Agenda

IFRS9 background
SAS solution for IFRS9
  Monthly run, consolidation, reporting
  Impairment calculation
  Model development
  Data management
Final considerations
IFRS9 BACKGROUND
IFRS 9 comprises of 3 main components:

- **Classification and measurement** - defines which valuation approach should be used for which balance sheet items.

- **Impairment** - introduction of single Expected Loss based impairment methodology which replaces the current Incurred Loss approach.

- **Hedge accounting** - redefines requirements that allow the use of hedge accounting
## IFRS9 BACKGROUND

### Final Standard

Requirements for impairment of financial assets based on 12 month and Lifetime Expected Losses (EL and LEL) replacing the current Incurred Loss (IL) approach under IAS 39

### Current Hot Topics

Practicalities, such as the assumption of 12-month EL for “low credit risk” assets and the delinquency trigger of 30 days for significant increase in credit risk.

Portfolio vs individual asset assessment of significant credit deterioration

Impact of macro-economic variables on lifetime expected loss calculations may require a new suite of models separate to Basel IRB

Statutory Impairment charge is based on the best estimate excluding conservative downturn assumptions inherent in Basel

### Impacts

High level of uncertainty regarding capital impacts – in a recent Deloitte survey 60% of participants do not yet know the impact on their capital ratios

Expectation for increase in the Impairment level driven particularly by the introduction of Stage II lifetime expected loss.

Expectations of higher volatility in the impairment estimates by incorporation of economic forecasts in the expected loss component.

Scope also includes loan commitments and financial guarantee contracts

<table>
<thead>
<tr>
<th>Stage 1 EL</th>
<th>Stage 2 LEL</th>
<th>Stage 3 LEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial recognition (unless purchased or originated as credit-impaired)</td>
<td>Significant increase in credit risk but not credit impaired</td>
<td>Credit impaired</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allowance recognised</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Month EL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interest revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross basis</td>
</tr>
</tbody>
</table>
IFRS 9 will create push on bank’s Equity, Profit and Basel figures.

1) Push on Equity: the increase of provisions will constantly decrease the equity will make it more volatile.

2) Push on Profit: the increase of provisions will generate one-off hit on Profit. After Implementation the P/L will become more volatile.

3) Push on Available Capital: Impact on Equity will transfer to certain extent into the Available Capital as well.

4) Required Capital: Impact will differ depending on the chosen approach (IRB / SA) and loan specific details. Generally a slight increase is expected by the industry.

5) Push on Capital Adequacy Ratio (CAR): Impact on available capital will push CAR down.
**IFRS9 BACKGROUND**

**IMPACT IS EXPECTED TO BE SIGNIFICANT**

Q16: Assuming today’s credit environment were to apply, how is your bank’s total impairment provision in the balance sheet likely to change on transition to IFRS 9/FASB’s CECL model?*

- Majority of banks expect the provision to increase up to 50%
- Some banks expect this to be even more that 100%

Q8a: To what extent are you considering a parallel run between your IFRS 9/FASB CECL approach and the existing IAS 39/US GAAP approach?

17% of respondents expect to perform a parallel run across 2016 and 2017

70% of respondents expect to perform a parallel run only during 2017

13% of the participants have no plans to implement a parallel run.
Q9: What do you see as the three biggest challenges to implementing your IFRS 9/FASB CECL programme? (Rank your top 3)*

- Capability to plan and execute a programme of this size in parallel with other current initiatives: 10%
- Capability to design, build and test new models with limited internal resources: 12%
- Availability of data: 14%
- Necessary level of co-ordination between finance, credit, risk, IT and others to deliver plans: 16%
- Clarity around acceptable interpretation of IFRS 9/FASB’s CECL model externally: 25%

* Participants’ responses have been weighted, assigning a greater weight to higher ranked options than lower ranked options. Percentages displayed are based on total weighted responses.
IFRS 9/FASB’s CECL model: impairment

Q24a: What best describes your delivery approach for IFRS 9 impairment/FASB’s CECL model development?

