Tony Boobier, Insurance Leader - EMEA, IBM Business Analytics

18 September 2013

New approaches for insurers to optimise capital and achieve better performance

Agenda

17.00 **The next generation of ALM modelling to optimise economic and regulatory capital**

Dan Wainwright, Principal Consultant, Risk Analytics, IBM

17.30 **New approaches for cost effective reporting and greater insight for risk aware decision making**

Patrick Braun, Senior Consultant – Insurance Solutions, Risk Analytics, IBM

18.00 **New approaches to optimise risk-return of your credit portfolio with integrated market and credit risk**

David Dullaway, Partner, Oliver Wyman

18.30 **New approaches to overcoming the challenges of ORSA modelling**

Andrew Blackburn, Principal Actuarial Consultant, Risk Analytics, IBM

19.00 **Wrap up**

Tony Boobier, Insurance Leader - EMEA, IBM Business Analytics

19.10 **Drinks reception & networking**

What we mean by 'Beyond Solvency II'

1

Some insurers are taking the view that **early delivery of their solutions is important for benefit release**, even if regulatory implementation is deferred.

2

With increasing complexity and escalating costs, compromises driving programmes closer to a "minimum compliance" solution have been made.

Now is the time for programmes to think forward, in terms of how to:

•**Protect the investment** – ensuring the solution continues to be used and governed appropriately, and that users do not revert to old behaviours and tools

•**Sweat the investment** – driving down the additional run cost which the addition of Solvency II solutions have inevitably entailed

•**Build on the investment** – determine how the assets can be used to drive additional benefit across the business.

3

Investment is not just about regulation and compliance.

1.Mitigate the risk of old processes or further excel spreadsheets being introduced

2.Encourage wider use of the Solvency II solution to solve business problems and drive value for your business

3.Transform the use of data in your business with deeper customer understanding e.g product development, segmentation, fraud management

Dan Wainwright - Principal Consultant, Risk Analytics, IBM

18 September 2013

Managing Both Sides of the Balance Sheet: Full Valuation ALM

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Agenda

- Drivers for improved ALM

- What is ALM?

- Uncovering the value of AFM

- Challenges of traditional ALM modelling

- ALM of the future

- The IBM ALM solution

- Recap

A Need For Better Balance Sheet Management

Greater scrutiny on the balance sheet....
Increased focus around risk, capital monitoring and solvency has created need for more robust company wide balance sheet management.

Avoid volatility in reporting….
Companies wishing to avoid volatility in reporting disclosures across the various different regulations; S2, IFRS, local reporting etc are investing in more robust and holistic ALM.

Increase management confidence….
In addition, decision makers & investors want increasing confidence that strategic business decisions will not result in negative headlines & possible regulatory oversight

Competitive advantage is key....
In the challenging economic environment competitive advantage is key. Assessing the impact of key business decisions on the balance sheet is critical. Insightful decision making based on sound numbers can make all the difference

What is ALM?

ALM is the practice of managing a business so that decisions and actions taken with respect to assets and liabilities are coordinated[1] and reflect the risks inherent in their interaction

ALM alongside proactive risk management is a powerful and robust method of managing the impact of a challenging economic & regulatory landscape. ALM can also be a highly effective strategic business tool in delivering value and competitive advantage across a business

[1] Society of Actuaries Professional Actuarial Specialty Guide describing Asset Liability Management – published 2003

ALM as a Strategic Decision Making Tool

ALM is a valuable decision making tool
Balance sheet modelling of assets and liabilities increasingly used as a key source of management information driving executive decision making

ALM models can be multi purpose
ALM can be used to derive core risk based reporting & management metrics such as MCEV, Economic Capital, SII & IFRS and can form the basis of a quantitative ERM framework

ALM can drive business strategy
Holistic ALM models can also be used to evaluate the impact of management decisions within a business and promote confidence in determining a host of strategic business decisions:
- Product &Investment strategy
- Capital and solvency monitoring
- Risk appetite and limits
- Performance management and attribution

Accurately modelling and accessing business critical information of this type in a single, consistent solution is a challenge for the majority of insurers

Challenges of ALM Modelling

Siloed approach
Traditionally ALM modelling is either liability or asset driven in its focus

Multi-departmental
It is often cross departmental with different teams/systems delivering key ALM analysis
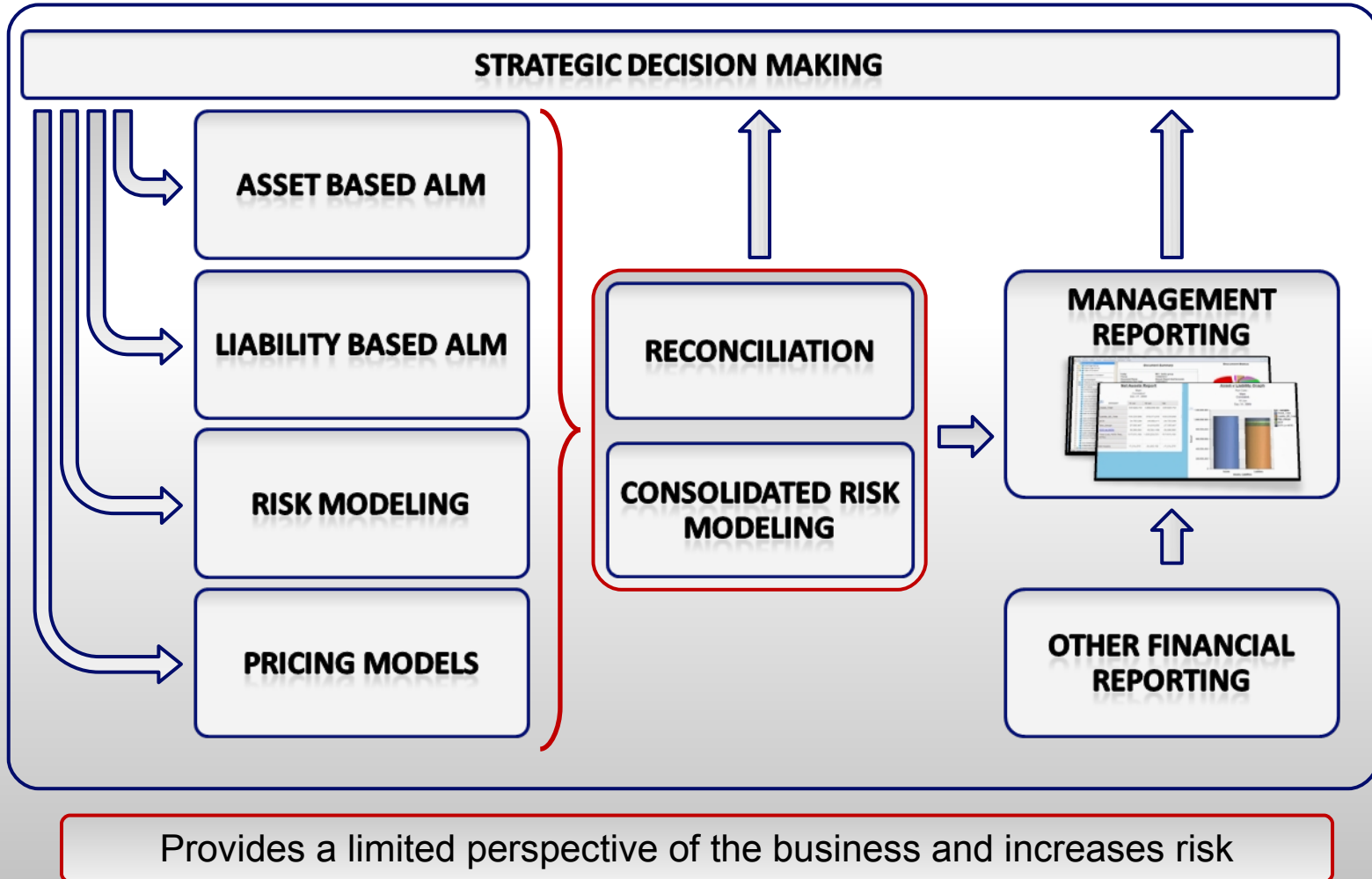
Use of approximations
- Actuarial ALM models tend to be liability focussed with proxy assets
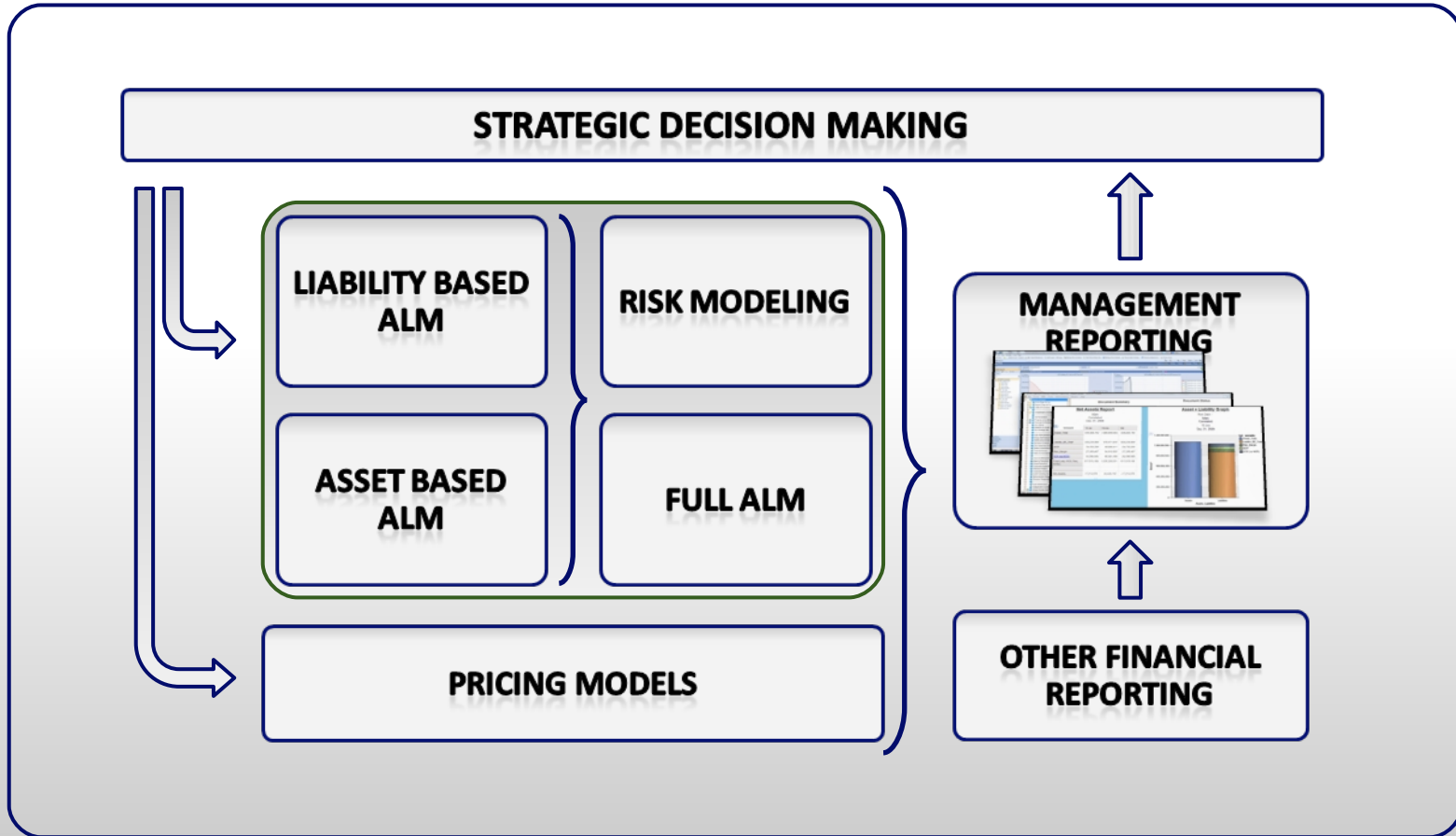- Asset models tend to use proxy liabilities for risk management analysis

