



The Actuarial Profession

making financial sense of the future

ICAS – The way forward

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The Chesford Grange Hotel, Kenilworth

What is ICAS?

Initial Challenges

**Experience
to date**

Specific issues

Where next

What is ICAS?

Integrated Prudential Sourcebook in context

Global context

- Basel II
- EU RBCD
- Solvency II
- IAS

UK context

- Integrated Prudential Sourcebook (PSB) which includes ICAS
-
- Senior Management Arrangements, Systems and Controls (SYSC)
 - Role of the Actuary
 - Financial Reporting Requirements
 - Financial Conglomerates / Insurance Groups Directive

Common themes

- Three pillar regulatory framework
 - Minimum capital requirements
 - Prudential supervision
 - Market disclosure
- Use of internal models to calculate capital
- Quantification of operational risk
 - Models for banks
 - Stress tests for insurers
- Emphasis on risk management

Insurance Regime: Capital requirements

Integrated Prudential Sourcebook (PRU)

■ PRU 1.2.26R

- “A firm must carry out regular assessments of the adequacy of its financial resources...”

■ PRU 1.2.31R

- “The processes and systems required by PRU 1.2.26 must enable a firm to identify the major sources of risk and its ability to meet its liabilities as they fall due, including the major sources of risk in each of the following categories:

(1)

(2)

(3)

(4)

(5)



?

Insurance Regime: Capital requirements

Integrated Prudential Sourcebook (PRU)

■ PRU 1.2.35R

- “For each major sources of risk identified in accordance with PRU 1.2.31R, the firm must carry out stress tests and scenario analyses that are appropriate to the nature of those major sources of risk, as part of which the firm must:
 - (1) take reasonable steps to identify an appropriate range of realistic adverse circumstances and events in which the risk identified crystallises; and
 - (2) estimate the financial resources the firm would need in each of the circumstances and events considered in order to be able to meet its liabilities as they fall due.”

■ PRU 1.2.37

- “A firm must make a written record of its assessment of the adequacy of its financial resources, including
 - (1) the major sources of risk identifies in accordance with PRU 1.2.31R;
 - (2) how it intends to deal with those risks;
 - (3) details of the stress tests and scenario analyses carried out and the resulting financial resources estimated to be required in accordance with PRU 1.2.35R”

Systems & Controls: Governance Requirements

Integrated Prudential Sourcebook (PRU)

■ PRU 1.4.20

- “A firm must take reasonable steps to ensure the establishment and maintenance of a business plan and appropriate systems for the management of prudential risk.”

■ PRU 1.4.19

- “When establishing and maintaining its business plan and prudential risk management systems, a firm must document:
 - 1) an explanation of its overall business strategy, including its business objectives;
 - 2) a description of ... its policies towards market, credit ..., liquidity, operational, insurance and group risk ..., including its appetite or tolerance for these risks and how it identifies, measures or assesses, monitors and controls these risks;
 - 3) the systems and controls that it intends to use in order to ensure that its business plan and risk policies are implemented correctly;
 - 4) a description of how ... [it] accounts for assets and liabilities ... and the assumptions [used] for valuation;
 - 5) appropriate financial projections and the results of its stress testing and scenario analyses; and
 - 6) details of, and the justification for, the methods and assumptions used in financial projections and stress testing and scenario analyses.”

..so there are two main aspects to ICAS / PSB

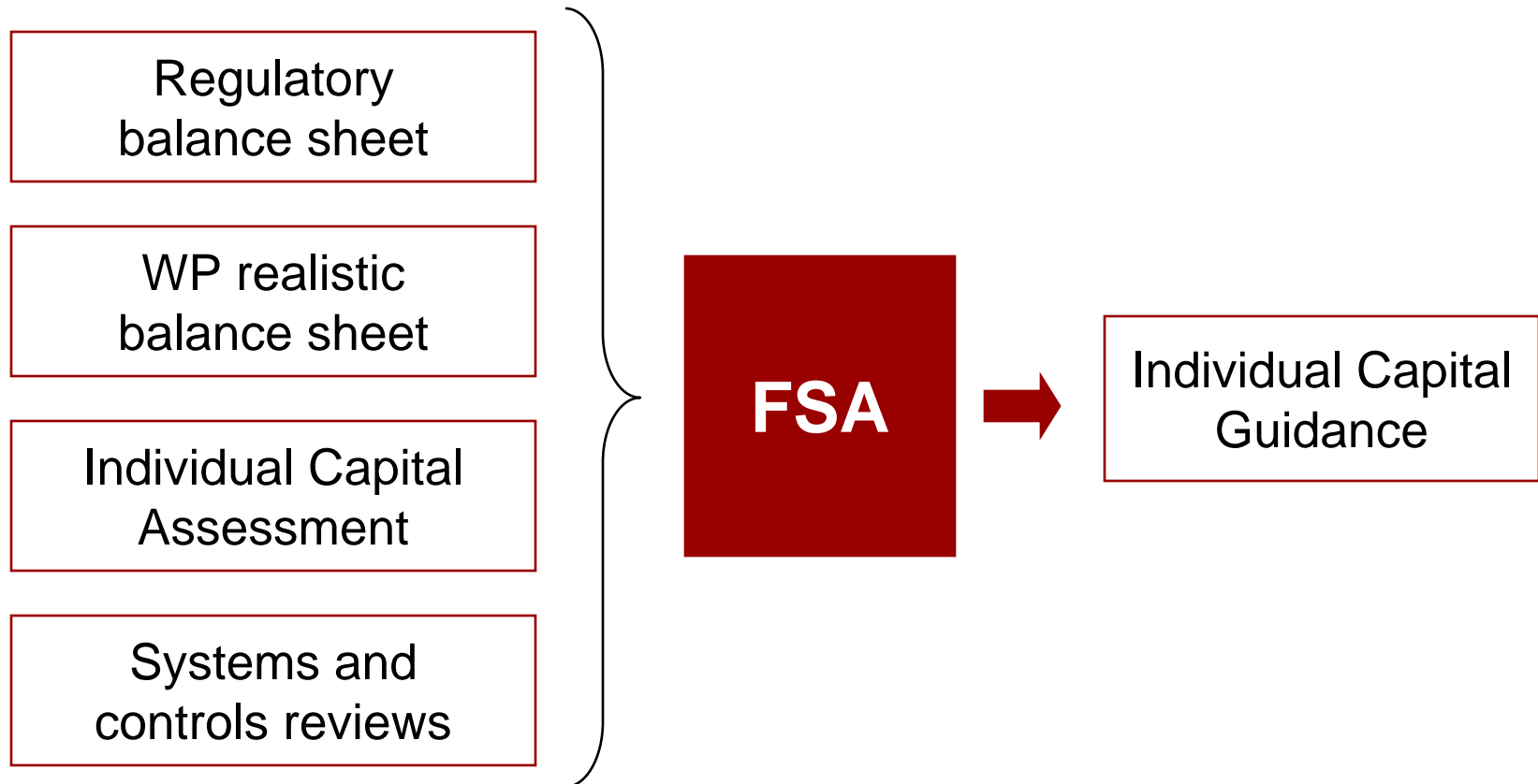
Risk Management

Firms will need to ensure that they have a robust risk management framework in place and can demonstrate the existence of the framework to the FSA

Risk Measurement

Firms will need to calculate a capital requirement using stress and scenario tests and be prepared to present their analysis and assumptions to the FSA

How does this all fit in?