<table>
<thead>
<tr>
<th>Category</th>
<th>Build new models</th>
<th>Leverage existing models (e.g. IAS 39)</th>
<th>Leverage existing models used in the existing collective impairment methodology</th>
<th>Leverage existing models used for Basel purposes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgages</td>
<td>25%</td>
<td>63%</td>
<td>8%</td>
<td>4%</td>
<td>8%</td>
</tr>
<tr>
<td>Other retail</td>
<td>28%</td>
<td>60%</td>
<td>7%</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>SME</td>
<td>26%</td>
<td>62%</td>
<td>7%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Corporate</td>
<td>18%</td>
<td>69%</td>
<td>8%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Securities</td>
<td>28%</td>
<td>47%</td>
<td>20%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Leverage on existing Basel models
IFRS 9/FASB’s CECL model: impairment

Q24b: For your chosen IFRS 9 impairment/FASB CECL model delivery, how would you describe your approach?

- Mortgages:
  - Sophisticated: 15%
  - Intermediate: 36%
  - Simple: 49%

- Other retail:
  - Sophisticated: 19%
  - Intermediate: 34%
  - Simple: 47%

- SME:
  - Sophisticated: 15%
  - Intermediate: 37%
  - Simple: 48%

- Corporate:
  - Sophisticated: 17%
  - Intermediate: 35%
  - Simple: 48%

- Securities:
  - Sophisticated: 20%
  - Intermediate: 41%
  - Simple: 39%

Sophisticated or intermediate for product lines
Common models and methodology with stress-testing
Several different criteria to classify assets on stages

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Mortgage</th>
<th>Other retail</th>
<th>SME</th>
<th>Corporate</th>
<th>Securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed payments</td>
<td>39%</td>
<td>41%</td>
<td>15%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Step changes in grading scale</td>
<td>19%</td>
<td>18%</td>
<td>27%</td>
<td>30%</td>
<td>35%</td>
</tr>
<tr>
<td>Change in PD exceeds a trigger</td>
<td>17%</td>
<td>16%</td>
<td>21%</td>
<td>18%</td>
<td>19%</td>
</tr>
<tr>
<td>PD exceeds a trigger</td>
<td>8%</td>
<td>7%</td>
<td>11%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Enters a watch list/specialist problem credit team</td>
<td>5%</td>
<td>6%</td>
<td>16%</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>Modification/forgiveness</td>
<td>8%</td>
<td>8%</td>
<td>6%</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
<td>7%</td>
</tr>
</tbody>
</table>

*Participants’ responses have been weighted, assigning a greater weight to higher ranked options than lower ranked options. Percentages displayed are based on total weighted responses by asset category.*
IFRS 9/FASB’s CECL model: impairment

Q28: Regardless of credit deterioration status, do you anticipate calculating both a 12 month expected loss and a Lifetime Expected Loss for all exposures?

Systems prepared to calculate LEL for all exposures
**Data Collection**

- New Information
- Individual Account Level
- Forecasts / Historical Segmentation
- Individual Asset Level

  - Massive Amount Data
  - More Granular Data

**Forward Looking Calculations**

- Financial Impact
- Increased Measurement complexity
- Additional Data Collection
- More Risk Models

  - New Analytical Models

---

**Governance**

- Documentation
- Governance
- Change Control
- Regulatory Capital forecast
- Model Management

  - New Control Framework

---

**Audit Preparation**

One of the most challenging areas of an IFRS 9 implementation will be aligning the banks' interpretation with what is deemed acceptable by the auditor and regulator.

  - Risk and Finance Integration
1) Inventory of Existing Process & Systems
2) Define IFRS 9 Methodology
3) Bring together & manage right data
4) Develop & manage models
5) Design ECL Calculation
6) Derive results, Analyze, Rerun
7) Make Decisions
8) Integrated SAS Technology Platform

IFRS 9
BACKGROUND

HIGH LEVEL PROCESS FLOW

1) Inventory of Existing Process & Systems
2) Define IFRS 9 Methodology
3) Bring together & manage right data
4) Develop & manage models
5) Design ECL Calculation
6) Derive results, Analyze, Rerun
7) Make Decisions
8) Integrated SAS Technology Platform
SAS IMPLEMENTATION APPROACH

