Outline

• The Term Structure
• The Term Structure and Predictive Power
• Credit Spreads and Ratings Agencies
Term Structure of Interest Rates

• Why do bonds with the same default rate and tax status but different maturity dates have different yields?
  – Long-term bonds are like a composite of a series of short-term bonds.
  – Their yield depends on what people expect to happen in the future.

• How do we think about future interest rates?
Term Spread and GDP Growth

GDP growth, y/y annualized

10 yr-3 mo spread, lagged 1 year
Ratings & the Risk Structure of Interest Rates

• Default is one of the most important risks a bondholder faces.

• In fact, independent companies (rating agencies) have arisen to evaluate the creditworthiness of potential borrowers.
  – These companies estimate the likelihood that the corporate or government borrower will make a bond’s promised payments.
  – The government has acknowledged a few firms as “nationally recognized statistical rating organizations” (NRSROs).
  – Moody’s, Standard & Poors, Fitch
Bond Ratings

• Firms or governments with an exceptionally strong financial position carry AAA or Aaa.
  – Ex: U.S. Government, ExxonMobil, Microsoft

• The top four categories are considered investment-grade bonds.
  – These bonds have a very low risk of default.
  – Reserved for most government issuers and corporations that are among the most financially sound.

• Contrast with non-investment-grade or speculative/highly speculative grade bonds.
  - regulated institutional investors can’t hold these.
<table>
<thead>
<tr>
<th>Grade</th>
<th>Moody's</th>
<th>Standard &amp; Poor's</th>
<th>Description</th>
<th>Examples of Issuers with Bonds Outstanding in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aaa</td>
<td>Aaa</td>
<td>AAA</td>
<td>Bonds of the best quality with the smallest risk of default. Issuers are exceptionally stable and dependable.</td>
<td>U.S. government ExxonMobil Microsoft</td>
</tr>
<tr>
<td>Aa</td>
<td>AA</td>
<td>AA</td>
<td>Highest quality with slightly higher degree of long-term risk.</td>
<td>General Electric Procter and Gamble Spain</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
<td>High-medium quality, with many strong attributes but somewhat vulnerable to changing economic conditions.</td>
<td>Bank of America Oracle China Italy</td>
</tr>
<tr>
<td>Baa</td>
<td>Baa</td>
<td>BBB</td>
<td>Medium quality, currently adequate but perhaps unreliable over the long term.</td>
<td>General Mills Time Warner Russia</td>
</tr>
<tr>
<td><strong>Noninvestment, Speculative Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ba</td>
<td>Ba</td>
<td>BB</td>
<td>Some speculative element, with moderate security but not well safeguarded.</td>
<td>Goodyear Tire Sears Turkey</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
<td>Able to pay now but at risk of default in the future.</td>
<td>Ford Motor Hertz Argentina</td>
</tr>
<tr>
<td><strong>Highly Speculative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caa</td>
<td>Caa</td>
<td>CCC</td>
<td>Poor quality, clear danger of default.</td>
<td>Beazer Homes USA Ukraine</td>
</tr>
<tr>
<td>Ca</td>
<td>Ca</td>
<td>CC</td>
<td>Highly speculative quality, often in default.</td>
<td>Ambac</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
<td>Lowest-rated, poor prospects of repayment though may still be paying.</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>D</td>
<td>In default.</td>
<td>Champion Enterprises CIT Group</td>
</tr>
</tbody>
</table>
• What caused the ratings errors?
  – Data didn’t have sufficient information.
  – Firms hire the agencies to consult on what types of MBS have the highest ratings and then rate them, which was a conflict of interest.
  – Ratings agencies are compensated by the issuers of the bonds.
  – Agencies used a single rating scale to represent default probabilities, independent of other characteristics like liquidity.

  • This may have led investors to underestimate other important risks.
Commercial Paper

- **Commercial paper** is a short-term version of a bond.
  - The borrower offers no collateral so the debt is *unsecured*.
  - Commercial paper is
    - Issued on a discount basis, as a zero-coupon bond specifying a single future payment with no associated coupon payments.
    - Has maturity of less than 270 days, usu. 5-45 days.
    - Rated P-1, P-2 at issue, or speculative after downgrades
  - More than 1/3 is held by money-market mutual funds.
Commercial Paper

- Most commercial paper is issued with a maturity of 5 to 45 days and is used exclusively for short-term financing.
- The rating agencies rate the creditworthiness of commercial paper issuers in the same way they do bond issuers.
- Almost all carry Moody’s P-1 or P-2 rating
  - P stands for prime grade commercial paper.
  - Speculative-grade commercial paper does
# Commercial Paper

## Table 7.2 Commercial Paper Ratings

<table>
<thead>
<tr>
<th>Moody's</th>
<th>Standard &amp; Poor's</th>
<th>Description</th>
<th>Examples of Issuers with Commercial Paper Outstanding in 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment or Prime Grade</td>
<td>P-1</td>
<td>A-1+, A-1</td>
<td>Strong likelihood of timely repayment.</td>
</tr>
<tr>
<td></td>
<td>P-2</td>
<td>A-2</td>
<td>Satisfactory degree of safety for timely repayment.</td>
</tr>
<tr>
<td></td>
<td>P-3</td>
<td>A-3</td>
<td>Adequate degree of safety for timely repayment.</td>
</tr>
<tr>
<td>Speculative, below Prime Grade</td>
<td>B, C</td>
<td>Capacity for repayment is small relative to higher-rated issuers.</td>
<td>Alcoa, Cardinal Health, Inc. India</td>
</tr>
<tr>
<td>Defaulted</td>
<td>D</td>
<td></td>
<td>Lehman Brothers</td>
</tr>
</tbody>
</table>
Figure 7.8  The Risk Spread and GDP Growth

A. GDP Growth with Recessions Shaded

B. GDP Growth with Risk Spread

- GDP Growth (left scale)
- Risk Spread (right scale)
The Impact of Ratings on Yields

• Changes in the U.S. Treasury yields account for most of the movement in the Aaa and Baa bond yields.

• From 1979-2009, the 10-year U.S. Treasury bond yield has averaged almost a full percentage point below the average yield on Aaa bonds and two percentage points below the average yield on Baa bonds.
Asset-backed commercial paper (ABCP) is a short-term liability with a maturity of up to 270 days.

- ABCP is collateralized by assets that financial institutions place in a special portfolio.

These played a special role in the housing boom that preceded the financial crisis of 2007-2009.
To lower costs and limit asset holding, some large banks created firms (a form of shadow bank) that issued ABCP and used the money to buy mortgages and other loans.

- The payment stream generated by the loans was used to compensate the holders of the ABCP.
- This also allowed banks to boost leverage and take on more risk.
- When mortgage volume surged, these shadow banks issued more ABCP to finance expansion.
• When the ABCP matures, issues have to borrow (or sell underlying assets) to be able to return the principal to the ABCP holders.
• The risk was that the issuers would be unable to borrow - they faced rollover risk.
• If they were also unable to sell the long-term assets easily, the shadow banks would face failure.
• The uncertainty in the value of mortgages lead ABCP purchasers to realize the risk and ABCP purchases halted.

• Firms that has issued ABCP faced an immediate threat to their survival.
  – Inability to sell assets or obtain other funding caused many to fail.
  – Some banks rescued their shadow banks, facing heightened liquidity needs and pressures to sell assets during the worst time