Impact of current approaches
- Lack of consistency between asset/liability results
- Substantial reconciliation needed to tie together numbers for risk/financial reporting purposes
- Significant time required to deliver key metrics
- Lack of confidence in analytics derived from ALM models
- Potential impact on capital/solvency position
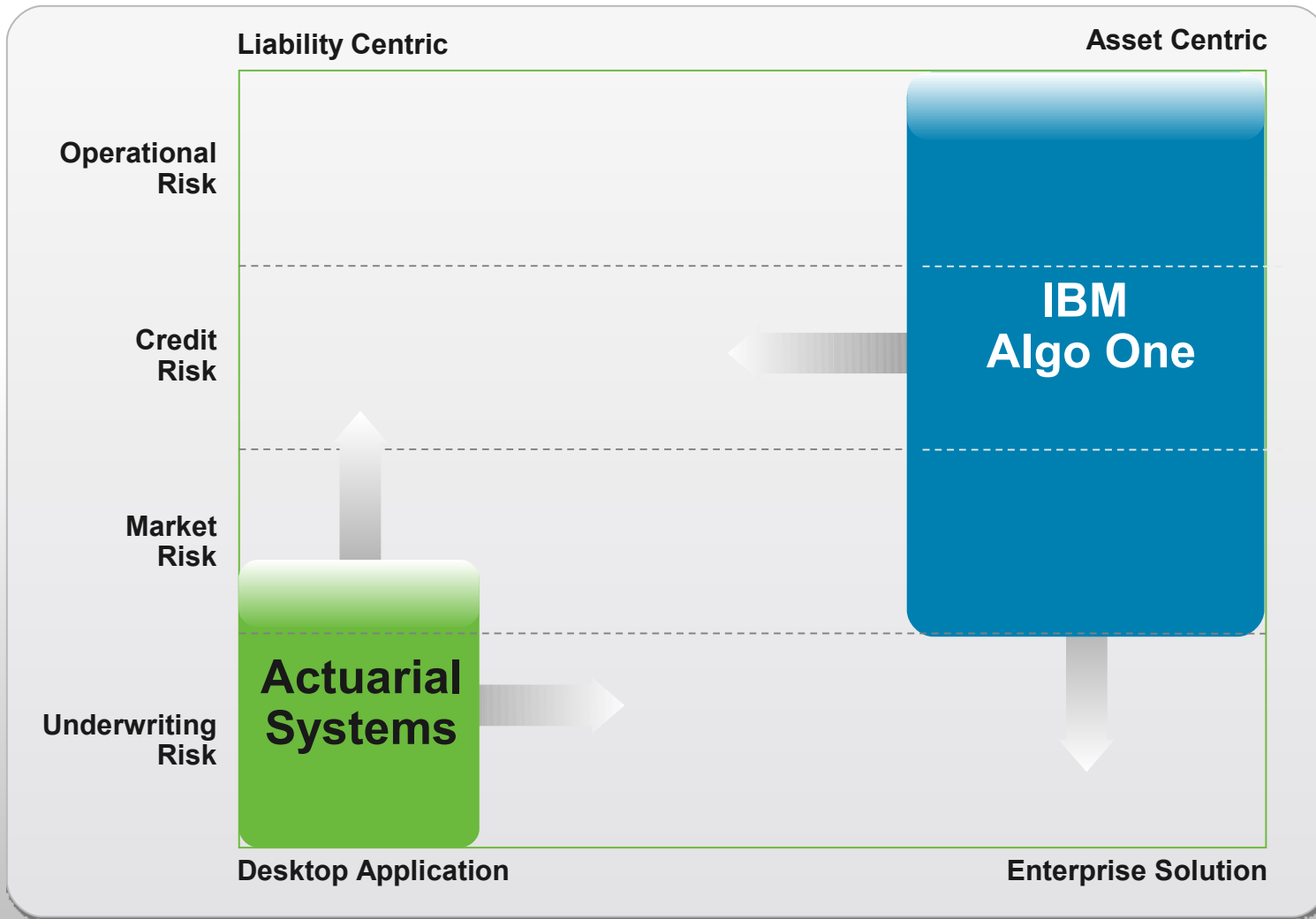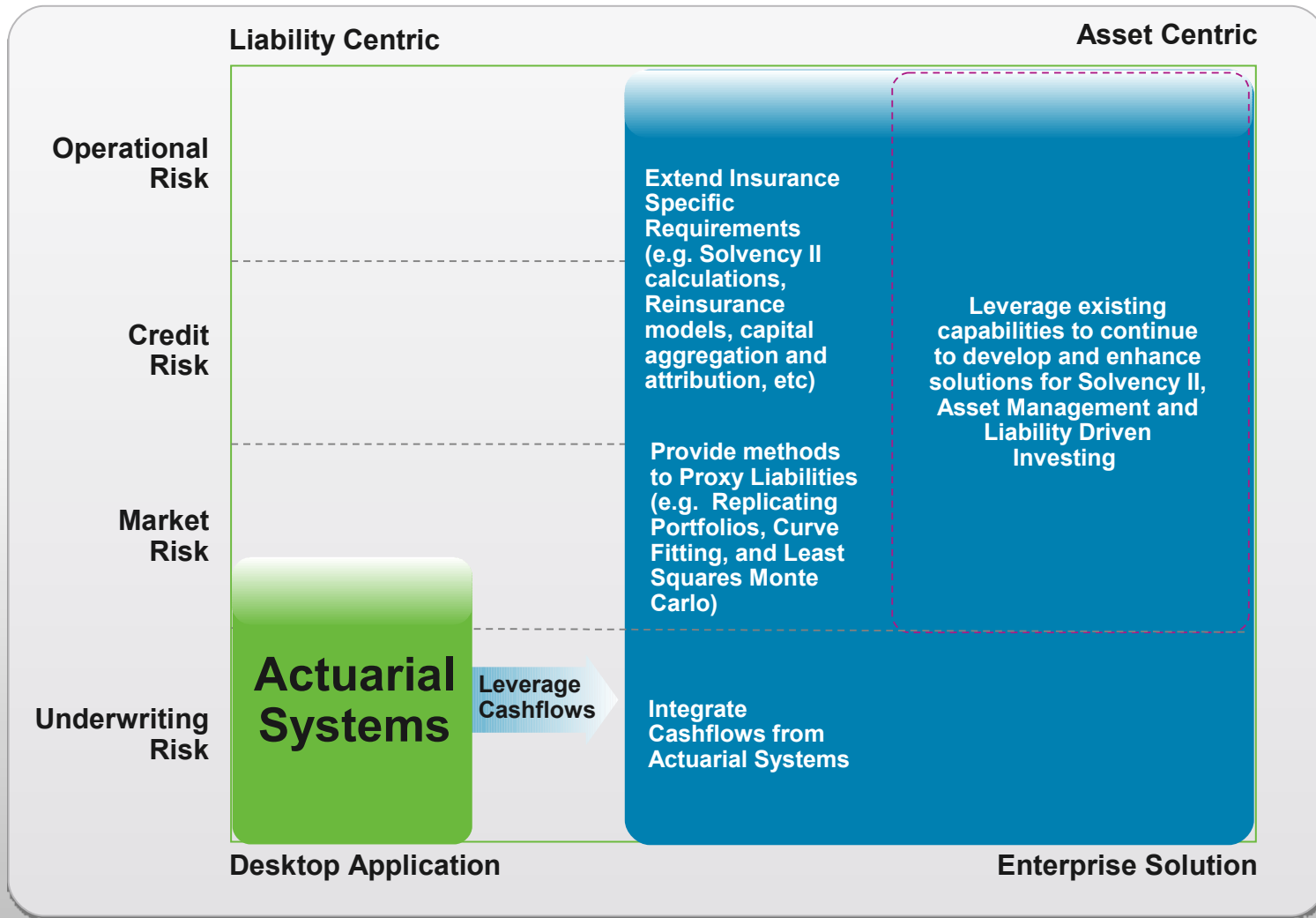
The Impact of Traditional ALM Modelling

STRATEGIC DECISION MAKING

- ASSET BASED ALM
- LIABILITY BASED ALM
- RISK MODELING
- PRICING MODELS

- RECONCILIATION
- CONSOLIDATED RISK MODELING

- MANAGEMENT REPORTING
- OTHER FINANCIAL REPORTING

Provides a limited perspective of the business and increases risk

A Fresh Perspective to ALM

STRATEGIC DECISION MAKING

| LIABILITY BASED ALM | RISK MODELING |
| ASSET BASED ALM | FULL ALM |

PRICING MODELS

MANAGEMENT REPORTING

OTHER FINANCIAL REPORTING

Provides a more efficient and accurate perspective of the business
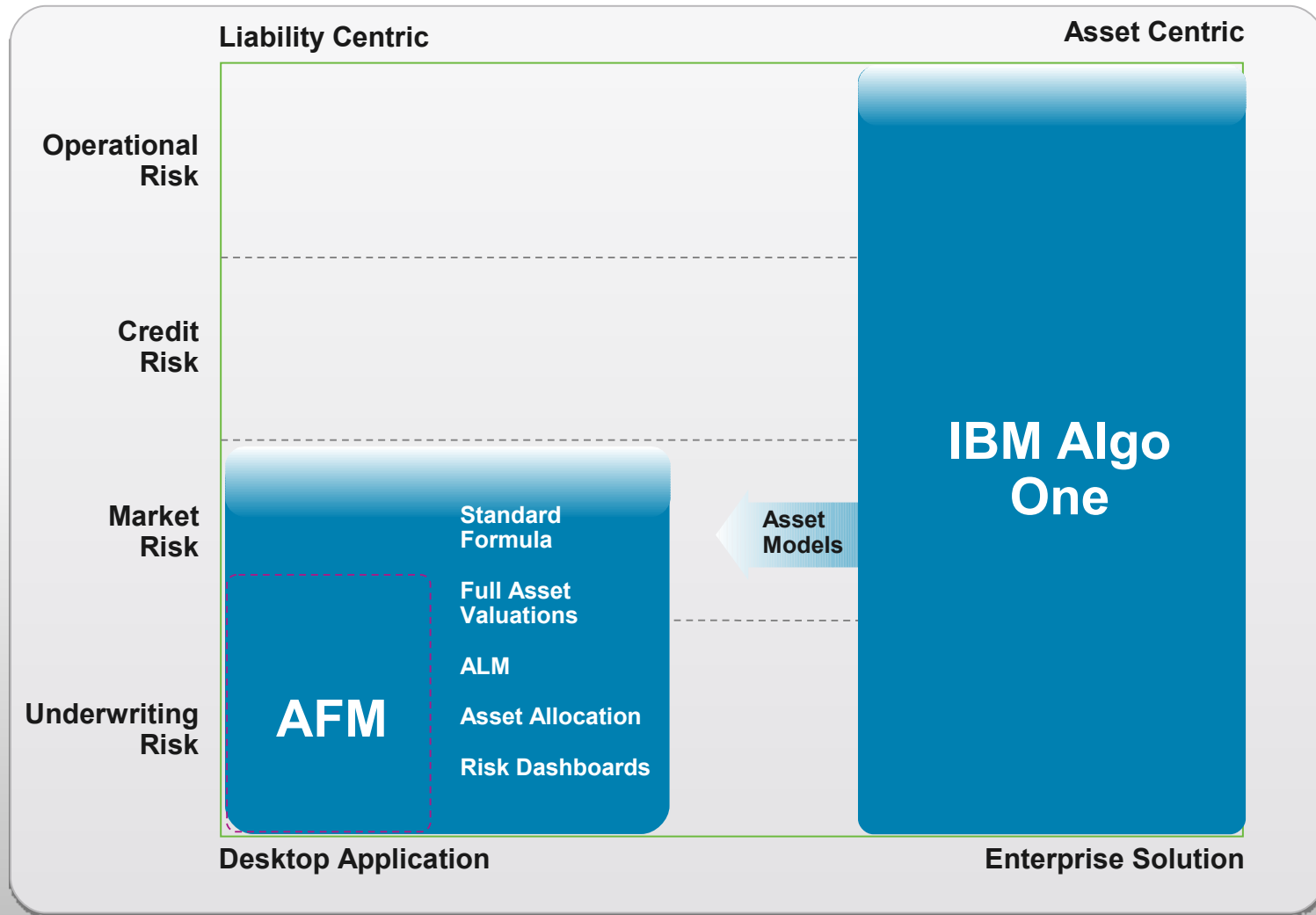
IBM's Risk Analytics Insurance Solution Strategy