Data Environment
- Data management & governance
- Process, not code
- Integration with multiple systems
  - SAP
  - Oracle
  - Teradata
  - Others

Model Environment
- Model & Development
  - 12 month and Life-time Expected Credit Risk parameters estimation (PD, LGD, EAD, CCF) under several customizable methods
  - Incorporate Macro-economic modelling and flexible forecasting features
- Data Retrieval and Management
- Model Inventory / Documentation
- Model Review & Validation
- Model Approval

Simulation Environment
- Implementing several methodological options, compare results, compare with current method (IAS39)
  - Flexible segmentation of assets, editable rules and adjustable level of granularity
  - Calculate 12 month and Lifetime ECL based on Credit Risk Parameters (PD, LGD, CCF, EAD)
  - Cash flow builder with cash flow parameters
  - EIR and Amortized cost calculation including complex parameters like Pre-payments and Interest Rate curves
  - Fair value modeling
  - Dynamic Stage allocation
- Results Analysis and Reporting
  - Sensitivity Analysis

Production Environment
- Automated process to calculate provisions
- Leverage on previous environments
- Workflow for:
  - Results Revision
  - Parameters Adjustments
  - Re-runs
  - Results Approval
  - Post Management Adjustments
- Pre-defined Management Reporting
- Ad-hoc Reporting
- Regulatory Reporting
- Accounting Posting

SAS® Risk Data Aggregation and Reporting
SAS® Risk Model Workbench
SAS® Model Implementation Platform
SAS® Stress Testing Workbench

Copyright © 2012. SAS Institute Inc. All rights reserved.
MONTHLY RUN, CONSOLIDATION AND REPORTING
Production Process

- Build on best practices
- Collect GL history into Data Mart:
  - Reconciliation
- Prepare GL Post Entries
  - Classification (New Business, Write-offs, Stage Transition, Increase/Decrease Provision …)
  - Hierarchies mapping
  - Changes of the period
ORCHESTRATION AND COORDINATION FOR MODEL USAGE

- Workflow to coordinate tasks and people interaction, approve results and adjustments
- Leverage worksheets to review results
- Generate audit report on adjustments
- Prepare Journal to GL
- Report on results
SAS FOR IFRS 9

MANAGEMENT REPORTING

- Analyze impacts
- Compare portfolios
- View evolution
- Highlight outliers
- Determine influential parameters
- Data flow based on mapping tables
- Drill-back to data sources
- Report rendering in multiple formats
  - Excel
  - XBRL
  - XML
  - CSV File
- Possible integration with Regulator infrastructure – e-filling
- Database with Security, Audit-trail and versioning
- Alerts-driven review and approval process
- Collaboration and workflow definition
- Validations Rules integration
STRESS TESTING WORKBENCH

SCB IFRS9 WORKFLOW

1. Kick-Off Meeting
2. 7.0 Refresh Data
3. 7.2 Load Individual Assessment
4. 7.1 Run ECL Calculation
5. 7.2.1 Review Individual Assessment Group A
6. 7.2.2 Review Individual Assessment Group B
7. 8. Apply Stage Allocation
8. 9. Load Results
9. 10.1 Review Retail
10. 10.2 Review Corporate
11. 11. Overall Approve/Reject
12. 12. Apply Account Classification

12 Modeling
RESULTS ANALYSIS

SAS FOR IFRS9
## STRESS TESTING WORKBENCH

### SCB IFRS9 WORKFLOW (ADJUSTMENT)

**Worksheet**

- **Label**: A01_RISK_OUT_CORP/B7

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>LOAN</td>
<td>44,999.74</td>
<td>46,828.27</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>COMMERCIAL</td>
<td>44,999.74</td>
<td>46,828.27</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>STAGE1</td>
<td>75.73</td>
<td>75.53</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>A1</td>
<td>0.31</td>
<td>0.33</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>a001</td>
<td>0.04</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>a002</td>
<td>0.02</td>
<td>0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>a003</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>a004</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>a005</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>a006</td>
<td>0.02</td>
<td>0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>a007</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>a008</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>a009</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>a010</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>a011</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>a012</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>a013</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>a014</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>a015</td>
<td>0.02</td>
<td>0.02</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>a016</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>a017</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>a018</td>
<td>0.01</td>
<td>0.01</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Entry: BHC Total As of date: 25/12/2014 Iteration: 1*
IFRS 9 CALCULATIONS

