Fixed Income – I
Valuation Concepts
Distinguish among default risk, credit spread risk & downgrade risk

• Default risk
  – Risk that borrower will not be able to fulfill the obligation of debt repayment

• Downgrade risk
  – Risk that credit rating of an issue will be downgraded leading to drop in prices of the bonds

• Credit spread risk
  – Risk that increase in credit spread will decrease the value of issue

• Credit rating agencies like S&P and Moody’s measure only credit risk

• Credit rating
  – For a long term debt, credit ratings reflect the probability of default & the default loss rate i.e. loss to the investor in case of a default
  – For a short term debt, ratings reflect only the probability of default

• Rating watch
  – Issues which are under review with potential upgrade/downgrade within next 3 months

• Rating outlook
  – Rating agencies also forecast long term projections
  – Issues which are likely to be upgraded / downgraded in a next 6 months to 2 years
Key Components of credit analysis

• Character
  – Refers to management’s honesty & willingness to repay the debt
  – Also takes into account management’s strategic goals, leadership style, problem solving capabilities, track record, motivation, internal control system etc. before assigning a rating
  – Rating agency gives due weightage to corporate governance practices like
    • Large & effective team of board of directors with more number of independent directors
    • Board should have enough resources & powers to fulfill their duties toward shareholders
    • Board should not be chaired by any management representative to minimize the conflict of interests between shareholders and management i.e. cost associated with it is known as Agency cost

• Covenants
  – Terms & conditions on which lenders have agreed to lend or participate in debt issue
  – Affirmative covenants require management to act on certain issues like regular payment of interests
  – Negative covenants forbid management from taking any actions which could affect debtors’ interests
  – Limit management’s ability to raise fresh debt at company level & subsidiary level, needs to maintain certain level of solvency & liquidity ratios and cash flows in order to service the debt
  – Limitations on dividend payments and stock buy-back
  – Covenants are legal binding contractual framework which needs to be assessed carefully before assigning any credit rating
Key Components of credit analysis

• Collateral
  – Collateral is pledging of specific assets to a lender, to secure the repayment of loan
  – Valuation of the collateral property or collateral analysis is an important part of assessing credit risk

• Capacity to pay
  – Ability to generate enough cash flow in order to service its debt obligations
  – Firm’s capacity to repay is assessed by its solvency ratios, high solvency ratios indicate a greater capacity to repay
  – Apart from the financial position, sources of liquidity, company structure, guarantees from parent company etc. plays an important role in deciding the company’s capacity to repay
  – Steady and visible cash flow is the primary source of liquidity for company
  – In worst case scenarios, company can either liquidate some of its assets or it can securitize its assets to generate short term liquidity
  – If parent company has provided the bank guarantee, lender can either ask parent company to repay or it can liquidate the bank guarantee
Key financial ratios for creditor

- **DuPont framework** - profitability ratios like ROE assess the borrower’s capacity to generate earnings

  \[
  \text{ROE} = \left( \frac{\text{Net Income}}{\text{Sales}} \right) \times \left( \frac{\text{Sales}}{\text{Total Assets}} \right) \times \left( \frac{\text{Total Assets}}{\text{Shareholders' Equity}} \right)
  \]

- **Short term solvency ratios**: Current ratio & acid–test ratio test the company’s ability to take care of short-term debt obligations

  \[
  \text{Current Ratio} = \frac{\text{current assets}}{\text{current liabilities}}
  \]

  \[
  \text{Acid – test ratio} = \frac{\text{current assets} - \text{inventories}}{\text{current liabilities}}
  \]

- **Financial leverage ratios**: ratios like long-term debt to capitalization and total debt to capitalization measures the firm’s capacity to bear additional risk by borrowing

  \[
  \text{Long term debt to capitalization ratio} = \left( \frac{\text{long term debt}}{\text{long term debt + minority interest + shareholders' equity + preference equity}} \right)
  \]

  \[
  \text{Total debt to capitalization ratio} = \left( \frac{\text{current liabilities + long term debt}}{\text{current liabilities + long term debt + minority interest + common equity + preferred equity}} \right)
  \]

- **Interest coverage ratios** assess the firm’s financial ability to repay interest out of its operating cash flow

  \[
  \text{EBIT coverage ratio} = \frac{\text{EBIT}}{\text{annual interest expense}}
  \]

  \[
  \text{EBITDA coverage ratio} = \frac{\text{EBITDA}}{\text{annual interest expense}}
  \]
Key financial ratios for creditor

Example – Neev has provided following information in its annual report for FY2009. Calculate the following 1) ROE, 2) current ratio, 3) acid test ratio, 4) debt capitalization ratios, 5) interest coverage ratios