IBM's Risk Analytics Insurance Solution Strategy

Liability Centric

Asset Centric

Operational Risk

Credit Risk

Market Risk

Underwriting Risk

Extend Insurance Specific Requirements (e.g. Solvency II calculations, Reinsurance models, capital aggregation and attribution, etc)

Provide methods to Proxy Liabilities (e.g. Replicating Portfolios, Curve Fitting, and Least Squares Monte Carlo)

Leverage existing capabilities to continue to develop and enhance solutions for Solvency II, Asset Management and Liability Driven Investing

Actuarial Systems

Leverage Cashflows

Integrate Cashflows from Actuarial Systems

Desktop Application

Enterprise Solution

IBM's Risk Analytics Insurance Solution Strategy

Liability Centric   **Asset Centric**

Operational Risk

Credit Risk

Market Risk

Underwriting Risk

AFM

Scenarios

Mark-to-Future

Extend Insurance Specific Requirements (e.g. Solvency II calculations, Reinsurance models, capital aggregation and attribution, etc)

Provide methods to Proxy Liabilities (e.g. Replicating Portfolios & Curve Fitting)

Integrate Cashflows from Actuarial Systems

Leverage existing capabilities to continue to develop and enhance solutions for Solvency II, Asset Management and Liability Driven Investing

Desktop Application   **Enterprise Solution**

Mark-to-Future (MtF) – Underlying Methodology
Consider a Single Financial Instrument
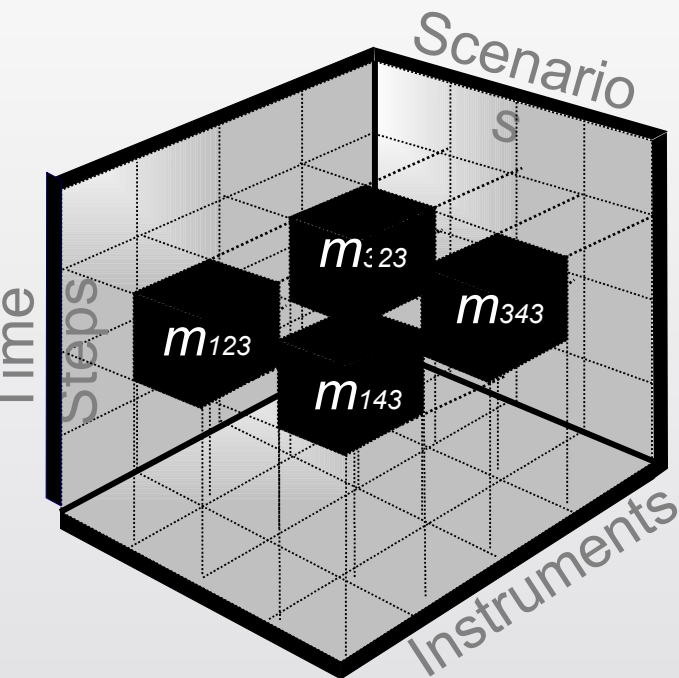
Portfolio values are linear combinations of the values of individual instruments

$$(1+x_1) \cdot m_{123} + x_3 \cdot m_{323} \equiv v_{23} + \Delta v_{43}$$

$$(1+x_1) \cdot m_{143} + x_3 \cdot m_{343} \equiv v_{43} + \Delta v_{43}$$

Integrated ALM Process

| Market Data | → | Asset Terms & Conditions | → | Economic Scenario Generator | → | Algo Market Risk | → | Algo Financial Modeler | → | Algo Risk Application/ COGNOS | → |

ASSETS

ESG FILES

LIABILITIES

RISK WATCH

AFM

DASHBOARD – ARA/COGNOS

ALM ANALYSIS

INTEGRATED ASSET LIABILITY DISTRIBUTION

REPORTING & DRILLDOWN
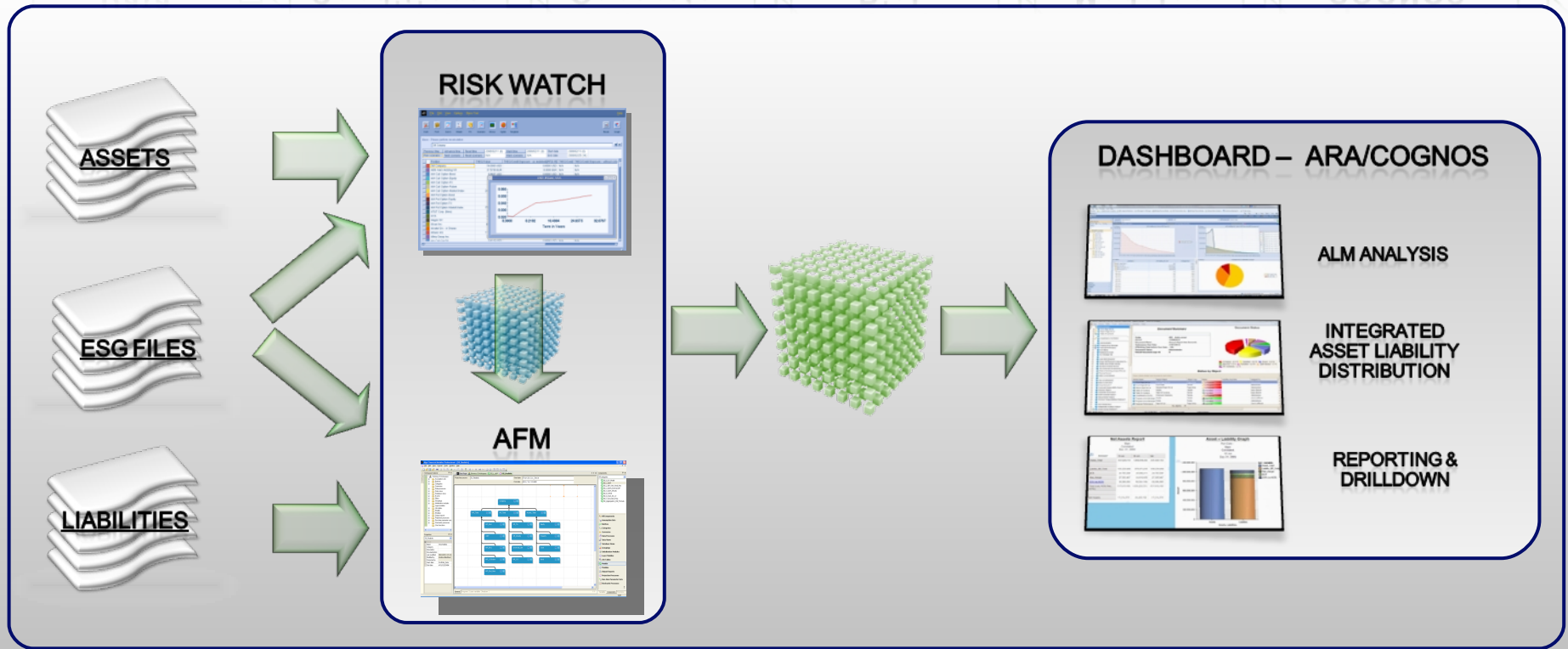
Reading in Asset & Liability Cash-Flows
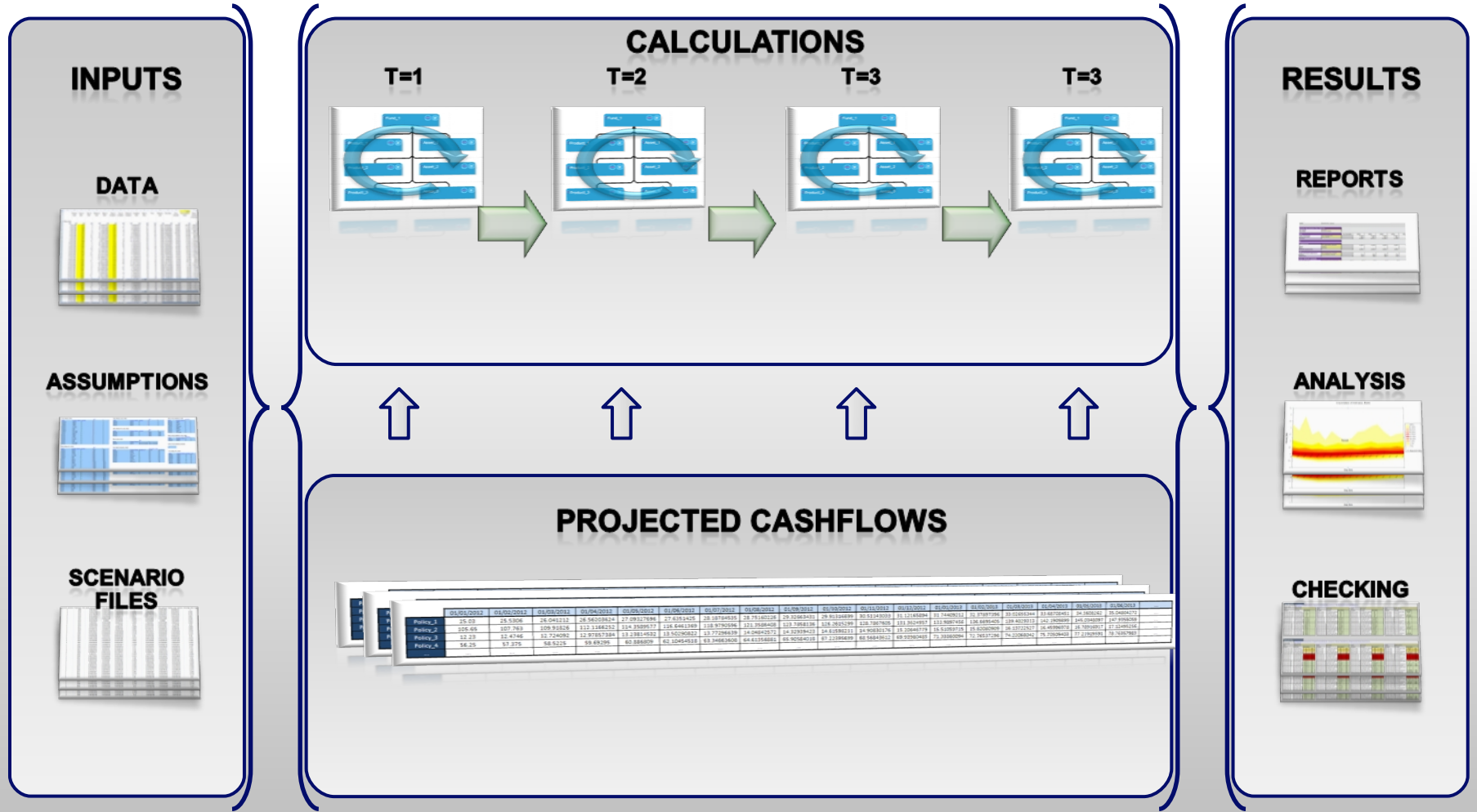
Results Analysis Example
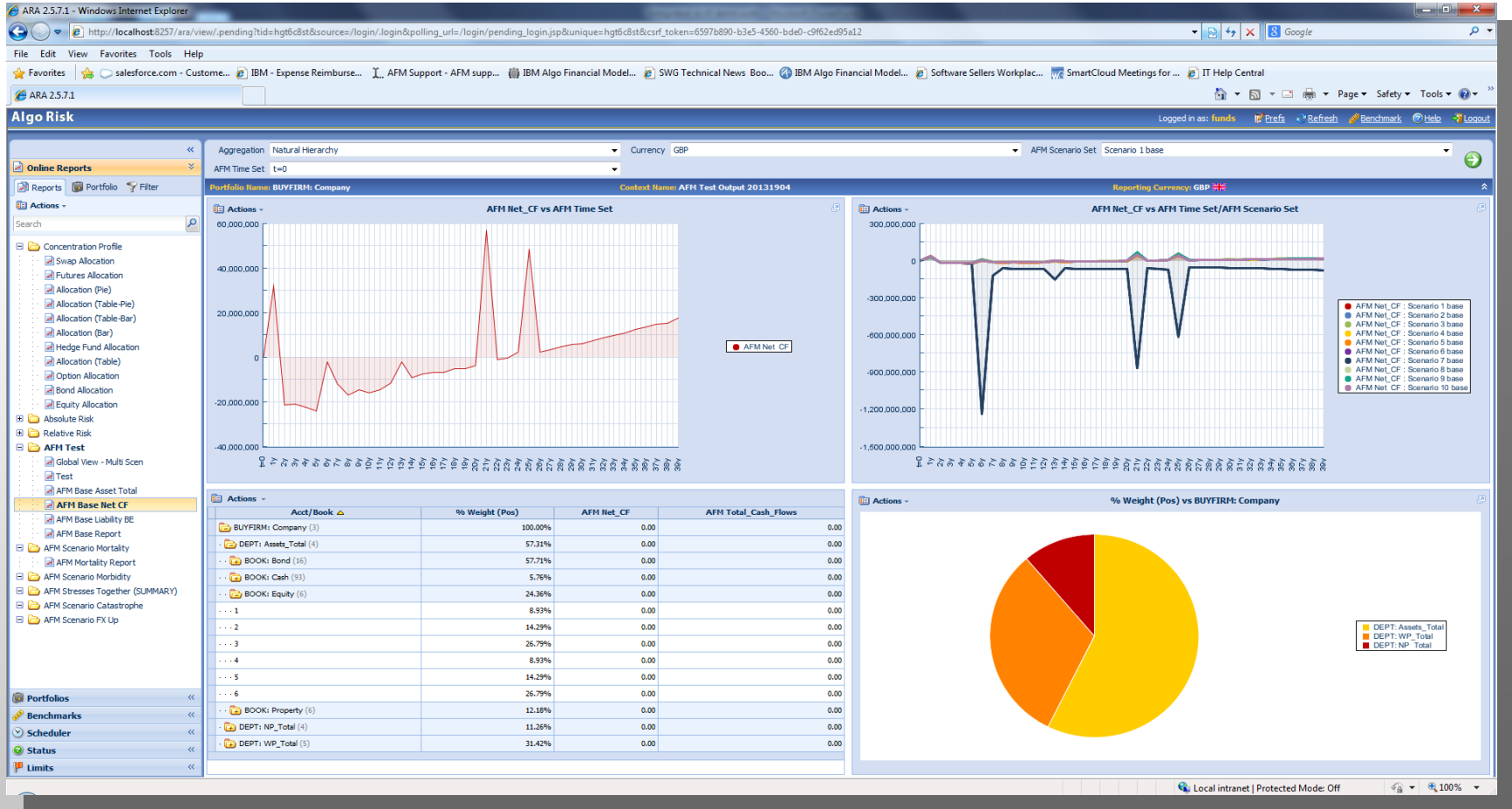
Advantages of Using Granular ALM