IMPAIRMENT CALCULATIONS
• Prebuilt implementation infrastructure
• Apply different combinations in implementation
  • Calculate 12 month and Lifetime ECL based on Credit Risk Parameters (PD, LGD, CCF, EAD)
• Cash flow generator with cash flow parameters
• EIR and Amortized cost calculation including complex parameters like Pre-payments and Interest Rate curves
• Fair value modeling
• Quick to implementation
CLASSIFICATION AND ALLOCATION RULES
SAS FOR IFRS 9

SCENARIO MANAGEMENT

- Open and run scenarios
- Edit & Create scenarios
- Scenario library
- Import and Export scenarios
**SAS FOR IFRS 9**

**DETAILED CALCULATION**

- Loan Level Calculations
  - Scenario based execution
  - Results review
Supports wide range of models and methodologies

- Incorporate Macro-economic modelling and flexible forecasting features
- 12 month and Life-time Expected Credit Risk parameters estimation (PD, LGD, CCF), transition probabilities under several customizable methods
- Incorporate Macro-economic modelling and flexible forecasting features
- Counterparty/customer behavioral models, exposure valuation models, mitigation valuation models
DATA MANAGEMENT AND GOVERNANCE

DATA INTEGRATION FOR LOADING AND LINKING OF DIFFERENT SOURCES

Highlights

Features:
- Access all data sources with a graphic view of data flows and dependencies, automatic error handling and scheduling

Benefits:
- Automated data collection and consolidation
- Easy development based on widgets
- More intuitive view on data flows
- Complete transparency and auditability
Banking Detail Data Store

- Unique integrated View for Risk and Finance
- Reconciled between risk and finance
- Avoid duplication and data redundancy
- Can incorporates EBA recommend DPM data model
- Traceability, lineage back to the source system
- Open Data Model - ability to adapt to the banks specific
- Incremental implementation
- Unified place to support Risk and Finance (CRDIV, IFRS 9, ...)

DATA MANAGEMENT AND GOVERNANCE

RISK/FINANCE DATA
# IFRS 9 TABLES - EXAMPLE

## GL_ACCOUNT Properties

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Length</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Q_ACCOUNT_RK</td>
<td>Account Number</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>VALID_TO_DTTM</td>
<td>Valid To Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>3</td>
<td>INTERNAL_Org_RK</td>
<td>Internal Organization Number</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLNUM18.5})</td>
</tr>
<tr>
<td>4</td>
<td>CTA_ACCOUNT_FLG</td>
<td>CTA Account Flag</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>5</td>
<td>INTERCOMPANY_ACCC</td>
<td>Intercompany Account Code</td>
<td>Character</td>
<td>32</td>
<td>(None)</td>
</tr>
<tr>
<td>6</td>
<td>RETAINED_EARNINGS</td>
<td>Retained Earnings</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>7</td>
<td>SOURCE_SYSTEM_CD</td>
<td>Source System Code</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>8</td>
<td>ACCOUNT_NN</td>
<td>Account Number</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>9</td>
<td>Q_ACCOUNT_DESC</td>
<td>Account Description</td>
<td>Character</td>
<td>50</td>
<td>(None)</td>
</tr>
<tr>
<td>10</td>
<td>Q_ACCOUNT_TYPE_CD</td>
<td>Account Type Code</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>11</td>
<td>Q_ACCOUNT_VALUE</td>
<td>Account Value</td>
<td>Numeric</td>
<td>12</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>12</td>
<td>CURRENCY_CD</td>
<td>Currency Code</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>13</td>
<td>Q_FINANCIAL_BOOK_RK</td>
<td>Financial Book Number</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td>PROCESSED_DTTM</td>
<td>Processed Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>15</td>
<td>CTA_ELIM_BEHAVIOR</td>
<td>CTA Elimination Behavior</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>16</td>
<td>RETAINED_EARN_ELIM</td>
<td>Retained Earnings Elim</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>17</td>
<td>RETAINED_EARN_FRT</td>
<td>Retained Earnings Front</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>18</td>
<td>RETAINED_EARN_KR</td>
<td>Retained Earnings KR</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>19</td>
<td>ROLL_UP_TO_PARENT</td>
<td>Roll Up to Parent</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>20</td>
<td>NORMAL_BALANCE_CD</td>
<td>Normal Balance Code</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>21</td>
<td>VALID_FROM_DTTM</td>
<td>Valid From Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
</tbody>
</table>

