

SAS – Your One-Stop Shop for Solvency II

EIOPA - XBRL

Tallinn

11.04.2012



THE
POWER
TO KNOW.

Agenda

- **Introduction**
- Getting the Data Right
- Pillar 1 Calculations
- Pillar 3 Reporting
- DEMO
 - 2 sample tables: SCR-B3C, TP-E1
 - Own taxonomy with +400 XBRL formulae
Aligned with the consultation taxonomy

SAS Risk Management for Insurance

Combination of technology and business logic

SII Business Logic

Dedicated data models storing:

- storing detailed historized data
- analytical data used in Risk Management processes
- intermediate and final results of calculations

Preconfigured with parameters used in QIS5

Dedicated ETL jobs

- To upload analytical marts with data at requested effective date
- To prepare data for calculations performed by specific models
- Automatized processes of running calculations
- Automatized processes of generating predefined reports

Dedicated RD environment

(Implementing standard approach of QIS5)

Dedicated GUI (for running the SCR calculations)

Dedicated reports

- Regulatory reports
- Sample internal management reports

Data Management

Data Storage



Data Integration



Analytics / Risk Calculations

Risk engine Modeling

SCR/MCR
Stress Tests
Simulations

Reporting

Reporting



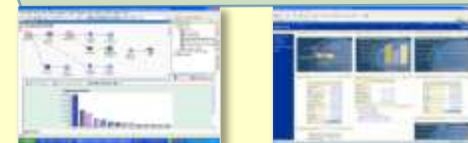
SAS DI



SAS Risk Dimensions

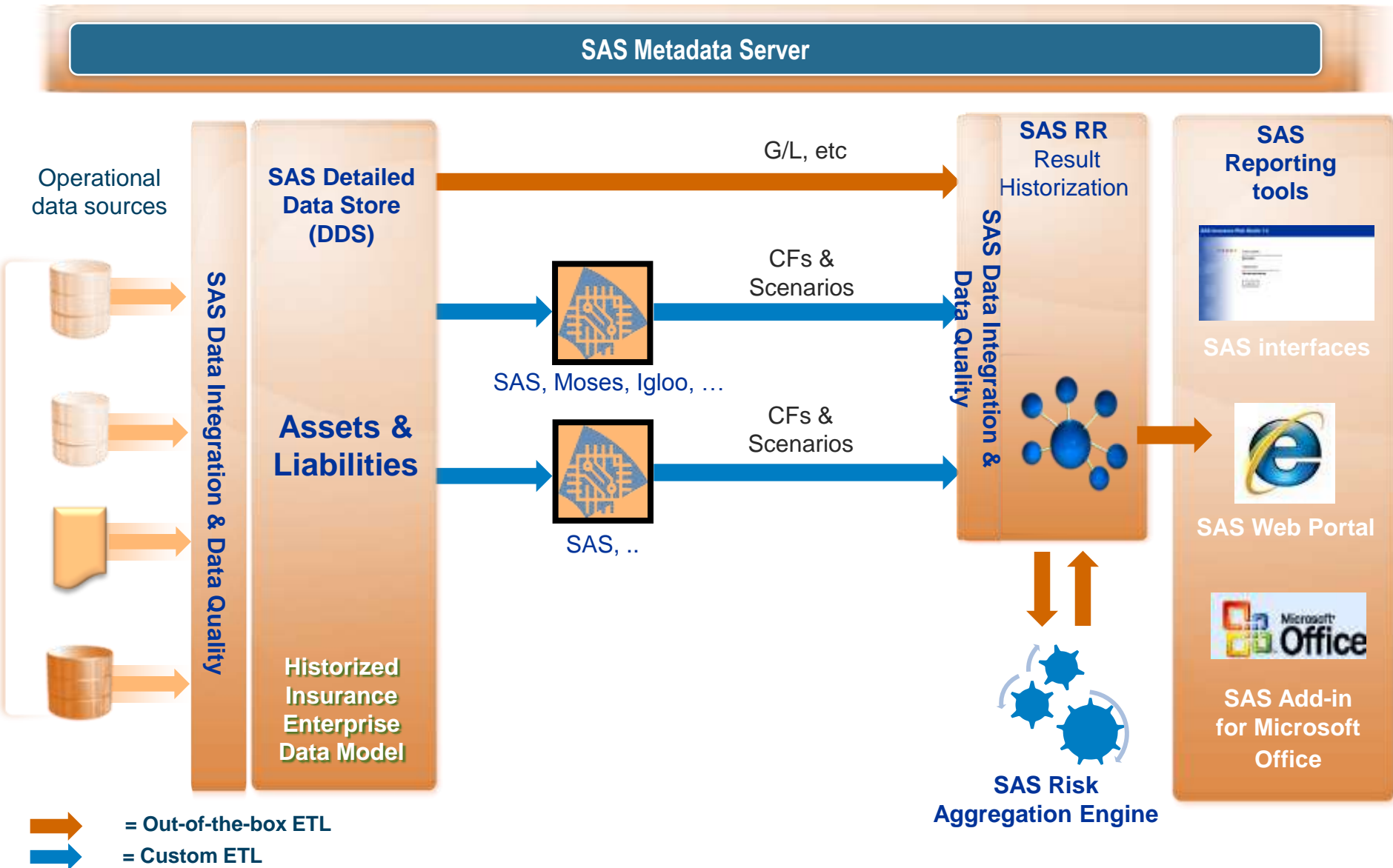


SAS BI



Technology

SAS Risk Management for Insurance



Agenda

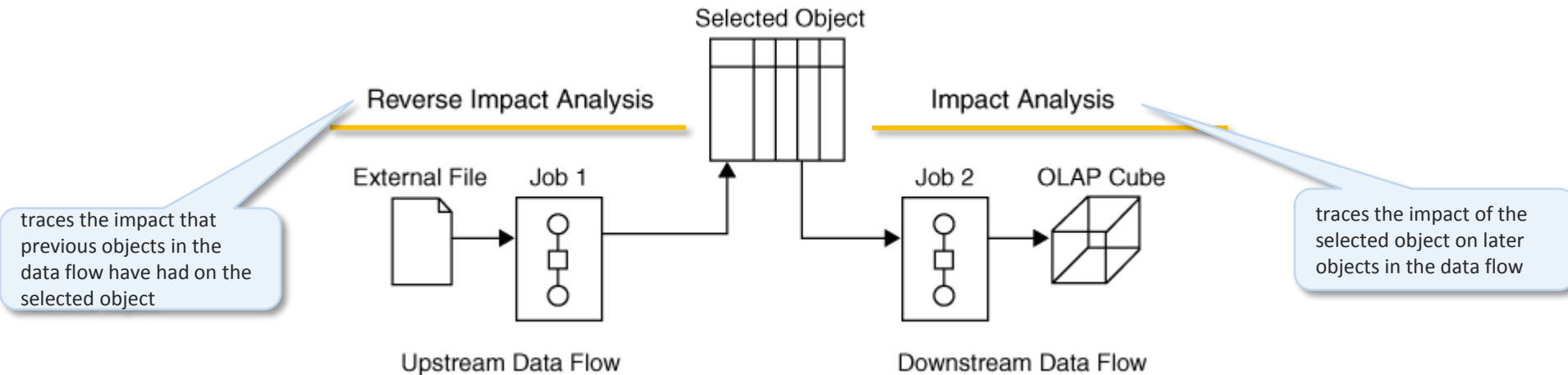
- Introduction
- **Getting the Data Right**
- Pillar 1 Calculations
- Pillar 3 Reporting
- DEMO