Accuracy
- Can model the **exact** asset holding
- Performs very **detailed calculations** and projections on the assets
- Can now have very detailed and accurate asset and liability calculations within the **same model**.

Decision making
- Can be made on **individual** asset level if required
- Can easily be **grouped** to realistically reflect actual decision making process
- Code in AFM can be tailored to **buy and sell** assets in a realistic manner
- Cube can contain assets incepting in the future

Consistency
- Across business reporting lines
- Why use granular assets for investment decisions and not valuation purposes?

Capital required
- Additional accuracy in model calculations can **reduce capital** required to be held.

Summary

Old Technologies....

- Traditional ALM modelling can involve compromises that could have a material impact on critical numbers.

Moving Technology On....

- ALM analysis becoming increasingly valuable in the quest to manage risk and increase competitive advantage

Benefits of investing in a more robust and granular ALM....

- Increased accuracy
- Consistency in calculations
- Reliability of results for risk reporting and strategic decision making

The IBM Full Valuation ALM solution can provide tangible benefits....

- A single consistent framework for ALM modelling across the enterprise
- Enhanced decision making capability
- Increased confidence for management and shareholders

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Questions

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Acknowledgements & Disclaimers

Patrick Braun, Principal Consultant – Customer Solutions Group, Risk Analytics
18 September 2013

New approaches for cost effective reporting and greater insight for risk-aware decision making
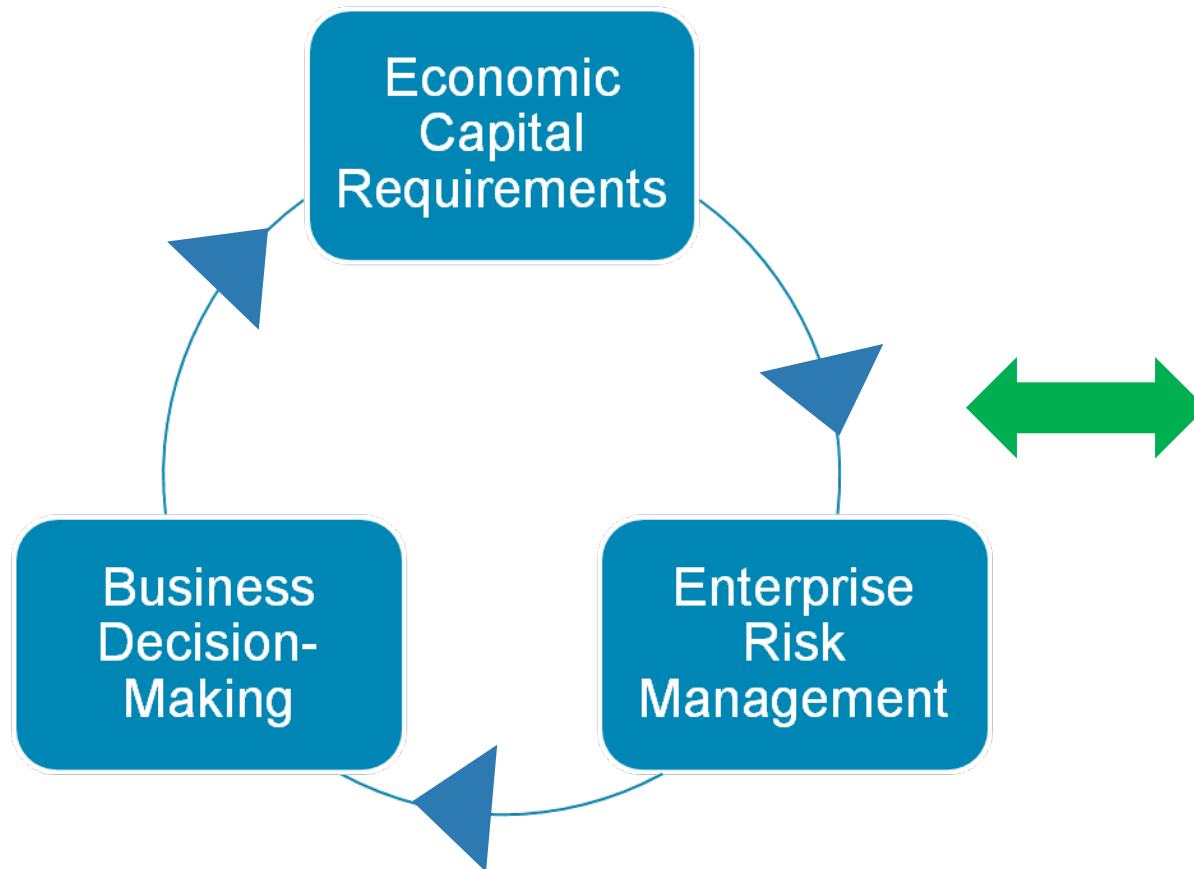
Agenda

Solvency II Regulatory Reporting Requirements

Solvency II Quantitative Reporting Templates

IBM Quantitative Reporting for Solvency II (QRT's)

Quick Reminder of Solvency II Key Goals

- Risk-based regulation framework
- Improve the corporate governance programs
- Embed risk management in the decision-making processes

Economic Capital Requirements

Enterprise Risk Management

Business Decision-Making

Insurer's benefits

- Regulatory capital requirements reflect firm's risk exposures and risk management strategies

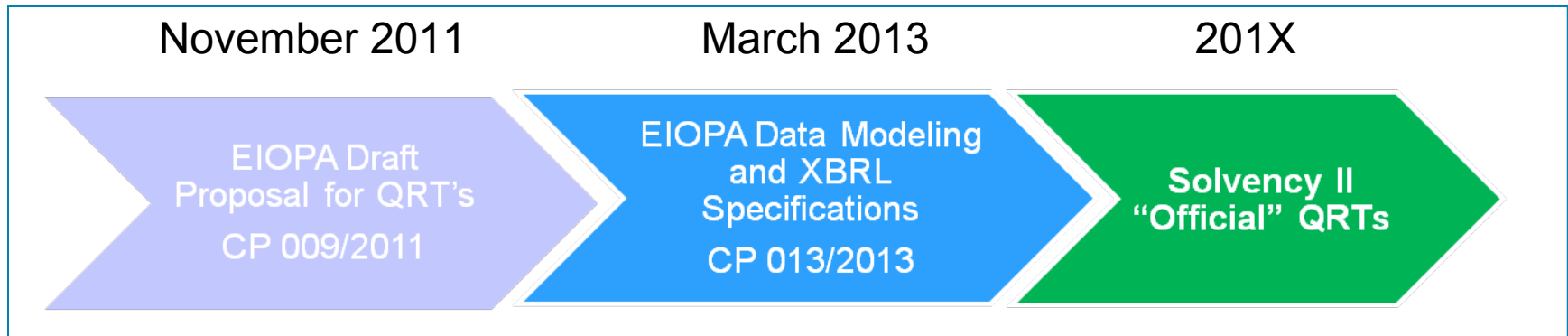- Firm's capital position resistant to financial, economic, and underwriting shocks

- Risk-informed business operations and business planning

What Are The Implications for Regulatory Risk Reporting?

