

ERM & Risk Appetite

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Council 2012

Chairman ERM Research Thought Leadership Committee

ERM Practice Executive Committee

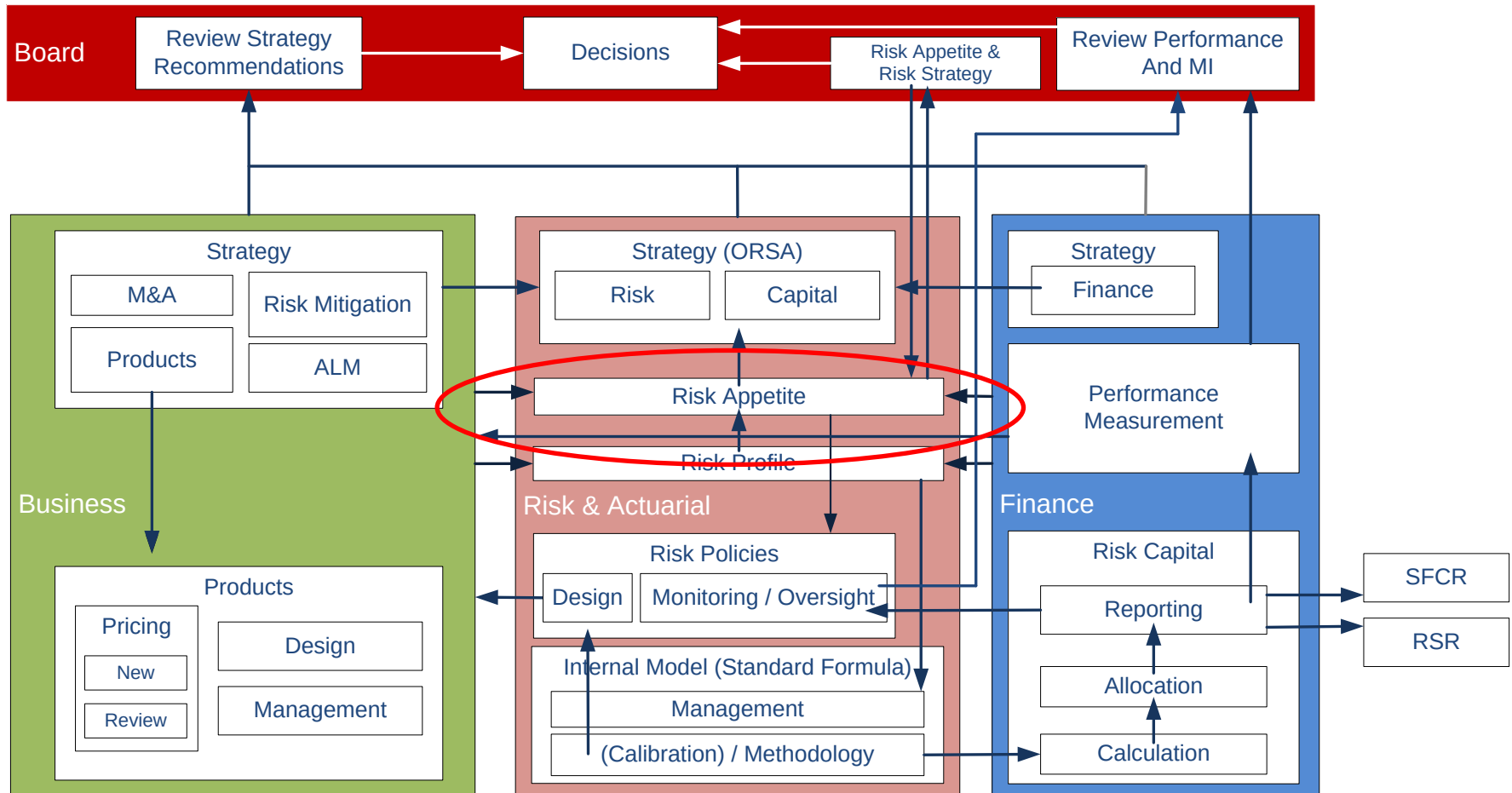
Finance and Investment Research Committee

Agenda

- Risk Appetite / Risk Tolerance Definitions
- Risk Appetite Stakeholders
- Risk Appetite Design
- Risk Appetite Execution
- Risk Appetite Research
- Selected 2012 Risk Appetites

Solvency II & ERM

Risk Appetite



Risk Appetite Definitions

Solvency II Viewpoint



COMMISSION OF THE EUROPEAN COMMUNITIES

Level 1

Article 44

Own risk and solvency assessment

1. As part of its risk management system every insurance or reinsurance undertaking shall conduct its own risk and solvency assessment.
That assessment shall include at least the following:
 - (a) the overall solvency needs taking into account the specific risk profile, approved risk tolerance limits and the business strategy of the undertaking;

Article 251 SG3

(Art. 44(1) of Directive 2009/138/EC)

Risk Management System

Insurance and reinsurance undertakings shall put in place an effective risk management system which requires at least the following:

1. a clearly defined and well documented risk management strategy which includes the relevant objectives, key principles, general risk appetite and tolerance as well as the assignment of responsibilities across all the activities of the undertaking and which is consistent with the undertaking's overall business strategy;
3. In relation to investment risk management, actions to take into account the undertaking's business, its overall risk tolerance levels, its own internal ratings of credit risk, and its solvency position and the long-term risk. When undertakings use



COMMISSION OF THE EUROPEAN COMMUNITIES

Level 2



Level 3

Guideline 17 (Article 44 (1) of the Directive)

The management body of the undertaking should be responsible for ensuring the suitability, effectiveness and proportionality of the risk management system, the setting of the undertaking's risk appetite and overall risk tolerance limits as well as approving of the main risk management strategies and policies.

Guideline 4 (Article 45(2) of the Directive)

The ORSA policy should comply with the guidelines established under General Governance - Written policies- and include additionally at least:

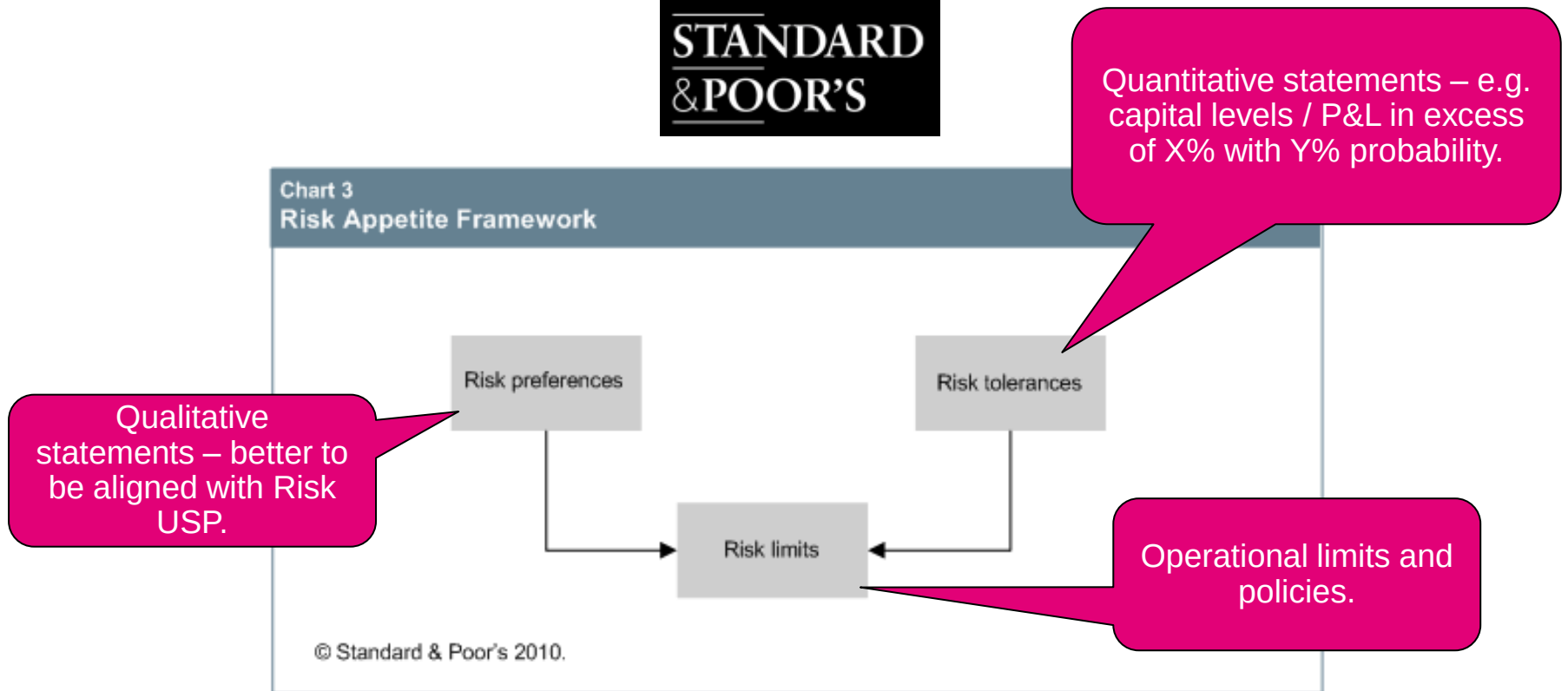
- a) a description of the processes and procedures in place to conduct the ORSA;
- b) a description of the linkage between the risk profile, the risk tolerance limits and the overall solvency needs;
- c) details on:
 - (i) how often stress tests/sensitivity analyses are to be performed and what tests/analyses are to be used;
 - (ii) the assumptions on which the assessment and the aggregation of risks are to be based;

Risk Appetite Definitions

Rating Agency (S&P)



Chart 3
Risk Appetite Framework



Risk Appetite Definitions

Professions (Actuarial, ISO)

Risk Appetite—The level of aggregate risk that an organization chooses to take in pursuit of its objectives.

