



**The Actuarial Profession**

making financial sense of the future

# Reserving For Critical Illness Guarantees

Adrian Pinington – December 2004

# Outline

- Different reporting bases
- FSA Returns
- How much is enough?
- Investor confidence
- Balance a linear concept?

# Differing Reporting Bases

- FSA Returns
- IAS
- Realistic valuation
- Rating Agencies

# Outline

- Different reporting bases
- FSA Returns
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# FSA Returns (Orig)

Reinsurers - original tables		Accelerated				Deterioration/Notes	
	Table	MNS	MS	FNS	FS	Male	Female
A	IC 94	Percentages varying by age				2.00%	2.00%
B	CIBT93	42%	80%	42%	80%	1.00%	1.75%
C	IC 94	110%	110%	120%	120%	1.50%	1.50%
D	CIBT93	45%	90%	50%	110%	2.00%	2.00%
E	CIBT93	50%	86%	56%	69%	2.00%	2.00%
F	CIBT93	100%	160%	100%	160%	1.50%	1.50%
G	CIBT93	65%	120%	75%	140%	1.60%	1.60%
H	CIBT93i	110%	110%	110%	110%	2.00%	2.00%

F uses adjusted CIBT93

# FSA Returns (Rebase)

Roughly in ascending order of stringency

Reinsurers - re-based tables		Accelerated				Deterioration/Notes	
	Table	MNS	MS	FNS	FS	Male	Female
B	CIBT93	42%	80%	42%	80%	1.00%	1.75%
D	CIBT93	45%	90%	50%	110%	2.00%	2.00%
E	CIBT93	50%	86%	56%	69%	2.00%	2.00%
A	CIBT93	50%	93%	60%	110%	2.00%	2.00%
F	CIBT93	56%	89%	69%	110%	1.50%	1.50%
C	CIBT93	70%	70%	90%	90%	1.50%	1.50%
G	CIBT93	65%	120%	75%	140%	1.60%	1.60%
H	CIBT93	110%	110%	110%	110%	2.00%	2.00%

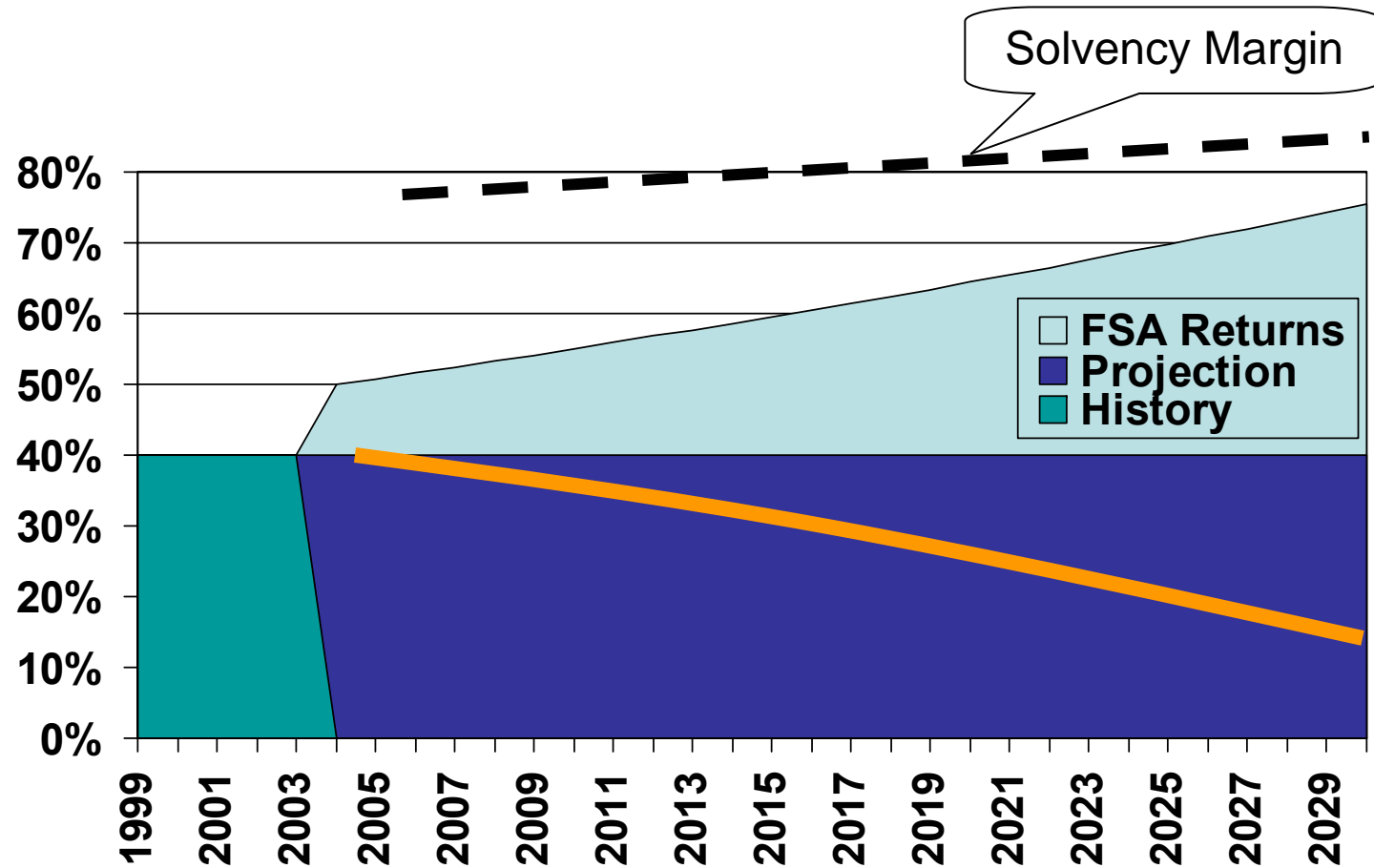
*Italicised numbers are estimates*

Blue – Reinsurers unequivocally  
open to current design G'teed CI

# Peer View “?”

	<b>Recent MNS Experience</b>	<b>FSA Returns</b>
<b>Incidence</b>	40% CIBT93	50% = 125% of experience
<b>Trend</b>	0% (possibly falling trend, but little data)	1.6%