Insurers need to deliver timely and trusted risk information…

…to regulators (group and solo)...

…for prudential supervisory purposes.

What are the Pillar III Reporting Requirements → QR Coverage?
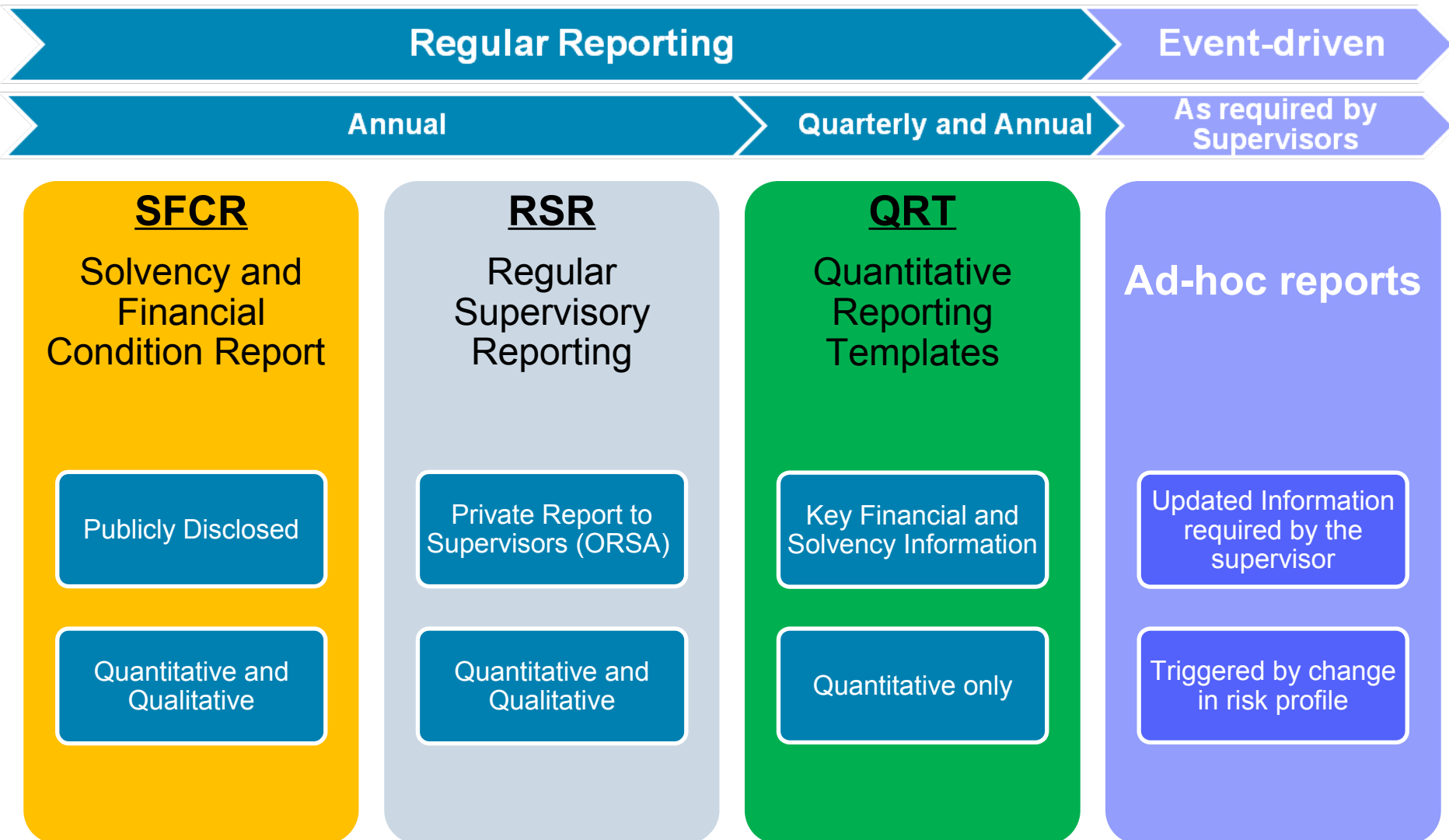
Regular Reporting			Event-driven
Annual		**Quarterly and Annual**	**As required by Supervisors**

SFCR	**RSR**	**QRT**	**Ad-hoc reports**
Solvency and Financial Condition Report	Regular Supervisory Reporting	Quantitative Reporting Templates	
Publicly Disclosed	Private Report to Supervisors (ORSA)	Key Financial and Solvency Information	Updated Information required by the supervisor
Quantitative and Qualitative	Quantitative and Qualitative	Quantitative only	Triggered by change in risk profile

Agenda

Solvency II Regulatory Reporting Requirements

Solvency II Quantitative Reporting Templates

IBM Quantitative Reporting for Solvency II (QRTs)

Source: If applicable, describe source origin

Solvency II Quantitative Reporting Templates - Overview

November 2011	March 2013	201X
EIOPA Draft Proposal for QRT's CP 009/2011	EIOPA Data Modeling and XBRL Specifications CP 013/2013	Solvency II "Official" QRTs

QRT Reports

- EIOPA-prescribed format
- Reports at group and solo levels
- Annual and quarterly reports
- Some reports are included in the public SFCR information

- Financial Stability Report templates for large insurers
    (Semi-annual Requirements)

Template Types

- Balance Sheet
- Assets
- Solvency Capital Requirements
- Minimum Capital Requirements
- Technical Provisions
- Variation Analysis
- Reinsurance
- Others templates

XBRL* Tagging
* Extensible Business Reporting Language

Quantitative Reporting Templates in Detail

Quarterly

Solo (20 templates)

BS-C1
Cover–A1Q
OF-B1Q
SCR-B2A_B2C
MCR-B4A
MCR-B4B
Assets-D1
Assets-D1Q
Assets-D2O
Assets-D2T
Assets-D3
Assets-D4
Assets-D5
TP-F1Q
TP-E1Q
Re-J2_basic
Re-J2_shares
Re-J3
Lapses
Profit and Loss

Group (13 templates)

BS-C1
Cover–A1Q
OF-B1Q
SCR-B2A_B2C
Assets-D1
Assets-D2O
Assets-D2T
Assets-D3
Assets-D4
Assets-D5
Re-J3
Lapses
Profit and Loss

Annual

Solo (48 templates)

BS-C1	TP-F2
BS-C1B	TP-F3
BS-C1D	TP-F3A
Country-K1	TP-F3B
Cover–A1A	TP-F4
OF-B1	TP-E1
Participations	TP-E2
VA C2A	TP-E3
VA C2B	TP-E4
VA C2C	TP-E6
SCR-B2A	TP-E7A
SCR-B2B	TP-E7B
SCR-B2C	Duration
SCR-B3A	Liabilities
SCR-B3B	Re-J1_basid
SCR-B3C	Re-J1_shares
SCR-B3D	Re-J2_basic
SCR-B3E	Re-J2_shares
SCR-B3F	Re-J3
SCR-B3G	Re-SPV
MCR-B4A	Profit and Loss
MCR-B4B	
Assets-D1S	
Assets-D3	
Assets-D4	
Assets-D5	
Assets-D6	
TP-F1	

Group (35 templates)

BS-C1	G03
BS-C1B	G04
BS-C1D	G14
Cover–A1A	IGT1
OF-B1A	IGT2
SCR-B2A	IGT3
SCR-B2B	IGT4
SCR-B2C	RC
SCR-B3A	
SCR-B3B	
SCR-B3C	
SCR-B3D	
SCR-B3E	
SCR-B3F	
SCR-B3G	
Assets-D1S	
Assets-D3	
Assets-D4	
Assets-D5	
Assets-D6	
TP-F3	
Duration	
Liabilities	
Re-J2	
Re-J3	
Re-SPV	
Profit and Loss	
G01	

What are the Operational Implications?

- Data Challenges
    - Disparate data sources (BU vs. LO)
    - Disparate modelling systems
    - Data integrity

- Process Challenges
    - Manual processes
    - Error-prone processes
    - Governance in place

- Tight regulatory reporting timelines*
    - Solo entity -> 5 weeks for Quarterly / 14 weeks for Annual reports
    - Group -> 11 weeks for Quarterly / 20 weeks for Annual reports
    - 6 weeks for financial stability reports

* Source: EIOPA Final Report on Public Consultations No.11/009 and 11/011

Agenda

Solvency II Regulatory Reporting Requirements

Solvency II Quantitative Reporting Templates

IBM Quantitative Reporting for Solvency II

What does the IBM Quantitative Reporting Solution Provide?

▪ A stand-alone, pre-packaged, cost-effective fast-track solution to satisfy the tight deadlines for the Solvency II Quantitative Reporting Template requirements

Product Features	Standard Edition	Enterprise Edition
QRT Reports	Yes	Yes
QRT XBRL tagging	Yes	Yes
Management Dashboard Reports	-	Yes
Solvency II Datamart	Yes	Yes
Data modeling capabilities	Yes	Yes
Report term Glossary	-	Yes
Data lineage	-	Yes

▪ Possible solution customization and client data integration through IBM's professional services teams

Quantitative Reporting Solution - Architecture Overview
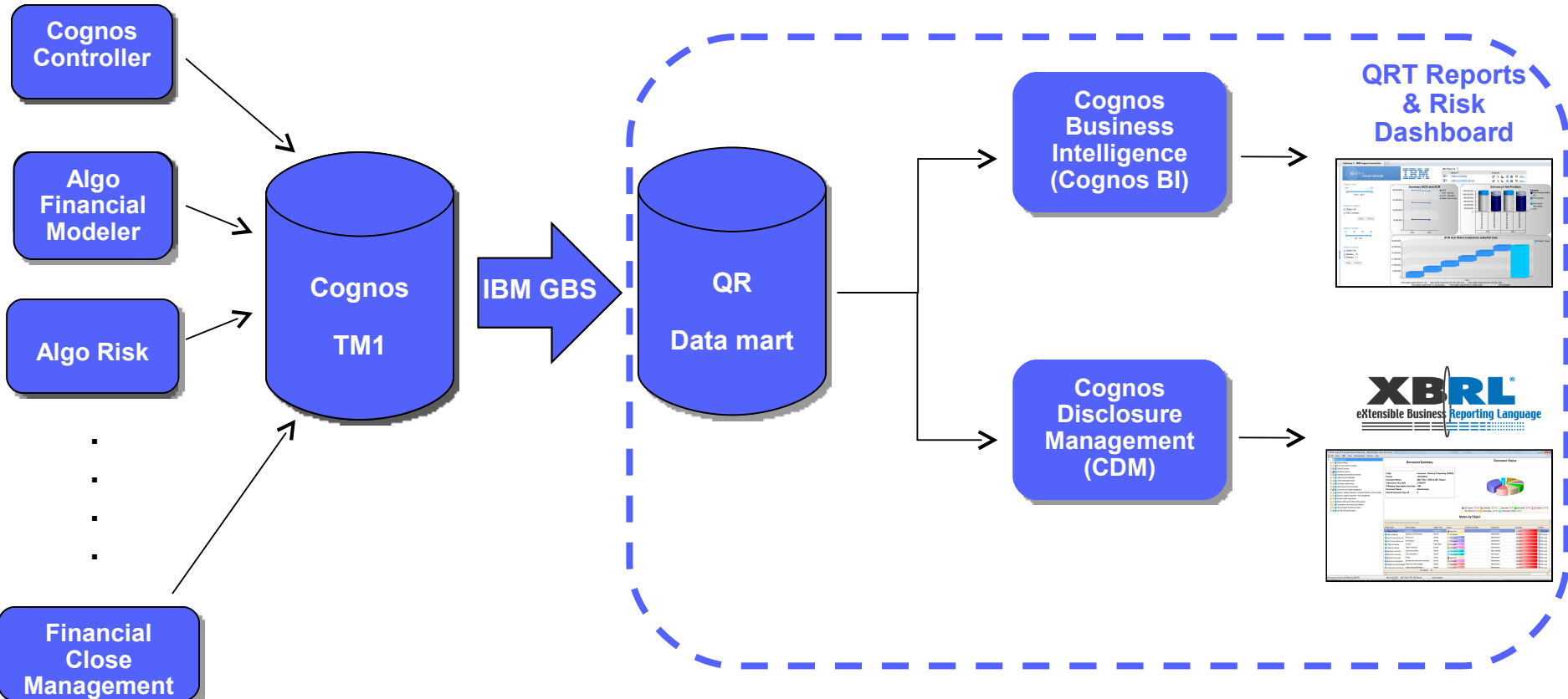
A Solution to Help Reduce Reporting Costs and Improve Efficiency