Risk Tolerance—The aggregate risk-taking capacity of an organization.

Risk Limit—A threshold used to monitor the actual risk exposure of a specific unit or units of the organization to ensure that the level of aggregate risk remains within the risk tolerance.



ACTUARIAL STANDARDS BOARD

3.7.1.2

risk appetite

amount and type of **risk** (1.1) that an organization is willing to pursue or retain

3.7.1.3

risk tolerance

organization's or **stakeholder's** (3.2.1.1) readiness to bear the **risk** (1.1) after **risk treatment** (3.8.1) in order to achieve its objectives

NOTE Risk tolerance can be influenced by legal or regulatory requirements.

Definition of Risk Appetite

ISO 31000 / Guide 73	BS31100
Amount and type of risk	Amount and type of risk
that an organisation is willing to pursue or retain	that an organisation is prepared to seek, accept or tolerate



Risk Appetite Definitions

Conclusion

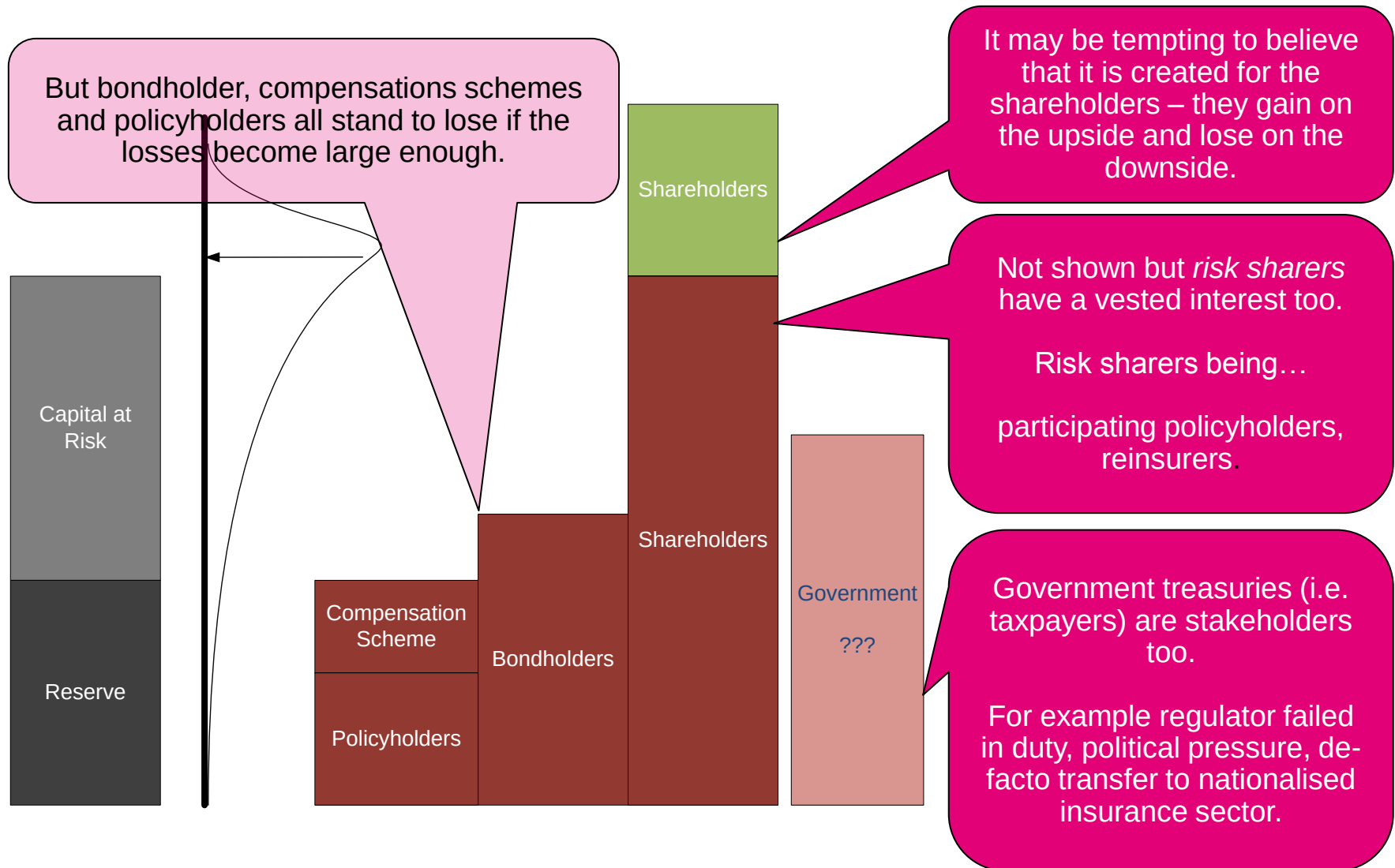
- Little consensus of risk appetite / risk tolerance definitions.
 - Trying to impose a universal definition is likely to lead to endless debate
 - Each *risk appetite* is different so perhaps definitions are not so important
- What is important is that...
 - the producers and consumers of a *particular* “risk appetite” agree on the definitions they will use
 - the concepts associated with defining how much risk the insurer is willing to take are all defined and understood by the stakeholders

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Risk Appetite Stakeholders

Risk Appetite Consumers



Risk Appetite Stakeholders

Risk Appetite Producers : Board involvement needed

SENIOR SUPERVISORS GROUP

Risk Management Lessons from the Global Banking Crisis of 2008



EUROPEAN COMMISSION

B) Lack of ownership by Boards of risk strategy

In addition to the lack of effective challenge by Boards of management decisions, excessive risk-taking in credit institutions has been partly due to lack of adequate Board involvement in approving and overseeing the risk strategy (risk appetite) and risk management structure. Board members did not feel themselves sufficiently concerned by risk issues which resulted in lack of ownership of risk matters by Boards. Often, there were no clear lines of responsibility with regard to risk identification and management. The evidence gathered⁹⁴ shows that in several credit institutions, there was a lack of acknowledgement at the Board level of the risk certain transactions implied, while the risk appetite was either not properly defined or not defined at all. There was also no effective monitoring of whether the limits set by the risk strategy and the risk appetite were respected. This can be illustrated by the example of UBS, where there were no clear guidance on front desk on the limits of risk exposure and lack of coordination of risk strategy.

2. Articulating Risk Appetite

- Supervisors see insufficient evidence of board involvement in setting and monitoring adherence to firms' risk appetite.
- Risk appetite statements are generally not sufficiently robust; such statements rarely reflect a suitably wide range of measures and lack actionable elements that clearly articulate firms' intended responses to losses of capital and breaches in limits.



The failure of the Royal Bank of Scotland

risk appetite when the budget was reviewed. The 2006 report⁶⁵⁵ said that directors felt there was insufficient input to and review of risk appetite at Board level, that the Board needed to articulate its risk appetite and that a third of them did not appear to be satisfied with the Board's role in defining and developing strategy.

RBS's risk functions were involved in the final stages of the strategy-setting process. Their involvement included assessing the impact of the strategy on RBS's expressed risk appetite and its existing risk limits as part of the Annual Divisional Budget Risk Assessment Process. However, the risk functions' role in the earlier stages of the strategy formulation was very limited. There was no comprehensive risk assessment of the impact of the growth strategy at that stage; for example how changes to the assumptions underlying the strategy might increase RBS's risk profile. This was because the strategy primarily

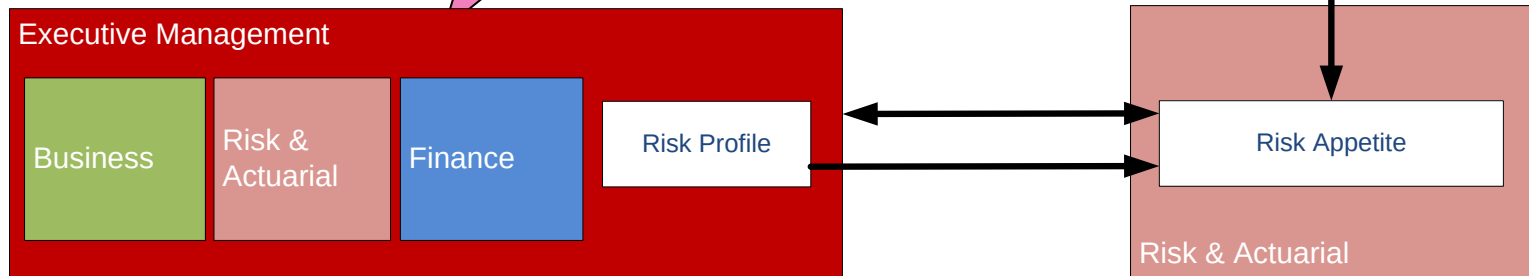
Risk Appetite Stakeholders

Getting the Risk Appetite Agreed

There are three main areas of the business that we see as forming the strategic direction of the company.

We could include HR and IT but keep our focus on where Insurance Regulation is likely to focus more.

The Board needs to take ownership of the Risk Appetite and challenge proposed Risk Appetite from Executive.