Dashboard: Data Quality Monitoring



Impact Analysis and Reverse Impact Analysis

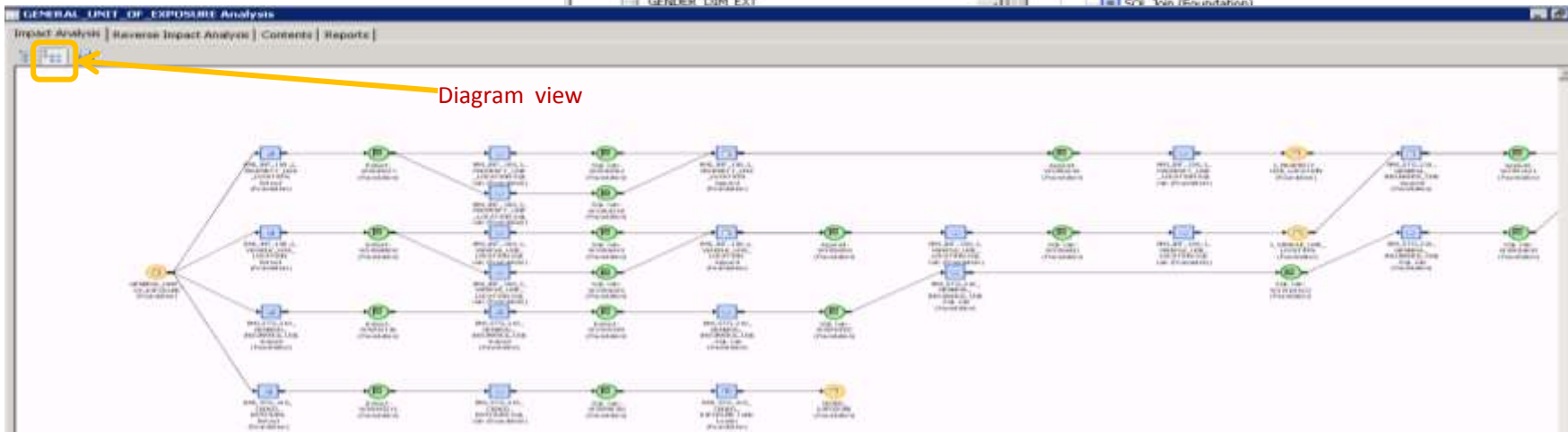
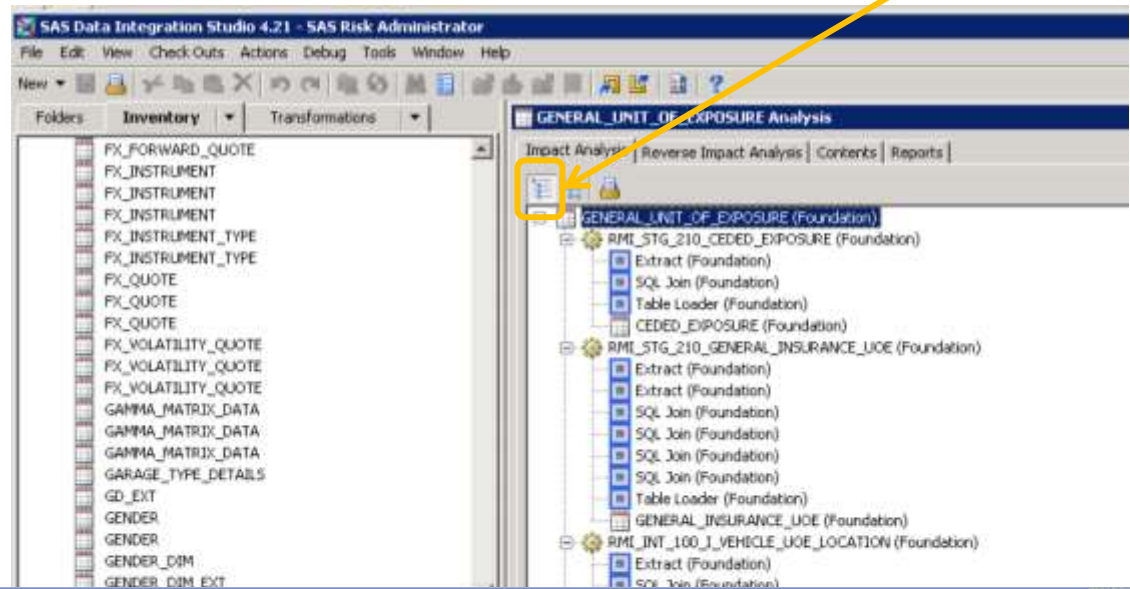
Embedded mechanisms of SAS DI



- Analysis is performed on all metadata repositories on the current metadata server.
- One can generate impact and reverse impact analyses for most types of data objects, including columns, tables, external files, information maps, Enterprise Guide projects and associated objects, and the levels and measures in OLAP cubes.
- One can also generate impact analyses for generated transformations (transformations created by user)

