>
</tr>
<tr>
<td><strong>Book Value</strong></td>
<td>$(1+g)B$</td>
<td>$(1+g)^2B$</td>
<td>...</td>
<td>$(1+g)^tB$</td>
</tr>
<tr>
<td><strong>(end of year)</strong></td>
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Stationary Model with Constant Growth $g$ (cont’d.)

\[
M = \sum_{t=1}^{\infty} \frac{(\text{ROE} - g)(1 + g)^{t-1}B}{(1 + k_E)^t} 
\]

(1)

\[
\frac{M}{B} = \frac{\text{ROE} - g}{k_E - g} 
\]

(2)
Valuation of 3M Stock

Estimated Value per Share = \( \frac{\text{ROE} - g}{k_E - g} \times \text{Book Value of 3M per Share} \)

= \( \frac{24\% - 7.5\%}{13\% - 7.5\%} \times $28.72 \)

= $86

Actual Value per Share = $92
The Essential Features of the M/B Model for a Firm Under Strategy Growth

<table>
<thead>
<tr>
<th>The profitable firm or business</th>
<th>The breakeven firm or business</th>
<th>The unprofitable firm or business</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE &gt; $k_E$</td>
<td>ROE = $k_E$</td>
<td>ROE &lt; $k_E$</td>
</tr>
<tr>
<td>M/B &gt; 1</td>
<td>M/B = 1</td>
<td>M/B &lt; 1</td>
</tr>
<tr>
<td>Growth will increase M/B</td>
<td>Growth will not affect M/B</td>
<td>Growth will reduce M/B</td>
</tr>
<tr>
<td>NPV &gt; 0</td>
<td>NPV = 0</td>
<td>NPV &lt; 0</td>
</tr>
</tbody>
</table>
• Size of the competitive advantage, measured as spread = ROE - $k_E$

• Number of years in which the spread is maintained = $N$

• Growth opportunities measured as rate of reinvestment = $P$
Factors Affecting the Market Value of the Firm Under Stationary Growth for a Finite Period

- Return on assets: ROA = ROS x AT
- Leverage: D/E
- Cost of debt: k_D
- Corporate tax rate: T_C
- Risk-free rate: r_f
- Market risk premium: (r_m - r_f)
- Beta of the stock: β_E

Return on equity (ROE)

Size of spread = ROE - k_E

Equity growth: g = P x ROE

Retention rate (including new equity): P

Number of years in which spread is maintained: N

Sales margin ROS = Profit After Taxes/Sales

Asset turnover AT = Sales/Assets
Figure by MIT OCW. Adapted from: Marakon Associates, “Criteria for Determining an Optimum Business Portfolio,” 1981.
An M/B-vs.-Spread Graph for the 30 Dow Jones Industrials (1987)

Figure by MIT OCW.

Profitability of Dow Jones Industrials (1992)

Figure by MIT OCW.

Adapted from: Value Line Investment Survey (1992), Marakon Associates analysis.
Profitability of 15 U.S. Industries (September 1987)

Figure by MIT OCW. Adapted from: McTaggart, 1988.
Profitability of Paper and Forest Products Companies (Spring 1987)

Figure by MIT OCW. Adapted from: McTaggart, 1988.
Profitability of Company Portfolio

Forecast of ROE less Cost of Equity
Circle Size = Equity Investment

Figure by MIT OCW. Adapted from: McTaggart, 1988.
Historical Equity Spreads Across Industries (1976-91)

Source: Value Line Investment Survey (1992), Marakon Associates analysis.
Historical Equity Spreads within the Chemicals Industry (1976-91)

Source: Value Line Investment Survey (1992), Marakon Associates analysis.