<table>
<thead>
<tr>
<th>In USD ,000</th>
<th>FY2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>390</td>
</tr>
<tr>
<td>EBITDA</td>
<td>130</td>
</tr>
<tr>
<td>EBIT</td>
<td>95</td>
</tr>
<tr>
<td>PBT</td>
<td>75</td>
</tr>
<tr>
<td>Net Profit</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>In USD ,000</th>
<th>Assets</th>
<th>In USD ,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders’ equity</td>
<td>380</td>
<td>Fixed assets</td>
<td>310</td>
</tr>
<tr>
<td>Preference equity</td>
<td>100</td>
<td>Investments</td>
<td>380</td>
</tr>
<tr>
<td>Long term debt</td>
<td>240</td>
<td>Inventory</td>
<td>96</td>
</tr>
<tr>
<td>Short term debt</td>
<td>125</td>
<td>Receivables</td>
<td>134</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>85</td>
<td>Cash in hand</td>
<td>10</td>
</tr>
<tr>
<td>Total assets</td>
<td>930</td>
<td></td>
<td>930</td>
</tr>
</tbody>
</table>
Key financial ratios for creditor

Answer

• ROE = \( \left( \frac{50}{390} \right) \times \left( \frac{390}{930} \right) \times \left( \frac{930}{380} \right) = 13.2\% \)

• Current ratio = \( \left( \frac{96+134+10}{85+125} \right) = 1.14 \)

• Acid test ratio = \( \left( \frac{134+10}{85+125} \right) = 0.69 \)

• Long term debt – capitalization ratio = \( \left( \frac{240}{240+380+100} \right) = 0.33 \)

• Total debt – capitalization ratio = \( \left( \frac{240+125}{240+125+85+380+100} \right) = 0.39 \)

• EBIT coverage ratio = \( \left( \frac{95}{20} \right) = 4.75 \)

• EBITDA coverage ratio = \( \left( \frac{130}{20} \right) = 6.5 \)
Analysis of high yield corporate bonds

• Debt structure
  – Typical debt instruments are bank debt, senior & subordinated debt, reset notes etc.
  – Typically rely on short term bank debt offering floating rate, as they lack short term liquidity.
    • Bank debt is senior to high yield corporate securities including senior corporate bonds
    • Analyst uses different interest rate scenarios to assess the effect of floating bank rate.
    • If refinancing is necessary to repayment of debt, analyst must analyze capital market conditions
    • Analyst should consider the effects of asset sale in order to pay off short-term bank debt, which is likely to decrease the firm’s capacity to generate operating cash
  – Interest rate on reset notes is floating and adjusted frequently.
    • Analyst should incorporate the change in credit spreads in order to assess its effect.
  – Over the period, interest on zero-coupon bond gets accrued and it increases bond’s weightage in debt structure. Thus, if zero coupon bond is senior to high yield securities, credit risk of the high yield securities will increase.
• Corporate structure
  – Generally debt is obtained at holding Company level, whereas operating cash flow comes from the subsidiary. Hence, credit risk on high yield securities at holding company level increases if:
    • There are restrictions on dividend payments to parent company in the debt covenants of subsidiary
    • Asset sales is prohibited
Cash Flow analysis

- Analysis of operating cash flow is inevitable to understand the firm’s capacity to repay

  Operating cash flow / FCFF = Net income
  
  + depreciation
  
  +/- other non-cash items

  **Funds from operations**
  
  + decrease (increase) in non-cash current assets
  
  + increase (decrease) in non-debt current liabilities

  **Operating cash flow**
  
  - capital expenditures

  **Free operating cash flow**
  
  - cash dividends

  **Discretionary cash flow**
  
  - acquisitions
  
  + asset disposals
  
  + other sources

  **Prefinancing cash flow**
Credit analysis of asset backed securities (ABS)

• Collateral credit quality
  – Credit quality of collateral i.e. pool of loans is utmost important factor in deciding whether quality of an asset is good enough to service the interest and debt repayment over the life of the issue
  – Presence of a few large loans in the asset pool makes it less diversified and increases the concentration risk.

• Quality of the servicer
  – In any ABS transaction, third party servicer is responsible for administrative functions like collecting payments, notices to delinquents, recoveries & liquidation etc.
  – Rating agency gives due importance to the servicer’s performance history, underwriting standards, financial strength and servicing capabilities etc.
  – In an ABS transaction, where servicer plays a role of exclusive administrator process is called true securitization
  – In case of hybrid securitization, servicer is also responsible for advancing payments to the bondholders when there is temporary cash flow shortage
  – Significance of the credit quality of servicer increases, as its role in cash origination increases
  – In case of hybrid securitization, credit analysis involves quality of the collateral pool and corporate credit analysis of servicer
Credit analysis of asset backed securities (ABS)

- **Cash flow stress**
  - Collateral pool should be able to generate sufficient cash flow to meet the requirements of some of its tranches and not all tranches
  - Rating agency analyze different scenarios on prepayments, losses, delinquencies, economic conditions in order to project cash flow