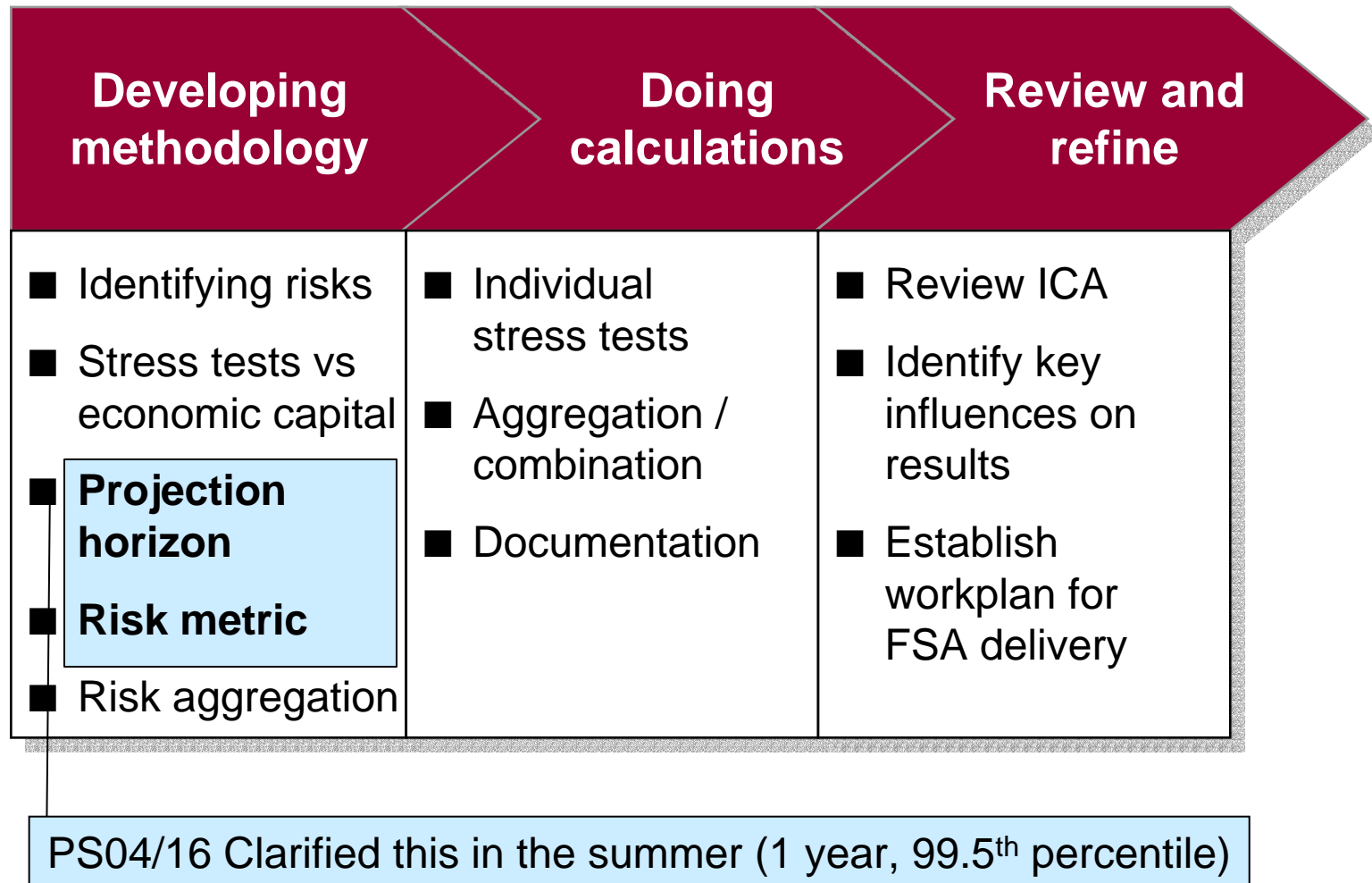
So what have companies been doing?

Reviewing governance and risk management processes

Developing methodology	Doing calculations	Review and refine
<ul style="list-style-type: none">■ Identifying risks■ Stress tests vs economic capital■ Projection horizon■ Risk metric■ Risk aggregation	<ul style="list-style-type: none">■ Individual stress tests■ Aggregation / combination■ Documentation	<ul style="list-style-type: none">■ Review ICA■ Identify key influences on results■ Establish workplan for FSA delivery

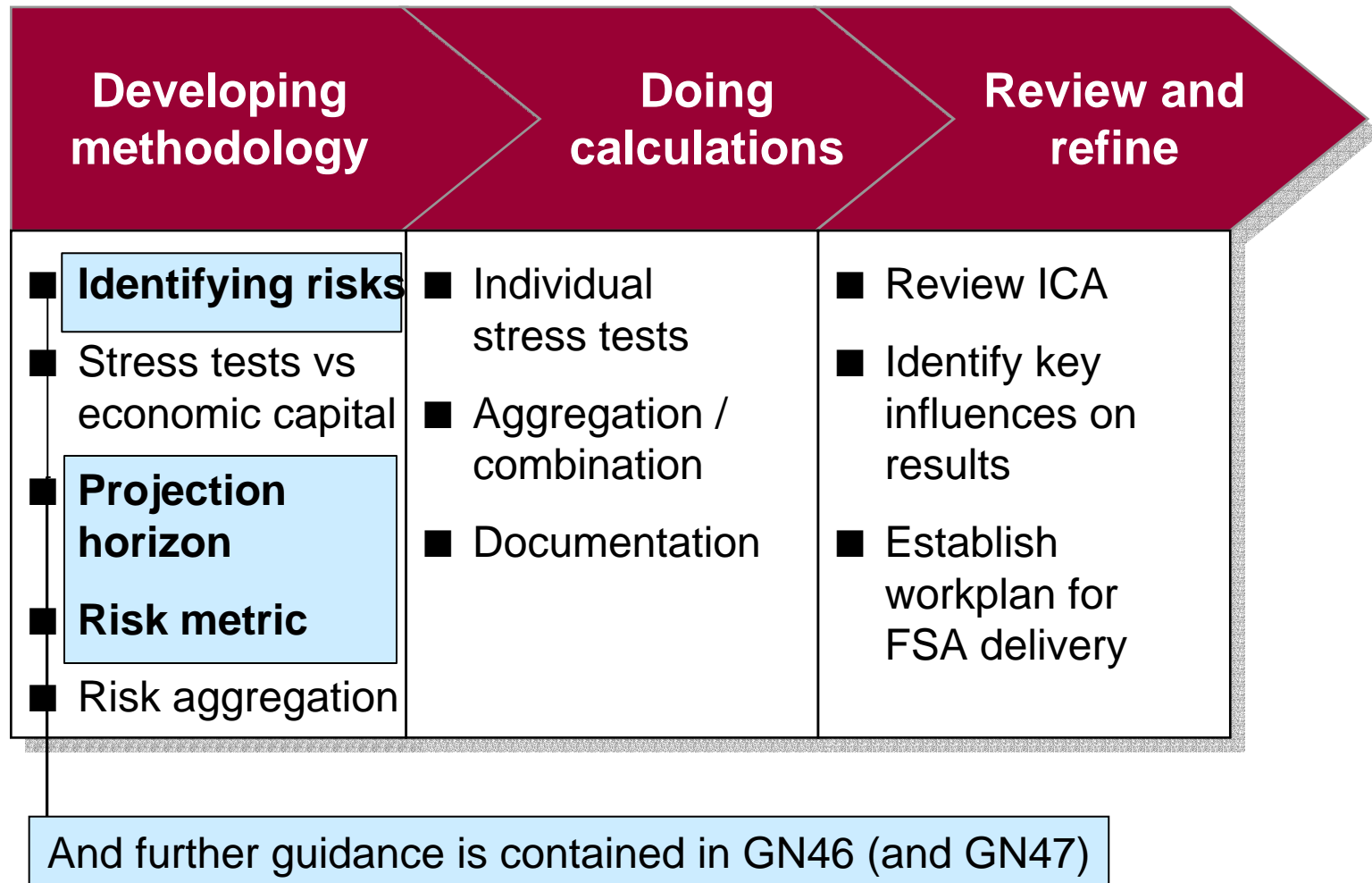
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So what have companies been doing?

