



Institute of Actuaries of Australia

# 4th Financial Services Forum

*Innovation in Financial Markets*

19 and 20 May 2008 – Melbourne

## Operational Risk Management – Why is it Hard?

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## Operational Risk (Basel II, APRA)

- The risk of loss resulting from inadequate or failed
  - Internal processes
  - People
  - Systems
  - External events
- Not all inclusive ...



## Is It Important?

- Can't measure it so assume NIL ...
- 2008 Société Générale rogue trading
- Unit pricing errors
- 2001 HIH
- US: Financial institutions, 10 years to 2003, over 100 events > \$100m
- ...



## A Major Event Will Happen

	P[Event] = 1 in 10 5/10/20 entities	P[Event] = 1 in 25 5/10/20 entities
1 yr	40%/65%/88%	20%/33%/55%
2 yr	65%/88%/98%	33%/55%/80%
5 yr	93%/99%/100%	64%/87%/98%

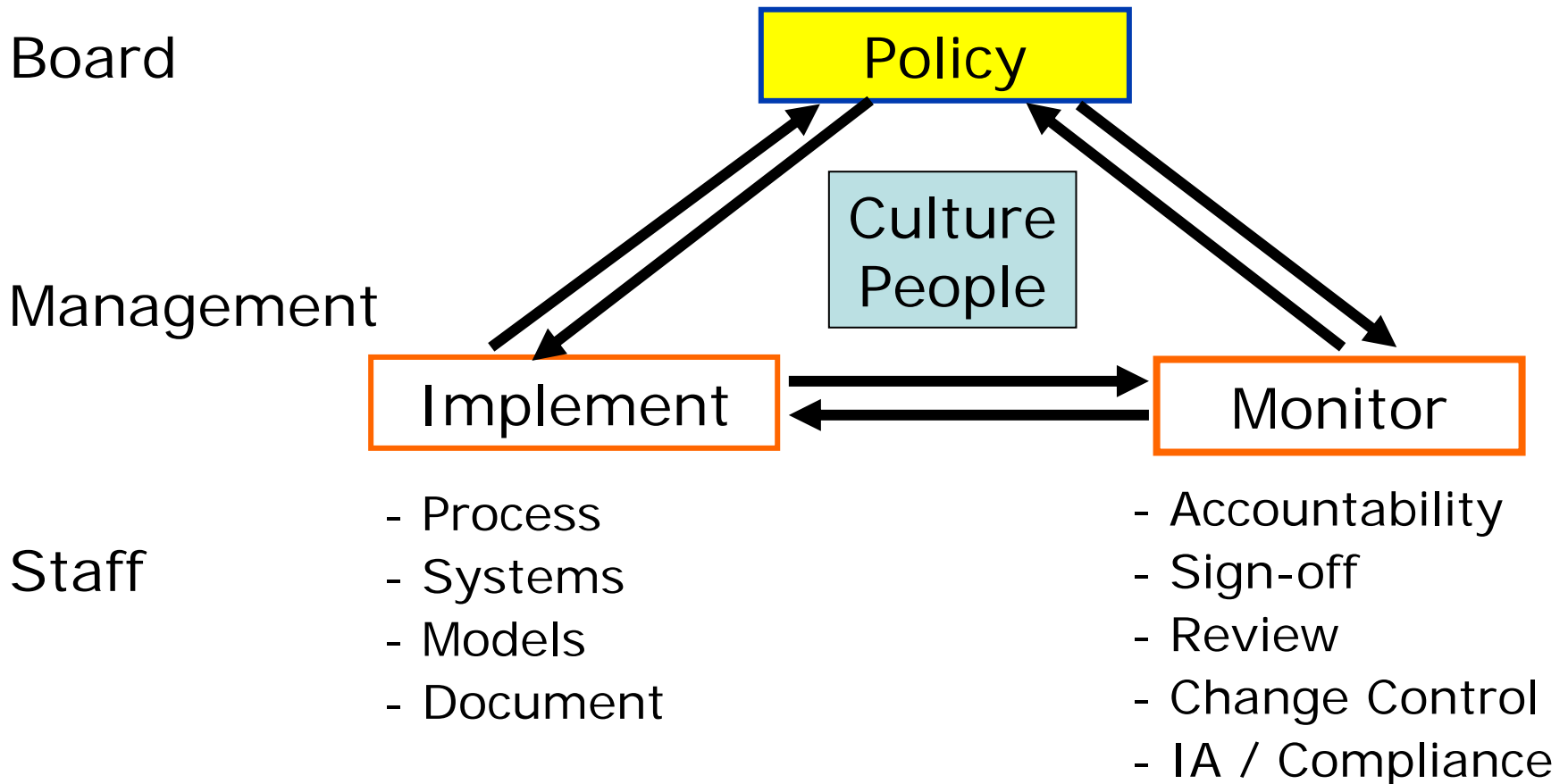


## OpRisk is Different

- Many aspects not new, but ...
- Unavoidable – part of business process
- Entity specific
- Data not ‘independent’
- Breadth and disparity of aspects
- Fundamental role of entity culture
- Residual risk profile evolves