- The stand-alone solution provides an automated QRT report development process

- It includes:
  - QRT Data Model
  - QRT Report Templates
  - XBRL Tag-Once for Reports

- Once data is loaded into the store, reports and dashboards are automatically populated.

- Solo and group level report production

- Report drill down and data change tracking

QR Template 'Assets-D1' Example

Asset - D1 Investments Data - Portfolio list

Back to Table of Contents

Applied Filters
Reporting Year :	2010
Reporting Quarter :	Q4 2010
Business Units :	ABC Company
Submission Version :	Release _1.0

Reporting Quarter : Q4 2010

					Identification section							**Categorisation section**			**Risk section**			**Data section**				
Portfolio	Fund number	Asset held in unit linked and index linked funds (Y/N)	ID Code	ID Code type	Asset pledged as collateral	Security Title	Issuer Name	Issuer Sector	Issuer Group (Code)	Issuer Country	Country of custody	Currency (ISO code)	CIC	Participation	External rating	Rating agency	Duration	Quantity	Unit SII price	Valuation method SII	Acquisition price	Total SII amount	Maturity date	Accru inter
L	2902	Y	2902	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK22	YNGNS	A+	Price hopper	10	200.00	1,000.00	MktMk	200	406,000.00	Mar 10, 2011	3,000
L	3902	Y	3902	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK11	YNGNS	A-	Standard & Poor	10	200.00	1,200.00	MktMk	200	486,000.00	Apr 10, 2011	3,000
L	4902	Y	4902	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK31	YNGNS	B	Standard & Poor	10	200.00	1,000.00	MktMk	200	406,000.00	May 10, 2011	3,000
L	4903	Y	4903	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK41	YNGNS	A	Standard & Poor	4	200.00	1,000.00	MktMk	200	406,000.00	Jun 10, 2011	3,000
L	4904	Y	4904	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK51	YNGNS	B-	Standard & Poor	6	2,000.00	4,000.00	MktMk	200	8,003,000.00	Jul 10, 2011	3,000
L	4905	Y	4905	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK61	YNGNS	B+	Standard & Poor	8	200.00	1,100.00	MktMk	200	446,000.00	Aug 10, 2011	3,000
L	4906	Y	4906	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK22	YNGNS	A+	Price hopper	10	200.00	1,000.00	MktMk	200	406,000.00	Feb 10, 2011	3,000
L	4907	Y	4907	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK22	YNGNS	A+	Price hopper	10	200.00	1,000.00	MktMk	200	406,000.00	Mar 10, 2011	3,000
NL	4908	Y	4908	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK11	YNGNS	A-	Standard & Poor	10	200.00	1,200.00	MktMk	200	486,000.00	Apr 10, 2011	3,000
NL	4909	Y	4909	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK31	YNGNS	B	Standard & Poor	10	200.00	1,000.00	MktMk	200	203,000.00	May 10, 2011	3,000
NL	New 4910	Y	4910	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK41	YNGNS	A	Standard & Poor	4	200.00	1,000.00	MktMk	200	203,000.00	Jun 10, 2011	3,000
NL	New 4911	Y	4911	ISIN	CP	Security	AA	Insurance	CP Group 2	GB	BE	EUR	UK51	YNGNS	B-	Standard & Poor	6	2,000.00	4,000.00	MktMk	200	8,003,000.00	Jul 10, 2011	3,000

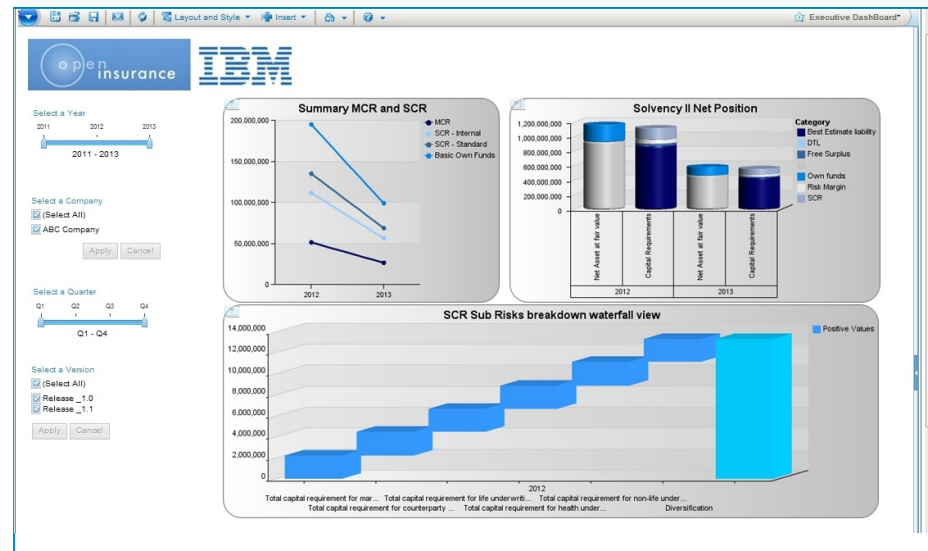Keep this version   Add this report

Done   Trusted sites | Protected Mode: Off   100%

Moving Beyond Compliance - Management Dashboard Examples

- A solution and data structure that can be used for a broader purpose

- Embedded Solvency II dash-boarding capabilities through Cognos BI

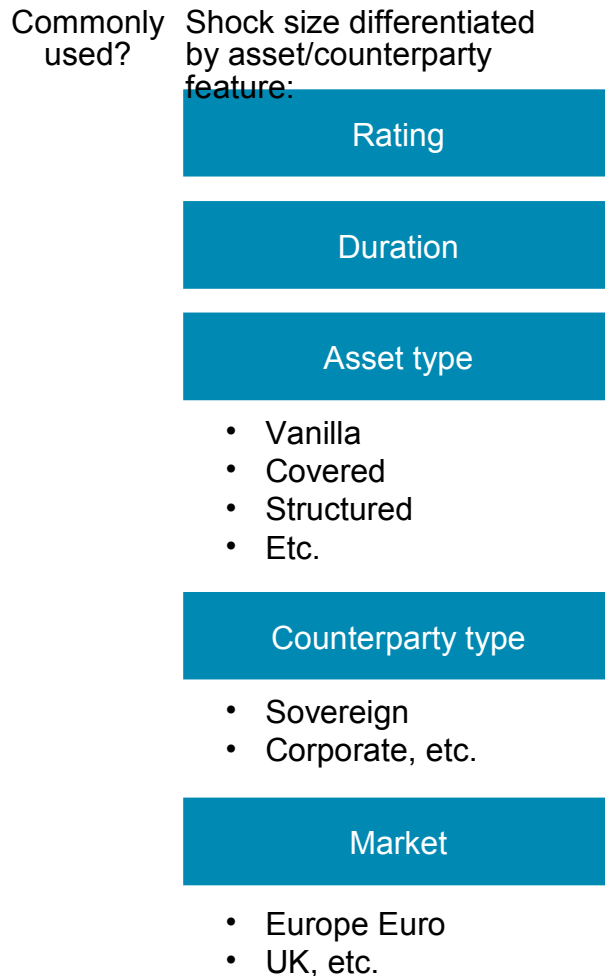- Examples based on assets and time evolution of Solvency status

Questions

OLIVER WYMAN

Improving credit portfolio management with integrated market and credit risk
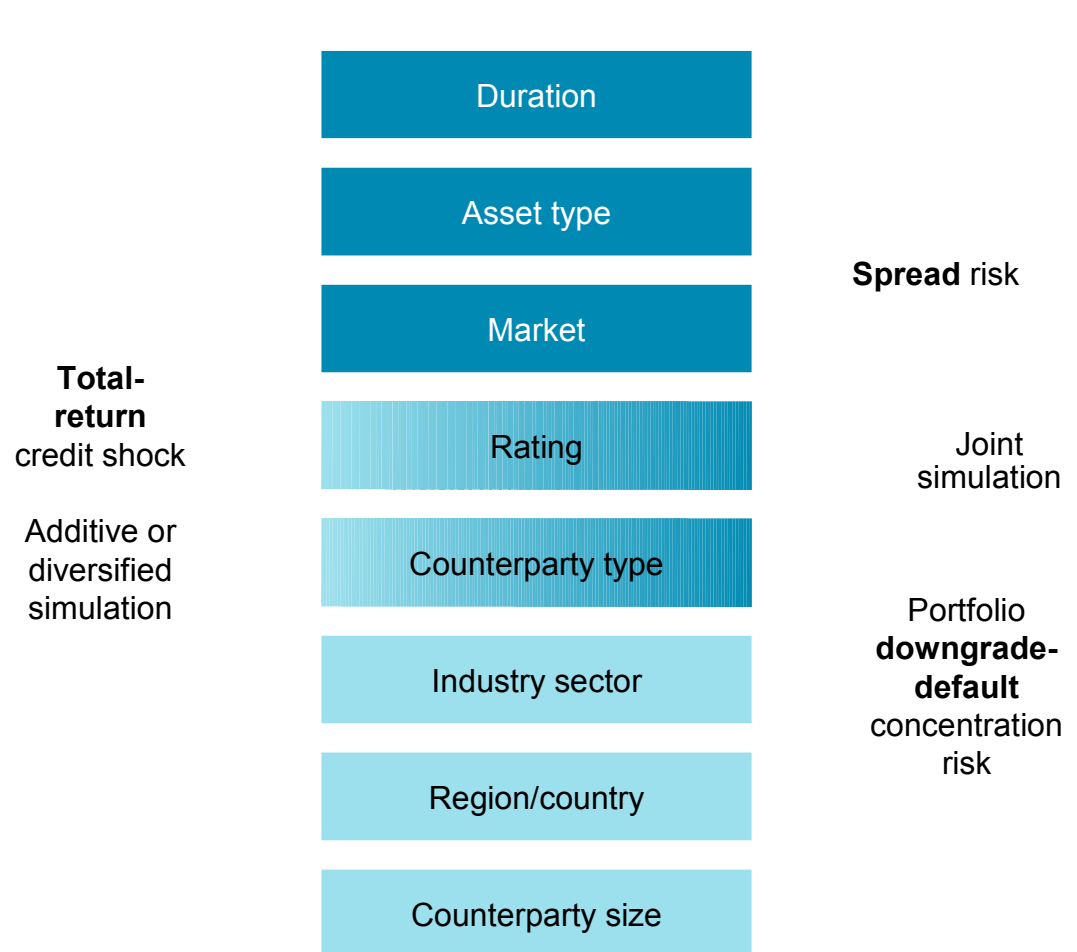
18th September 2013

David Dullaway

Increasingly, the simplifications of the original Solvency II credit models are being replaced with more granular models better describing portfolio risk

Typical Solvency II credit risk model

Emerging best-practice credit model

Commonly used?