Reviewing governance and risk management processes

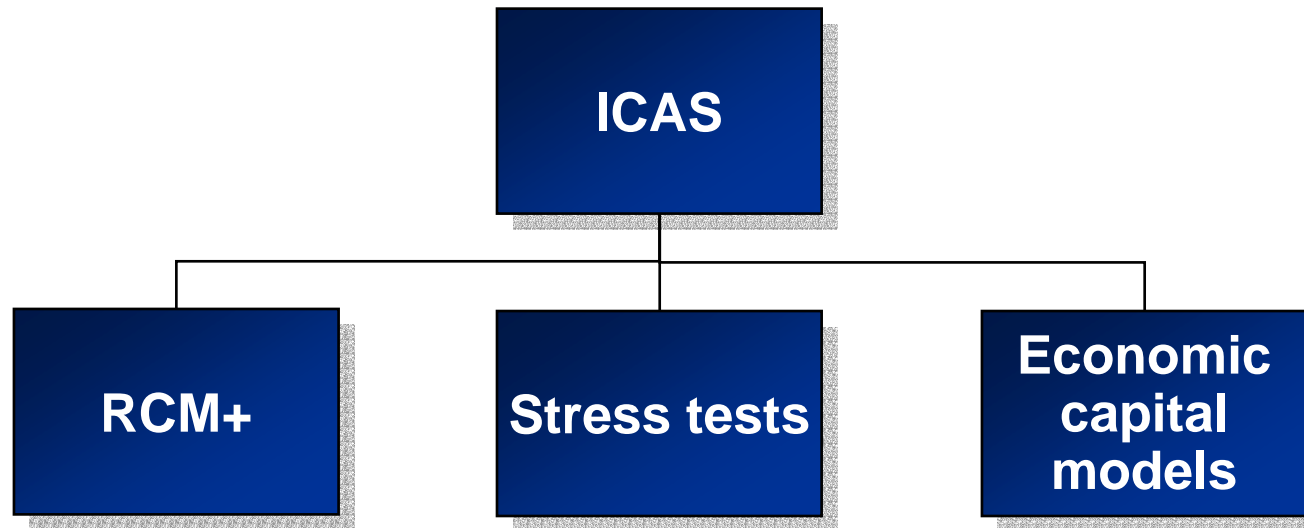


Developing methodology

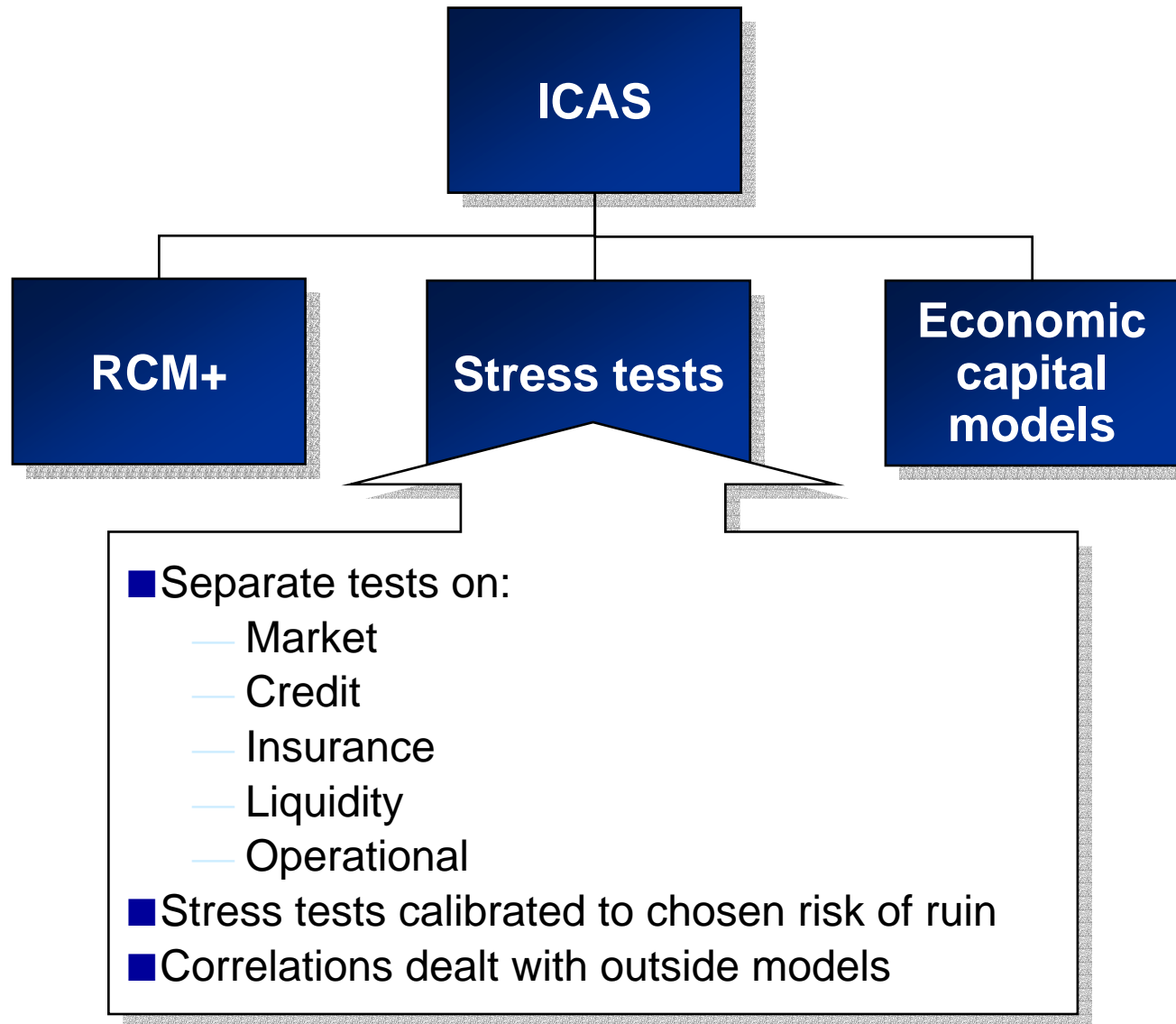
– what issues have arisen ?

- Realistic valuation only or reflect statutory solvency position?
 - in order to “meet liabilities when due” do you need to be solvent throughout?
 - does this differ between with profits and non-profit business?
- Low probability / high impact events
 - need to “hold sufficient capital to meet such a single event”
- How do you aggregate results?
 - correlations between various risks
 - formulae approach
 - combination tests
 - what about operational and group risks
- What allowance do we make for management actions?

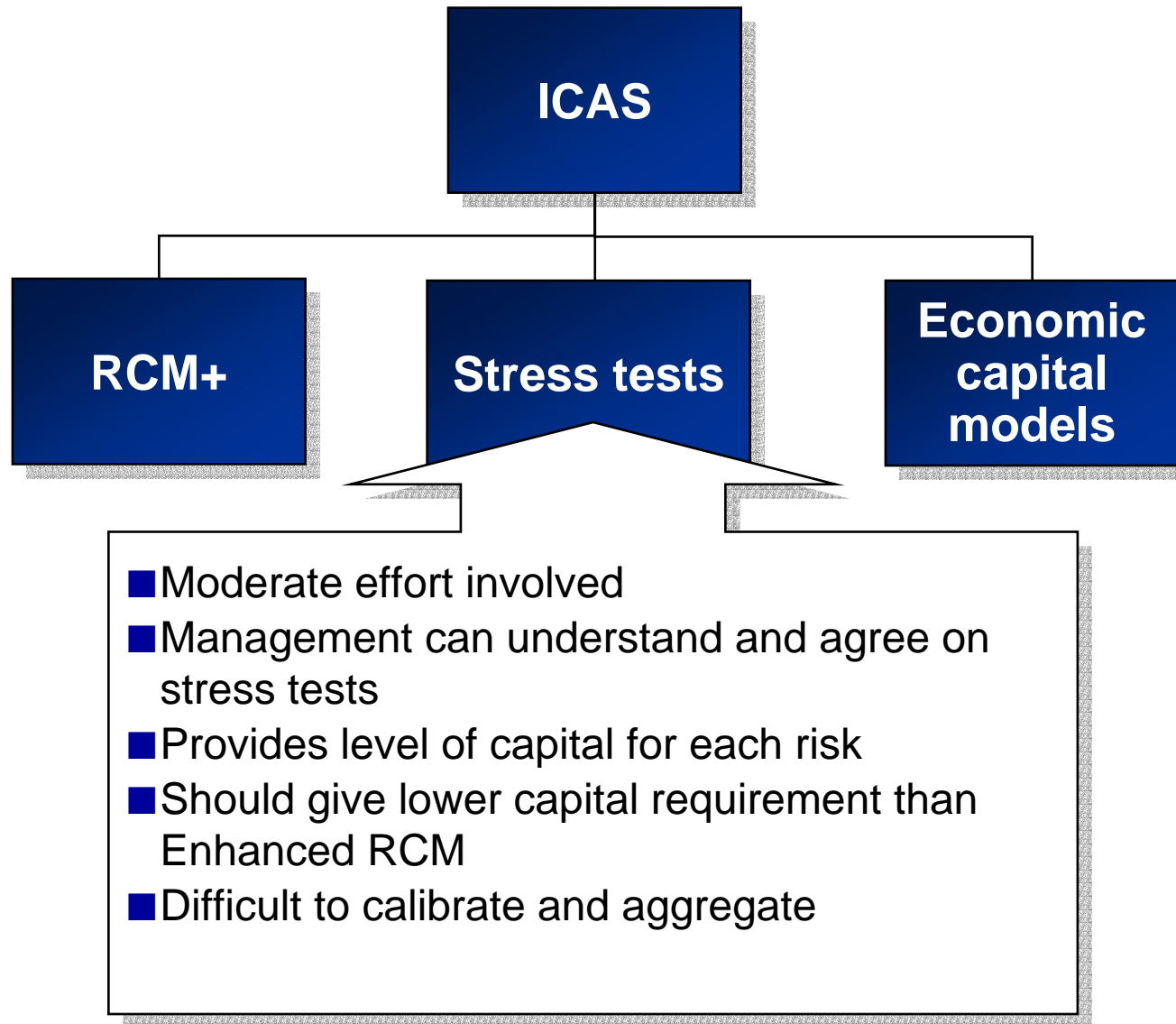
There are three fundamental ways of approaching ICAS