# FSA Reserving Pictorially





# Outline

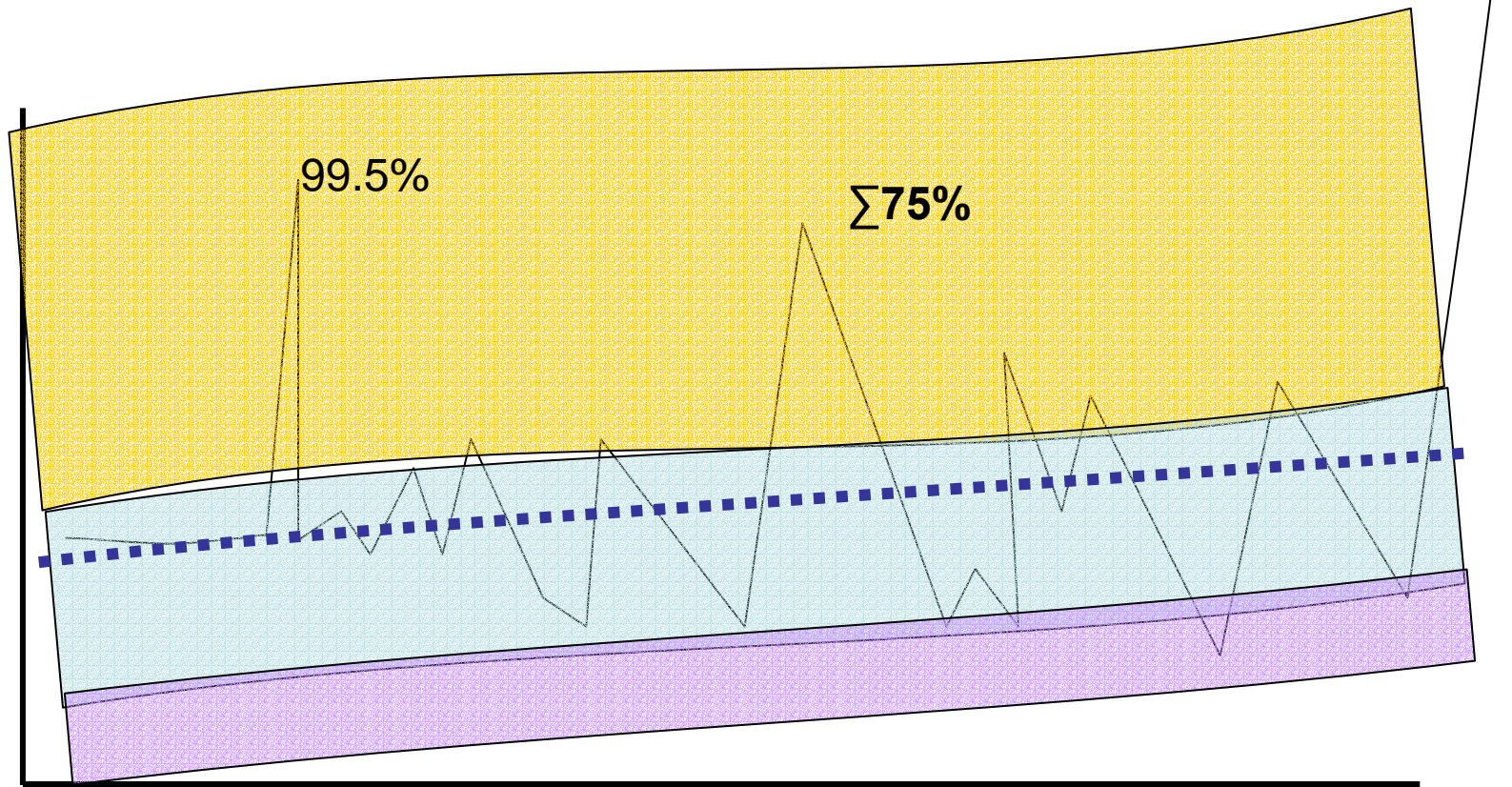
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# How much is enough?

