Certified Credit Research Analyst Program
Credit Specific Analysis

Introduction to Stress testing and Scenario Building

- Key steps in stress testing
- Framework for developing scenarios
- Commodities and Stressed Scenario
- Scenario – Base, Bear and Bull
Key steps in stress testing
Financial Stress

“...An interruption to the normal functioning of financial markets...”

...Extremely low probability events, highly unlikely to occur but still may occur (always exists a finite however small probability of occurrence)...

**Signs of financial distress:**

1. Increased Uncertainty about fundamental value of assets
2. Increased uncertainty about the behaviour of other investors
3. Increased asymmetry of information
4. Reduced interest to hold risky assets (flights to quality)
5. Reduced interest to hold illiquid assets (flights to liquidity)

**Can stress be predicted on the basis of past data?**

1. Past data best describes the current form and is based on reality
2. However past is no indicator or future
3. Events that have never happened in past can happen in future

**Credit Ratings Perspective**

1. Consider outlier (remote probability events)
2. Assess the likely impact
# Key Steps in Stress Testing

Stress Testing Process is a combination of:

1. **Creative Thinking**
2. **Mathematical modeling**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Step</th>
<th>Creative Thinking</th>
<th>Mathematical Modeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Scenario Building</td>
<td>What if....volume dips x%, inflation goes to s%,......and so on...; think beyond obvious</td>
<td>Base case, bull case, bear case assumptions modeling</td>
</tr>
</tbody>
</table>
| 2.      | Stress Application    | 1. Extreme situations; improbable events  
2. Simultaneous occurrence of a number of events that may not lead to stress independently but cause stress in combination                                  | Identify the stressed variables; identify the impacted variables and their linkages with the stressed variable |
| 3.      | Impact Analysis       | How will business behave if a stress event happens? Will obligations be met? Will company survive?                                                                                                               | Develop the mathematical model and assess whether covenants are met? Quantification of impact |
| 4.      | Probability Analysis  | Most likely, likely, unlikely                                                                                                                                                                               | Assign probabilities – .01, 0.5, 0.0                                                   |
| 5.      | Value of event        |                                                                                                                                                                                                              | Expected value of financial impact; assess ability to meet the covenants and honour the obligations |
Framework for developing scenarios
Framework for Developing Scenarios

1. Range of Sales
   Revenue Drivers
   Sensitivity: market size, market share, price realizations

2. Operating Leverage Sensitivities
   Cost Drivers, Pressure on Margins

3. Financial Leverage
   Capital Structure, Interest Rate Variations, fund raising

4. Economic Or Industry Shocks
   Inflation, GDP Growth Rate, Income Levels

5. Contingent Event
   Contingent Claims, regulatory hurdles, legal cases, political / social turmoil

Company’s Projections
Commodities and Stressed Scenario
Commodities and Stressed Scenario

Volatility in Commodity prices: Direct Impact on P&L of the companies with

1. Commodities as inputs – timing difference between purchase and usage exposes it to further risks; example – steel companies, ferrous & non – ferrous companies

2. Products that are closely linked to commodity prices; Example – Refineries; agricultural products companies, Commodity Trading companies

Framework for Stress Assessment in Commodities Trading Companies (As per Global Risk and trading Practise, Oliver Wyman, Global Management Consulting Firm)

1. Supplement stress tests for risk reporting
   1. Stress scenarios: extreme price movements; correlation coupling and decoupling; and liquidity decreases on a recurring basis.
   2. Outcome of stress test outcomes should feed into the risk governance framework of the company

2. Consider market liquidity
   1. Regular evaluation of the market liquidity of each position
   2. Risk quantification should take liquidity in to account

Source: Published article titled “Embracing the Highly Improbable” by Global Risk and Trading Practise, Oliver Wyman, Global Management Consulting Firm
Commodities and Stressed Scenario (Cont’d..)

3. **Apply proven methods**
   1. Identify key historical incidents that had a detrimental impact on risk drivers
   2. Use them as inputs for standardized stress scenarios
   3. Evaluate on a regular basis

4. **Conduct reverse stress tests**
   1. Examine the level of loss posing a significant threat to the trading organization.
   2. Use that for prioritizing risk mitigation measures and allocating resources based on the vulnerabilities and dependencies of the firm’s businesses.

5. **Define combined stresses for commodity price developments and correlations**
   1. Develop stress tests and more sophisticated risk aggregation methodologies
   2. Consider risks related to not only commodity price fluctuations, but also alterations in their correlations (Under extreme market conditions, commodities often become either much more positively or negatively correlated)

6. **Incorporate a checkpoint prior to stop-loss close-out procedures**
   1. Stop-loss limit procedures should be structured so that commodity traders must explain losses to senior management before hard limits are triggered.
   2. Furthermore, they should allow, in exceptional cases, a trader to leave a position open if a convincing case for the persisting fundamental rationale of the trade can be made.

Source: Published article titled “Embracing the Highly Improbable” by Global Risk and Trading Practice, Oliver Wyman, Global Management Consulting Firm
Scenario – Base, Bear and Bull
Scenario – Base, Bear and Bull

What is Scenario Analysis?
Methodology by an analyst to
1. Study default risk on predictive basis for companies and economic systems with expected benchmark of risk and return
2. Estimate the expected value of financial statement data and their probability

This analysis helps in
1. Monitoring the health of a company in future against a benchmark (peer set, industry or sectoral average)
2. Evaluation of credit rating level

The rating Agency looks at three cases:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameters</th>
<th>Base Case</th>
<th>Bear Case</th>
<th>Bull case</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>All performance factors (operational, financial and economical) in comparison with long term average, industry or sectoral trends</td>
<td>In line, normal</td>
<td>Deviated, negative or unfavourable deviations</td>
<td>Deviated, positive or favourable deviations</td>
</tr>
<tr>
<td>2.</td>
<td>Likelihood</td>
<td>Most likely</td>
<td>Pessimistic</td>
<td>Optimistic</td>
</tr>
<tr>
<td>3.</td>
<td>With respect to what is known in foreseeable</td>
<td>In line</td>
<td>Not in line</td>
<td>Not in line</td>
</tr>
<tr>
<td>4.</td>
<td>Bias</td>
<td>Neutral</td>
<td>Downward (Worse)</td>
<td>Upward (better)</td>
</tr>
<tr>
<td>5.</td>
<td>Nature</td>
<td>Neutral</td>
<td>Recessive,</td>
<td>Boom</td>
</tr>
</tbody>
</table>
Scenario – Base, Bear and Bull (Cont’d…)

Bear Scenario vs. Stressed Scenario

Bear scenario – within the realm of probable events; not a very low probability event

Stressed Scenario – extremely low probability events, highly unlikely to occur but still may occur (always exists a finite however small probability of occurrence)

What to analyse for in scenario analysis?

1. Impact on liquidity – solvency in short term
2. Ability to honour obligations to lenders
3. Ability to meet short term cash requirements for continuing the business
4. Impact on long term solvency
5. Ability to meet financial covenants
6. Resilience in business model

During scenario analysis, focus is to assess the impact of operational events such as:

1. Movement in revenue drivers
2. Changes in input costs
3. Changes in working capital cycles – credit terms, payment terms, turnovers etc.

And not that of non operational events such as:

1. M&A
2. Change in management control
3. Disposal / Acquisition of major assets
4. Technological obsolescence
5. External shocks – abnormal changes in macroeconomic variables, hyperinflation, stagflation
6. Natural calamities, disasters etc