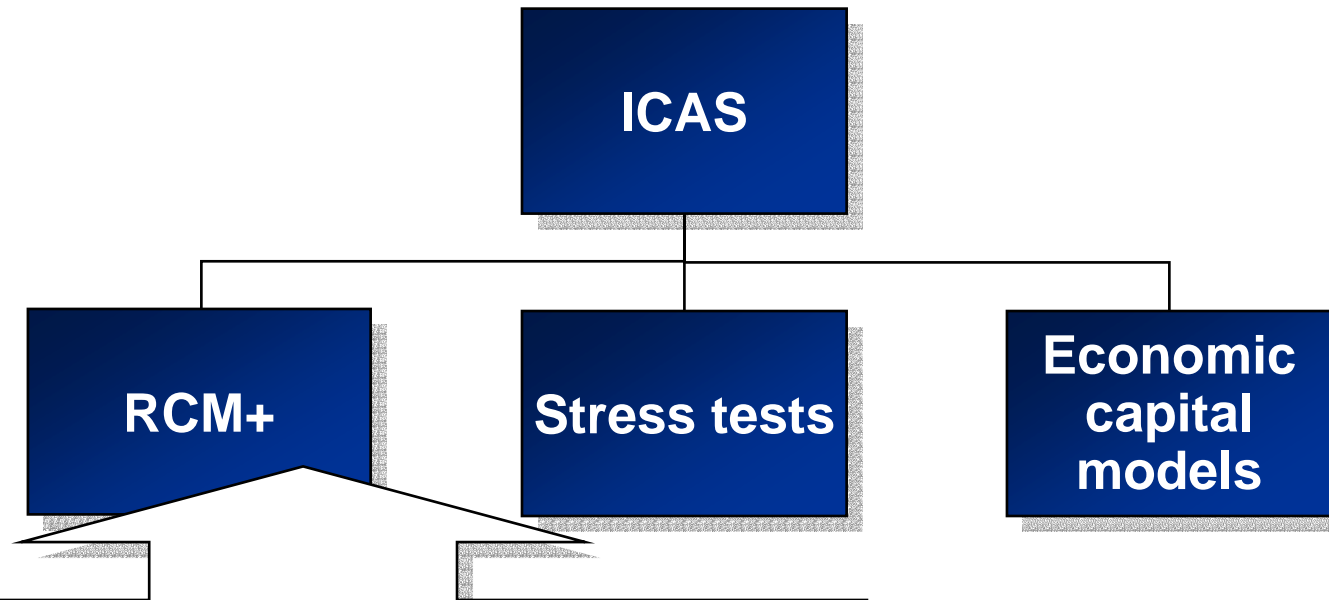
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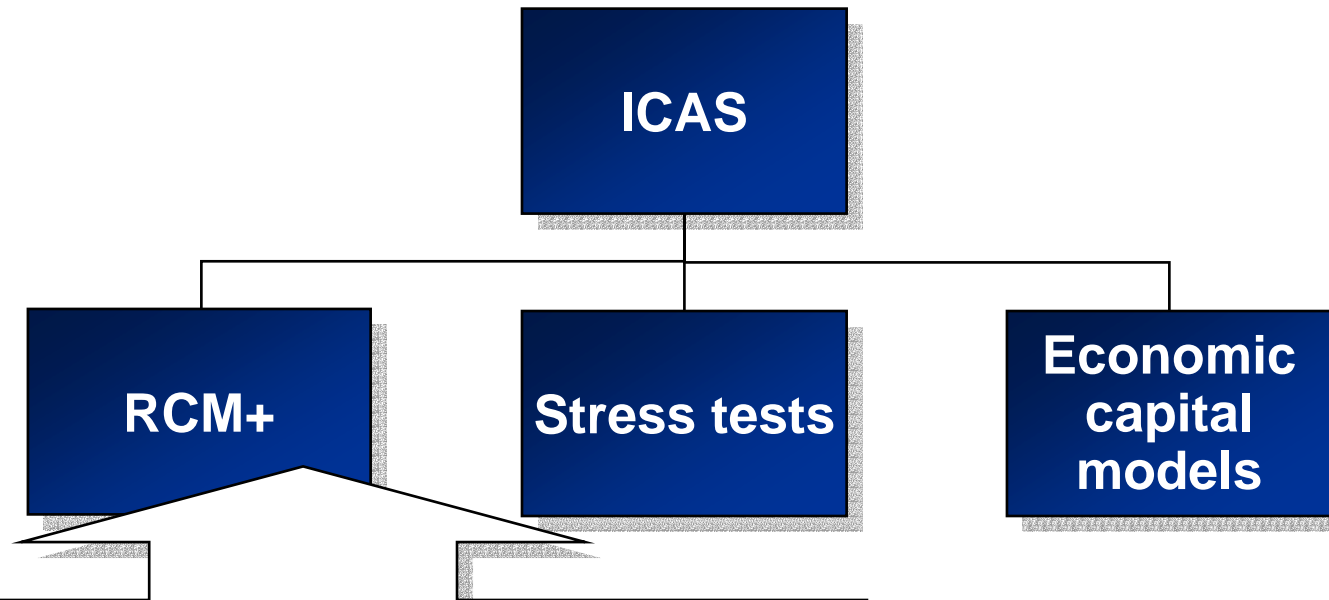


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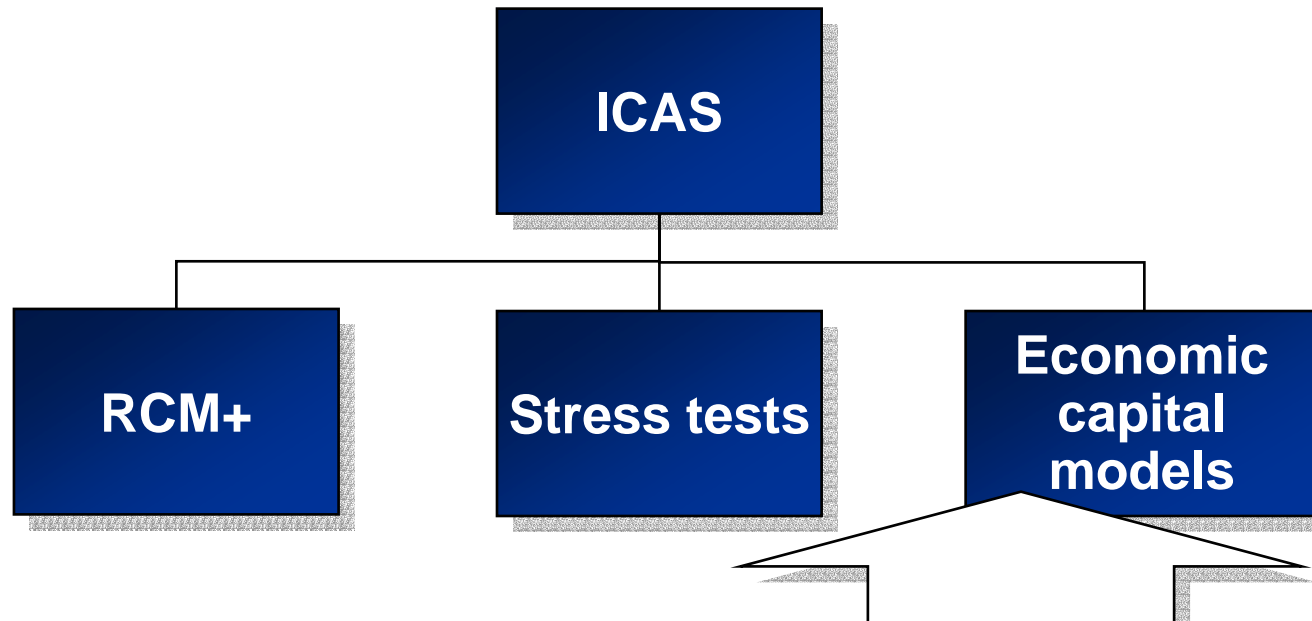
- RCM addresses:
 - Market
 - Credit
 - Persistency
- Need to add:
 - Insurance
 - Liquidity
 - Operational
- Consider extent to which firm's risks are unusual
- RCM calibrations themselves are not sufficient for individual stress test approach

There are three fundamental ways of approaching ICAS



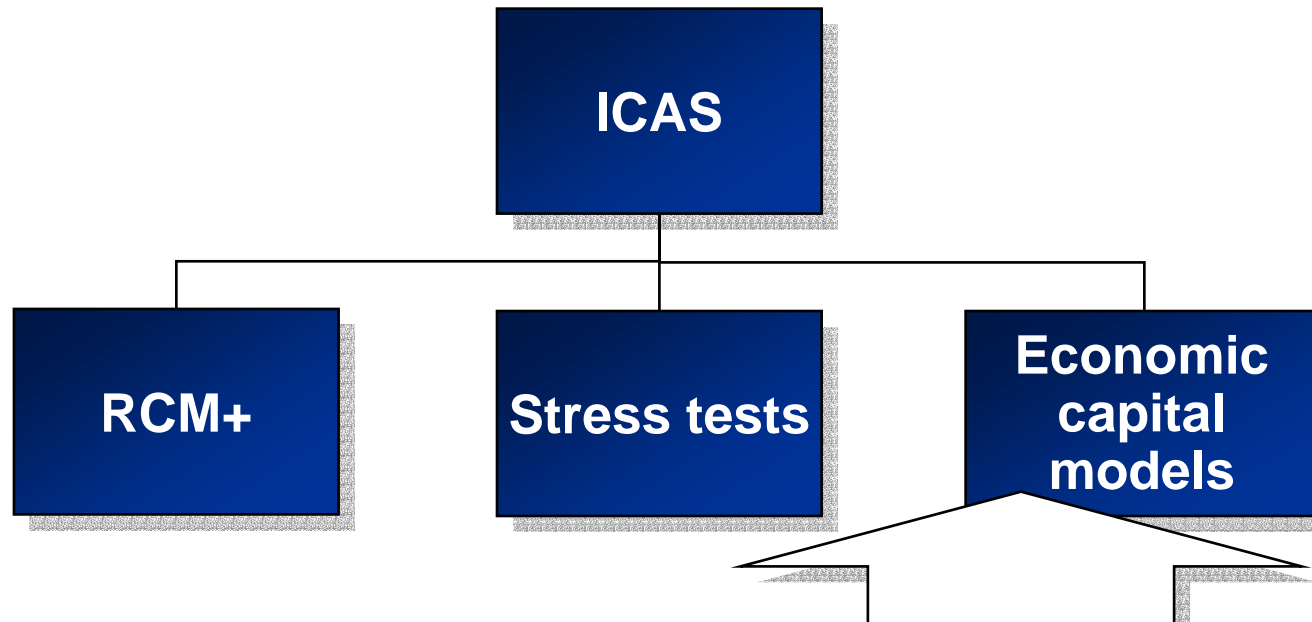
- Minimum effort required
- May satisfy the FSA in early years while more sophisticated approaches are developed
- May give higher capital requirement
- In the longer term FSA will expect more sophistication