- IAA
  - Diversifiable volatility
  - Catastrophe risk
  - Uncertainty risk – mis-estimation of incidence
  - Mis-estimation of trend parameters (speculative)
- FSA
  - 99.5% confidence of still being solvent in 1 year
  - Something lower in the longer term (75%?)
    - “capital consistent with a 99.5% confidence level over a one year period or, if appropriate to the firm’s business, a lower confidence level over a longer period” J Tiner – Life Conference 2004
- Seems FSA would like some convergence with international approach

# What might this mean?

Diversifiable volatility



# Diversifiable volatility

yr 1 volatility & long term volatility

Claims	1yr	$\Sigma$	Solvency	Solvency as % Expec in Yr 1
Expected	99.50%	75%		
500	558	7,558	116	23%
1000	1,081	15,083	164	16%
2000	2,115	30,117	232	12%
5000	5,182	75,185	367	7%

# Catastrophe Risk

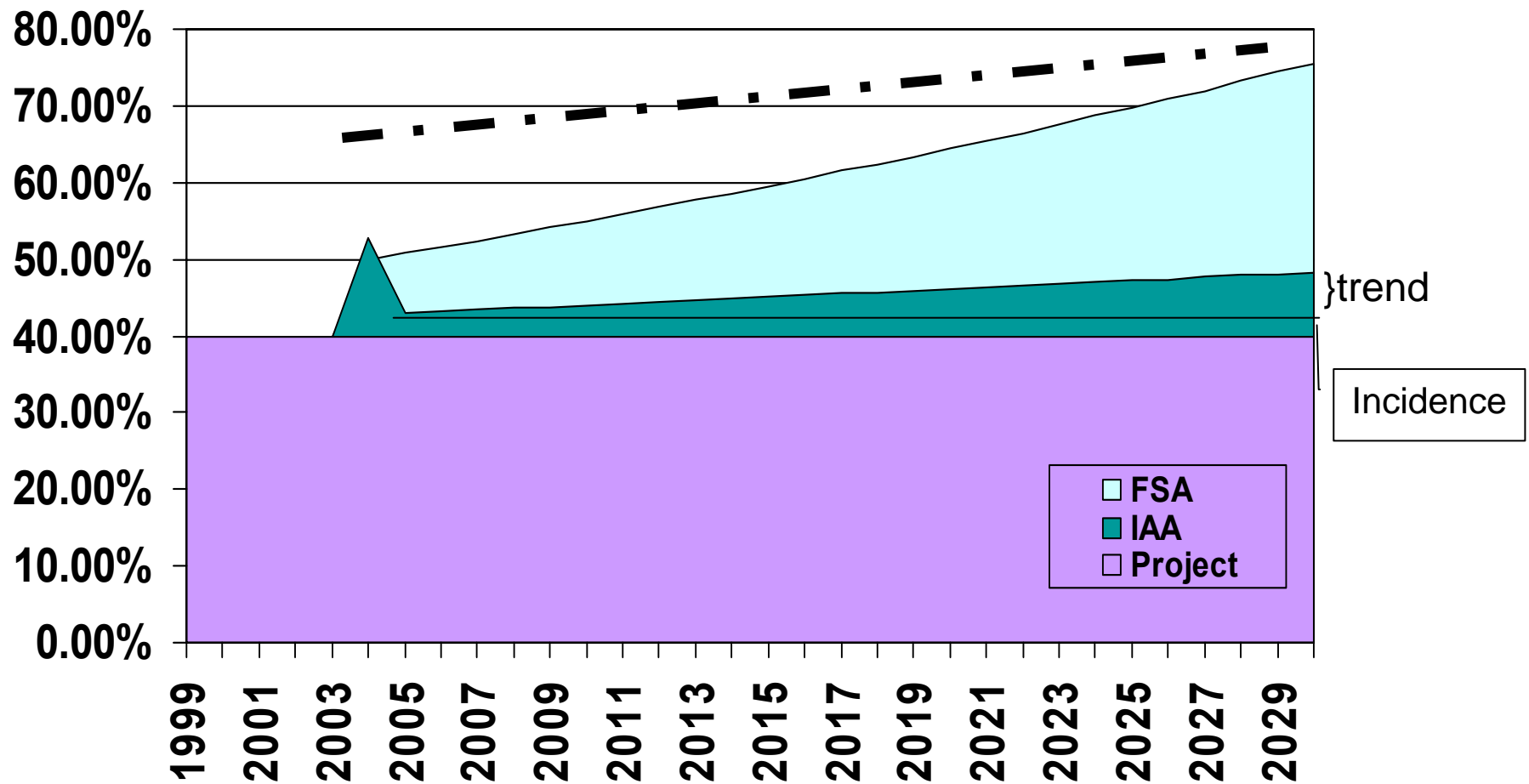
- Little data to go on
- Epidemic (1918 Spanish Flu )?
  - Reserve for level seen?
  - Reserve for multiple of background incidence?
  - Response to HIV, CJD, SARS, Meningitis, Ebola
- Terrorism
  - Dirty bomb – how big? Where?
  - 9/11 not detectable

# Uncertainty risk

## incidence level and trend

- Mis-estimation of the level of incidence
  - Perhaps derive using approach similar to 1 year volatility (Normal Power technique)
- Mis-estimation of trend assumption
  - Usually there is a sparsity of data problem
  - Past not necessarily a guide to future
  - We may have to guess!

