Chapter 10: Credit Analysis and Distress Prediction
Key Concepts in Chapter 10

• The likelihood of financial distress is an important aspect of firm risk.

• Numerous parties are interested in the credit-worthiness of a company, including banks, investors, suppliers, auditors, and employees, among others.

• Debt is an important source of financing, though there are trade-offs in financing with debt instead of equity capital.
Why Firms Use Debt Financing

• Interest tax shields
  – Corporations or other taxable entities are able to deduct interest paid on debt as an ordinary business expense.

• Management incentive alignment
  – Leverage imposes a discipline on management to create value, reducing conflicts of interest between managers and shareholders.
Some Potential Downsides of Debt Financing

• Increasing levels of debt financing may be accompanied by higher a likelihood of financial distress.

• Financial distress has some of the following negative consequences:
  – Legal costs
  – Damage to ability to raise capital
  – Cost of conflicts between creditors and stockholders
Median Leverage in Selected Industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>All Listed Firms</th>
<th>NYSE Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepackaged Computer Software</td>
<td>-41.9%</td>
<td>-49.4%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>-60.2%</td>
<td>-7.5%</td>
</tr>
<tr>
<td>Crude Petroleum and Natural Gas</td>
<td>10.8%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Industrial Inorganic Chemicals</td>
<td>3.1%</td>
<td>26.3%</td>
</tr>
<tr>
<td>Electric Services</td>
<td>74.2%</td>
<td>79.5%</td>
</tr>
<tr>
<td>Water Supply</td>
<td>81.7%</td>
<td>90.5%</td>
</tr>
</tbody>
</table>

Source: Standard and Poor’s Compustat 2011.
The Market for Credit

• Commercial banks
  – May have better knowledge of a firm, but are constrained in the amount of risk they can assume.

• Non-bank financial institutions
  – For example, savings & loans, insurance companies, and investment bankers.

• Public debt markets
  – Requires that a firm have the size, financial strength, and credibility to bypass the banking sector.

• Sellers who provide financing
  – Suppliers typically extend very short term financing to buyers, but may occasionally grant a loan.
Analyzing Credit

• Credit analysis is more narrowly focused than estimating the value of a firm’s equity.

• Business strategy, accounting, financial, and prospective analyses are still important.
  – The better a firm’s future business prospects, the lower the risk to the creditor.

• The steps a commercial lender might follow are presented next. Note that they are interdependent.
The Credit Analysis Process in Private Debt Markets

1. Consider the nature and purpose of the loan.
   - This helps with structuring the terms and duration of the loan, along with the rationale for borrowing.
   - The size of the loan must be set.

2. Consider the type of loan and available security.
   - Numerous types of loans are available from open lines of credit to lease financing.
   - The type and amount of security needed to collateralize a loan must be established.
The Credit Analysis Process in Private Debt Markets

3. Conduct financial analysis.
   – Comprehensive analysis of business strategy, accounting, and financial aspects of the firm.
   – Ratio analysis is useful, particularly ratios addressing the ability to make loan payments.

4. Assemble loan structure and debt covenants.
   – Loan covenants specify mutual expectations of the borrower and lender.
   – Some covenant terms include the borrower maintaining specific financial conditions.
Debt ratings provide important information to investors

- The meaning of debt ratings:
  - Standard & Poor’s has a rating system from D to AAA that grades the relative riskiness of debt.
  - Debt ratings influence the yield that debt instruments must pay for investors to buy them.
<table>
<thead>
<tr>
<th>S&amp;P debt rating</th>
<th>Example firms in 2010</th>
<th>Percentage of public industrials given same rating by S&amp;P</th>
<th>Average yield, 2010</th>
<th>Average spread over 12-month LIBOR rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Exxon Mobil, Johnson &amp; Johnson, Microsoft</td>
<td>0.4%</td>
<td>4.0%</td>
<td>3.2%</td>
</tr>
<tr>
<td>AA</td>
<td>General Electric, Wal-Mart, Canon</td>
<td>2.1%</td>
<td>4.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>A</td>
<td>Coca-Cola, McDonald’s, TJX</td>
<td>11.7%</td>
<td>4.4%</td>
<td>3.6%</td>
</tr>
<tr>
<td>BBB</td>
<td>Daimler, Nordstrom, Best Buy</td>
<td>29.7%</td>
<td>4.9%</td>
<td>4.1%</td>
</tr>
<tr>
<td>BB</td>
<td>General Motors, Fiat, Netflix</td>
<td>27.3%</td>
<td>6.4%</td>
<td>5.6%</td>
</tr>
<tr>
<td>B</td>
<td>Ford Motor Company, Eastman Kodak, American Airlines (AMR)</td>
<td>27.7%</td>
<td>8.0%</td>
<td>7.2%</td>
</tr>
<tr>
<td>CCC</td>
<td>E-Trade, Sbarro’s, Clearwire</td>
<td>1.1%</td>
<td>9.9%</td>
<td>9.1%</td>
</tr>
<tr>
<td>CC</td>
<td>Realogy</td>
<td>&lt;0.1%</td>
<td>13.6%</td>
<td>12.8%</td>
</tr>
<tr>
<td>D</td>
<td>Blockbuster, A&amp;P</td>
<td>&lt;0.1%</td>
<td>30%+</td>
<td>30%+</td>
</tr>
</tbody>
</table>