There are three fundamental ways of approaching ICAS



- Economic scenario generator and asset/liability model deal with risk/correlations:
 - Market
 - Credit
- Model may also deal with:
 - Insurance
 - Persistency
- Operational/liquidity typically outside models

There are three fundamental ways of approaching ICAS



- Significant time to implement and validate
- Demonstration of business usage required prior to FSA acceptance
- Aggregation allowed for within model
- Not all risks can be modelled
- Potentially minimises capital requirements

The three approaches compare as follows

Enhanced RCM

- Minimum effort required
- May satisfy the FSA in early years while more sophisticated approaches are developed
- May give higher capital requirement
- In the longer term FSA will expect more sophistication

Stress and scenario tests

- Moderate effort involved
- Management can understand and agree on stress tests
- Provides level of capital for each risk
- Should give lower capital requirement than Enhanced RCM
- Difficult to calibrate and aggregate

Economic capital model

- Significant time to implement and validate
- Demonstration of business usage required prior to FSA acceptance
- Aggregation allowed for within model
- Not all risks can be modelled
- Potentially minimises capital requirements

Intermediate approach for WP companies

Approach for non-profit companies, some WP companies

Longer term approach for large WP companies

Issues to consider: Market and credit risk

RCM+	Stress test	Economic model
RCM contains stress tests for market and credit risk	Determine stress test or use Economic Scenario Generator	Use real world Economic Scenario Generator
Add test for asset volatility		

Other issues

- Credit risk includes risk of reinsurer defaults
- May be significant market risk in staff pension scheme

Issues to consider: Insurance risk

Insurance risks

- Mortality
- Persistency
- Expenses
- New business

Capital should cover:

- Volatility in base experience
- Base level uncertainty
- Trends
- Extreme events

- If using RCM + approach, the RCM allows only for persistency risk
- Large source of risk from annuitant mortality improvements
- Calibration is a problem

Issues to consider:

Liquidity and operational risk

- No allowance within RCM for liquidity risk or operational risk
- Liquidity risk expected to be small for most companies
- Significant operational risks likely to be due to misselling
- Some operational risks better managed than measured

Issues to consider: Aggregation and management actions

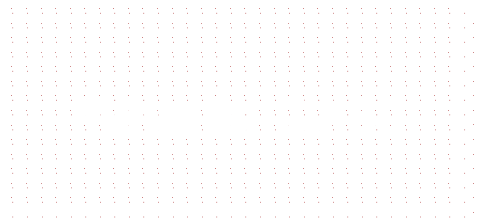
	Market risk	Credit risk	Mortality risk	Persistency risk	Expense risk	Operational risk
Market risk	100%	40%	0%	40%	30%	20%
Credit risk		100%	0%	0%	0%	0%
Mortality risk			100%	0%	0%	0%
Persistency risk				100%	20%	0%
Expense risk					100%	20%
Operational risk						100%

Aggregate capital

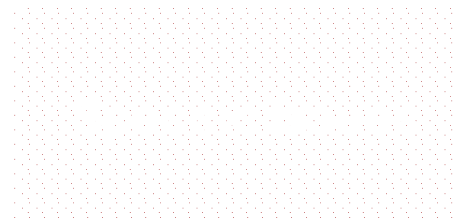
$$= \sqrt{\sum_i \sum_j \rho_{ij} C_i C_j}$$

Allowance for management actions

- Change in asset mix
- Reducing payouts
- Asset share charges



**Experience
to date**



Economic modelling is not yet used by (m) any companies

With-profit

RCM+

- Review market stress vs economic models
- Additional tests for:
 - volatility
 - longevity
 - pension fund

Stress and scenario testing

Non-profit

Stress and scenario testing

Whether doing a RCM + or scenario testing, approaches are typically similar

Market Risks

- One year time-frame
- Implicitly “hedge” after year
- What does this mean for non-profit/unit linked?

Insurance Risks

- Lifetime of the business (mainly)

New Business

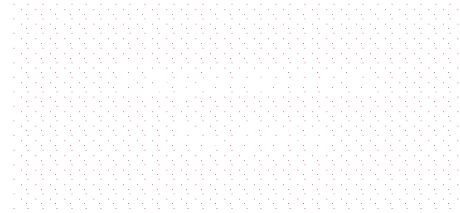
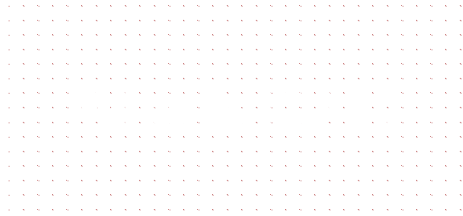
- One to three years
- Also closure

Other points on the overall approach

- How to measure liability at end of the year?
 - Market consistent
 - Traditional
- Confidence level
 - 99.5% over one year
 - Longer term
- Statutory position
- Use of data/models

The range of stress-test parameters is wide

	Low	High	Average
Equity fall	-20%	-42%	-35%
Interest rate	-0.75%	-3.0%	-1.7%
Spread credit risk (AA)	80bp	150bp	120bp
Mortality	+10%	+33%	+16%
Morbidity	+20%	+50%	+33%
Annuitant mortality	MC	Basis B	LC



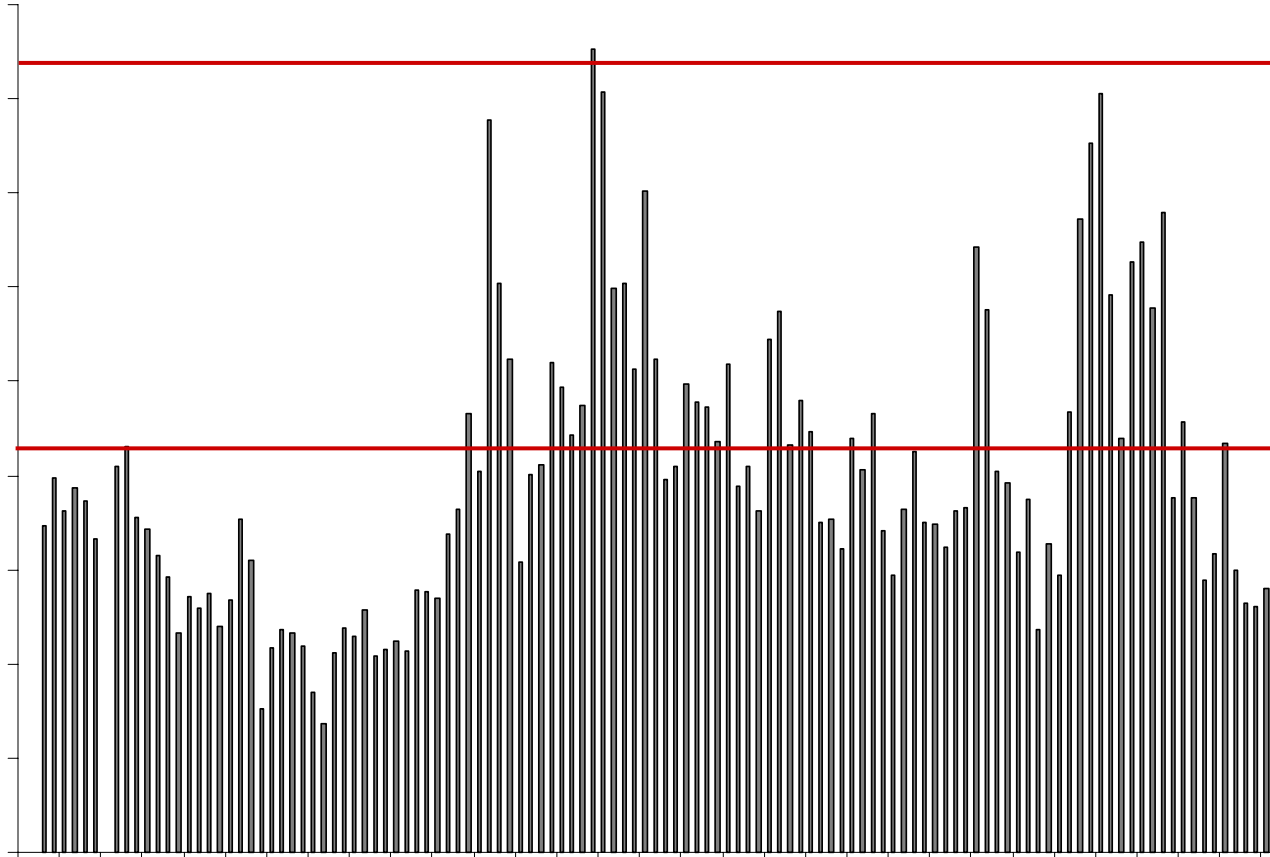
Specific issues



Specific Issues

- Equity volatility
- Pension fund risk
- Aggregation

Equity volatility is very volatile!



■ But this is shorter term volatility

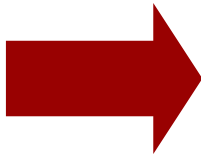
Pension fund risk

- Typically subject to
 - market risk
 - mortality/longevity
 - other (including operational)
- What liability (open or closed)?
- Allocation
 - in-force vs new business
 - across BUs (expense test)
- Management actions (may cost money in the short term)
 - close to new entrants
 - close to future accrual
 - manage salaries
 - change investment policy

Can management take actions in isolation?