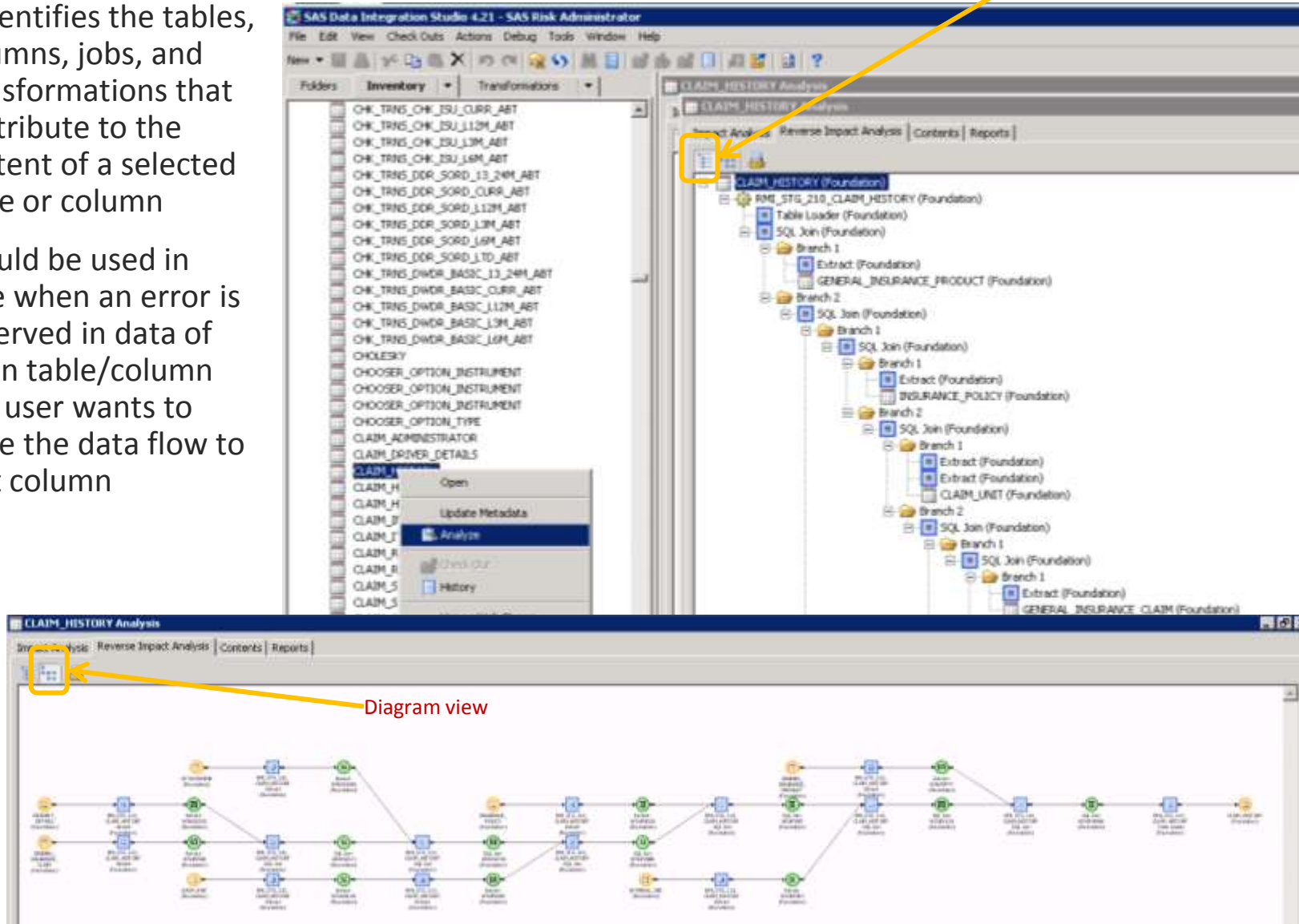
Impact Analysis

- It identifies the tables, columns, jobs, and transformations that are affected by a change to a selected table or column
- Should be used for instance in case of change of data sets in interface with external tools (deleted table, deleted or changed columns..)



Reverse Impact Analysis

- It identifies the tables, columns, jobs, and transformations that contribute to the content of a selected table or column
- Should be used in case when an error is observed in data of given table/column and user wants to trace the data flow to that column

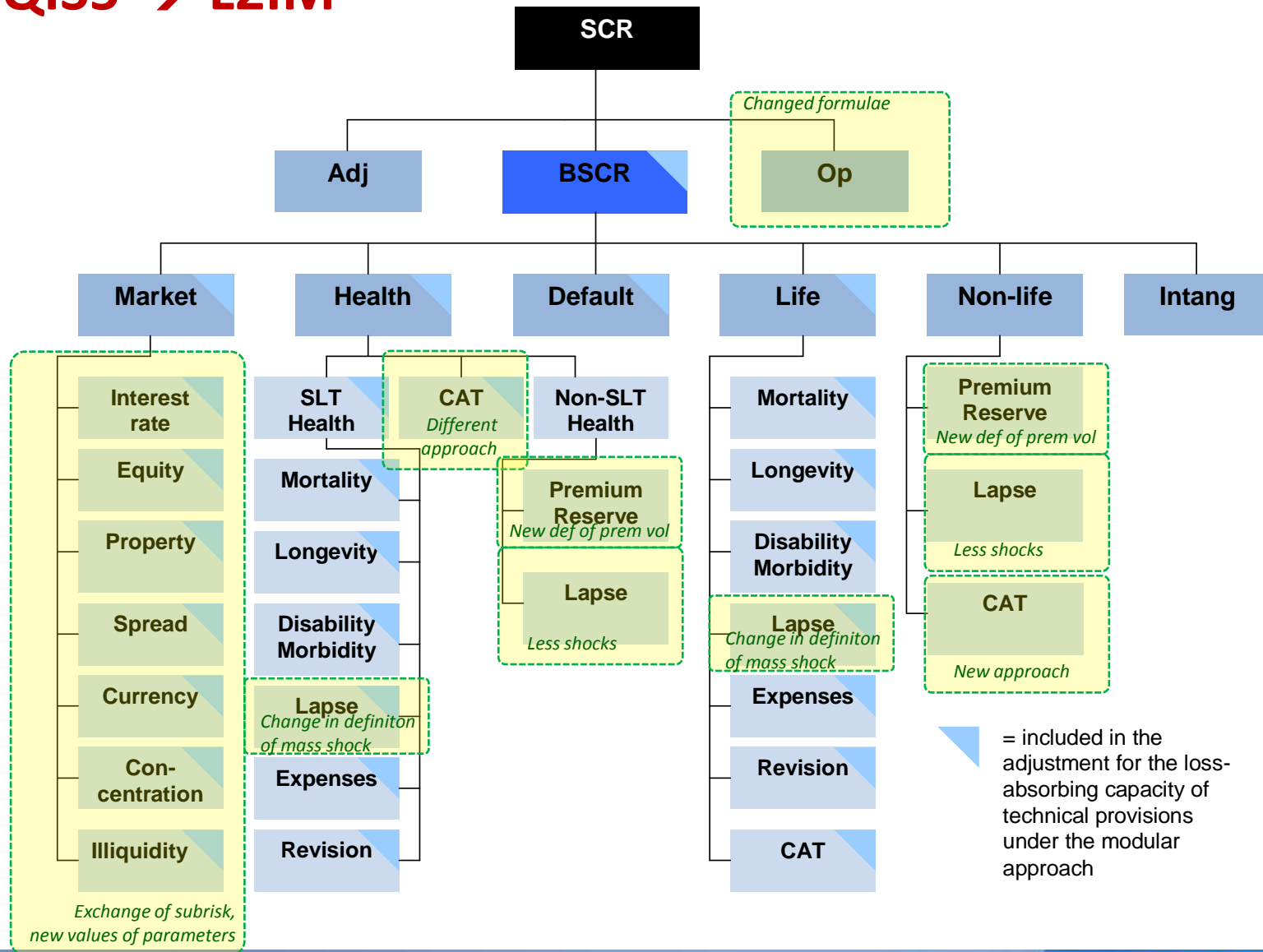


Agenda

- Introduction
- Getting the Data Right
- **Pillar 1 Calculations**
- Pillar 3 Reporting
- DEMO

