PNC’s Operational Loss Stress Test Methodology

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Objective
- Forecast expected operational losses by quarter given a specified macroeconomic path

Assumptions
- Expected loss equals expected number of events times the expected severity
- Macroeconomic factors drive the expected number of operational loss events
- Severity does not depend on macroeconomic factors

Approach
- Leverage Advanced Measurement Approach (AMA) capital model for loss forecasting
  - Use the capital model’s severity component to calculate expected loss for most risk areas
  - Use scenario analysis inputs to augment (limited) internal loss data for risk areas with thin data
1. Estimate event frequency forecast model
2. Use event frequency projections and components of the AMA Operational Risk capital model:
   - Loss = # of events X model avg. severity
   - OR, for thin data areas
   - Loss = # of events X historical avg. severity
   - + scenario frequency X scenario loss amount
     (summed over all scenarios)
3. A separate model estimates average annual losses for events with loss amounts less than $10K – independent of macro factors
Event frequency forecast groups are nearly identical to the capital model’s units of measure

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Business Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Fraud</td>
<td>Historical average frequency</td>
</tr>
<tr>
<td>External Fraud</td>
<td>See below¹ Res. delq. rates</td>
</tr>
<tr>
<td>Workplace Safety</td>
<td>GDP per capita</td>
</tr>
<tr>
<td>Employment Practices²</td>
<td>Historical average frequency</td>
</tr>
<tr>
<td>Clients, Products, Business Practices</td>
<td>GDP per capita</td>
</tr>
<tr>
<td>Execution, Delivery, Process Mgmt.</td>
<td>C-S HPI GDP per capita, Res. delq. rates</td>
</tr>
<tr>
<td>Damage to Physical Assets²</td>
<td>Historical average frequency</td>
</tr>
<tr>
<td>Business Disruption, System Failure²</td>
<td>Historical average frequency</td>
</tr>
</tbody>
</table>

¹Retail, External Fraud: Unemployment, Residential delinquency rates
²The event frequency has only a small effect on forecasted losses because losses depend primarily on scenarios