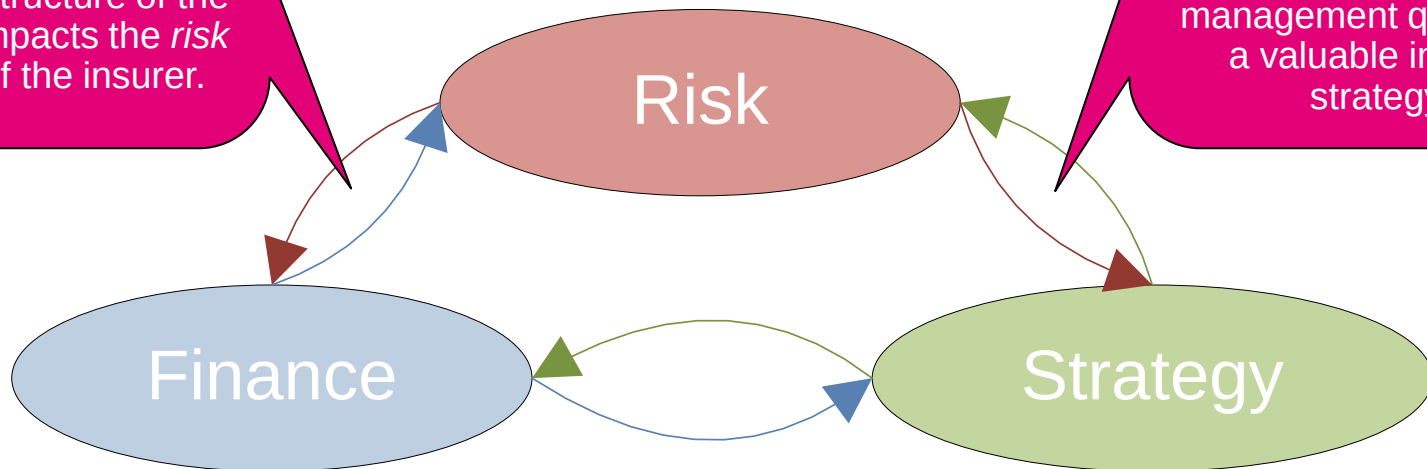
Risk Appetite Stakeholders

Executive Producers

We see three main players in the risk appetite design: Strategy, Risk and Finance.

The risk profile has consequences for the financial structure of the insurer.

Financing structure of the company impacts the *risk capacity* of the insurer.



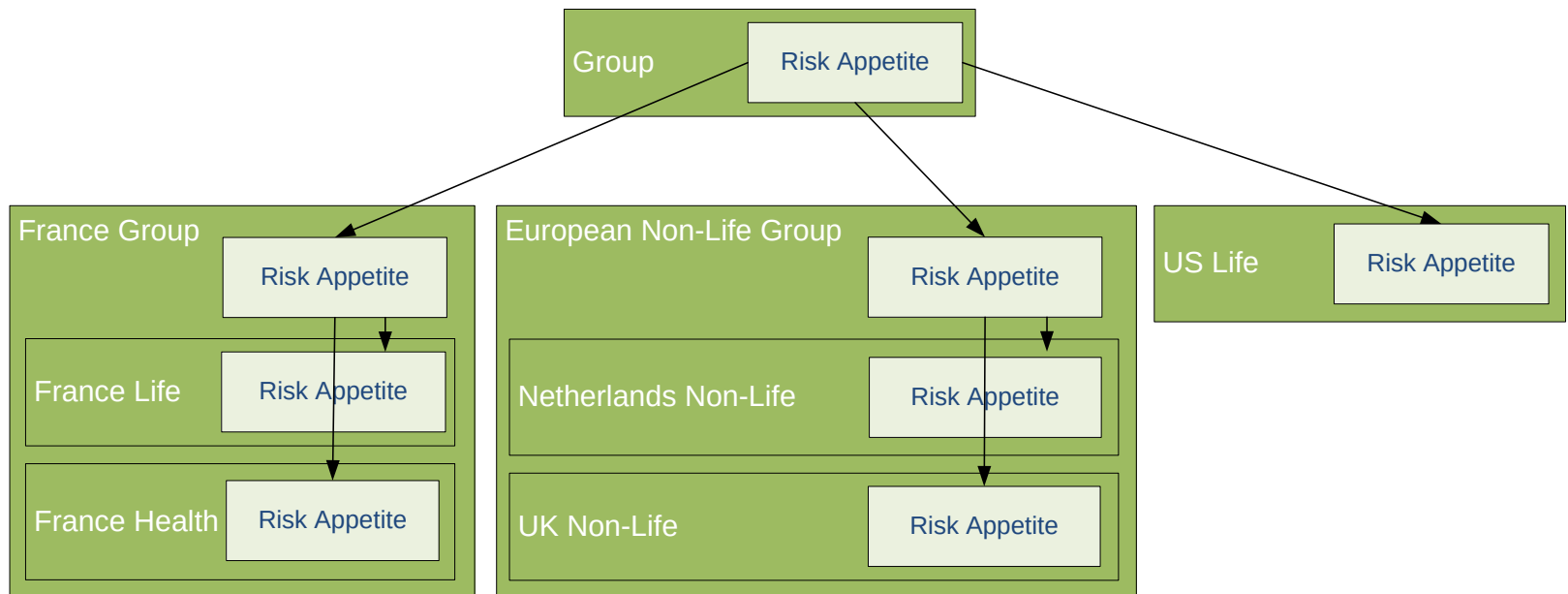
Risk Appetite Stakeholders

Engaging the business

Investors in the group would expect their investments to be subject to the strategy and risk appetite of the *group*.

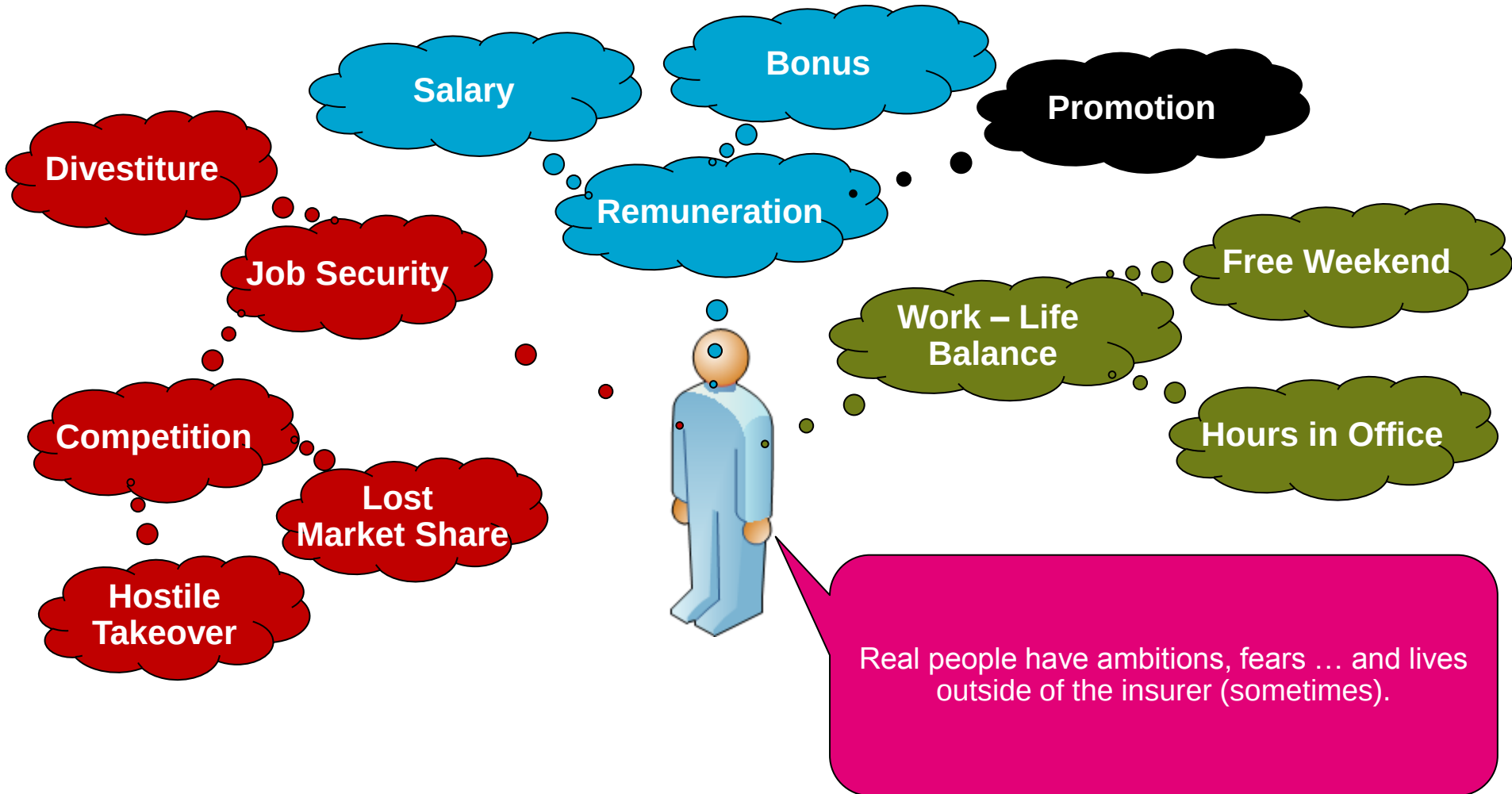
However all entities need to comply with Solvency II and all will have a Board. Therefore each business unit will have a risk appetite the local board is comfortable with.

Furthermore there are *real people* in those entities who will have to deliver to the risk appetite.