*Representative yields as most securities not actively traded.
Source: Standard and Poor’s Compustat 2011.
<table>
<thead>
<tr>
<th>S&amp;P debt rating</th>
<th>Earnings before interest and taxes to net capital</th>
<th>Pretax interest coverage</th>
<th>Cash flow from operations to total debt</th>
<th>Net debt to net capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>41.6%</td>
<td>105.4</td>
<td>317%</td>
<td>−33%</td>
</tr>
<tr>
<td>AA</td>
<td>25.9%</td>
<td>14.6</td>
<td>47%</td>
<td>31%</td>
</tr>
<tr>
<td>A</td>
<td>23.5%</td>
<td>11.5</td>
<td>57%</td>
<td>22%</td>
</tr>
<tr>
<td>BBB</td>
<td>16.1%</td>
<td>5.9</td>
<td>35%</td>
<td>32%</td>
</tr>
<tr>
<td>BB</td>
<td>15.4%</td>
<td>3.7</td>
<td>28%</td>
<td>37%</td>
</tr>
<tr>
<td>B</td>
<td>9.6%</td>
<td>1.5</td>
<td>14%</td>
<td>58%</td>
</tr>
<tr>
<td>CCC</td>
<td>−2.6%</td>
<td>−0.3</td>
<td>&gt;0.1%</td>
<td>87%</td>
</tr>
</tbody>
</table>

Source: Standard and Poor’s Compustat 2011.
Financial Analysis and Public Debt

• Factors that drive debt ratings:

  – Performance measures are used to gauge the expected future health of the firm and the ability to repay debt.
<table>
<thead>
<tr>
<th>TABLE 10-4</th>
<th>Factors Used in Quantitative Models of Debt Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Firm 1</td>
</tr>
<tr>
<td>Profitability measures</td>
<td>Return on long-term capital</td>
</tr>
<tr>
<td>Leverage measures</td>
<td>Long-term debt to capitalization</td>
</tr>
<tr>
<td></td>
<td>Total debt to total capital</td>
</tr>
<tr>
<td>Profitability and leverage</td>
<td>Interest coverage Cash flow to long-term debt</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>Sales</td>
</tr>
<tr>
<td>Other</td>
<td>Total assets</td>
</tr>
<tr>
<td></td>
<td>Standard deviation of return Subordination status</td>
</tr>
<tr>
<td>Source: © Cengage Learning</td>
<td></td>
</tr>
</tbody>
</table>
Prediction of Distress and Turnaround

• Models for distress prediction
  – Several models to predict distress have been developed over the years. One of the more popular and robust models is the Altman’s Z-score model:

\[ Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5 \]

where
\[ X_1 = \text{net working capital/total assets (measure of liquidity)} \]
\[ X_2 = \text{retained earnings/total assets (measure of cumulative profitability)} \]
\[ X_3 = \text{EBIT/total assets (measure of return on assets)} \]
\[ X_4 = \text{market value of equity/book value of total liabilities (measure of market leverage)} \]
\[ X_5 = \text{sales/total assets (measure of sales generating potential of assets)} \]

• Debt of distressed companies present investment opportunities because they trade at steep discounts.
# Z-Score Calculations for Canon and Kodak

<table>
<thead>
<tr>
<th>Model Coefficient</th>
<th>Canon, Inc. Dec. 31, 2010</th>
<th>Eastman Kodak Company Dec. 31, 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ratios</td>
<td>Score</td>
</tr>
<tr>
<td>Net working capital/Total assets</td>
<td>1.2</td>
<td>0.079</td>
</tr>
<tr>
<td>Retained earnings/Total assets</td>
<td>1.4</td>
<td>0.771</td>
</tr>
<tr>
<td>EBIT/Total assets</td>
<td>3.3</td>
<td>0.096</td>
</tr>
<tr>
<td>Market value of equity/Book value of total liabilities</td>
<td>0.6</td>
<td>4.934</td>
</tr>
<tr>
<td>Sales/Total assets</td>
<td>1.0</td>
<td>0.900</td>
</tr>
<tr>
<td>Altman Z-score:</td>
<td></td>
<td>5.35</td>
</tr>
</tbody>
</table>

Concluding Comments

• Debt financing offers tax savings and possible reduction of agency costs to firms.
• The risk of financial distress increases with the level of debt financing.
• Credit analysis employs many of the same tools used in business valuation, and is used by issuers of debt, and investors.
• Debt ratings are important information to investors of public debt.