Pillar 1 – Standard SCR Calculations

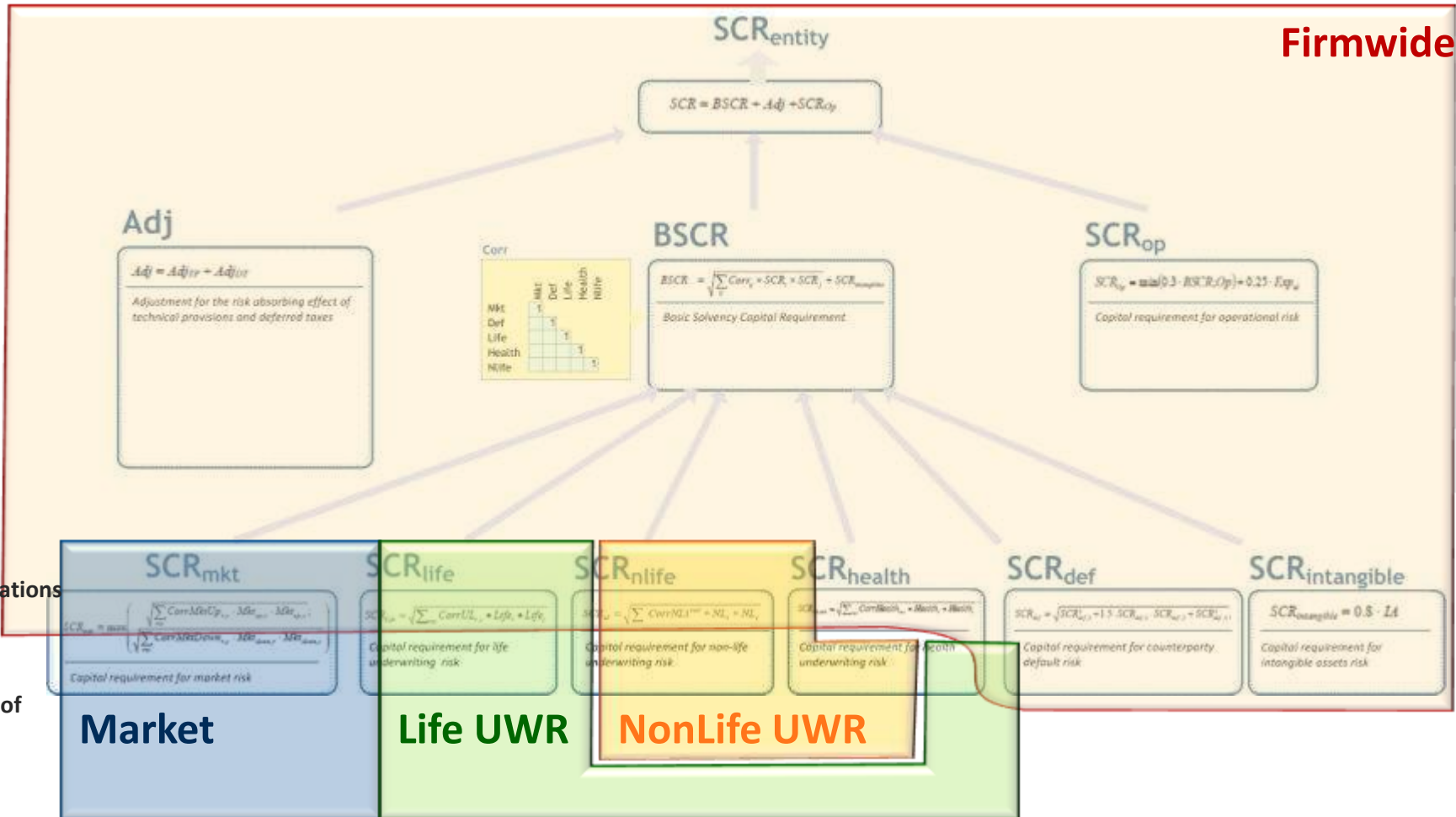
QIS5 → L2IM



SCR Calculation on Solo Level

Scope of SAS RMfl modules/applications

Firmwide



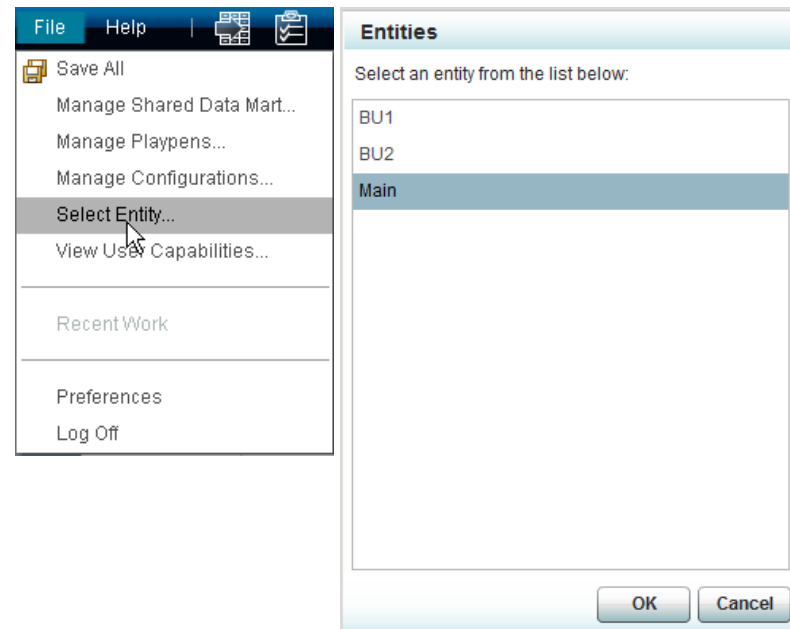
SAS RMfl – Web Application

Step 1 – Log on to the application



The image shows the SAS Log On screen. It has a blue header with the text "SAS® Log On". Below the header, there is a blue padlock icon. To the right of the icon, there are two text input fields: "User name:" and "Password:". Below these fields is a "Log On" button.

Step 2 – Select entity



The image shows the SAS application interface. On the left, the "File" menu is open, showing options: "Save All", "Manage Shared Data Mart...", "Manage Playpens...", "Manage Configurations...", "Select Entity..." (highlighted), "View User Capabilities...", "Recent Work", "Preferences", and "Log Off". On the right, the "Entities" dialog box is open. It has a title bar "Entities" and a subtitle "Select an entity from the list below:". Below the subtitle is a list box containing three items: "BU1", "BU2", and "Main" (highlighted). At the bottom of the dialog box are "OK" and "Cancel" buttons.