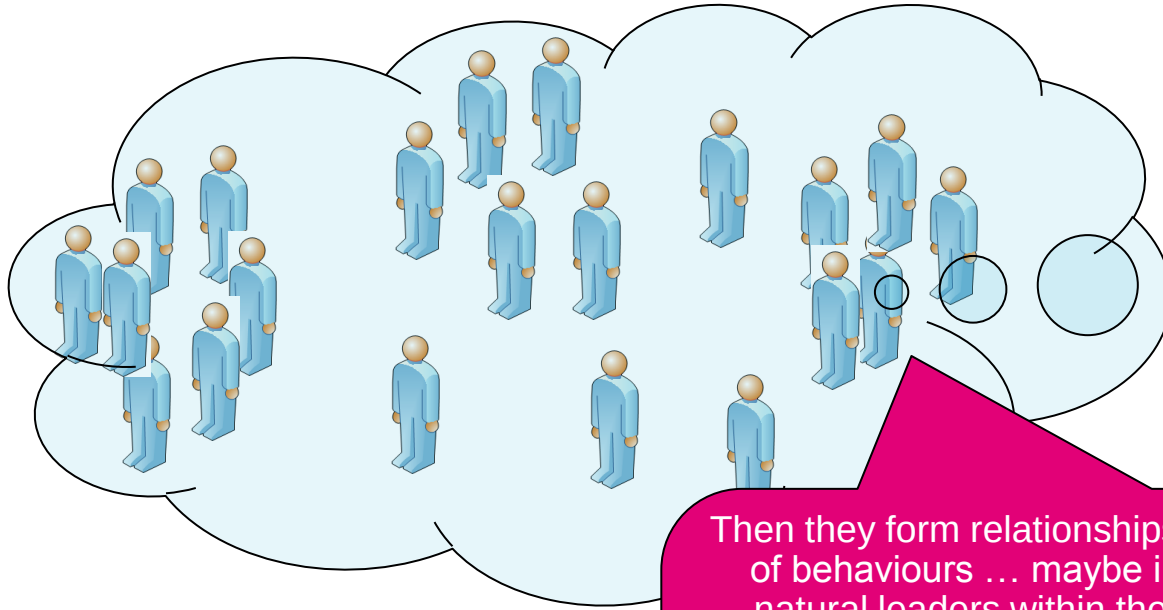
Risk Appetite Stakeholders

Real people think about things other than risk appetite



Risk Appetite Stakeholders

Real people create (risk) cultures



Then they form relationships, groupings and develop common set of behaviours ... maybe influenced by strong personalities or natural leaders within the business – hierarchy and personal networks.

They develop a *culture* – in fact they develop into lots of *sub-cultures* in any sizable organisation.

For a risk appetite to be implemented it needs to become part of the culture of these real people ... or risk becoming an *orphaned risk appetite*.

Risk Appetite Stakeholders

Risk Appetite - Risk Culture (Old) → Risk Appetite → Risk Culture (New)

Many firms find that their *risk appetite* is intimately linked to their *risk culture*.

They find that to change the *risk appetite* they need to change the (risk) culture.

Risk Appetite

How difficult this is depends on how different the target risk appetite is compared to the risk culture. The more different it is the more the people need to adapt (or the more the people need to change). Effective governance crucial to making this work

Risk Appetite

Corporate Culture

Risk Appetite

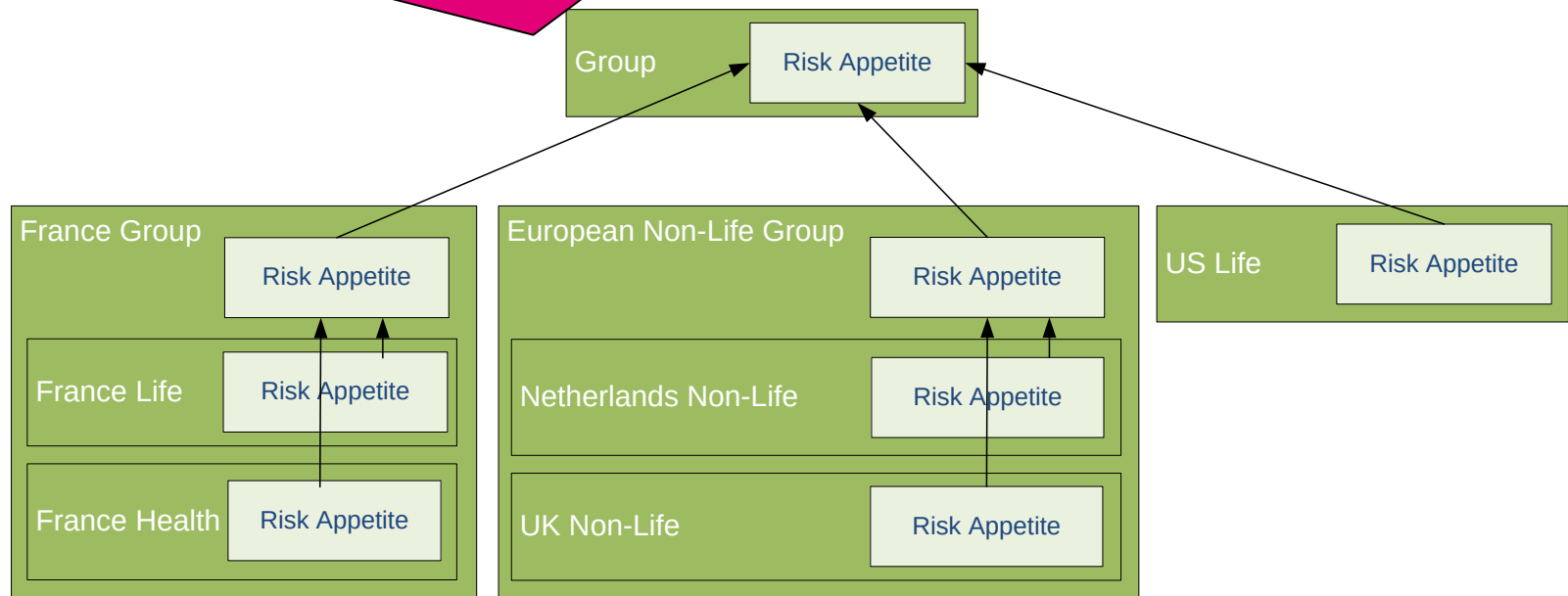
Risk Appetite

Risk Appetite Stakeholders

Corporate Culture → (de Facto) Risk Appetite

Accepting the culture of the business units can mean accepting the *de-facto* risk appetite at first of the business units. This in turn can mean that the group risk appetite is constrained by the business units it owns.

Changing risk appetite from the top *can* change / influence the risk appetite below but its success will depend on the nature of the relationship between the group and the entities. Compromises between Group and entities are almost inevitable.



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Risk Appetite Design

Quantitative Criteria Examples

Some statements can be mapped to the probability of future capital-at-risk (own funds).

Deliver an (economic) profit 7 years out of 10.

Ensure that economic profit and loss volatility is within a range of $\pm 10\%$

(In practice P&L measures may well differ in how “economic” they are – IFRS Earnings, EEV Earnings are often referred to.)

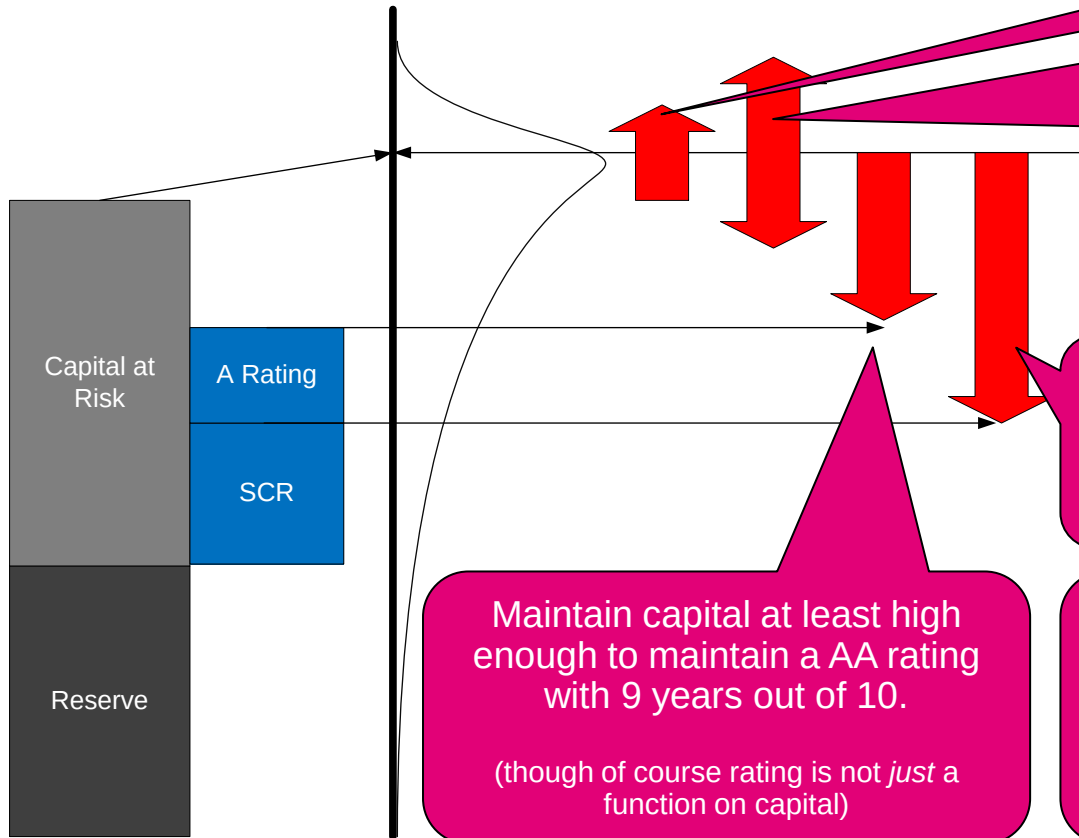
Avoid regulatory intervention due to a capital requirements breach.

(typically *any* regulatory intervention is considered undesirable)

Maintain capital at least high enough to maintain a AA rating with 9 years out of 10.

