Intro to Credit, Credit Analysis, and Credit Ratings

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Credit Ratings and Fixed-Income Credit Analysis

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What is Credit (Debt)?

- Money owed
- Not an equity interest
- Principal and Interest only
  - Not as much “upside” as equity
- A traditional corporate bond is an “IOU” or a promise to pay from a company
- Credit relationships are everywhere
- May be secured or unsecured or carry ‘preferences’
U.S. Domestic Non-Financial Debt

Debt Outstanding as of 6/30/2014 ($ Trillions)

Source: Federal Reserve, Flow of Funds Accounts of The United States, Table L.2
Comparative Amounts
as of 6/30/2014 ($ Trillions)

Debt Owed by

- Domestic Non-Financial, 40.44
- Rest of World

Debt Held by

- Rest of World, 7.37
- Financial Sectors, 37.15

U.S. Equity Market Cap, 23.59

Sources: Federal Reserve, Flow of Funds Accounts of The United States, Table L.1;
Bloomberg WCAUUS <index>
U.S. Capital Market Debt
as of 6/30/2014 ($ Trillions)

Sources: Federal Reserve, Flow of Funds Accounts of The United States; SIFMA
Credit Process Basics

• Lending money out
  – Whether to lend/invest
  – How much to lend/invest
  – What is the risk premium (*i.e.*, spread)

• Getting it back
  – Paid as due
  – Collecting on defaulted debts
  – Dealing with bankruptcy
What is Credit Quality?

• How close is a borrower to defaulting (miss making required payments)?
  – Likelihood/probability approach
  – Scenario approach (e.g., recession, depression, etc.)

• If the borrower does default, will the lender's loss be large or small?
  – Expected loss approach

• How stable is the borrower's credit quality over time?

• What are the drivers of each of the above items?

• Multi-dimensional
Drivers of Credit Quality

• Ability to pay
  – Sources of repayment
    • Future cash flows from operations
    • Future cash flows from specific assets
    • Liquidation of assets
    • Guarantees or other support arrangements
  – Competing claims on available resources
  – You can’t get blood from a stone

• Willingness to pay
  – Enforcement is expensive
  – Enforcement is not always possible
Analyzing Credit Quality

• Quantitative and qualitative factors
• Part science, part art
• Consider scenarios: probable, reasonably likely, unlikely, remote
Analyzing Credit Quality
Example: Residential Mortgage Loan

• Credit reputation
  – FICO® score
  – Credit history
  – Stability factors (time in home/job)

• Capacity
  – Monthly debt payments vs. stable monthly income
  – Financial reserves

• Collateral
  – Amount of loan vs. value of the property
Analyzing Credit Quality
Example – Business Exposures

• Corporates
  – Country risk
  – Industry risk
  – Competitive position
  – Cash flow
  – Profitability
  – Leverage
  – Diversification
  – Capital structure
  – Liquidity
  – Management

• Financial firms
  – Country risk
  – Asset quality
  – Reserves
  – Leverage
  – Capital structure
  – Off-balance sheet
  – Maturity matching
  – Regulation
  – Reputation
What Comes after Credit Analysis?

• Mitigate risk
• Price risk
• Consider opportunity cost
• Decide
What is a Rating? – Dictionary Definition

• A position assigned on a scale; a standing

• a. A classification according to specialty or proficiency, as of a member of the armed forces.  
b. *Chiefly British* An enlisted person in the navy

• **An evaluation of the financial status of a business or person: a credit rating**

• A specified performance limit, as of capacity, range, or operational capability: the power rating of a light fixture

• The popularity of a television or radio program as estimated by a poll of segments of the audience
Examples of Ratings (Credit & Non-Credit)

- MPAA movie ratings (child suitability)
- Roger Ebert's movie ratings
- Gasoline octane ratings (87, 91, 93)
- Underwriters Laboratories (est. 1894)
- Good Housekeeping Seal, GHRI
- FICO® consumer credit ratings
- Consumer Reports
- National Baseball Hall of Fame
- Value Line® Timeliness Ranking System
- Miss America, Miss Universe
- Morningstar Ratings™
- Broker-dealer buy/hold/sell ratings
- Bond ratings (today's topic)
Attributes of Rating Systems

- Prospective vs. historical
- Grading/ranking scale vs. pass/fail
- Relative vs. absolute
- Multi-dimensional vs. one-dimensional
  - Factor weightings
- Designed for specific purpose
- Defined by their related rating organizations
Why Have Credit Ratings?