Analysis Tasks

File Help Analysis Tasks					
Open Actions					
Analysis Tasks (13 of 13) Filter: none Enter filter text					
Name	Type	Status	Analysis Ended	Configuration Description	
▶ 01. Balance Sheet Analysis	Task	Completed	03/25/12 01:51 PM	LVM	
▶ 02. Intangible Asset Risk Calculation	Task	Completed	03/25/12 01:52 PM	LVM	
▶ 03. Life Solvency Analysis	Task	Completed	03/25/12 01:53 PM	LVM	
▶ 04. Nonlife Solvency Analysis	Task	Completed	03/25/12 01:54 PM	LVM	
▶ 05. Health Solvency Analysis	Task	Completed	03/25/12 02:28 PM	LVM	
▶ 06. Market Risk Solvency Analysis	Task	Completed	03/25/12 02:06 PM	LVM	
▶ 07. Counterparty Solvency Analysis	Task	Completed	03/25/12 02:07 PM	LVM	
▶ 08. Basic SCR Aggregation	Task	Completed	03/25/12 02:08 PM	LVM	
▶ 09. Operational Risk Calculation	Task	Completed	03/25/12 02:08 PM	LVM	
▶ 10. Net SCR Aggregation	Task	Completed	03/25/12 02:09 PM	LVM	
▶ 11. Firmwide SCR Calculation	Task	Completed	03/25/12 02:10 PM	LVM	
▶ 12. Risk Margin Calculation	Task	Completed	03/25/12 02:10 PM	LVM	
▶ 13. Group Solvency Analysis	Task	Completed	03/25/12 02:11 PM	LVM	

Running the Analysis Tasks

Task Wizzard

The screenshot displays the 'Analysis Wizard' application window. The top menu bar includes 'File', 'Help', and 'Analysis Tasks'. Below the menu is a toolbar with an 'Open' button, indicated by a yellow arrow. The main window is divided into several sections:

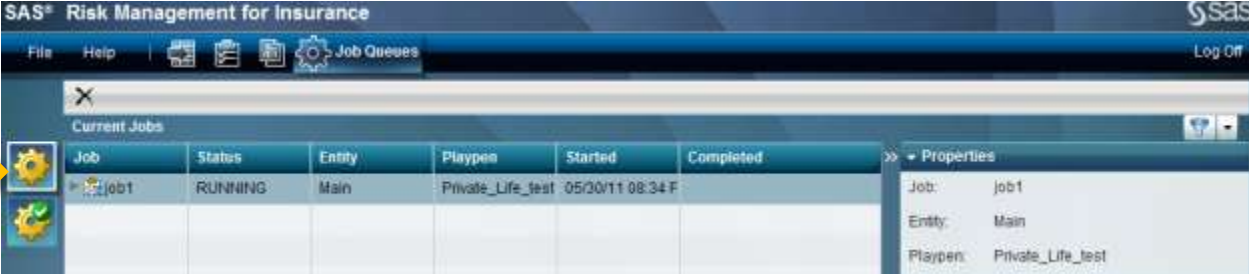
- Analysis Tasks (13 of 13):** A list of tasks on the left side, including:
 - 01. Balance Sheet Analysis
 - 02. Intangible Asset Risk Calculation
 - 03. Life Solvency Analysis
 - 04. Nonlife Solvency Analysis
 - 05. Health Solvency Analysis
 - 06. Market Risk Solvency Analysis
 - 07. Counterparty Solvency Analysis
 - 08. Basic SCR Aggregation
 - 09. Operational Risk Calculation
 - 10. Net SCR Aggregation
 - 11. Firmwide SCR Calculation
 - 12. Risk Margin Calculation
 - 13. Group Solvency Analysis
- Select Analyses:** A section with a tree view showing 'Adjust Parameters' and 'Job Parameters'.
- Available items:** A list of items that can be added to the selected items, including:
 - 07. Counterparty Solvency Analysis
 - 11. Firmwide SCR Calculation
 - 12. Risk Margin Calculation
 - 08. Basic SCR Aggregation** (highlighted)
 - 10. Net SCR Aggregation
 - 13. Group Solvency Analysis
 - 01. Balance Sheet Analysis
 - 09. Operational Risk Calculation
 - 02. Intangible Asset Risk Calculation
 - 06. Market Risk Solvency Analysis
 - 03. Life Solvency Analysis
 - 04. Nonlife Solvency Analysis
 - 05. Health Solvency Analysis
- Selected items:** A list of items that have been added to the wizard, including:
 - 01. Balance Sheet Analysis
 - 10. Net SCR Aggregation
 - 11. Firmwide SCR Calculation
 - 12. Risk Margin Calculation

At the bottom right of the window are 'Previous' and 'Next' buttons. The status bar at the very bottom shows 'Entity: Main', 'Playpen: LVM', and 'User: SAS D'.

Running the Analysis Tasks

Current and Completed Jobs

Running/Current Jobs



SAS® Risk Management for Insurance

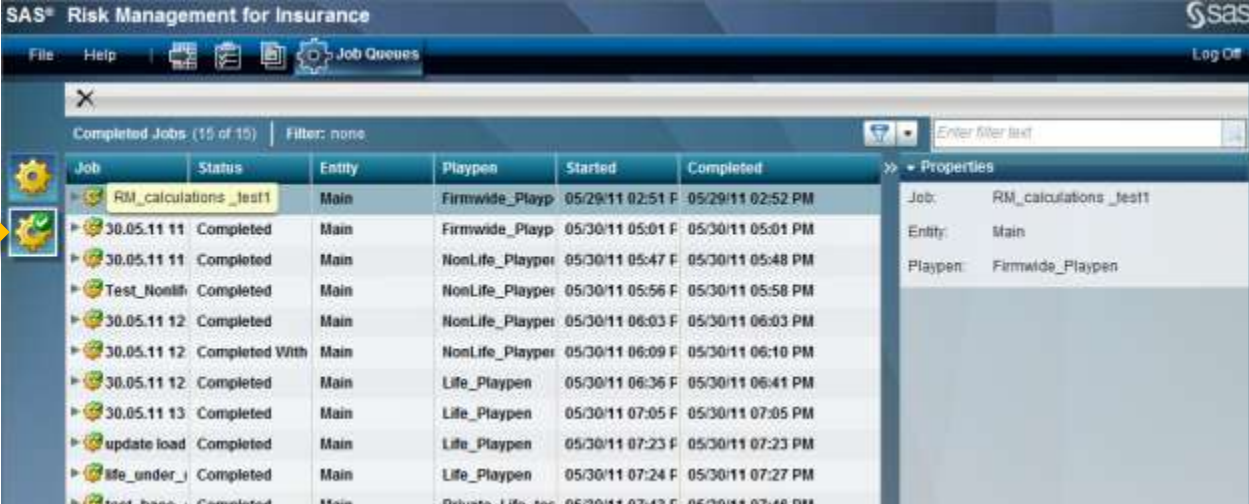
File Help | [Icons] Job Queues Log Off

Current Jobs

Job	Status	Entity	Playpen	Started	Completed
job1	RUNNING	Main	Private_Life_test	05/30/11 08:34 F	