Shock size differentiated by asset/counterparty feature:

Rating

Duration

Asset type

- Vanilla
- Covered
- Structured
- Etc.

Counterparty type

- Sovereign
- Corporate, etc.

Market

- Europe Euro
- UK, etc.

Total-return credit shock

Additive or diversified simulation

Duration

Asset type

Market

Rating

Counterparty type

Industry sector

Region/country

Counterparty size

Spread risk

Joint simulation

Portfolio **downgrade-default** concentration risk

What are firms trying to get out of their new models, from both a SII and wider perspective?

Aligning capital and risk (and vice-versa)

Integrated but separated spread and default risk

Recognition of concentrations

Ability to influence credit capital with ALM/hedging

True granular portfolio management (reflecting all of the above)

Extending the CPM framework to a system that works for insurers presents a number of issues which need to be overcome

Insurance-specific issues

- Need to focus on Mark-to-market rather than just default risk
- Focus on traded portfolios not loans
- Take a holistic view of risk, which that can be disaggregated down to components
- Understand net credit loss after liability loss absorption

Additional granularity needs to be calibrated

1

Simulations requirements are huge

- High-dimensional downgrade-default simulation requires high number of scenarios to converge
- Asset value simulation under spread and migration shocks expensive

2

Linking spread & default-downgrade risk is hard

- Challenging mathematical calibration
- Consistency across spread and equity correlations, and aligns with fundamentals of spread decomposition

3

Integration with wider risk infrastructure is challenging

- Incorporation of liability dynamics
- Too computationally expensive to embed within full Internal Model simulation given high granularity

4

Data

- Wealth of asset Ts&Cs data is needed for security modelling
- Data to support differentiated risk calibrations

Insurers have been addressing the challenges through a mixture of careful methodology development and appropriate infrastructure

1 **Simulations requirements are huge**

Use an enterprise strength simulation engine on robust hardware

Pragmatically design the simulation process to balance granularity and pragmatism

2 **Linking spread & default-downgrade risk is hard**

Develop an internal framework for decomposing spread into creditworthiness, illiquidity and other risk components

3 **Integration with wider risk infrastructure is challenging**

Use proxy modelling techniques – use the CPM granular model to 'calibrate' the credit risk drivers in wider Internal Model

4 **Data**

Setup an industrial strength asset data system

Smart calibration – improve on brute force fitting to data under all risk factor combinations by overlaying risk management perspective

Example insurer CPM project

- 18months, with a phased delivery

- Phase 1 (nine months):
  - Implement proof-of-concept CPM model, preliminary
  - Develop and test methodology options
- Phase 2:
  - Finalise implementation for all risks with industrialised infrastructure
  - Final risk calibrations

IBM

Andrew Blackburn – Principal Actuarial Consultant, Risk Analytics, IBM
18 September 2013

New approaches for overcoming the challenges of ORSA modelling

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Agenda

- ORSA - Key Points & Challenges

- Challenges: A Closer Look

- The IBM Response

- Recap & Questions

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ORSA Background

Supervisors want to see plans to develop the ORSA
- Dry run 2014 & near final ORSA 2015

Local regulators pushing ORSA type requirements
- United Kingdom – Business Model Analysis

Rest of The World....

EU – SII
ORSA
(2016/17)

US –
RMORSA
(2015)

MEXCIO –
LISF (2015)

CHINA –
C-ROSS
(?)

SA – SAM
(2015)

AUS – ICAAP
(2013)
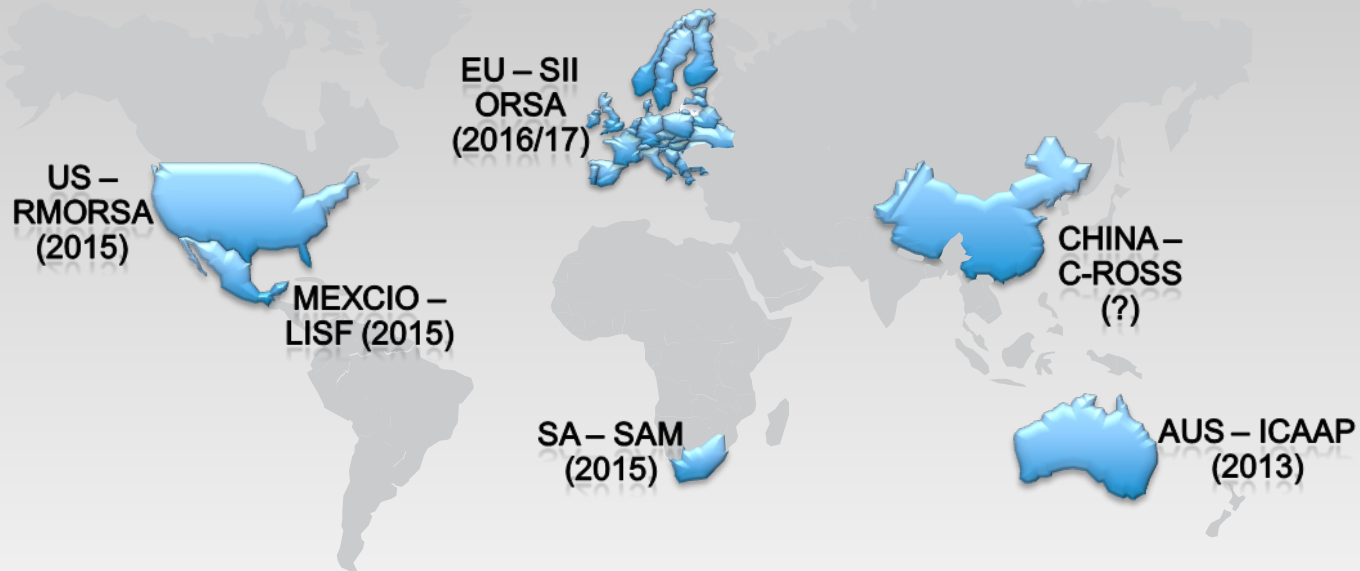
Analysis & Investigations

Article 45 requirement:

"*..... firms need to perform forward-looking solvency assessment and it should be either over a medium or long term perspective, whichever is appropriate.....*"

IBM Identified Areas:

- Be forward looking and project risk and solvency levels for future years
- Monitor solvency on a continuous basis
- Be able to assess risk through tools such as stress, scenario and reverse stress testing

Key issues faced:

- Integration and consolidation of a company projection
- New business
- Sophistication of proxy methods for projecting future periods

The Key Challenges

Forward Projection
- Model integration and New Business
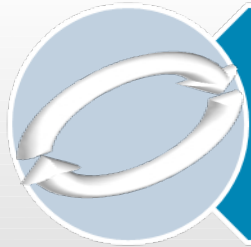
Continuous Modeling
- Approximation Techniques