- **Legal structure**
  - Company can form a special purpose vehicle (SPV) to hold the collateralized assets and it can obtain a credit rating higher than the parent company’s corporate credit rating
  - In order to get higher credit rating, company has to ensure that bondholders of ABS gets a first charge on cash flow generated from collateral assets
  - In a worst case scenario if the parent company defaults or files for bankruptcy, creditors of parent company should not have any recourse charge on assets held by SPV
Credit analysis of Municipal bond

• Bonds issued by local municipalities and backed by some form of tax revenue
  – Issuer’s debt structure – debt burden measured as per capita debt as well as debt as % of the real estate properties and personal income, which are subject to property and income tax
  – Budgetary policy – it’s a manifesto of financial and political discipline
  – Local tax & intergovernmental revenue availability – historical tax collection numbers and state government guarantee helps in deciding repayment capacity of municipality
  – Issuer’s socioeconomic environment – local employment level, economic & business environment helps in assessing the stability of revenue and future earnings

• To finance some projects, municipalities issue revenue bonds and securitize the future revenue likely to be generated from this project
  – Limits of the basic security – indenture guidelines explains the use of project revenue and any limitations on that reduces bond’s credit rating
  – Flow of fund structure – revenue bonds are backed by net revenues after deducting operating expenses. Expenses which are non-operating in nature, but still classified under operating expenses will reduce the credit quality of revenue bonds.
  – Priority of revenue claims – first claim on the project cash flow will determine the credit quality
  – Additional bonds test – conditions under which the municipality can issue additional debt. Tighter the restrictions higher the credit quality of the revenue bond
Credit analysis of Sovereign bonds

- Sovereign ratings are debt rating of national governments other than US government
- Two sovereign ratings are assigned to each government i.e. one is local currency rating & another is foreign currency rating
- Two general categories which are analyzed in deciding the sovereign rating:
  - Economic Risk
    - Economic risk is associated with an ability of government to repay its financial obligation and factors which are considered in analysing economic risk are listed below
      - Economic & income structure e.g. composition of economy, living standards, income growth etc.
      - Balance of payments flexibility e.g. structure of current a/c, impacts of fiscal & monetary policies etc.
      - External debt & liquidity e.g. size of public external debt, debt service track record, composition of reserves, maturity structure of external debt etc.
      - Economic growth prospects e.g. composition of savings & investments, pattern of economic growth
      - Fiscal flexibility e.g. tax raising flexibility, operating & total budget balance etc.
  - Political Risk
    - Political risk is associated with a willingness of government to repay its obligation and factors which are considered in analysing political risk are listed below
      - Form of government, political structure & stability of political institutions
      - Internal & external security risks
      - Integration in global trade & financial system
      - Orderliness of leadership succession
Local and foreign currency debt rating

- Two separate ratings are assigned for local currency debt and foreign currency debt
- Foreign currency debt has a higher default rate and default loss rate than local currency debt
- Generally local currency bonds have always been rated higher than foreign currency bonds because local currency debt can be repaid by printing more currency, raising taxes etc.
- Factors which are analyzed in determining local currency debt rating are listed below
  - Political structure and stability of the political institution
  - Economic & income structure e.g. composition of economy, living standards, income growth
  - Economic growth prospects e.g. composition of savings & investments, pattern of economic growth
  - Fiscal flexibility e.g. tax raising flexibility, operating & total budget balance etc.
- Factors which are analyzed in determining foreign currency debt rating are listed below
  - Integration in global trade & financial system
  - Balance of payments flexibility e.g. structure of current a/c, impacts of fiscal & monetary policies etc.
  - External debt & liquidity e.g. size of public external debt, debt service track record, composition of reserves, maturity structure of external debt etc.
Credit analysis – Key considerations

- Credit analysis of corporate bonds v/s Asset backed securities (ABS)
  - No operational or business risks are involved in case of ABS compared to corporate bonds. More emphasis is on the quality of the collateral and its capacity to generate cash flows to meet repayment obligations
  - Efficiency, credit quality and capacity to service the ABS are few important factors considered by the rating agency

- Credit analysis of Municipal bonds v/s Corporate bonds
  - Credit analysis of municipal bonds is similar to credit analysis of corporate bonds
  - Credit analysis of municipal bonds also comprises of some special indentures like rate covenants and priority of revenue claims clause

- Credit analysis of Sovereign debt v/s Corporate bonds
  - Credit analysis of sovereign debt is similar to credit analysis of corporate bonds
  - Capacity to repay in terms of corporate bonds is similar to economical risks
  - Willingness to repay in terms of corporate of bonds is similar to political risks
Credit Risk Models

- Credit risk models assess the credit risk to value corporate bonds
- Structural models
  - Credit risk models developed on the basis of option pricing theory
  - Default can be modeled as an option to the borrowers granted by bondholders to default on its debt if the value of the assets falls below a certain default point
- Reduced form models
  - These type of models look out for external triggers which can compel the borrower to default
  - Value of any option is depends on the volatility of an underlying assets, thus probability of default is linked to the expected volatility of company's assets