Properties: Job: job1, Entity: Main, Playpen: Private_Life_test

Completed Jobs



SAS® Risk Management for Insurance

File Help | [Icons] Job Queues Log Off

Completed Jobs (10 of 10) | Filter: none

Job	Status	Entity	Playpen	Started	Completed
RM_calculations_test1	Completed	Main	Firmwide_Playpen	05/29/11 02:51 F	05/29/11 02:52 PM
30.05.11 11	Completed	Main	Firmwide_Playpen	05/30/11 05:01 F	05/30/11 05:01 PM
30.05.11 11	Completed	Main	NonLife_Playpen	05/30/11 05:47 F	05/30/11 05:48 PM
Test_NonLife	Completed	Main	NonLife_Playpen	05/30/11 05:56 F	05/30/11 05:58 PM
30.05.11 12	Completed	Main	NonLife_Playpen	05/30/11 06:03 F	05/30/11 06:03 PM
30.05.11 12	Completed With	Main	NonLife_Playpen	05/30/11 06:09 F	05/30/11 06:10 PM
30.05.11 12	Completed	Main	Life_Playpen	05/30/11 06:36 F	05/30/11 06:41 PM
30.05.11 13	Completed	Main	Life_Playpen	05/30/11 07:05 F	05/30/11 07:05 PM
update load	Completed	Main	Life_Playpen	05/30/11 07:23 F	05/30/11 07:23 PM
life_under_	Completed	Main	Life_Playpen	05/30/11 07:24 F	05/30/11 07:27 PM
test_base_	Completed	Main	Private_Life_test	05/30/11 07:43 F	05/30/11 07:46 PM

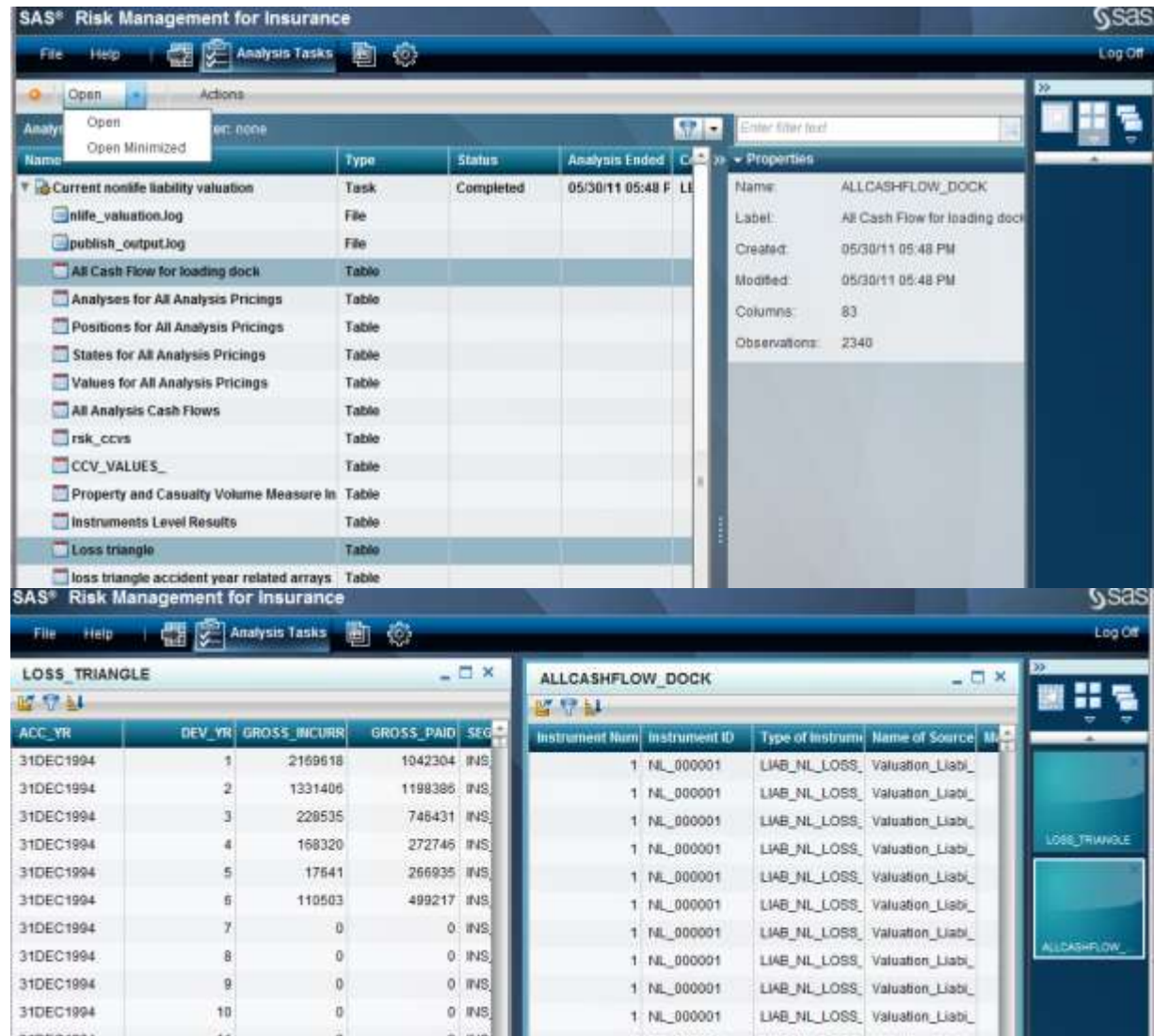
Properties: Job: RM_calculations_test1, Entity: Main, Playpen: Firmwide_Playpen

Running the Analysis Tasks

Result Data Sets

Data structures being the result of tasks – are shown within application and may be browsed by the user.

There are also detailed log files available.



The screenshot displays the SAS Risk Management for Insurance Analysis Tasks window. The main pane shows a list of tasks and their results. The 'All Cash Flow for loading dock' task is selected, showing a table of results. The 'LOSS_TRIANGLE' task is also visible, showing a table of results. The 'ALLCASHFLOW_DOCK' task is also visible, showing a table of results.