# Comparison to current FSA

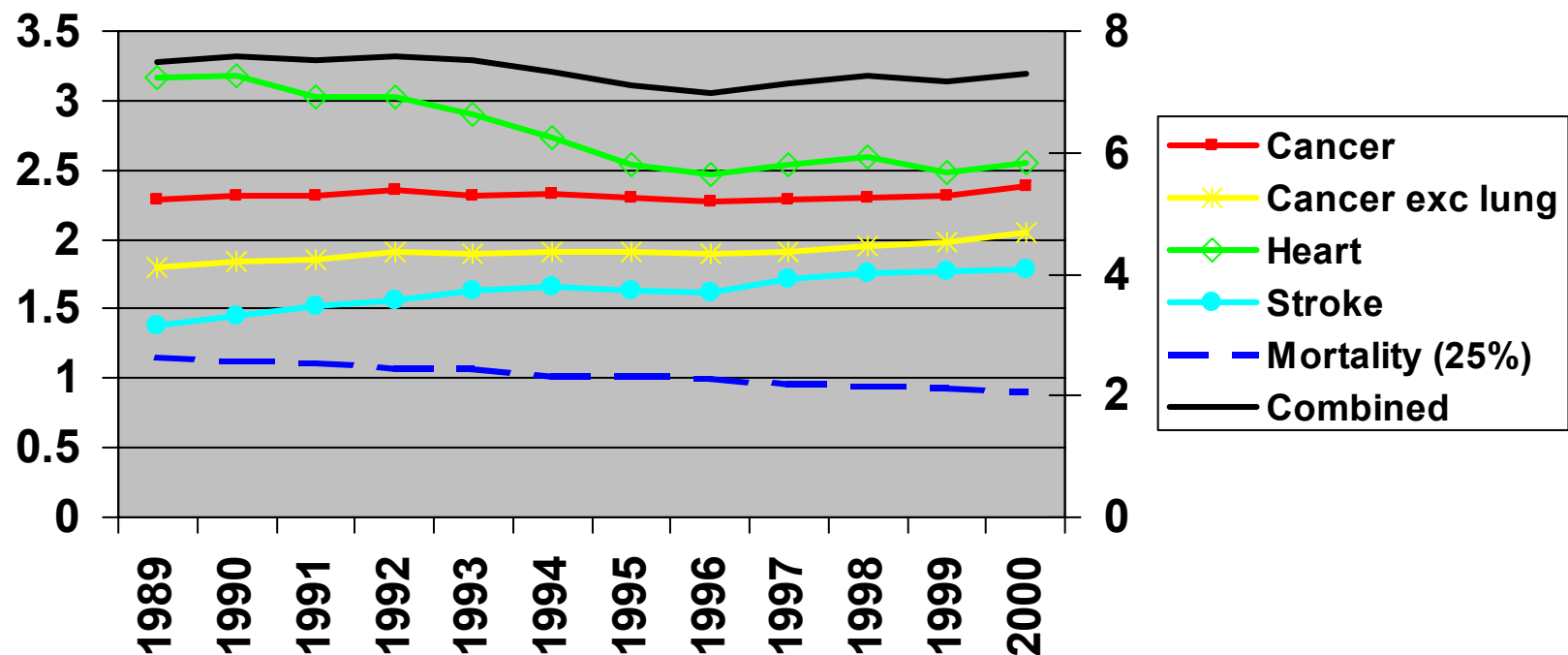


# Trend/Systemic risk

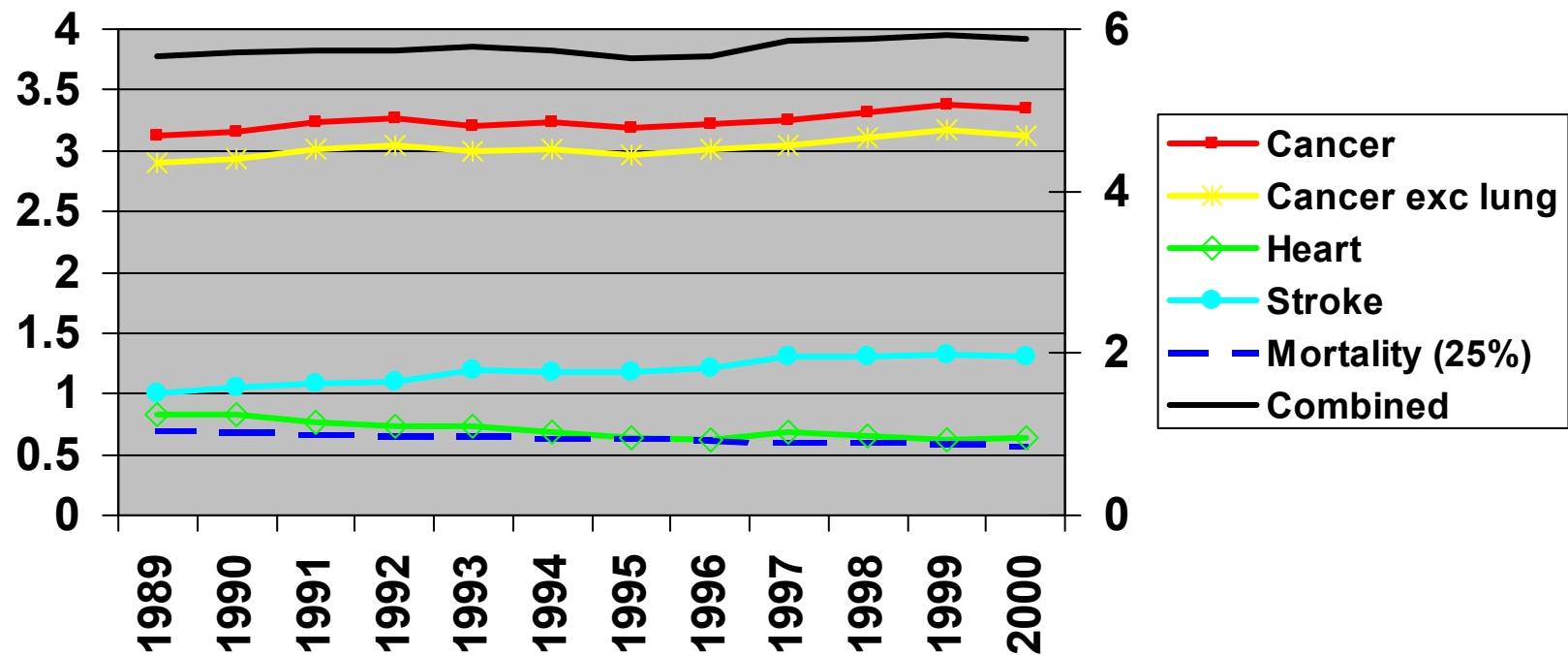
- No evidence in Morbidity data
  - Population data neutral
  - Medical developments both positive and negative for future prospects (e.g. statins, screening programs)
- Mortality – long downward trend
  - Systemic deviation from trend – world wars, 1918/19 Spanish Flu