## ASSESSMENT_RATING_GRADE Properties

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Length</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ASSESSMENT_RATING</td>
<td>Assessment Rating</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>2</td>
<td>VALID_TO_DTTM</td>
<td>Valid To Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
</tbody>
</table>

## DEFAULT_EVENT Properties

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Length</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DEFAULT_EVENT_RK</td>
<td>Default Event Key</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>VALID_FROM_DTTM</td>
<td>Valid From Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>3</td>
<td>DEFAULT_EVENT_ID</td>
<td>Default Event Identifier</td>
<td>Character</td>
<td>32</td>
<td>(None)</td>
</tr>
<tr>
<td>4</td>
<td>DEFAULT_DT</td>
<td>Default Date</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>5</td>
<td>COUNTERPARTY_RK</td>
<td>Counterparty Key</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>EXPOSURE_AT_DEFAULT_AMT</td>
<td>Exposure At Default Amount</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>7</td>
<td>CURRENCY_CD</td>
<td>Currency Code</td>
<td>Character</td>
<td>3</td>
<td>(None)</td>
</tr>
<tr>
<td>8</td>
<td>ACCOUNT_RK</td>
<td>Account Key</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>9</td>
<td>CREDIT_RISK_MITIGANT_RK</td>
<td>Credit Risk Mitigant Key</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>FINANCIAL_INSTRUMENT_RK</td>
<td>Financial Instrument Key</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>EFFECTIVE_FROM_DTTM</td>
<td>Effective From Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>12</td>
<td>EFFECTIVE_TO_DTTM</td>
<td>Effective To Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>13</td>
<td>PROCESSED_DTTM</td>
<td>Processed Timestamp</td>
<td>Date/Time</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
<tr>
<td>14</td>
<td>LGD_RISK_FACTOR</td>
<td>LGD Risk Factor</td>
<td>Numeric</td>
<td>8</td>
<td>(\text{NLDATE20.3})</td>
</tr>
</tbody>
</table>

## Credit Facility Properties

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Description</th>
<th>Type</th>
<th>Length</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>CREDIT_FACILITY_RK</td>
<td>Credit Facility Key</td>
<td>Numeric</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>
**SAS FOR IFRS9**

**SOLUTION BENEFITS**

**FLEXIBLE DATA MODEL**

*Unique data model for Impairment*

New information will lead to new stage II triggers or new segmentations.

**CORE PROCESSES**

*Collective assessment.*

*Auditability and scalability*

The IFRS9 demands accurate calculations in an auditable accounting process. The calculations will be performed on a loan by loan basis according with the financial characteristics of each operation using SAS calculation engine that provides off-the-shelf financial functions.

**IMPAIUREMENT DYNAMICS**

*Understanding Impairment sensitivity*

The loan by loan calculation will allow the identification of the several events that influence the impairment dynamics.

**WHITE-BOX**

*Transparent Method in SAS technology*

Open solution provides independence to maintain and evolve the impairment methodology over time.

**SIMULATION FRAMEWORK**

*Simulation of Risk Impacts*

IFRS 9 demands different scenarios as a standard process implying a need for governance over approval of the final estimation.

**ACTUALS & FORECAST**

*Static and Dynamic Portfolios*

Forecast modelling using SAS will provide input for projected portfolio calculation scenarios for Stress-testing.

Copyright © 2012, SAS Institute Inc. All rights reserved.