Name	Type	Status	Analysis Ended
Current nonlife liability valuation	Task	Completed	05/30/11 05:48 PM
nlife_valuation.log	File		
publish_output.log	File		
All Cash Flow for loading dock	Table		
Analyses for All Analysis Pricings	Table		
Positions for All Analysis Pricings	Table		
States for All Analysis Pricings	Table		
Values for All Analysis Pricings	Table		
All Analysis Cash Flows	Table		
risk_ccvs	Table		
CCV_VALUES_	Table		
Property and Casualty Volume Measure in	Table		
Instruments Level Results	Table		
Loss triangle	Table		
loss triangle accident year related arrays	Table		

ACC_YR	DEV_YR	GROSS_INCURR	GROSS_PAID	SEG
31DEC1994	1	2169618	1042304	INS
31DEC1994	2	1331406	1198386	INS
31DEC1994	3	228535	746431	INS
31DEC1994	4	168320	272746	INS
31DEC1994	5	17641	266935	INS
31DEC1994	6	110503	499217	INS
31DEC1994	7	0	0	INS
31DEC1994	8	0	0	INS
31DEC1994	9	0	0	INS
31DEC1994	10	0	0	INS

Instrument Num	Instrument ID	Type of Instrum	Name of Source
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi
1	NL_000001	LIAB_NL_LOSS	Valuation_Liabi

Agenda

- Introduction
- Getting the Data Right
- Pillar 1 Calculations
- **Pillar 3 Reporting**
- DEMO

Pillar 3 - Regulatory Reporting

Following **CP no. 58** „Supervisory Reporting and Public Disclosure Requirements”, insurance companies should provide following information to the supervisory authority:

Information to be received by the supervisory authority

- **REGULAR** supervisory reporting and public disclosure at predefined periods (*quarterly or annually*)

RTS – Report to Supervisors

Art. 35(1)

All information necessary for the purpose of supervision.

Should include:

- Qualitative report
- Quantitative reporting templates - **QRT**

SFCR – Solvency and Financial Condition Report

Art. 35(1)

Publicly disclosed information

Should include:

- Qualitative report
- Quantitative reporting templates - **QRT**

- **Upon occurrence** of predefined events - Art. 35(2) (a) (ii) and Art. 53(1)
- **During enquiries** regarding the situation of an undertaking – Art. 35(2) (a) (ii)

Regulatory reporting is supported by SAS RMfl:

- **QRT** (Quantitative Reporting Templates) reports are predefined and can be created by the user, within web application, based on data in RR

- **Qualitative** report may be prepared as MS Word template with embedded analysis/graphs based on data in SAS RR

Quantitative Reporting Templates (QRT)

Following **CP no. 9 (8Nov2011)** on the proposal on Quantitative Reporting Templates, insurance companies should provide following reprotos to the supervisory authority:

- **Regulatory capital**
 - Solvency capital required (SCR B2A, B2B and B2C)
 - Minimum capital required (SCR B3A and SCR B4B)
 - Market risk capital (SCR B3A)
 - Life insurance risk capital (SCR B3C)
 - P&C insurance risk capital (SCR B3E)
 - P&C catastrophe risk capital (SCR B3F)
 - Health insurance risk capital (SCR B3D)
 - Counterparty default risk capital (SCR B3B)
 - Operational risk capital (SCR B3G)
- **Minimum Capital Requirements**
 - Reports on MCR (MCR-B4A, MCR-B4B)
- **Available capital**
 - Solo own funds details (OF B1A ,OF B1Q)
 - Group own funds (G30)
- **Other general business information**
 - P&C claims (TP E3, TP E4, TP E6)
 - Life insurance liabilities (TP F3, TP F3A, TP F3B, TP F4)
 - Expenses (TP E5)
 - Reinsurance (Re J1, Re J2, Re J3, SPV)
 - Underwriting risk (TP-E7A, TP-E7B)
- **Regulatory and statutory balance sheets**
 - Balance sheet (BS C1, BS C1B and BS C1D)
 - Group subordinate liabilities (G15)
- **Technical provisions**
 - Life insurance liability (TP F1 and F1Q)
 - P&C insurance liability (TP E1 and E1Q)
 - Group technical provisions (G14)
- **Cash flow structure for life, health and P&C insurance liabilities**
 - Life insurance liabilities (TP F2)
 - Nonlife insurance liabilities (TP E2)
- **Information on the level of exposure**
 - Investments (Assets -D1, Assets-D1Q, Assets-D1S, Assets-D2O, Assets-D2T, Assets-D3, Assets-D4, Assets-D5, Assets -D6)
- **Insurance groups**
 - Intra group transactions (IGT1 – IGT6, RC)
 - Contribution to group capital (G20)
- **Others**
 - Cover (Country-K1, Cover-A1A, Cover-A1Q)
 - Analysis of changes in BOF (VA-C2A, VA-C2B, VA-C2C, VA-C2D)
 - Group (G01, G03, G04, G10)

QRT – Complexity of Process

CONTENT

- There are 55 solo and 10 group-specific reports
- There are about 2000 cells to be filled with data of various character

10 Group

55 Solo

2000 cells

GROUP STRUCTURE

While handling with capital group- there may be quite high number of entities and complex group structure



FREQUENCY & DISCLOSURE

There is a strict definition which reports should be generated with what frequency, whether for solo or group and whether public or not

Template	Content	S	G	QS	QG	DS	DG	RFF
BS - C1	Balance sheet	X	X	E	E	X	X	X
BS - C1B	Off-balance sheet items	X	X					
BS - C1D	Assets and liabilities by currency	X	X					
Country - K1	Activity by country	X						
Cover - A1A	Premiums, claims & expenses - Annual	X	X					
Cover - A1Q	Premiums, claims & expenses - Quarterly			X	X	X	X	
OF - B1A	Own funds - Annual	X	X					X
OF - B1Q	Own funds - Quarterly			X	X	X ³	X	
VA - C2A	Summary analysis of changes in BOF	X						
VA - C2B	Analysis of changes in BOF due to investments	X						
VA - C2C	Analysis of changes in BOF due to technical provisions	X						

GEOGRAPHY, CURRENCY

Some entities operate in different geographical regions. → complexity of languages and currencies

PROCESS

Generally there are several people involved in creation of one report. They need to collaborate with each other. Sometimes they require to manually change the data in the final report, keeping the auditability of the whole process.

SAS RMfl: Regulatory Reporting (QRT)

1

OF-B1Q

2

Own funds (quarterly)

3

4

5

Basic own funds

6

Own Funds items

7

Ordinary share capital (including the initial fund)

8

The initial fund

9

Share premium account

10

Retained earnings, including net of foreseeable dividends

11

Other reserves

12

Surplus funds

13

Preference shares

14

Subordinated liabilities

15

Subordinated mutual mortgage

16

Other items approved as above

17

Minority interests (for consolidation)

18

19

Reconciliation with S

20

Reconciliation reserve

21

22

Total basic own funds

23

24

25

Total eligible own funds

26

Total eligible own funds

27

28

29

TP-F1: Life and Health

30

TP-F1Q: Life and Health

31

SCR-B2A: Solvency Capital Requirement

32

G20: Contribution

5

Life underwriting

6

7

8

Mortality risk

9

Simplification

10

11

Longevity risk

12

Simplification

13

14

Disability risk

15

Simplification

16

17

Lapse risk

18

risk of increase

19

Simplification

20

risk of decrease

21

Simplification

22

mass lapse risk

23

mass lapse risk

24

25

Expense risk

26

Simplification

27

28

Revision risk

29

Catastrophe risk

30

Simplification

31

32

Diversification with

33

34

Total life underwriting

1

SCR-B2A

2

Solvency Capital Requirement - for firms on Standard Formula or Partial Internal Models