# Male - Critical Illness history (Standardised for Insured lives population)

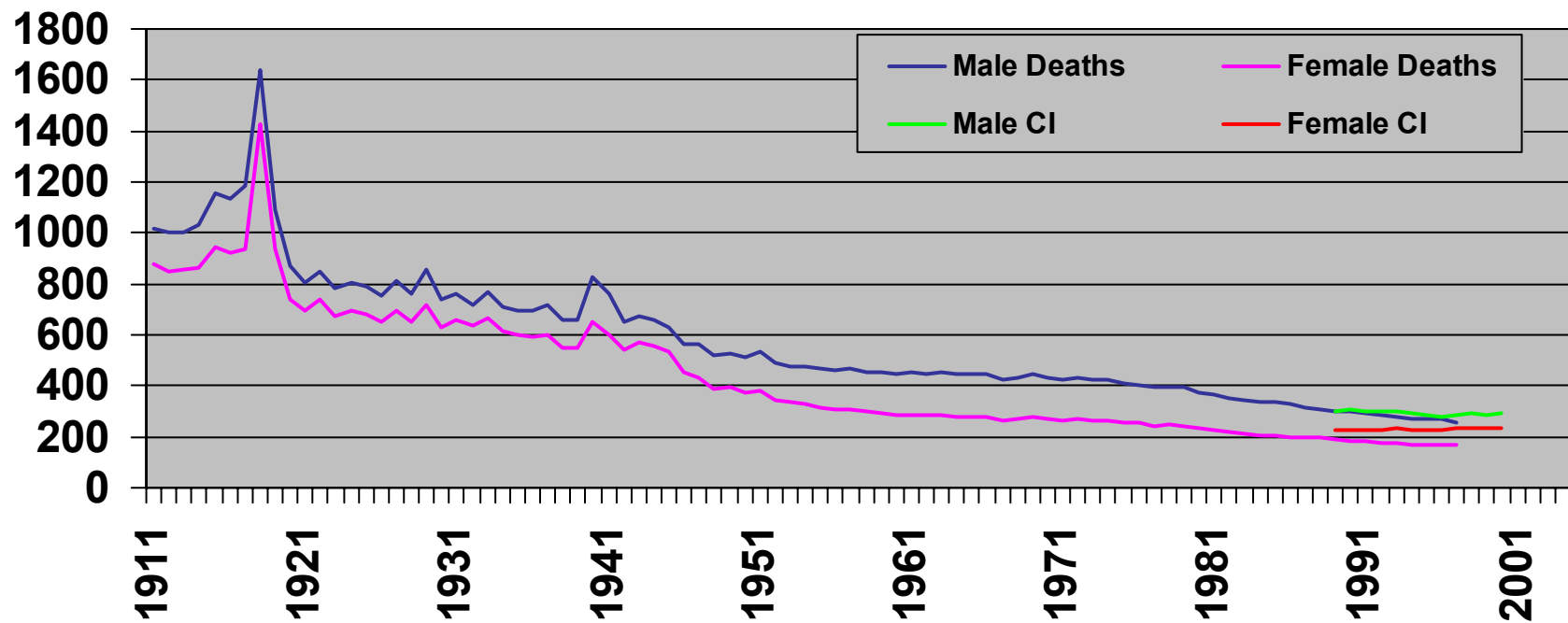


# Female - Critical Illness history (Standardised for Insured lives population)



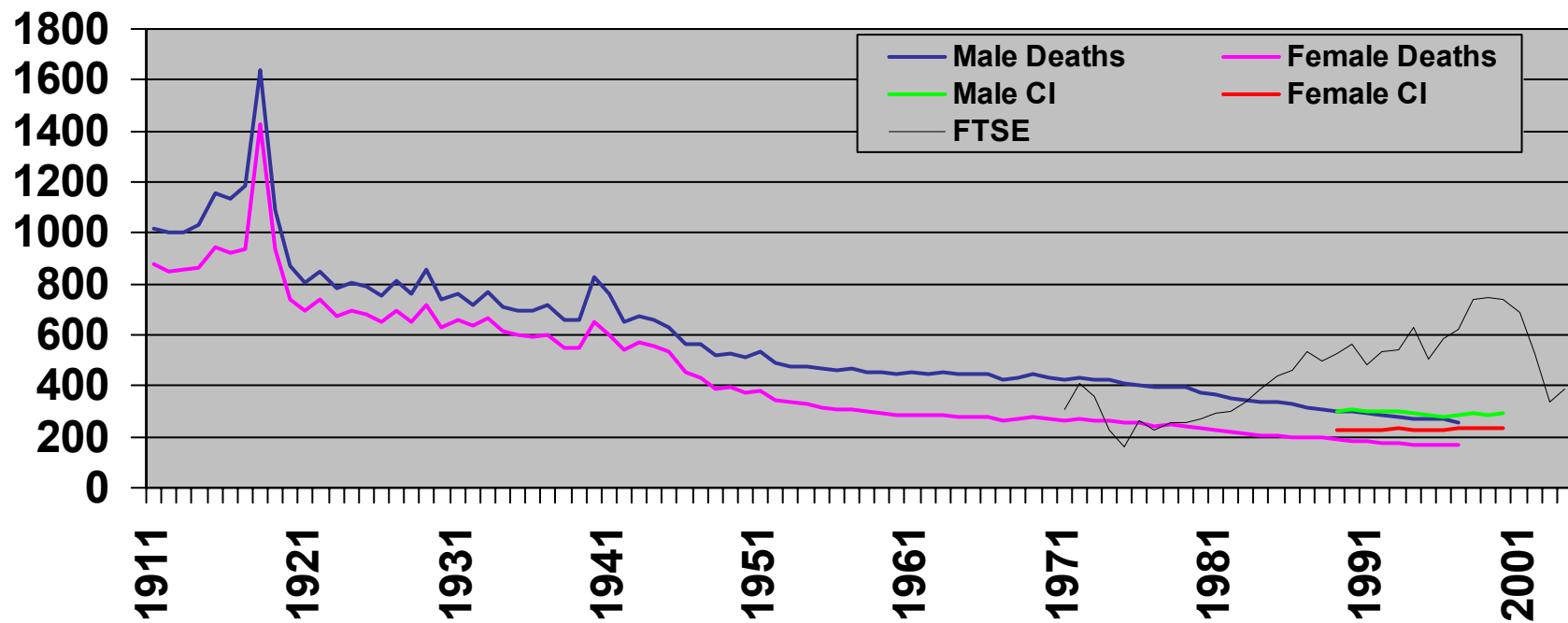
# Systemic Risk (Standardised population)

Warning: Data series rescaled for comparability