Most companies are using the “sum-of-squares” formula (modified) to consolidate results

- Formula assumes:
 - Underlying distributions are (approx) normal
 - Results are additive
- In practice this is often not the case:
 - With-profit : lapses and market
 - With-profit : equity and bond yields (GAOs)
 - Non-profit : lapses and mortality



Reflect in “combination” scenarios

Initial feedback from the FSA

Focus on governance

- Process for getting management and board comfortable with results
- Comprehensiveness of risks covered
- Risk policies
- Controls in ICA process
- Keen to understand operational and group risk

The “use” test

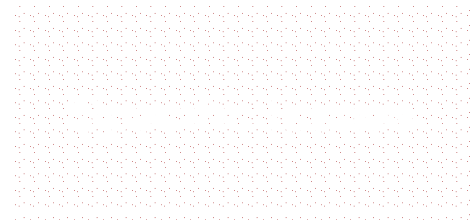
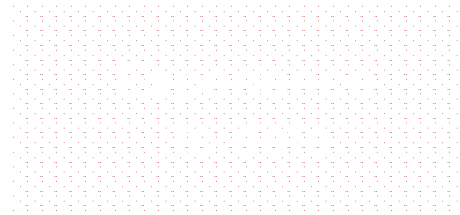
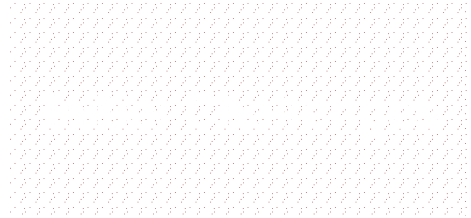
It's an ongoing process

Documentation, Documentation, Documentation

Initial feedback from the FSA

Focus on calculations

- Importance of robust process for justifying scenario test parameters
- Push back on “sum-of-squares” approach
- Justification of correlation approach (“tail risk”)
- Diversification benefits across Group?
- Push back on what can be charged to asset shares consistent with PRE (a “90% limit”?)
- How do you determine whether you’re different if using RCM + approach?
- Some inconsistencies over approach to “single events”

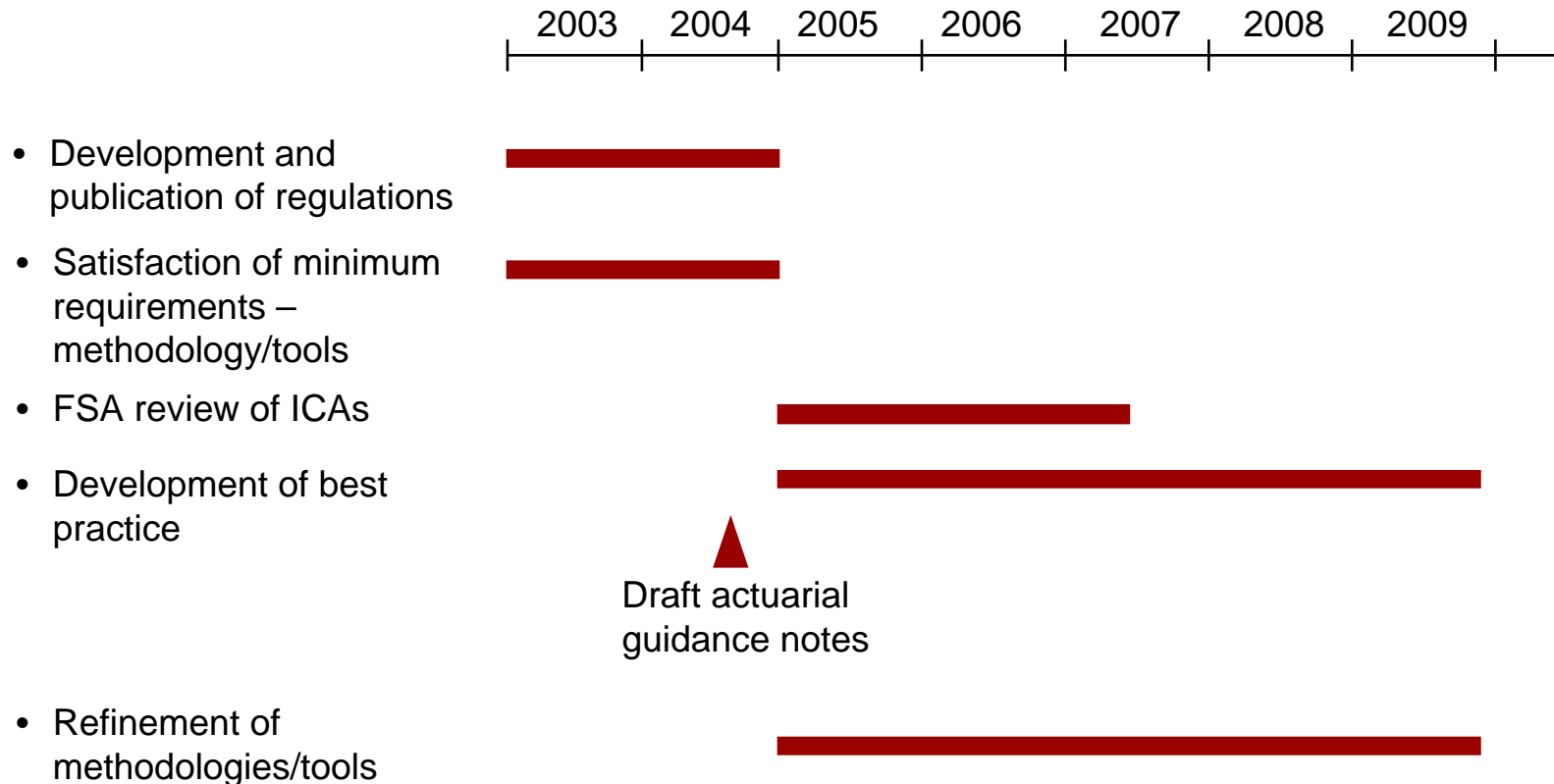


Where next

We are nearing the end of the formal timeline

	9/03	12/03	3/04	6/04	9/04	12/04	3/05
FSA publications	ICAS Capital requirements Regulatory reporting	Inherited estates Treating customers fairly Sandler/WP		ICAS/capital requirements Treating customers fairly			
FSA and HMT requirements	Enhanced whistle blowing duties for actuaries		Publish RBS (if needing waiver) with AA signoff Publish PPFM Put in place With-Profits Governance		Selection of actuary/actuaries for new roles Start to comply with PSB RBS to FSA	Publish audited RBS Confirm WP governance complies with PPFM	

But are some way from a stable regime?



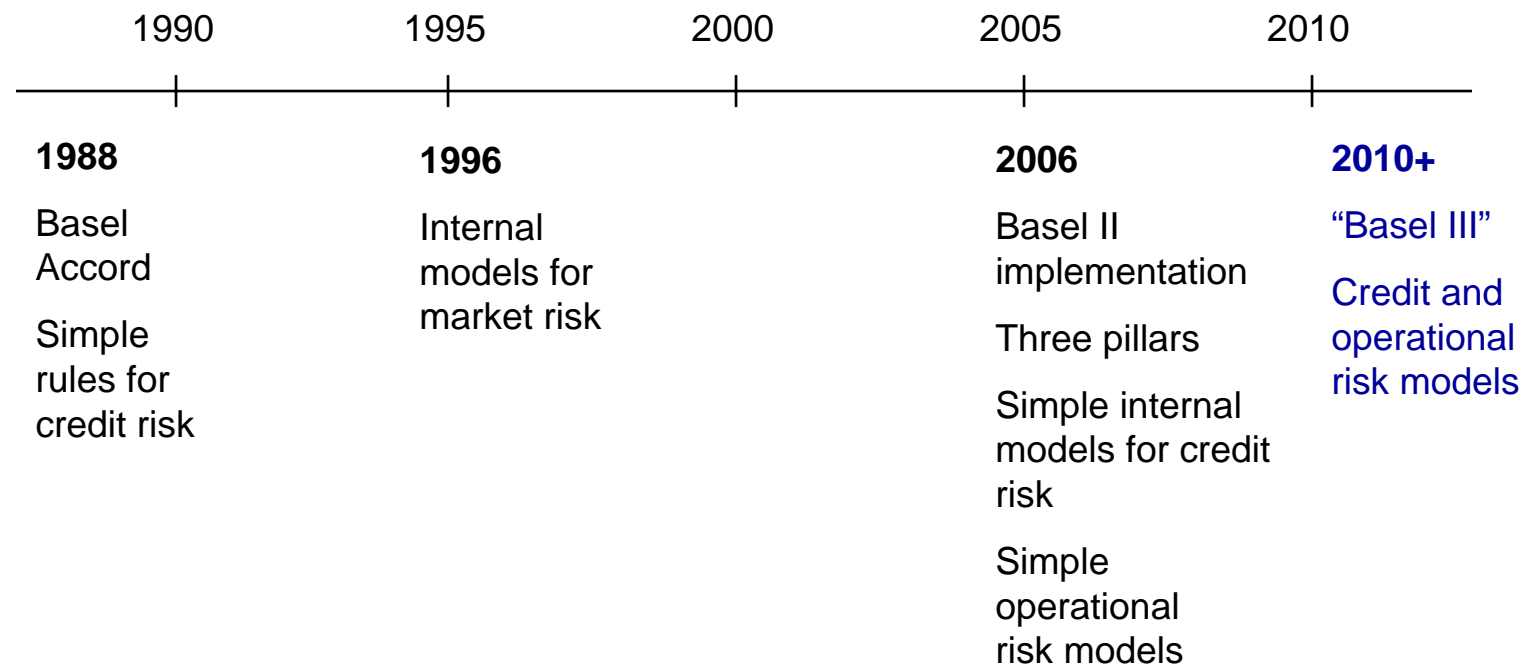
... and we await:

- Non-profit realistic balance sheet
- Solvency II

- Accounting developments

We have moved quickly compared to banks

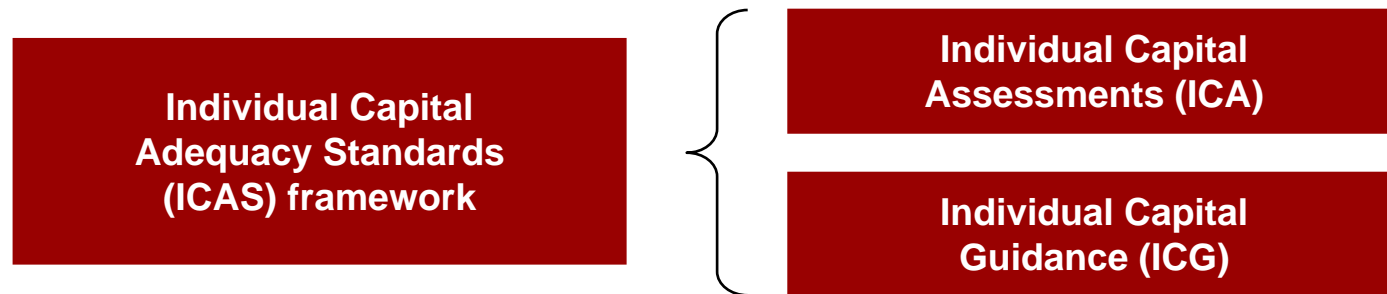
Development of banking regulation



But there is some way to go

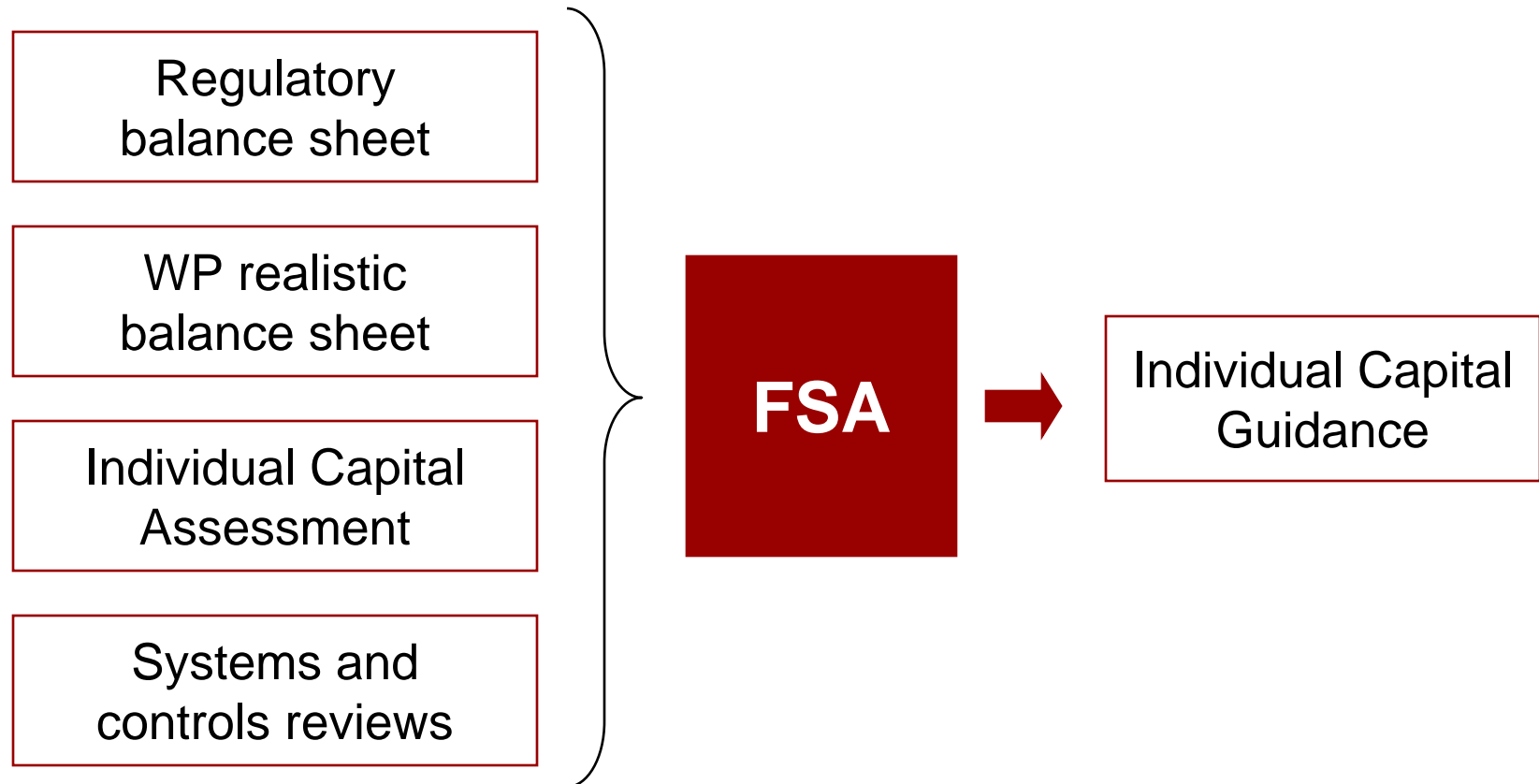
Over the next few years:

- The FSA will examine ICAs and give Individual Capital Guidance (ICG)



- Methods, assumptions and tools will continue to develop
 - Best practice – an “ICA standard” – will emerge
- Risk management will move to centre stage
- Risk exposures will change as management improves
 - Net risk exposures may change significantly

ICG is the next unknown

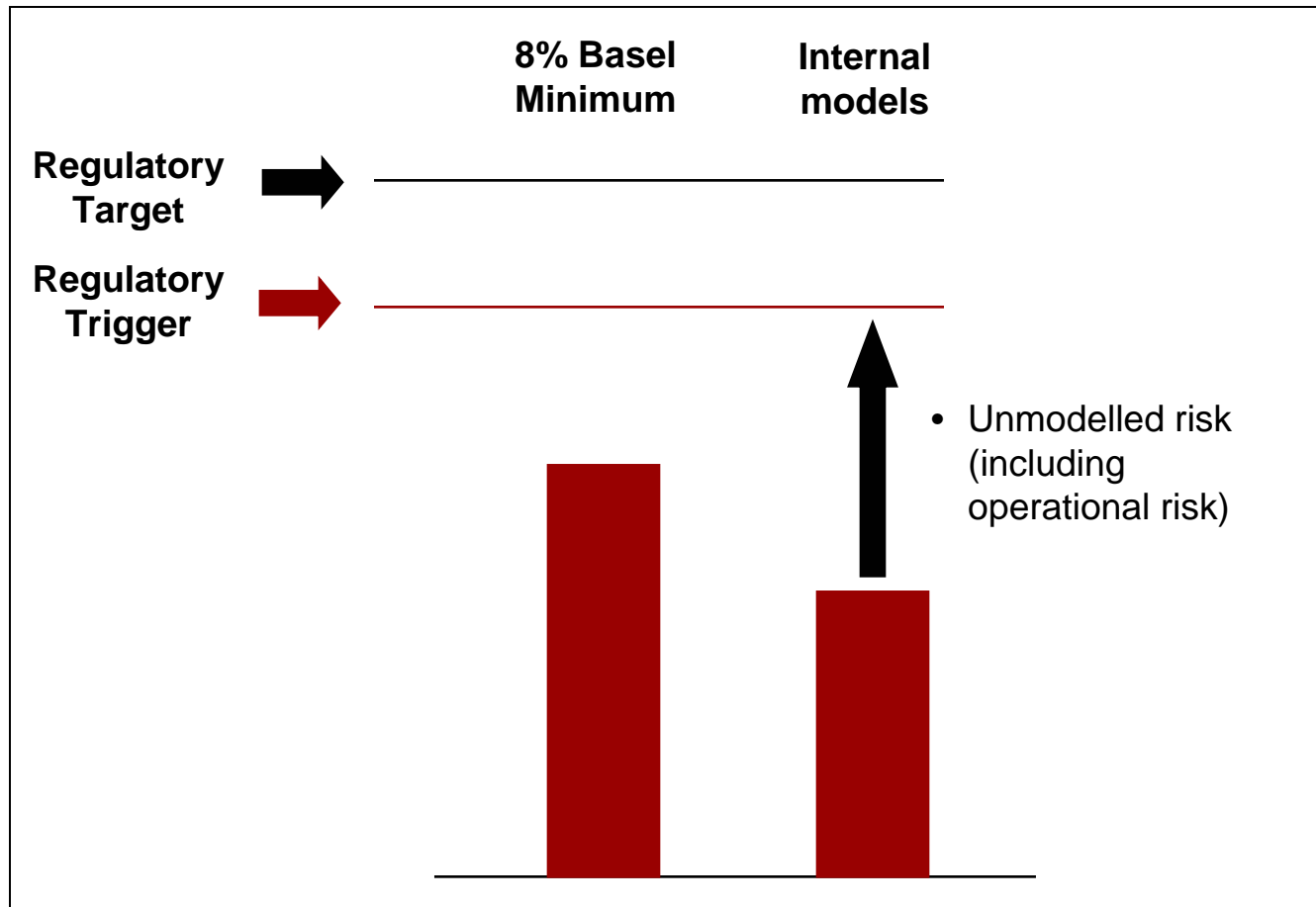


What has the FSA said about ICG?