Assessing Risk
- Production & Testing

Agenda

- ORSA - Key Points & Challenges

- Challenges: 1) Forward Projections

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Integrated System
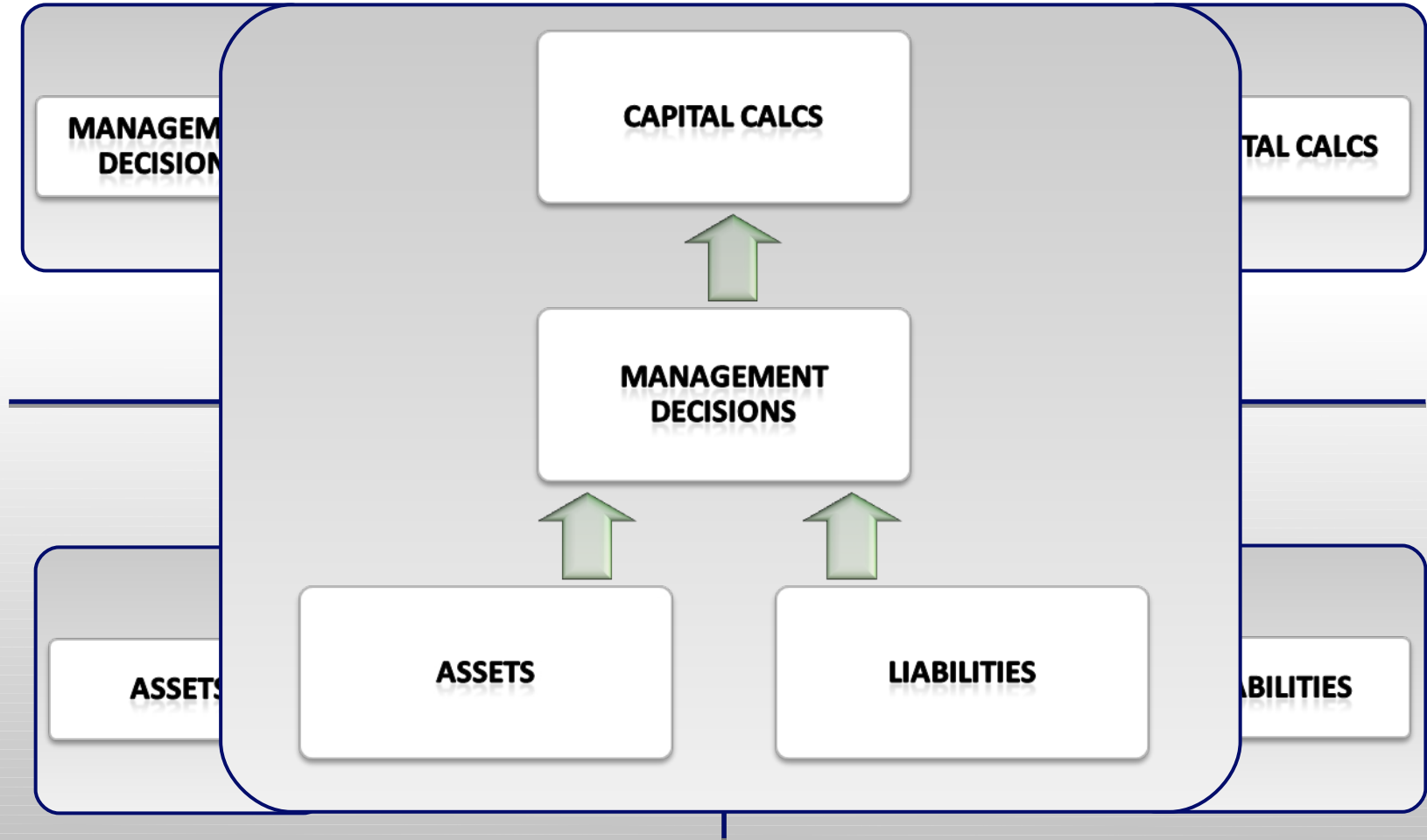
ALM Modelling Mechanics
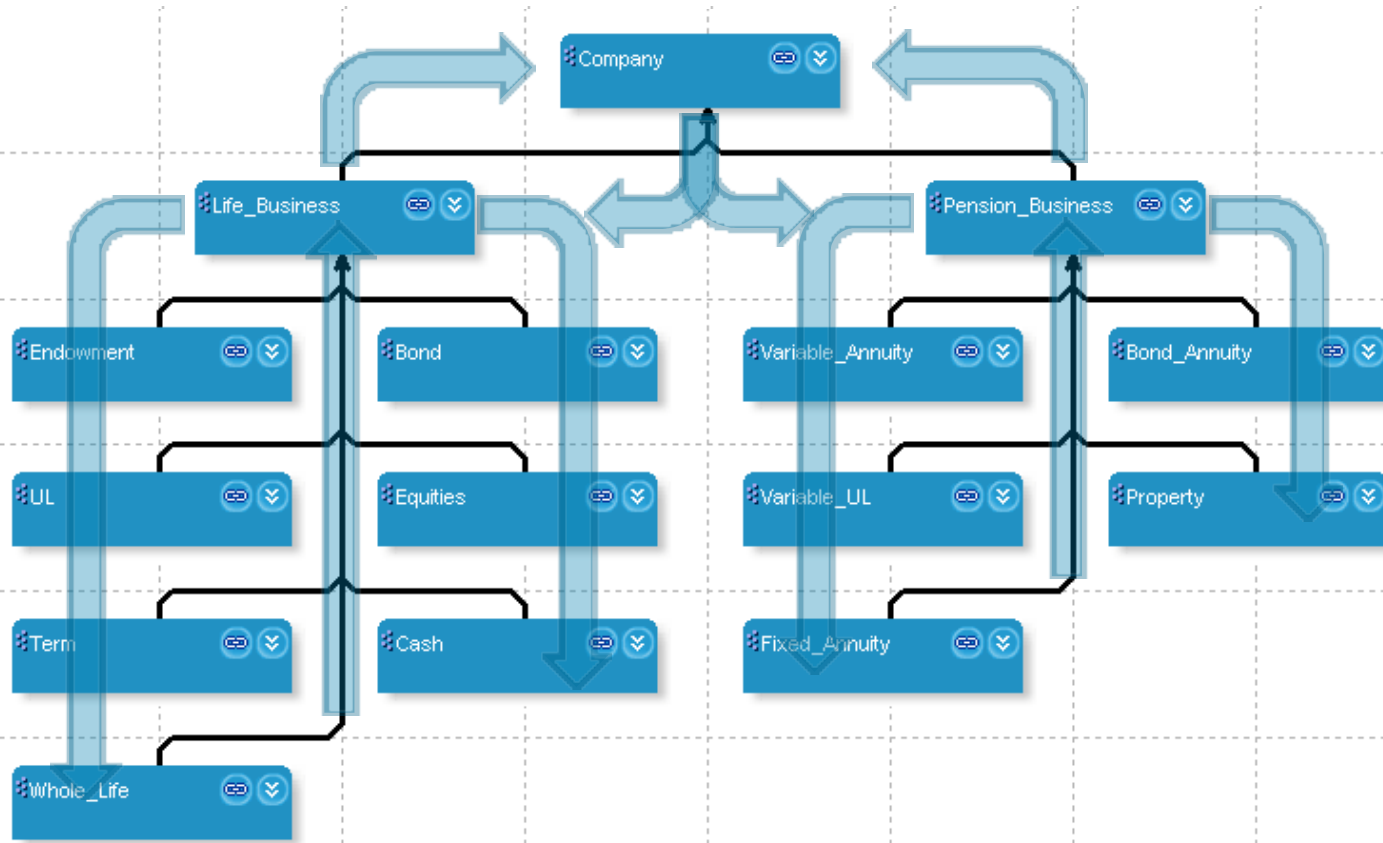
New Business

To allow for the growth in the business then a company has to allow for its expected new business, therefore need to think about:

- Variation depending on economic conditions at time of writing

- Variation with each economic scenario at every future time period

- Allowance for the dynamic new business

Agenda

- ORSA - Key Points & Challenges

- Challenges: 2) Continuous Monitoring

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Sophistications of approximations

Ideal solution is to use full nested stochastic models:
- Would allow accurately for any guarantees
- Time is an issue but becoming increasingly possible

The requirement for ORSA to be done on a continuous basis allows for the use of approximations

Most popular approximation techniques:

- Curve Fitting

- Replicating Portfolio

- Least Square Monte Carlo
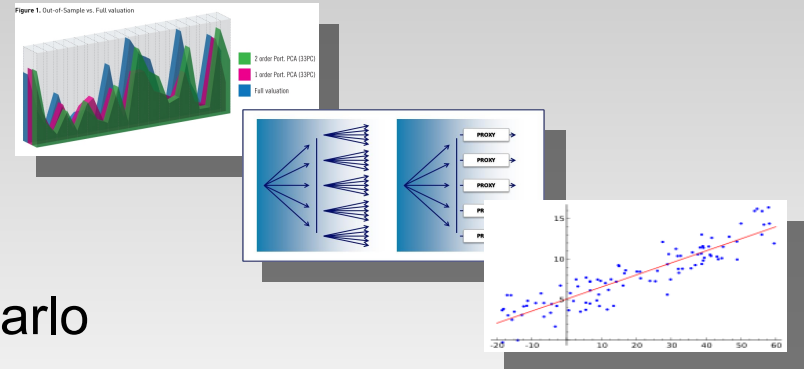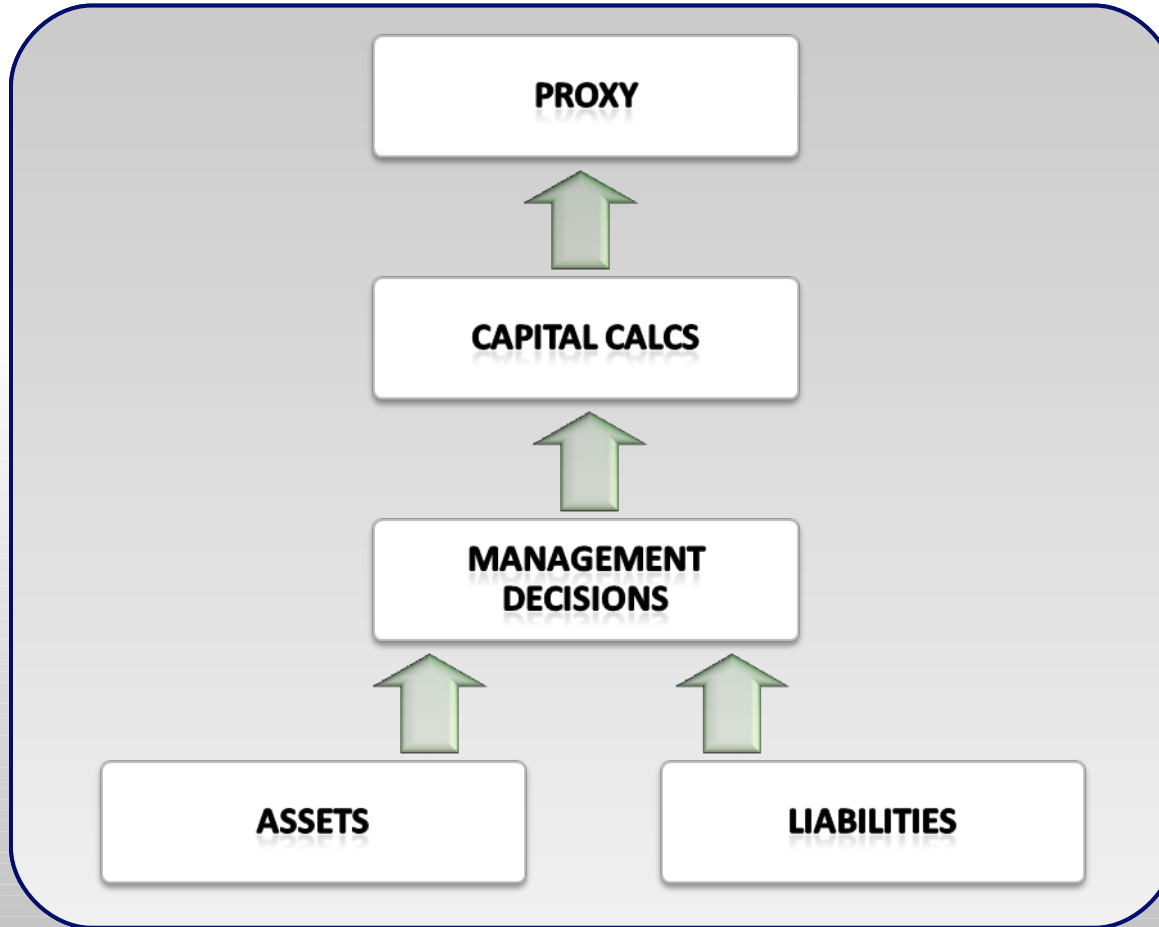
Proxy Methods

Stress, Reverse Stress & Scenario Testing

Need the ability to assess risk, there are already established techniques prevalent:

- Similar to those used for the Pillar II of ICA

- There is some additional complexity from projecting capital for ORSA calculation

- Two potential issues though are:

  - Volume of runs

  - Management actions

Volume of Runs

Looking more closely at the issue of volume::

- There are potentially time issues caused by volume of runs

- Security issues compounded by lack of time to re-run

- A good solution should:
  - Be efficient and make maximum use of hardware

  - Utilise 'dead' time

  - Provide a secure production environment

Management Actions

....Important that a solution covers all areas of the business and realistic management actions allowed for otherwise....

• The insurer could:

- • Hold too much capital

- • Not hold enough capital

....The difficulty lies in the ability to adequately test the management actions....

• Therefore need to ensure testing allows:

- • Range of scenarios including extreme scenarios

- • Individual sections tested to reduce time

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Conclusion – So How Can IBM Help You

Algo Financial Modeler:
- Allows complete company model to be built of assets and liabilities
- Allows **complex decision rules** to be incorporated
- Full **nested stochastic** model and proxy fitting in one system
- Includes batch functionality
- Output in a format consistent with IBM business intelligence tools and other dashboard systems

IBM Algo Financial Modeler Own Risk and Solvency Assessment and Curve Fitting Model Add-On:
- Template for projecting SCR
- Includes templates for **curve fitting** and **LSMC** proxy methods
- Support ORSA without heavy investment in hardware

Algo Financial Modeler Enterprise:
- **Secure** web server
- Allows models to be fully locked down in separate **production environment**
- Allows scheduling of runs to utilise otherwise dead time

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Summary
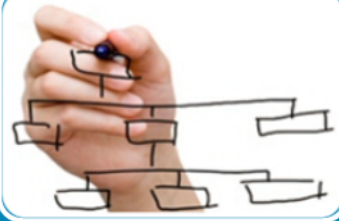
Modeling:
- Many insurers still struggling with practicalities of ORSA modelling
- However approximation techniques are available and can be used

Key areas of difficulty are:
- Being able to project risk and solvency levels for future years ✓
- Monitoring solvency on a continuous basis ✓
- Be able to assess risk ✓

IBM Solutions:
- There are solutions out there which can help and IBM provides a suite of tools to help quick and efficient implementation of ORSA solution.

Questions

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