• Reduce information asymmetry
• Tool for decision-making
  – Investment policy or regulatory standard
• Division of labor
• Specialized expertise
• Comparative advantage
• Reduced cost
• Increased efficiency
Desirable Features of a Rating System

• Understandable
• Reliable, accurate
• Timely
• Useful (to whom, for what)
  – Comparison
  – Qualification
  – Decision-making
• Rating organization must try to meet the needs of its customers
U.S. Bond Rating Agencies (registered with the SEC)

- A.M. Best Company, Inc.
- DBRS
- Egan-Jones Ratings
- Fitch
- HR Ratings de México
- Japan Credit Rating Agency
- Kroll Bond Rating Agency
- Moody’s Investors Service
- Morningstar
- Standard & Poor’s

NRSRO
Nationally Recognized Statistical Rating Organization
Rating Agency = Publishing Company

• Each has its own definition of “credit quality”
• Each defines its own ratings
• Each defines its own rating scale and rating symbols
• Each defines its own criteria or methodology
• Rating is an editorial
• Bond rating is an opinion about the future
  – Compare to lawyers or accountants, who give opinions about the past and present
• Rating analyst is a financial journalist
# Competing Philosophies (Oversimplified)

<table>
<thead>
<tr>
<th>Expected Loss (Frequency &amp; Severity)</th>
<th>Probability of Default (Frequency only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moody’s</td>
<td>Standard &amp; Poor’s Ratings Services</td>
</tr>
</tbody>
</table>

McGraw Hill Financial
Relative Frequency and Expected Severity of Defaults within Moody's Rating Grades

Expected Severity of Default vs. Expected Frequency of Default

- Aaa
- Aa1
- Aa2
- Aa3
- A1
- A2
- A3
Comparing Ratings of Different Rating Agencies

• Do the corresponding symbols on the rating scales of two rating agencies connote the same degree of “credit quality”?  
  – If so, the scales are “congruent”

• To what degree do the ratings of two different rating agencies tend to agree or disagree?  
  – The degree of agreement is “correlation”
What a Rating Agency Wants in a Rating System

• Market impact
  – Prices/yields/spreads
  – Liquidity

• Get embedded in regulations and investment policies

• Easy to implement and administer

• Perception of congruence and correlation with Moody’s and S&P
## Credit Ratings of “Blue Chip” Companies

<table>
<thead>
<tr>
<th>Name</th>
<th>Moody’s</th>
<th>S&amp;P</th>
<th>Name</th>
<th>Moody’s</th>
<th>S&amp;P</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M</td>
<td>Aa2</td>
<td>AA-</td>
<td>Johnson &amp; Johnson</td>
<td>Aaa</td>
<td>AAA</td>
</tr>
<tr>
<td>American Express</td>
<td>A3</td>
<td>BBB+</td>
<td>JPMorgan Chase</td>
<td>A3</td>
<td>A</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>A3</td>
<td>A-</td>
<td>McDonald's</td>
<td>A2</td>
<td>A</td>
</tr>
<tr>
<td>Boeing</td>
<td>A2</td>
<td>A</td>
<td>Merck</td>
<td>A2</td>
<td>AA</td>
</tr>
<tr>
<td>Caterpillar</td>
<td>A2</td>
<td>A</td>
<td>Microsoft</td>
<td>Aaa</td>
<td>AAA</td>
</tr>
<tr>
<td>Chevron</td>
<td>Aa1</td>
<td>AA</td>
<td>NIKE</td>
<td>A1</td>
<td>AA-</td>
</tr>
<tr>
<td>Cisco Systems</td>
<td>A1</td>
<td>AA-</td>
<td>Pfizer</td>
<td>A1</td>
<td>AA</td>
</tr>
<tr>
<td>Coca-Cola Co.</td>
<td>Aa3</td>
<td>AA</td>
<td>Procter &amp; Gamble</td>
<td>Aa3</td>
<td>AA-</td>
</tr>
<tr>
<td>DuPont</td>
<td>A2</td>
<td>A</td>
<td>Travelers Cos.</td>
<td>A2</td>
<td>A</td>
</tr>
<tr>
<td>Exxon Mobil</td>
<td>Aaa</td>
<td>AAA</td>
<td>United Technologies</td>
<td>A2</td>
<td>A</td>
</tr>
<tr>
<td>General Electric</td>
<td>Aa3</td>
<td>AA+</td>
<td>UnitedHealth Group</td>
<td>A3</td>
<td>A</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>Baa1</td>
<td>A-</td>
<td>Verizon</td>
<td>Baa1</td>
<td>BBB+</td>
</tr>
<tr>
<td>Home Depot</td>
<td>A2</td>
<td>A</td>
<td>Visa Inc</td>
<td>A1</td>
<td>A+</td>
</tr>
<tr>
<td>Intel</td>
<td>A1</td>
<td>A+</td>
<td>Wal-Mart Stores</td>
<td>Aa2</td>
<td>AA</td>
</tr>
<tr>
<td>IBM</td>
<td>Aa3</td>
<td>AA-</td>
<td>Walt Disney</td>
<td>A2</td>
<td>A</td>
</tr>
</tbody>
</table>
Average Difference in Ratings between Moody's and other Rating Agencies in 1990

Source: Richard Cantor and Frank Packer, The Credit Rating Industry, 19 FRBNY Q. Rev. 1 (Summer-Fall 1994)
What About Within a Rating Agency?