3

4

5

Basic SCR

6

Market risk

7

Counterparty default risk

8

Life underwriting risk

9

Health underwriting risk

10

Non-life underwriting risk

11

Diversification effects (between

12

13

Intangible asset risk

14

15

Remaining part of the SCR calculation

16

Diversification effects (between

17

Partial Internal Model components

18

Basic SCR (net and gross)

19

20

Final SCR calculation

21

Loss-absorbing capacity of technical provisions

22

Loss-absorbing capacity of default risk

23

Operational risk

24

25

Adjustment for Ring Fenced Funds

26

Non-insurance capital requirements

27

Non-controlled participation requirements

28

29

SCR, excluding capital add-ons

30

Capital add-ons already set

31

SCR (as disclosed)

32

1

SCR-B3B

2

Solvency Capital Requirement - Counterparty default risk

3

4

Counterparty default risk

5

Type 1 exposures

6

of which Reinsurance

7

of which Securitisations

8

of which Derivatives

9

of which Other risk mitigating contracts

10

of which Other credit exposures

11

12

Type 2 exposures

13

of which Intermediaries

14

of which Other credit exposures

15

16

Diversification within module

17

18

Total counterparty default risk

19

1

25,151.32

2

6,187.16

3

0.00

4

0.00

5

0.00

6

39,265.05

7

8

2,959.09

9

2,959.09

10

0.00

11

12

669.88

13

14

27,440.53

15

Tools

?

»

sas

Log Off

19/11 06:30

21/11 04:49

Editing the Results in the database

- System enables the user to edit the result data promoted to RR

The screenshot shows the SAS Risk Management for Insurance interface. The 'Reports' menu is open, and the 'Edit Results' option is selected. This opens the 'Edit Reporting Results' dialog box. The dialog box displays the 'Edit Reporting Results' window, which includes fields for 'Project' and 'Analysis / Fact Table'. The 'Fact Table' section shows 'Fact Table Editing' with a table of data. The table has columns: COUN, Project St, Classification St, Analysis Result, Gross Earned Pr, Gross Written Pr, Net Earned Prem, Net Written Prem, Coded Premiums, Coded Written P, and Coded E. The table contains 10 rows of data. The 'Edit Reporting Results' window is highlighted with a yellow border. An arrow points from the 'Edit Results' button in the 'Reports' menu to the 'Edit Reporting Results' dialog box.

- Since audit trail is set for all RR fact tables, the trace of changes is kept in audit file

ATDATETIME	ATOBSNO	ATRETURNCODE	ATUSERID	ATOPCODE	ATMESSAGE
23MAR2012:17:30:00	2		sasdemo	DR	
23MAR2012:17:30:00	2		sasdemo	DW	

Editing the Results in the tables

- System enables the user also to edit the result data in the tables

Imp004.tmp - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Developer Eyeglass

Open File Load Data Save Data Select Windows Clear Data View Changes Validate Current Current Options

Excel Service Reporting

233506221

Life underwriting risk - basic information		Initial absolute values before shock		Absolute values		
		Assets	Liabilities	Assets	Liabilities (including the loss absorbing capacity of technical provisions)	Net solvency requirement (including the absorbing capacity of technical provisions)
Mortality risk		233,386,221	167,741,899	250,487,652	202,389,563	17.1
Longevity risk		155,639,087	96,362,554	174,233,650	157,423,688	40.4
Disability-mortality risk		160,008,421	102,998,361	169,525,551	112,590,086	
Lapse risk						14.3
risk of increase in lapsation		163,822,674	105,539,221	196,506,420	139,512,262	1.2
risk of decrease in lapsation		163,822,674	105,539,221	170,308,838	126,355,699	14.2
mixed lapse risk		163,822,674	105,539,221	196,655,847	142,596,820	1.2
Life expense risk		152,997,362	94,862,599	169,696,331	126,384,839	14.7
Reversion risk		161,006,399	102,998,363	304,566,932	163,625,906	17.1
Life catastrophic risk		82,963,852	49,658,211	55,863,698	82,985,860	4

SCR-B3C

- Since audit trail is set for all RR fact tables, the trace of changes is kept in audit file

ATDATETIME	ATOBSNO	ATRETURNCODE	ATUSERID	ATOPCODE	ATMESSAGE
23MAR2012:17:30:00	2		sasdemo	DR	
23MAR2012:17:30:00	2		sasdemo	DW	

Validation and XBRL production

- System creates dataset and presents to XBRL processor for validation
- Errors against taxonomy (incl. formulae) are listed on portal view
- Open table viewer in Excel to do detailed XBRL debugging (see demo)
- Produce XBRL instance document(s)

The screenshot shows a Microsoft Excel window titled 'tmpC787.tmp - Microsoft Excel'. The active sheet is 'TP-E1' and the selected cell is 'D39'. The table contains financial data for 'Non-Life and Health non-SLT Technical Provisions (annual)'. The columns are: Medical expense (1), Income protection (2), Workers' compensation insurance (3), and Motor vehicle liability insurance (4). The rows include: Recoverables from Finite Reinsurance before adjustment for expected losses, Total recoverable from reinsurance/SPV after the adjustment for expected losses due to counterparty default, Net, Total best estimate - gross, Total best estimate - net, Risk margin, and Technical provisions - total. The table is color-coded: green for positive values, red for negative values, and yellow for totals. An 'Error List' pane on the right shows 20 formula errors, with the first one being 'Formula Error: 10'. A message at the bottom of the Error List states: 'The following formula is not satisfied in TP-E1: D39=D7+D33+D36'.

	Medical expense (1)	Income protection (2)	Workers' compensation insurance (3)	Motor vehicle liability insurance (4)
Recoverables from Finite Reinsurance before adjustment for expected losses	1,651,577	2,167,733	3,886,280	148,348
Total recoverable from reinsurance/SPV after the adjustment for expected losses due to counterparty default	388,160	131,390	952,834	72,155
Net	2,837,879	7,360,835	6,868,567	1,019,770
Total best estimate - gross	6,888,866	11,409,690	9,686,837	6,946,951
Total best estimate - net	6,429,066	11,112,036	8,589,074	5,265,875
Risk margin	15,317,390	2,252,682	52,391	48,453
Technical provisions - total	181,991,199	11,981,004	12,714,329	74,027,958
Recoverable from reinsurance contract/SPV after the adjustment for expected losses due to counterparty default - total	459,900	297,663	1,190,763	1,681,076
Technical provisions minus recoverables from reinsurance and SPV	181,531,299	11,683,341	11,523,566	72,346,882

Agenda

- Introduction
- Getting the Data Right
- Pillar 1 Calculations
- Pillar 3 Reporting
- **DEMO: 2 sample tables and taxonomy with +400 XBRL formulae**