(though of course rating is not *just* a function on capital)

These statements may well impose some tough constraints on the distribution of Capital at Risk. There may need to be push-back from finance / risk on what is achievable.



Risk Appetite Design

Daily Excess Capital (Excess Own Fund) Movements

A life insurer through 2008 assuming Solvency II had been implemented in 2007.

Insurer is a Single Life Fund, with non-profit business consisting of annuities, some protection and savings based unit-linked business.

ALM strategy is to match liabilities closely using corporates, swaps and some ordinary shares

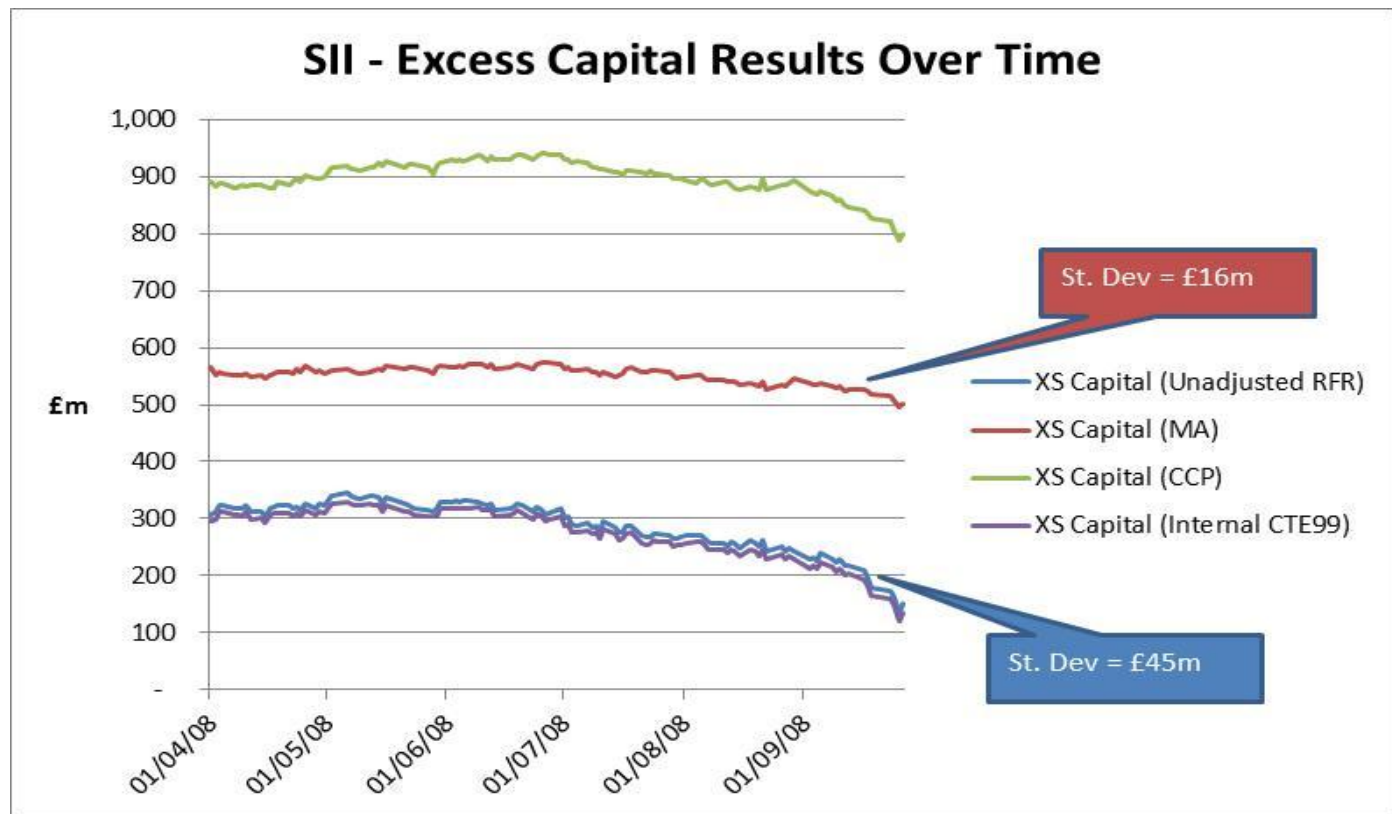
The banking crisis and collapse of Lehman Brothers:

Daily solvency position calculated:

01/04/08–30/09/08

Excess capital is significantly depleted as we approach the end of Sept 2008.

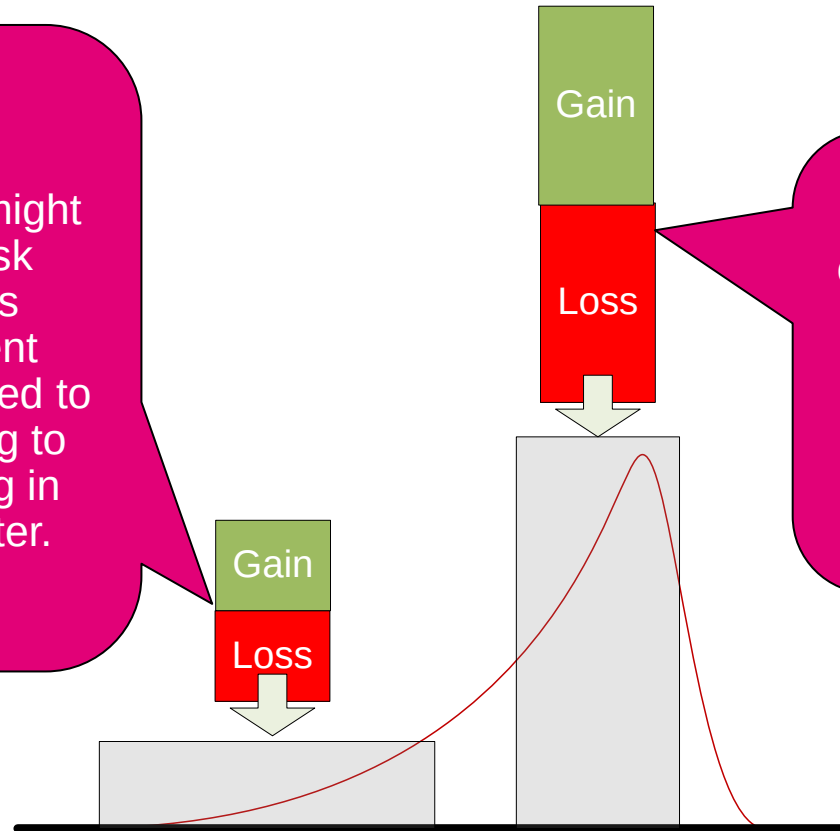
Matching Adjustment ranged from 38-63bps and would have significantly mitigated the fall in excess capital while helping to stabilise results via reduced capital volatility



Risk Appetite Design

Quantitative Criteria in Changing Circumstances

In “stressed” circumstances we might see a reined in risk appetite – boards bruised from recent losses – less prepared to take a risk – looking to consolidate and dig in until times are better.



In “normal” circumstances we might see a healthy risk appetite – boards prepared to risk the downside to get the upside.

Risk Appetite Design

Qualitative Criteria Suggested by FSA



Box 1 – Risk appetite

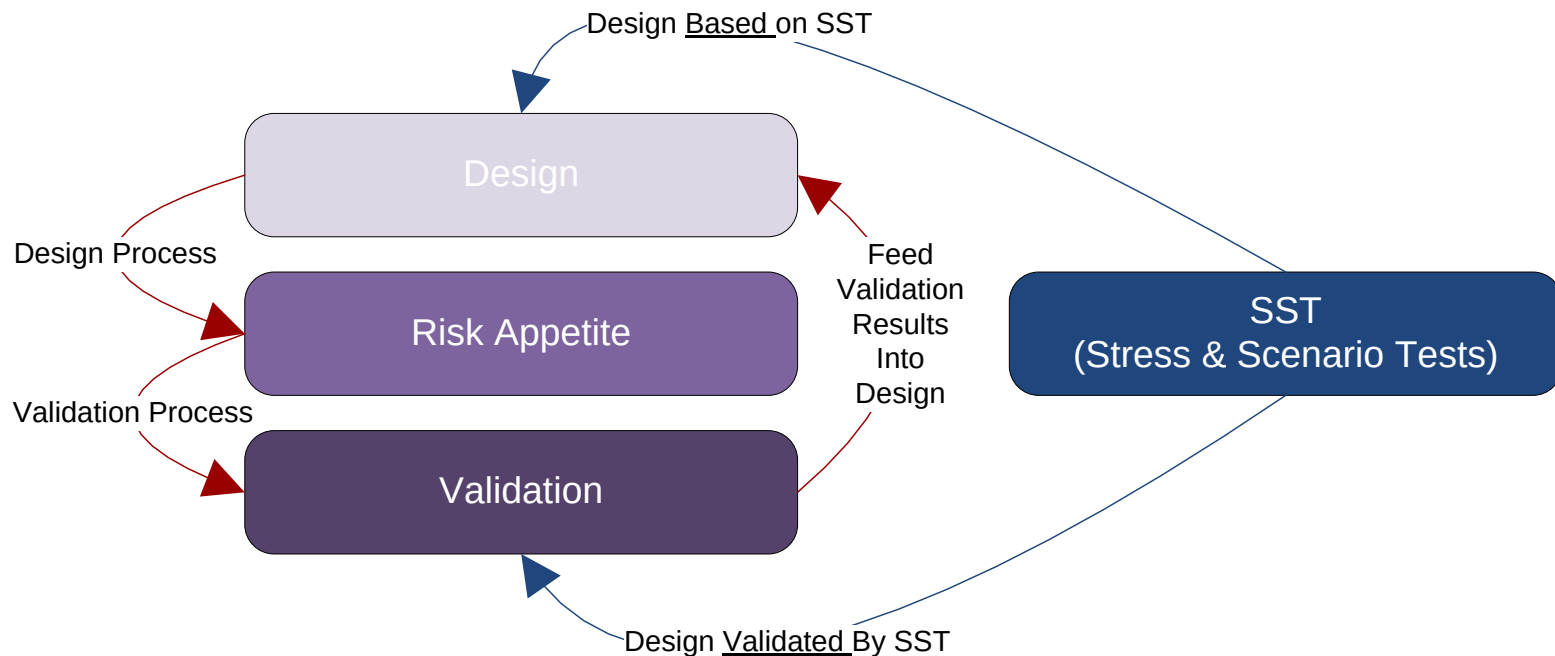
Some firms have considered their risk appetite in the context of the extent of ‘damage’ that they are prepared to accept in all areas that underpin their strategic objectives. A discussion of what factors are important to a firm, in addition to quantum of capital may therefore be a useful starting point for considering risk appetite statements. Such factors may include (in no particular order):