- The FSA's view of an adequate level of capital for your particular business
 - Subject to analysis/discussion (and potential for disagreement)
- Calibrated at a 99.5% one year confidence level (consistent with ICAs)
 - Lower confidence level over longer period if appropriate
- A regulatory intervention point
 - Notification requirement if fall below ICG level
- Firm has discretion as to maintenance of buffer over ICG
 - But for with profits, need to consider whether surplus capital should be distributed

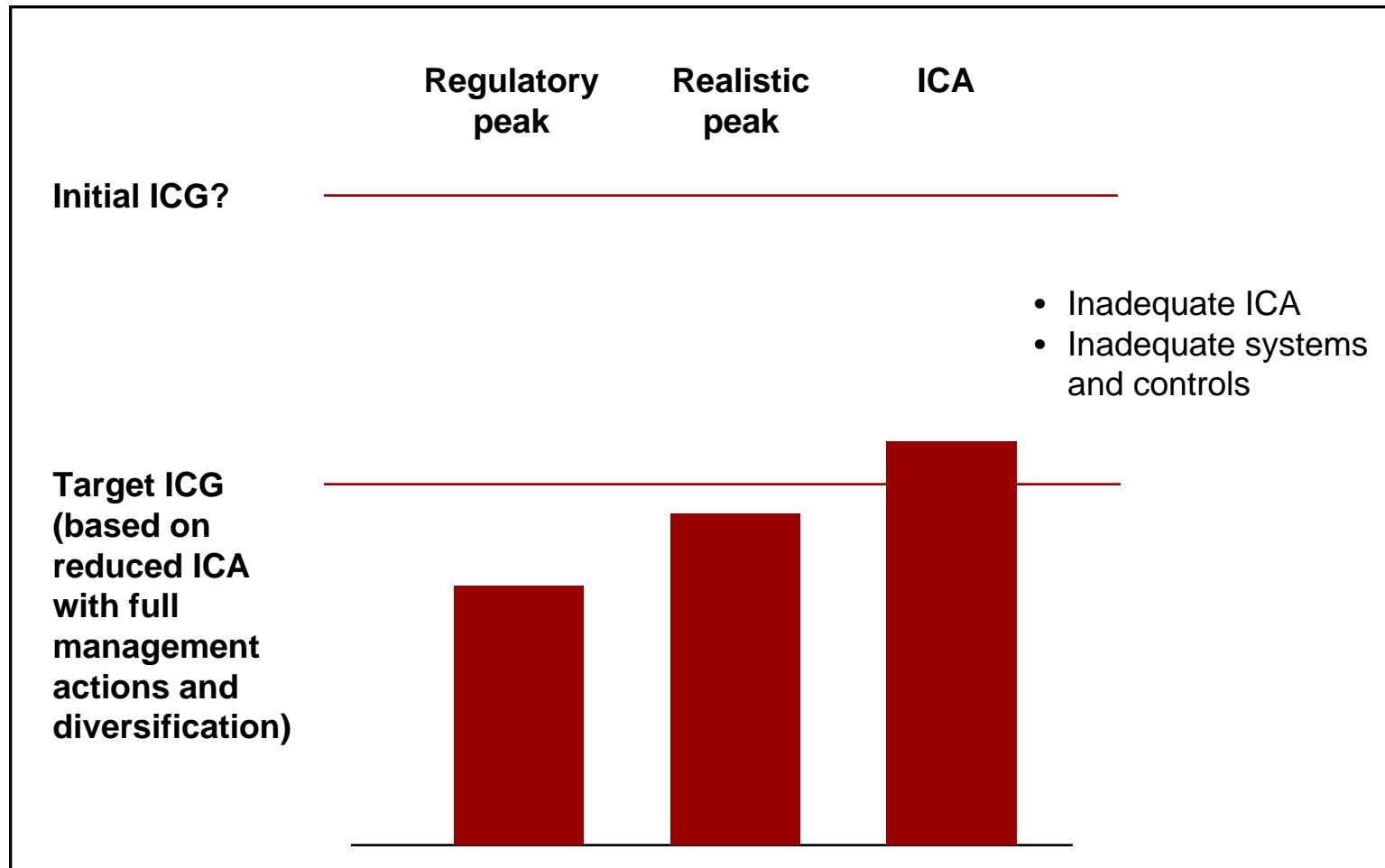
Where will ICG be pitched?

Banks – credit risk



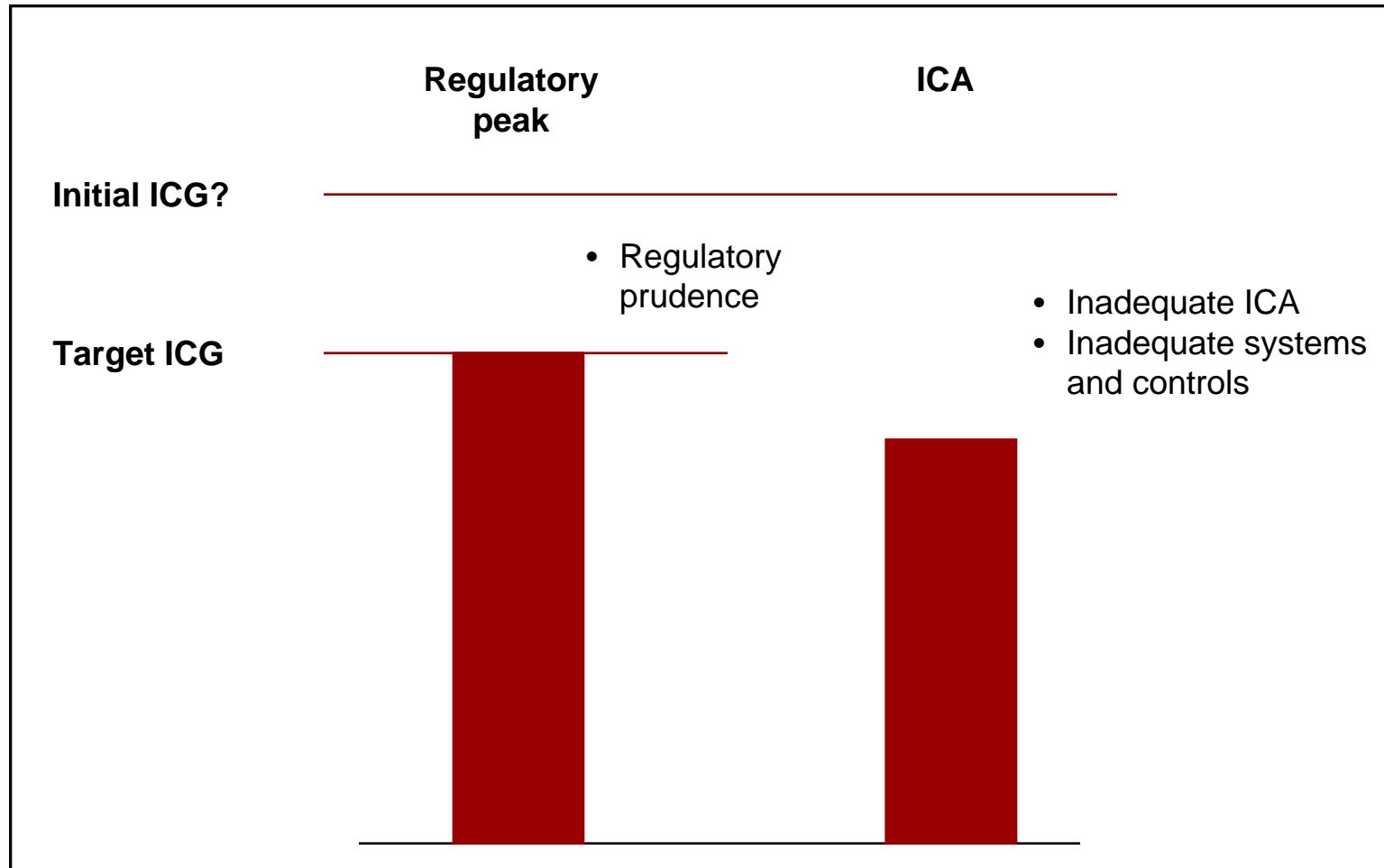
Where will ICG be pitched?

With profits



Where will ICG be pitched?

Non profit



What is being done to manage risk exposures?

- EBR reductions have reduced market risk exposures
 - Many are now implementing more sophisticated hedging programs to manage market risk
- Credit risk management has been highlighted by the FSA as an area for improvement
- Many would like to manage down their annuitant mortality exposures
- More attention will be given to risk management in product design

Net risk exposures may change significantly