- Must have a common definition of “credit quality”
- Cross-sector comparability
- Rating analysts are specialists
- Need to overcome departmental “silos”
- Rating committees
  - Narrow or broad composition
... and Stronger Cross-sector Comparability

- Corporate
- Banks
- Insurance
- Sovereigns
- U.S. Munis
- RMBS
- CMBS
- ABS
- CDO

Creditworthiness ➔
Four Dimensions of Comparability

There is a trade-off between recalibrating to maintain cross-sector comparability and maintaining comparability over time.
Delivering Comparability (S&P)

• Retrospective
  – Gini coefficients (rank ordering power)
  – Comparing default rates across sectors, regions, and over time

• Prospective
  – Common approaches to risk analysis (harmonization)
  – Stress scenarios for criteria calibration

<table>
<thead>
<tr>
<th>Criteria Calibration Stress Scenarios – Key Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
</tr>
<tr>
<td>ΔGDP</td>
</tr>
<tr>
<td>Unemp.</td>
</tr>
<tr>
<td>Equities</td>
</tr>
</tbody>
</table>
Ratings are forward looking and reflect views on relative ranking of overall creditworthiness.

S&P ratings are not just opinions of likelihood of default:
- Likelihood of default
- Payment priority
- Recovery
- Credit stability

New stress scenarios adopted to further our goal of comparability across sectors, geographies and time.

'AAA' ("extreme") stress scenario is based on the Great Depression:
- AAA face greater possibility of default under extreme scenario
- AAA are likely to face more transitions with increasing decline in economy

Stress scenarios used as a calibration tool for criteria.
Rating Process

- Information collection
- Analysis
- Committee action
- Publication of the rating
- Surveillance
- Withdrawal
Focus on Analysis

- Quantitative aspects
- Qualitative aspects
Information Quality

• A rating is only as good as the information upon which it is based
• The rating process is not an audit
• Rating agencies do not independently verify information from sources that they believe to be reliable
• Information filed with the SEC generally should be the most reliable and complete
• Differing views about the benefit of using other information
Credit Rating vs. Audit

• Credit rating is an opinion supported by a rationale
• Credit ratings are on a scale with gradations
• Scale and methodology vary from one rating agency to another
• Audit is a pass/fail test
• Audit standards are uniform within a country
So, Does It Actually Work?

• Well, it depends...
S&P Corporate Average Cumulative Default Rates (1981-2013)
Moody’s Corporate Avg. Cumulative Default Rates (1920-2013)
But Sometimes Ratings Disappoint

Adverse Credit Migrations of 2005-2007 Vintages of U.S. RMBS, CDOs of ABS, and SIV Lites

<table>
<thead>
<tr>
<th>Original S&amp;P Rating</th>
<th>Status as of 31 Dec 2010</th>
<th>No. of Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Default + Near Default</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Default</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Near Default</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any Downgrade</td>
<td></td>
</tr>
<tr>
<td>AAA</td>
<td>60.1%</td>
<td>4,043</td>
</tr>
<tr>
<td></td>
<td>22.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>37.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>77.3%</td>
<td></td>
</tr>
<tr>
<td>AA</td>
<td>78.2%</td>
<td>8,340</td>
</tr>
<tr>
<td></td>
<td>45.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>32.4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>87.6%</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>88.5%</td>
<td>7,456</td>
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<tr>
<td></td>
<td>59.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28.8%</td>
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</tr>
<tr>
<td></td>
<td>93.4%</td>
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<tr>
<td>BBB</td>
<td>94.0%</td>
<td>7,806</td>
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<tr>
<td></td>
<td>69.4%</td>
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<td></td>
<td>24.7%</td>
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</tr>
<tr>
<td></td>
<td>95.2%</td>
<td></td>
</tr>
<tr>
<td>Inv. Grade</td>
<td>82.8%</td>
<td>27,645</td>
</tr>
<tr>
<td></td>
<td>52.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>89.8%</td>
<td></td>
</tr>
</tbody>
</table>

Note: 'AAA' ratings from the same transaction are treated as a single rating in this table's calculation. Multiple rating actions are aggregated to calculate a security's cumulative rating performance. Near default means rated 'CCC+' or lower.

Source: Erturk, E., Global Structured Finance Securities End 2010 With Rising Credit Stability, Standard & Poor’s research report (7 Feb 2011) (Table 6a).
Competition and Business Model

• Demand drivers
  – Price
  – Service
  – Reliability/accuracy
  – Timeliness
  – Regulatory passport

• Criteria
  – Rating Shopping
  – Competitive laxity

• Who pays: issuers or investors
  – Public availability of ratings
What is the Optimal Organization of the Credit Rating Industry?

- Few companies, each with a high level of coverage
- Many companies, each with a low level of coverage
- Few companies, each with a high level of coverage, and many companies, each with a low level of coverage
- Many companies, each with a high level of coverage
Conclusion

• Credit relationships are everywhere
• Credit analysis supports effective credit decisions
• Credit analysis has quantitative and qualitative aspects
• Emphasizing quantitative analysis to the exclusion of qualitative factors is very dangerous
• Rating agencies define their own rating systems
• Rating agencies generate important efficiencies for the fixed-income capital markets
• Investors want ratings that are useful by being timely, reliable, and informative