- *ease of capital raising;*
- *returns to shareholders, debt-holders and customers;*
- *cost of new capital (or Ratings Agencies’ ratings);*
- *fair treatment of customers;*
- *delivery of customer propositions;*
- *reputation;*
- *relationships with third parties, including regulators and governments;*
- *tolerance of a particular level of adverse press publicity; and*
- *achievement of market and other strategic objectives.*

Risk Appetite Design

Use of Stress and Scenario Tests

Various opinions exist on to what extent stress and scenario tests play a role – some prefer to use in the design – some prefer to use them to validate.



Risk Appetite Design

Typical Statements

CAPITAL

Maintain sufficient capital to achieve at least a AA rating (19 in 20 years).

Zero tolerance for any kind of reputational risk.

REPUTATION

LIQUIDITY

Always have enough cash to meet financial obligations.

Ensure earnings volatility is in line with shareholder expectations.

P&L

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Risk Appetite Execution

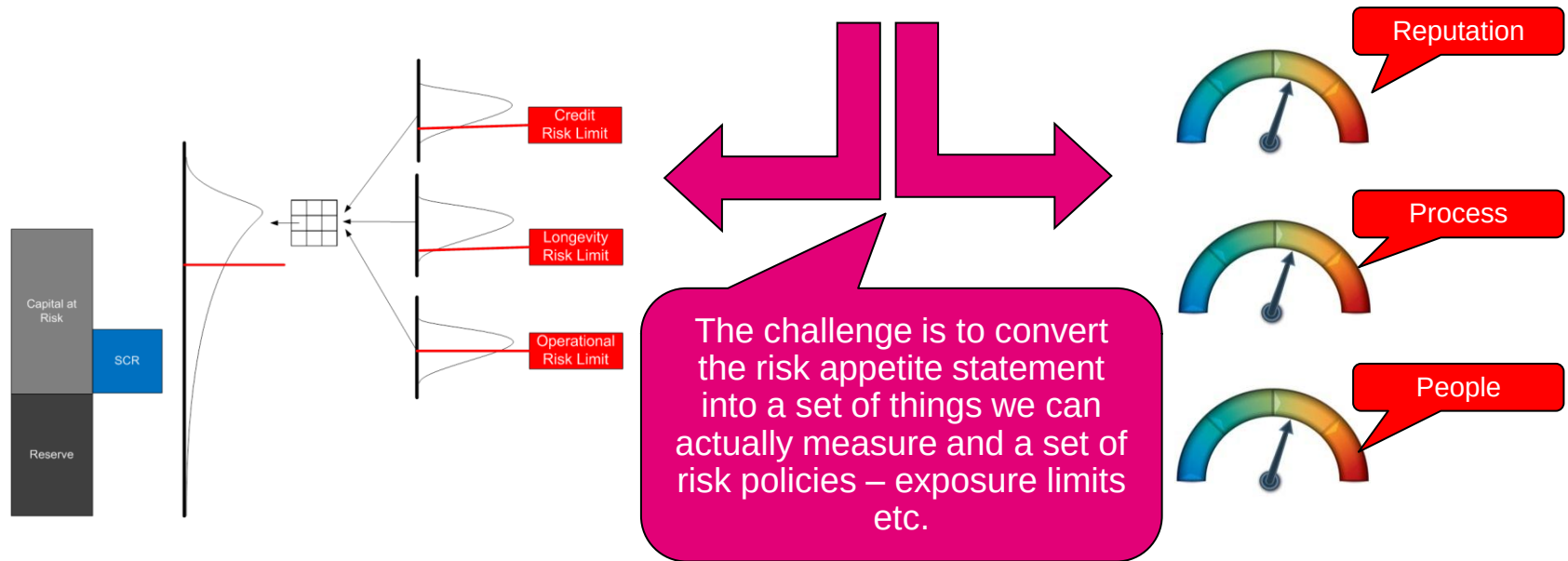
What boards might give the executive to work with...

- The Board expects to maintain sufficient capital during normal conditions to retain a AA rating
- Following a 1:25 year event the Board expects to have sufficient capital to retain at least a BBB rating
- During normal conditions the planned profit will be delivered
- Following a 1:10 year event, at least 75% of the planned profit will be delivered
- No appetite for regulatory censure or other significant reputational impact

Risk Appetite Execution

Limit Setting

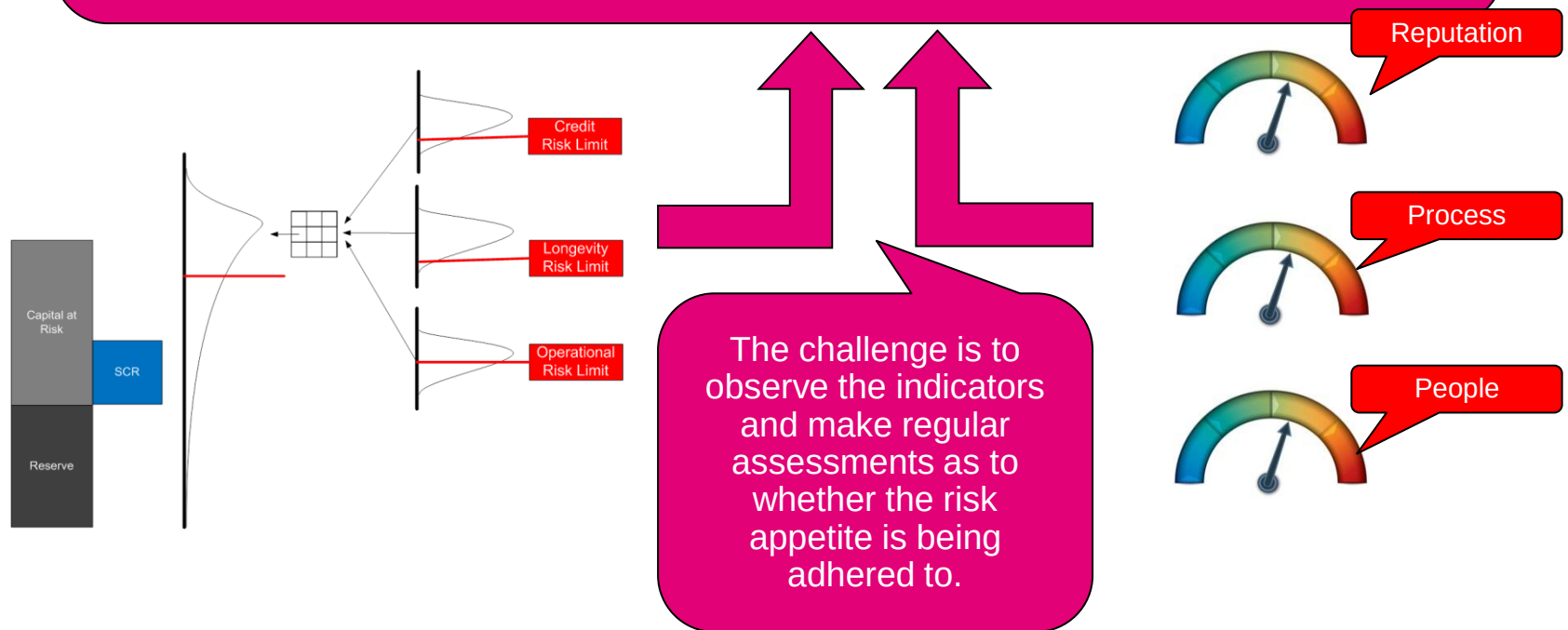
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Risk Appetite Execution

Measuring the adherence to the Risk Appetite

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Risk Appetite Research

Towards a solution from the Actuarial Profession



The Actuarial Profession

making financial sense of the future

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**A review of the use of complex systems applied
to risk appetite and emerging risks in ERM
practice**