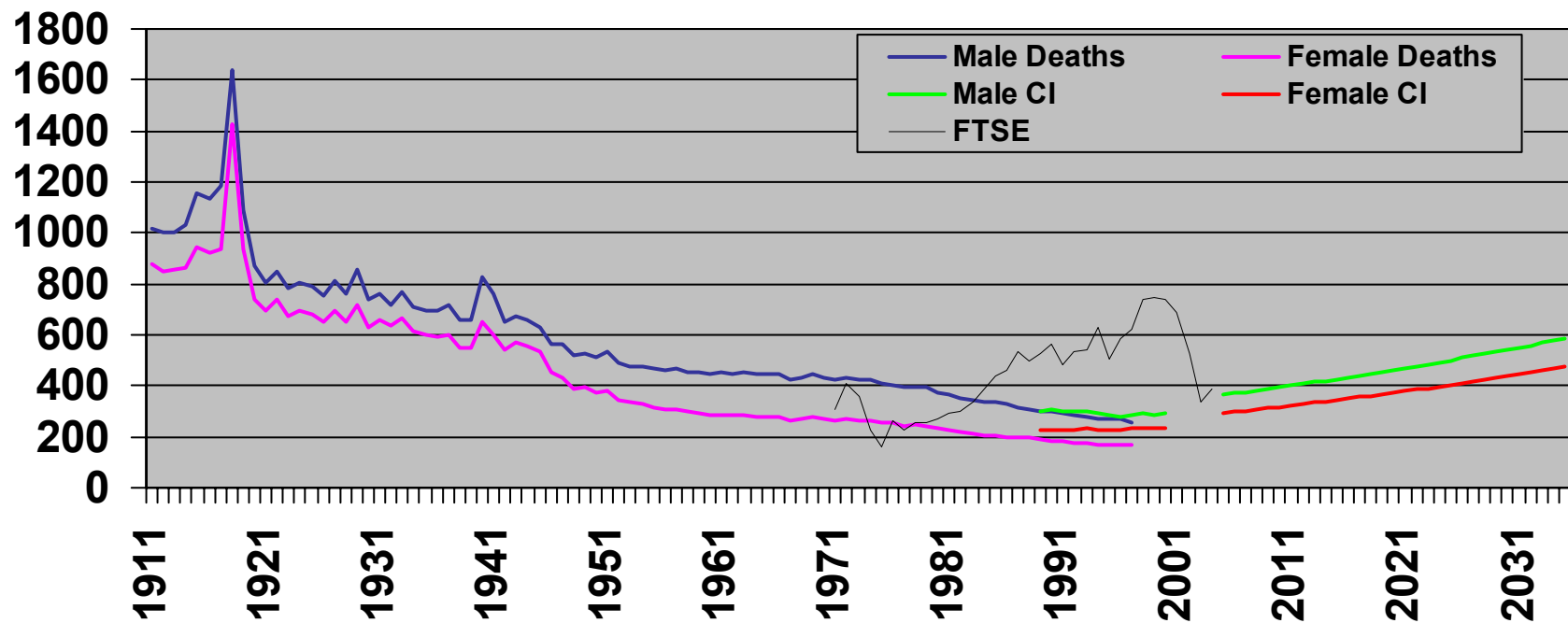
# Systemic Risk (Standardised population)

Warning: Data series rescaled for comparability



# Systemic Risk (Standardised population)

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- **Investor confidence**
- Balance a linear concept?

