Was Beatrice well-managed from 1950 to 1975?

• By what criterion?
• What does a rising stock price tell us?
  – About the company?
  – About its strategy?
  – About management?
• How does stock price relate to the value of the firm?
  – To value creation for society?
Debt is a fixed claim

Footnote on the definition of debt and equity
- Debt is a contractually complete claim.
  - Not necessarily fixed.
  - Example: gold denominated bonds.
- Equity is a residual claim.
  - Equity has a role in governance.

Levering (or “gearing”) profits and value
Capital Structure and Value

<table>
<thead>
<tr>
<th></th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td>500</td>
<td>550</td>
<td>600</td>
<td>650</td>
</tr>
<tr>
<td>% Debt</td>
<td>0%</td>
<td>30%</td>
<td>60%</td>
<td>90%</td>
</tr>
<tr>
<td>Average EBIT</td>
<td>657</td>
<td>657</td>
<td>657</td>
<td>657</td>
</tr>
<tr>
<td>Interest (10%)</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Average Profit</td>
<td>657</td>
<td>657</td>
<td>657</td>
<td>657</td>
</tr>
<tr>
<td>ROE</td>
<td>11.3%</td>
<td>12.3%</td>
<td>13.3%</td>
<td>17.5%</td>
</tr>
</tbody>
</table>

MM Proposition I

The law of conservation of value:

\[ V_A = V_D + V_E = \frac{\pi}{\rho} \]

\( \pi \) = profits from \( V_A \) (Perpetuity)
\( \rho \) = appropriate discount rate for these profits

\[ \frac{\pi}{V_A} = \frac{1}{\rho} \]

The irrelevance of capital structure

<table>
<thead>
<tr>
<th></th>
<th>All Equity</th>
<th>No Debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Interest</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PBT</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>ROE</td>
<td>6%</td>
<td>12%</td>
</tr>
<tr>
<td>Equity</td>
<td>500</td>
<td>550</td>
</tr>
<tr>
<td>Debt</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CF to Debt</td>
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<td>45</td>
</tr>
<tr>
<td>CF to Equity</td>
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<td>660</td>
</tr>
<tr>
<td>4003</td>
<td>Management and Markets</td>
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</tr>
</tbody>
</table>
The irrelevance of capital structure (cont)

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<tr>
<th></th>
<th>All Equity</th>
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<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>20</td>
<td>60</td>
<td>100</td>
<td>20</td>
<td>60</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Interest</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Net</td>
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<td>60</td>
<td>100</td>
<td>0</td>
<td>40</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>4%</td>
<td>12%</td>
<td>20%</td>
<td>12%</td>
<td>12%</td>
<td>27%</td>
<td>13%</td>
</tr>
<tr>
<td>Equity</td>
<td>500</td>
<td></td>
<td></td>
<td>200</td>
<td></td>
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</tr>
<tr>
<td>Debt</td>
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<td></td>
<td></td>
<td>0</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CF to Debt</td>
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<td>60</td>
<td>100</td>
<td>20</td>
<td>60</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>CF to Equity</td>
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<td>60</td>
<td>100</td>
<td>0</td>
<td>40</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

If the stockholder borrows $200 to buy the Equity:

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>20</td>
<td>60</td>
<td>100</td>
<td>20</td>
<td>60</td>
<td>100</td>
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<td>Interest</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Total CF</td>
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<td>40</td>
<td>80</td>
<td>20</td>
<td>60</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Questions

• What if the investor cannot borrow at the same rate as the firm?
• Why doesn’t the “discount rate” applied to the returns to equity stay constant?

Answers

• A levered equity claim is a combination of unlevered returns and a debt claim. Why should an investor buy this package from your firm?
• The price on the the levered equity adjusts to account for the risk, for the marginal investor. What does she look like?
M&M Proposition 2

The rate of return on equity demanded by investors increases as leverage increases.

\[ r_E = r_A + \frac{E}{D+E} (r_A - r_D) \]
Determination of the optimal capital structure

- What about taxes?
  - Interest expense is tax deductible
  - Dividends are not. (Dividends are taxed twice.)
  - Capital structure is no longer irrelevant!

- Firms should lever up as much as possible.

Optimal Capital Structure (cont)

- Why not lever up as much as possible?
  - The dead-weight costs of financial distress.
  - (This is a violation of the M&M assumptions).

Optimal Capital Structure

- Trade off of the tax benefits of debt with the expected costs of financial distress
The costs of financial distress
- Loss of financial flexibility.
- Actions taken in anticipation of bankruptcy.
- Bankruptcy lawyers, etc.
- Conflicts of interest between different security types, and different classes of the same security.

Financial Distress
- Technical Default
  - Violation of debt covenants
- Default
  - Failure to make a required principle or interest payment
- Bankruptcy
  - Legal filing by firm or its creditors
  - Chapter 7 vs. Chapter 11
- Liquidation
  - Sale of assets and cessation of operations

Financial distress (default) is not bankruptcy
Pr(bankruptcy) = Pr(default) + Pr(bankruptcy|default)

The costs and benefits of high leverage

• Costs
  – Reduced financial flexibility
  – Risk of financial distress

• Benefits
  – Early detection of problems
  – Avoid misuse of free cash flow

Summary (1)

• Different securities are characterized by different types of (contractual and non-contractual) claims on the firm’s cash flows.
• Differences in the type and quantity of some claims may induce (very) different risk characteristics for others.
  – Eg. leverage changes the risk and expected return on equity.
• Different securities thus may have very different risk and return characteristics.

Summary (2)

• These different types of claims may be differentially valuable to different types of investors. However…
• In an efficient capital market, the required returns on these different claims make the capital structure irrelevant (absent anything that changes the actual return to the assets).
  – Taxes
  – Transactions costs
  – Agency costs
Summary (3)

- The tax advantage of debt makes it preferred to equity financing, up to a point.
- The dead-weight costs of financial distress limit this advantage.
- Optimal capital structure trades off the tax advantage of debt with the cost of financial distress.

Summary (4)

- This (standard) explanation of optimal capital structure admits only one type of interaction between the left and right side of the balance sheet
  - The deadweight costs of financial distress.
- There may be many others.
  - Debt may induce caution, and/or reduce financial flexibility.
  - Debt may help discipline management, and lead to early detection of problems.