BY N. ALLAN, N. CANTLE, P. GODFREY
AND Y. YIN

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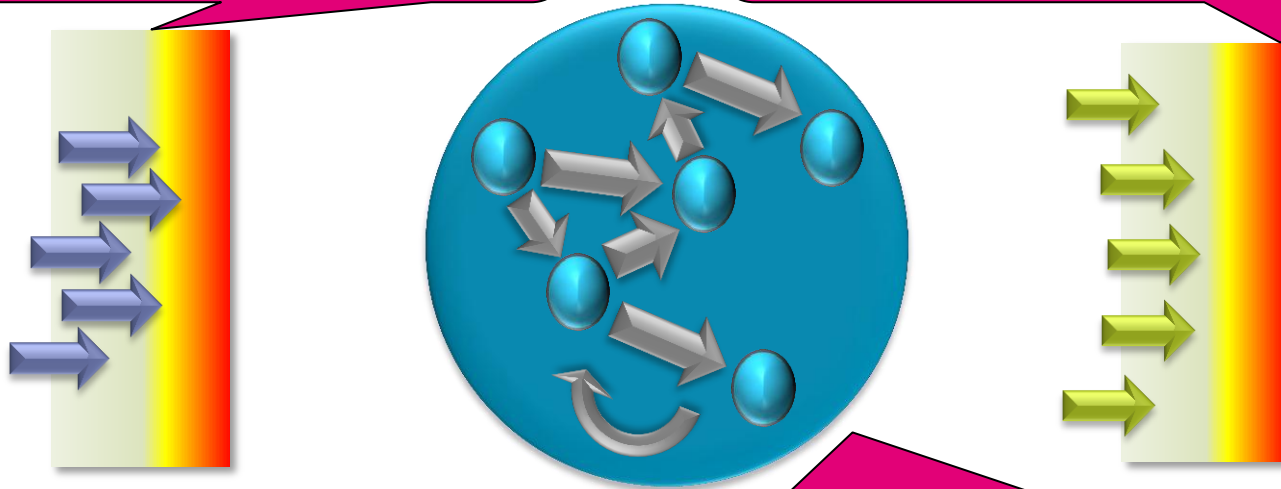
Risk Appetite Research

The Risk Appetite Problem

Need to find a link between the operational indicators (including the non-quantitative ones for things like process, people and reputation)

and...

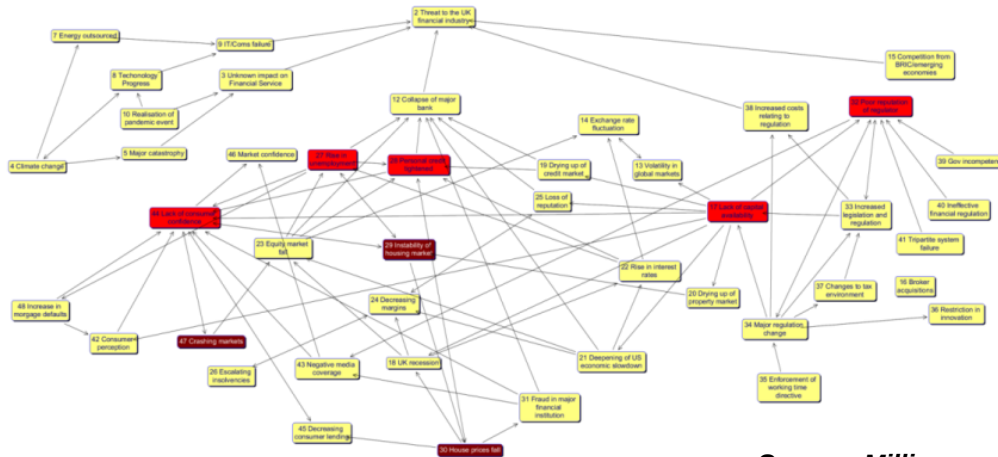
... the probability of the desires expressed in risk appetite statement being true or within the stated probability.



They identified that the mapping was *complex* and therefore turned to some on the tools of *complexity science* for a solution. Tools used were concept mapping and Bayesian Networks.

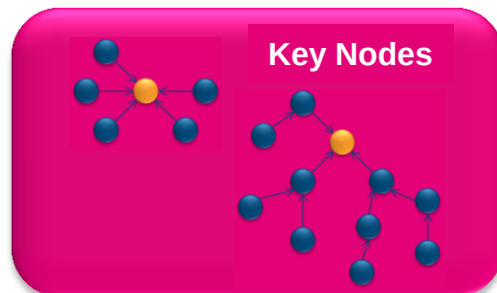
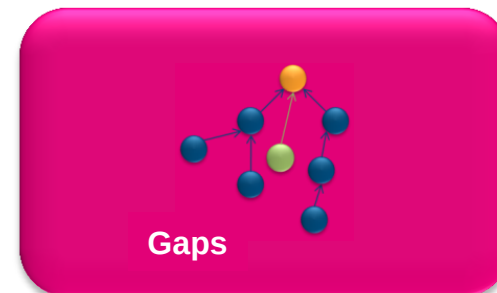
Risk Appetite Research

Stage 1 – Cognitive Mapping



Source: Milliman

- Experts are able to map the way the business works and how risks in their area of the business emerges and is propagated.
- Complex maps are created but can be distilled down to a manageable size extracting the important nodes.
- Gaps in the “story” can be identified and explored in more depth.

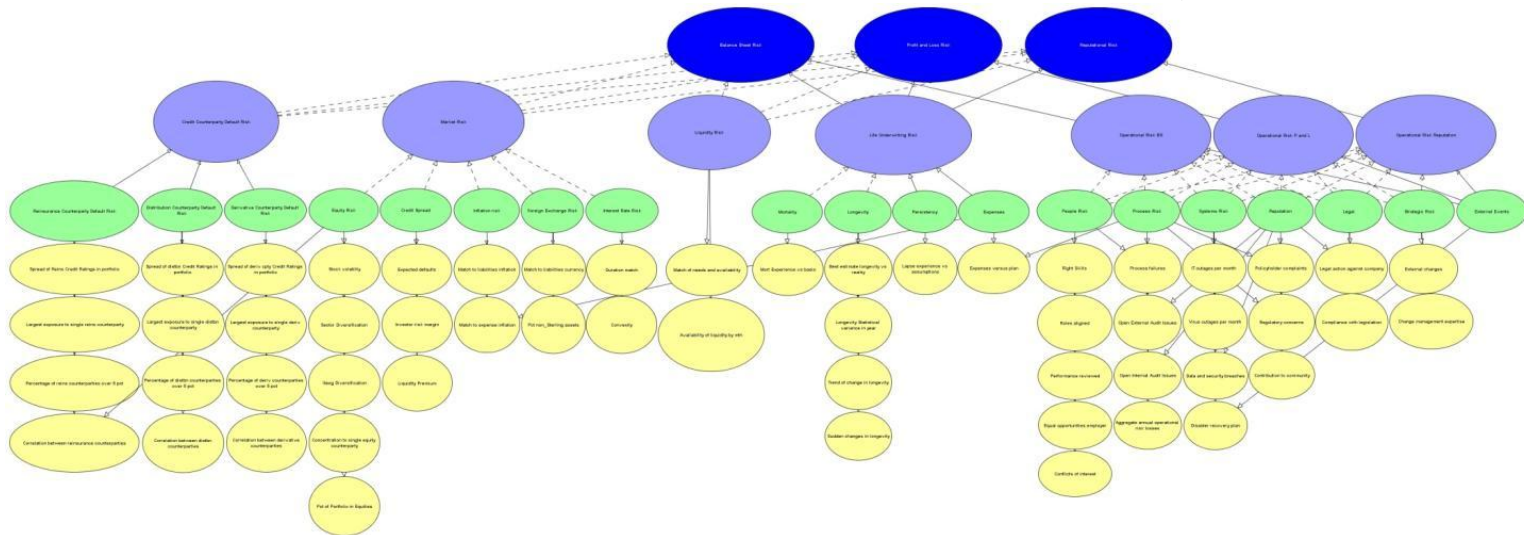


Risk Appetite Research

Stage 2 – Convert Concept Map to Bayesian Network

After simplifying the concept map (using some well established mathematical techniques) ... linking the risk appetite statements to the measurable indicators ... the simplified concept map is converted to a Bayesian Network.

The Bayesian Network is parameterised through conditional probabilities which have proven cognitively straightforward for stakeholders (including boards!) to relate to – aiding estimation and validation of the probability of risks propagating.

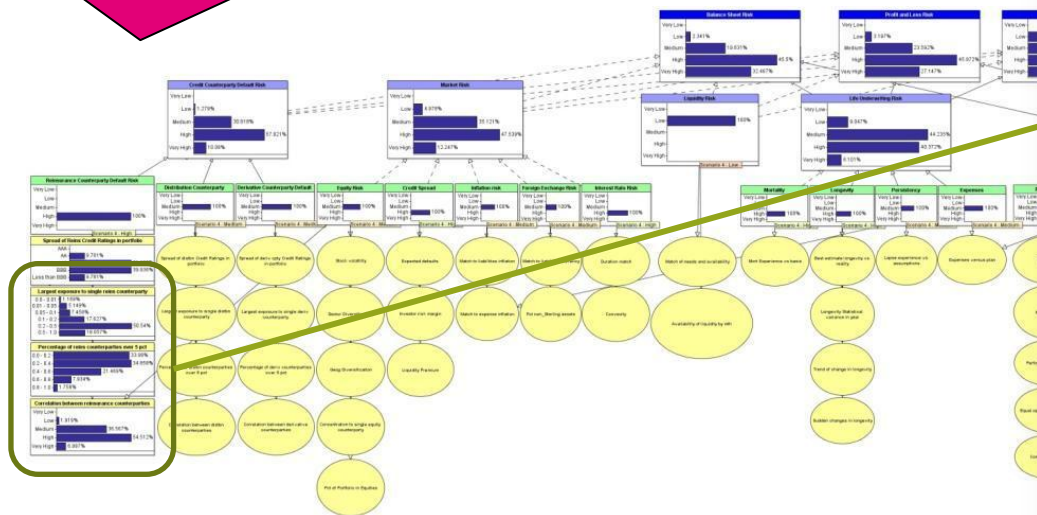
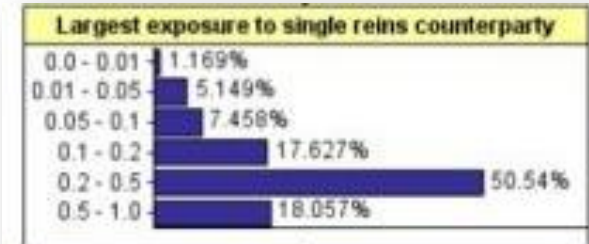
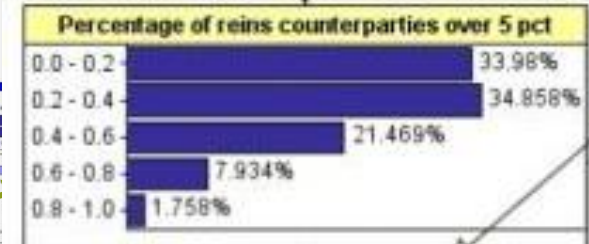
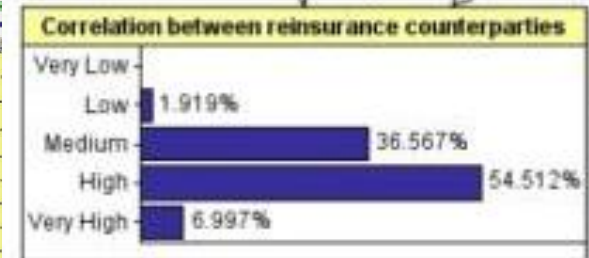