# Investor Confidence

- Supervisory process cannot preclude failure
- Excessive solvency controls:
  - Impair competitive innovation
  - Increases price to consumer
  - Undermines capital formation (support from investors)
  - Push business to less onerous countries

# Outline

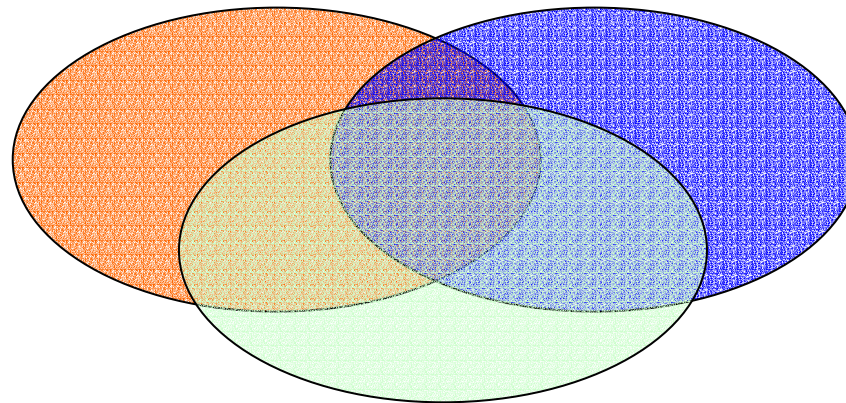
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# Balance a Linear concept?

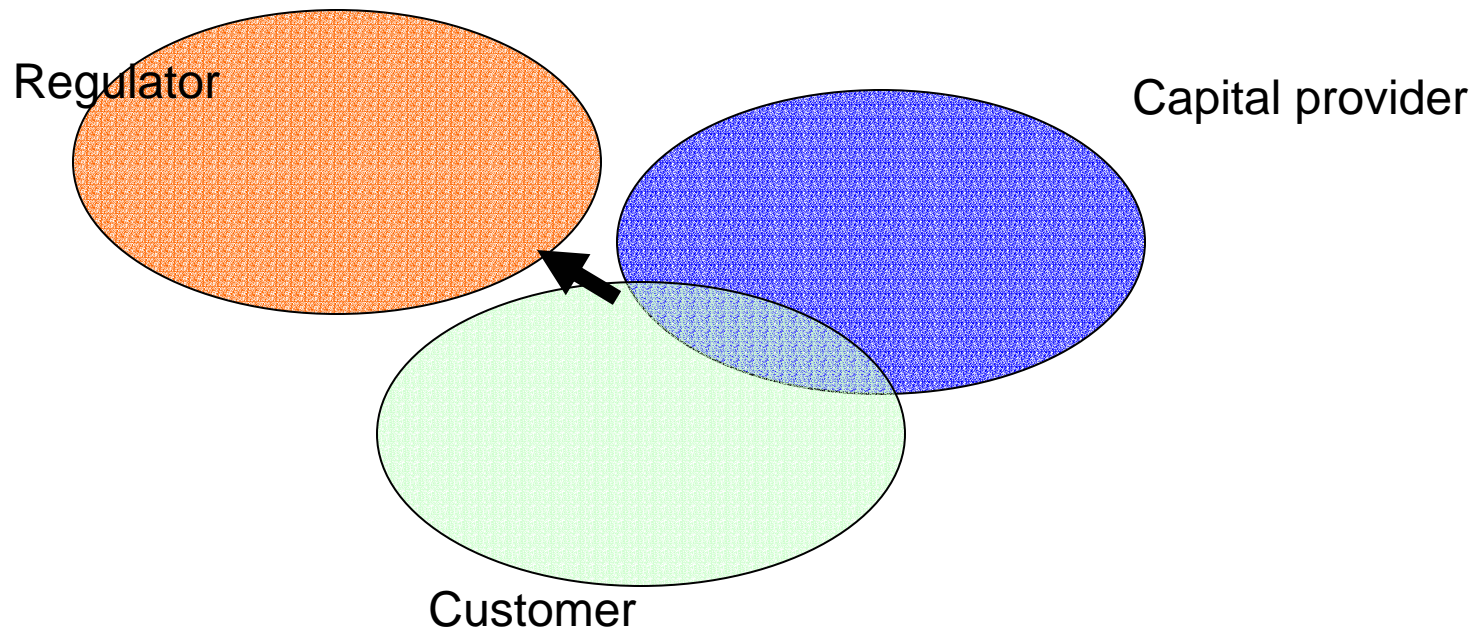
Regulator

Capital provider

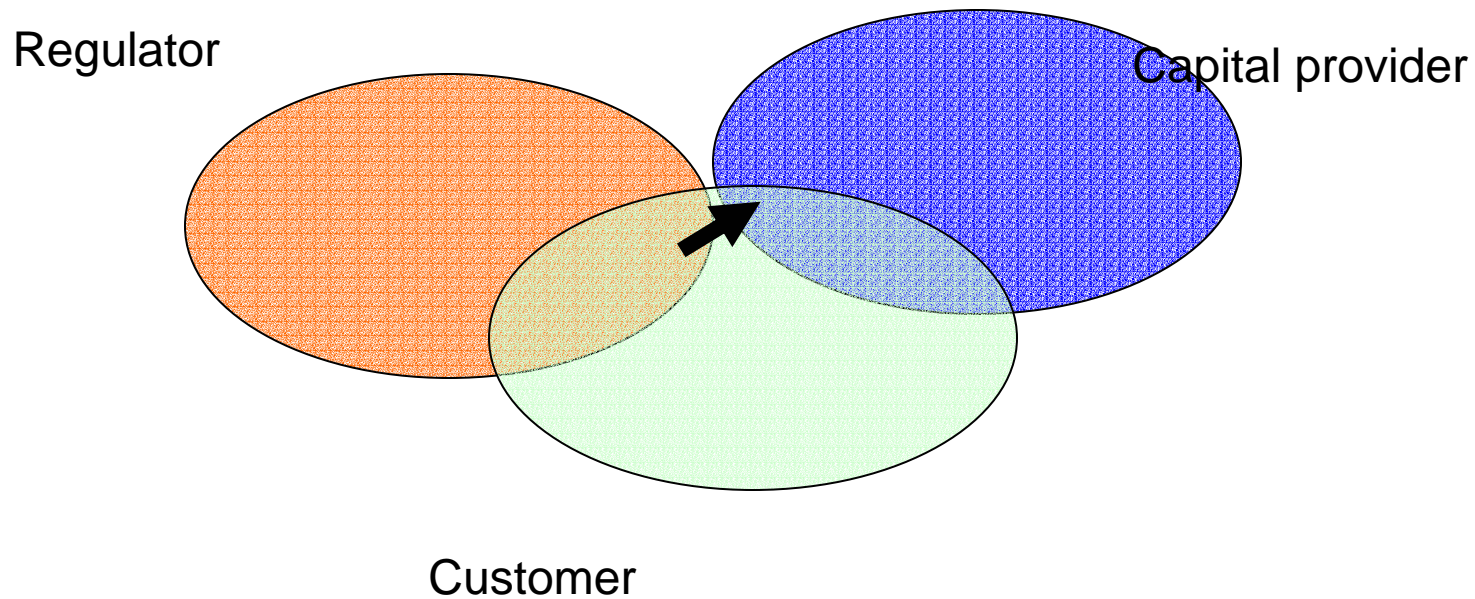


Customer

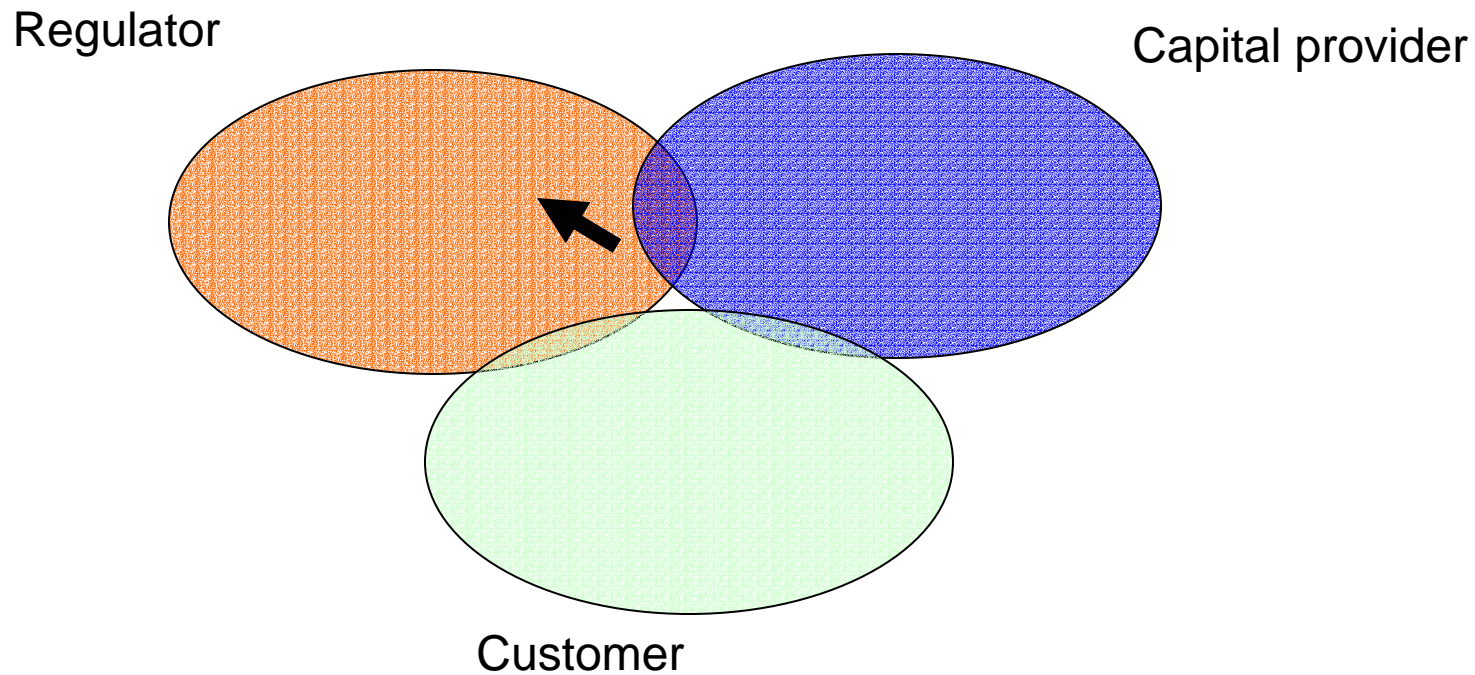
# Balance – increased solvency capital



# Balance – increased risk perception



# Balance – tragedy



# Summary

- Peer practice
- IAA proposals for assessing risk in protection products
  - agrees with allowance for statistical volatility + some
  - Cautious, but not conservative
- Life and Morbidity risks do not exhibit much volatility
  - Short term deviations arise from quite catastrophic events
- The best assurance of solvency is a function of:
  - Sufficient capital to meet statistical error
  - Sound governance practices – solid management practice
- Excessive pessimism leads to inefficient capital, loss of investor confidence and business shifting offshore

The optimist sees the rose and not its thorns; the pessimist stares at the thorns, oblivious of the rose.

Kahlil Gibran