Risk Appetite Research

Stage 3 – Mapping Appetite to Operational Indicators

Once the network is developed the high level risk appetite variables are set to have the probabilities set out in the risk appetite statement.

The propagation properties of the Bayesian Network are used to derive the resulting distributions of the indicators.



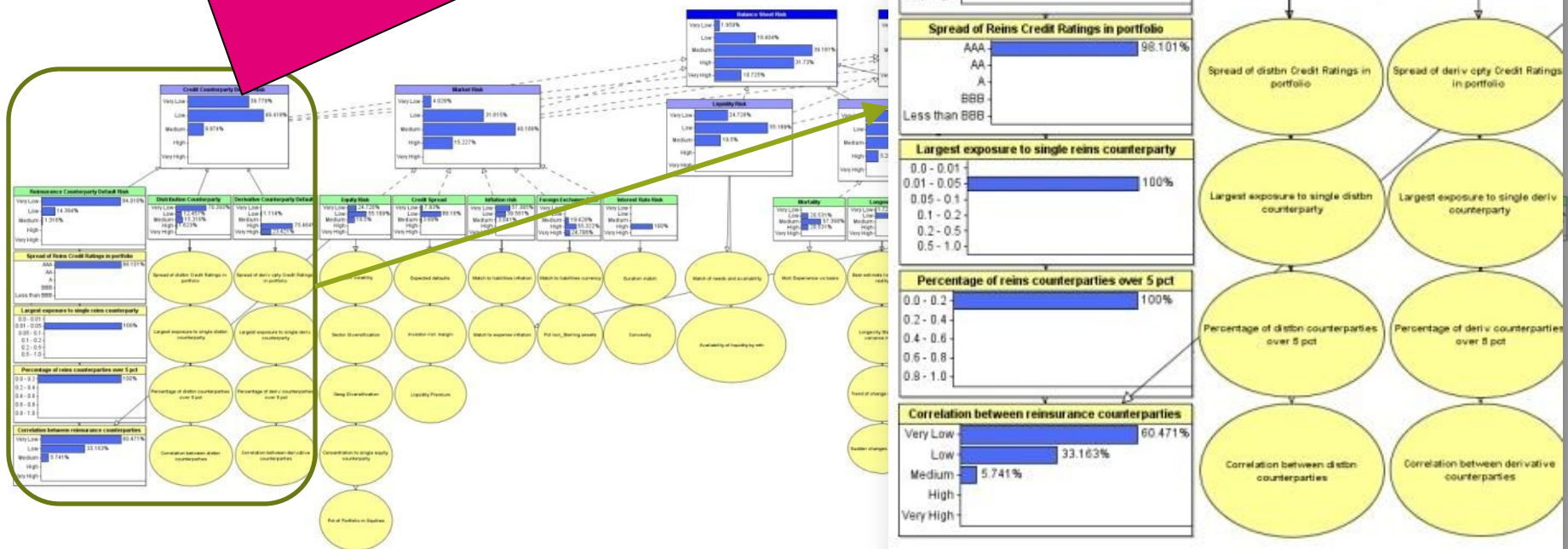
Risk Appetite Research

Stage 4 – Propagate Evidence

The network can be reversed too.

Operational indicator values can be propagated back through the Bayesian Network to the risk appetite variables.

The risk appetite variable distributions can be inspected to check they are in-line with the statement.



Risk Appetite Research

Download from the UK Actuarial Profession website


The Actuarial Profession

making financial sense of the future

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A review of the use of complex systems applied
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2011 Insurer Risk Appetites

Aviva



Risk appetite

Risk appetite is an expression of the level of risk we are willing and able to accept in pursuit of our strategic objectives and thus provides the context for our risk and capital management.

The following appetite statements, which are reviewed and approved by the Board, demonstrate a key focus on balance sheet strength and protection of the franchise value. They supplement risk appetite statements relating to the regulatory solvency position.

- Economic capital: the Aviva Board requires that the Group has sufficient capital to remain able to meet its liabilities in extreme adverse scenarios, on an ongoing basis, calibrated consistently with the Group's strategic target of maintaining a credit rating in the AA range.
- Liquidity: the Board requires that the Group maintains significant liquid resources to meet both planned cash outflows and cover unexpected cash requirements under stress conditions. In addition, the Group maintains substantial unutilised committed credit facilities to cover extreme adverse scenarios.
- Franchise value: we recognise that our long-term sustainability depends upon the protection of our franchise and our relationship with customers. As such, we will not accept risks that materially impair the reputation of the Group and we will require that customers are always treated with integrity.

2011 Insurer Risk Appetites

Prudential



A. Group risk appetite

Prudential defines and monitors aggregate risk limits based on financial and non-financial stresses for its earnings volatility, liquidity and capital requirements.

Earnings volatility: the objectives of the limits are to ensure that:

- a the volatility of earnings is consistent with the expectations of stakeholders,
- b the Group has adequate earnings (and cash flows) to service debt, expected dividends and to withstand unexpected shocks, and
- c earnings (and cash flows) are managed properly across geographies and are consistent with funding strategies.

The two measures used to monitor the volatility of earnings are European Embedded Value (EEV) operating profit and International Financial Reporting Standards (IFRS) operating profit, although EEV and IFRS total profits are also considered.

Liquidity: the objective is to ensure that the Group is able to generate sufficient cash resources to meet financial obligations as they fall due in business as usual and stressed scenarios.

Capital requirements: the limits aim to ensure that:

- a the Group meets its internal economic capital requirements,
- b the Group achieves its desired target rating to meet its business objectives, and
- c supervisory intervention is avoided.

The two measures used are the EU Insurance Groups Directive (IGD) capital requirements and internal economic capital requirements. In addition, capital requirements are monitored on a local statutory basis.

Our risk appetite framework forms an integral part of our annual business planning cycle. The Group Risk Committee is responsible for reviewing the risks inherent in the Group's business plan and for providing the Board with input on the risk/reward trade-offs implicit therein. This review is supported by our Group Risk function, which uses submissions by business units to calculate the Group's aggregated position (allowing for diversification effects between business units) relative to the limits contained within the risk appetite statements.

2011 Insurer Risk Appetites

Phoenix Group (UK)



Risk appetite

The Group's risk appetite framework consists of a set of statements and targets that articulate the level of risk the Group is willing to accept, in pursuit of shareholder value and achievement of the Group's strategic objectives. The statements encapsulate policyholder security, earnings volatility, liquidity and the internal control environment as follows:

- **Capital** – The Group and each life company will hold sufficient capital to meet regulatory requirements in a number of asset and liability stress scenarios
- **Cash flow** – The Group will seek to ensure that it has sufficient cash flow to meet its financial obligations and will continue to do this in a volatile business environment
- **Embedded value** – The Group will take action to protect embedded value

- **Regulation** – The Group and each life company will, at all times, operate a strong control environment to ensure compliance with all internal policies and applicable laws and regulations, in a commercially effective manner.

The risk appetite framework supports the Group in operating within the boundaries of these statements by seeking to limit the volatility of key parameters, defined with respect to the above statements, under a range of adverse scenarios agreed with the Board. Risk appetite limits are chosen which specify the maximum acceptable likelihood for breaching the agreed limits and assessment against the appetite targets is undertaken through scenario testing. Breaches of appetite are corrected through management actions where appropriate.

2011 Insurer Risk Appetites

GenRe (via Berkshire Hathaway)

BERKSHIRE HATHAWAY INC.

We have another insurance powerhouse in General Re, managed by Tad Montross.

At bottom, a sound insurance operation needs to adhere to four disciplines. It must (1) understand *all* exposures that might cause a policy to incur losses; (2) conservatively evaluate the likelihood of any exposure actually causing a loss and the probable cost if it does; (3) set a premium that will deliver a profit, on average, after both prospective loss costs and operating expenses are covered; and (4) be willing to walk away if the appropriate premium can't be obtained.

Many insurers pass the first three tests and flunk the fourth. They simply can't turn their back on business that their competitors are eagerly writing. That old line, "The other guy is doing it so we must as well," spells trouble in any business, but in none more so than insurance. Indeed, a good underwriter needs an independent mindset akin to that of the senior citizen who received a call from his wife while driving home. "Albert, be careful," she warned, "I just heard on the radio that there's a car going the wrong way down the Interstate." "Mabel, they don't know the half of it," replied Albert, "It's not just one car, there are hundreds of them."

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Questions

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