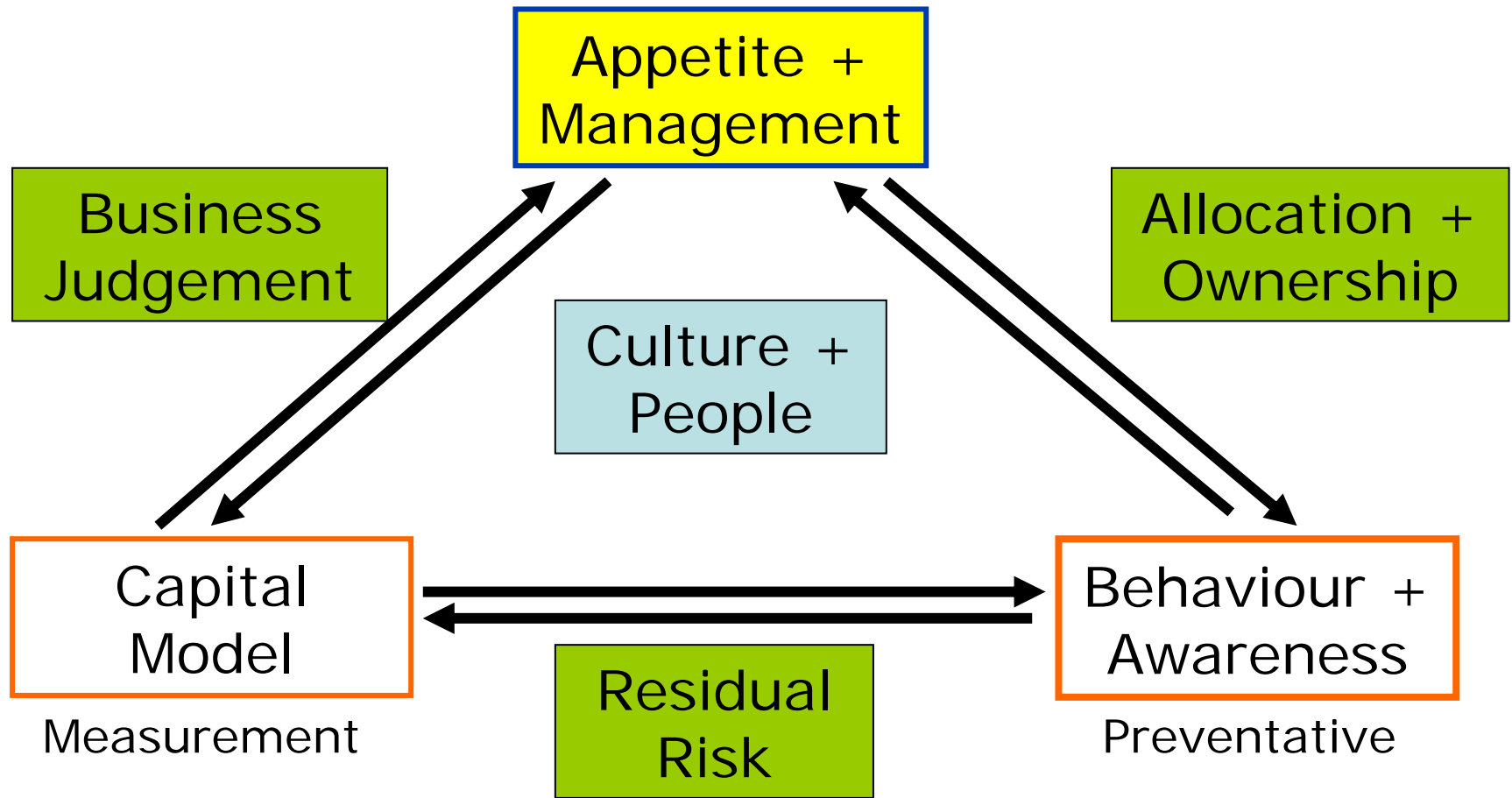


# (Risk Management) Governance





# Operational Risk Management





## Risk Types

- Known Risk
  - Identified and quantified
- Unknown Risk
  - Identified but not meaningfully quantifiable
  - Unmanaged directly - financially
- Unknowable Risk
  - Not identified, so not quantifiable
  - Unmanageable directly





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## Data Issues

- Internal
- External
- Scenarios
  
- Extreme events - outliers



## Modelling Issues

- Models do not manage risks
- Theoretical issues
- Models results are imprecise
- Aggregation and dependencies
- Confidence intervals for results
- Application Risk - model management
- Risk of 'intuition' ...



## Intuition ... ?

- Loss data
  - Expected \$4.5m,  $P[<\$8.2m] = 75\%$
- Typical approaches
  - Linearly
  - Normal distribution



P[<]	50%	75%	90%	95%	99%	99.9%
N	4.5	8.2	11.6	13.6	17.4	21.6
LogN	4.5	8.2	14.2	19.7	36.4	72.3
Ratio	1.00	1.00	1.22	1.45	2.10	3.35



## Conservatism

- Best estimate plus explicit margins
- Focus on outputs not inputs
- Role of business judgement
- Noise in tails of distributions



## Management Issues

- Culture is key
- Cannot stifle business
- Test is how risk events are managed
- Risk avoidance  $\neq$  risk management
- Don't shoot the messenger
- Understand causes not just symptoms



## Unquantifiable Risks

- Can't quantify all from historic data
- Process – attitude and scenarios
- Practice – weakest link in process
- Examples
  - BCP (Katrina)
  - Pandemic
  - Fire drills



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## Some APRA Focuses

- Outsourcing
- Business continuity
- Pandemics
- Project management
- Legacy systems and products



# Actuarial Opportunities

- New area
- Risk of getting lost in modelling
- Keys
  - Getting and understanding data
  - Interpreting results in business context





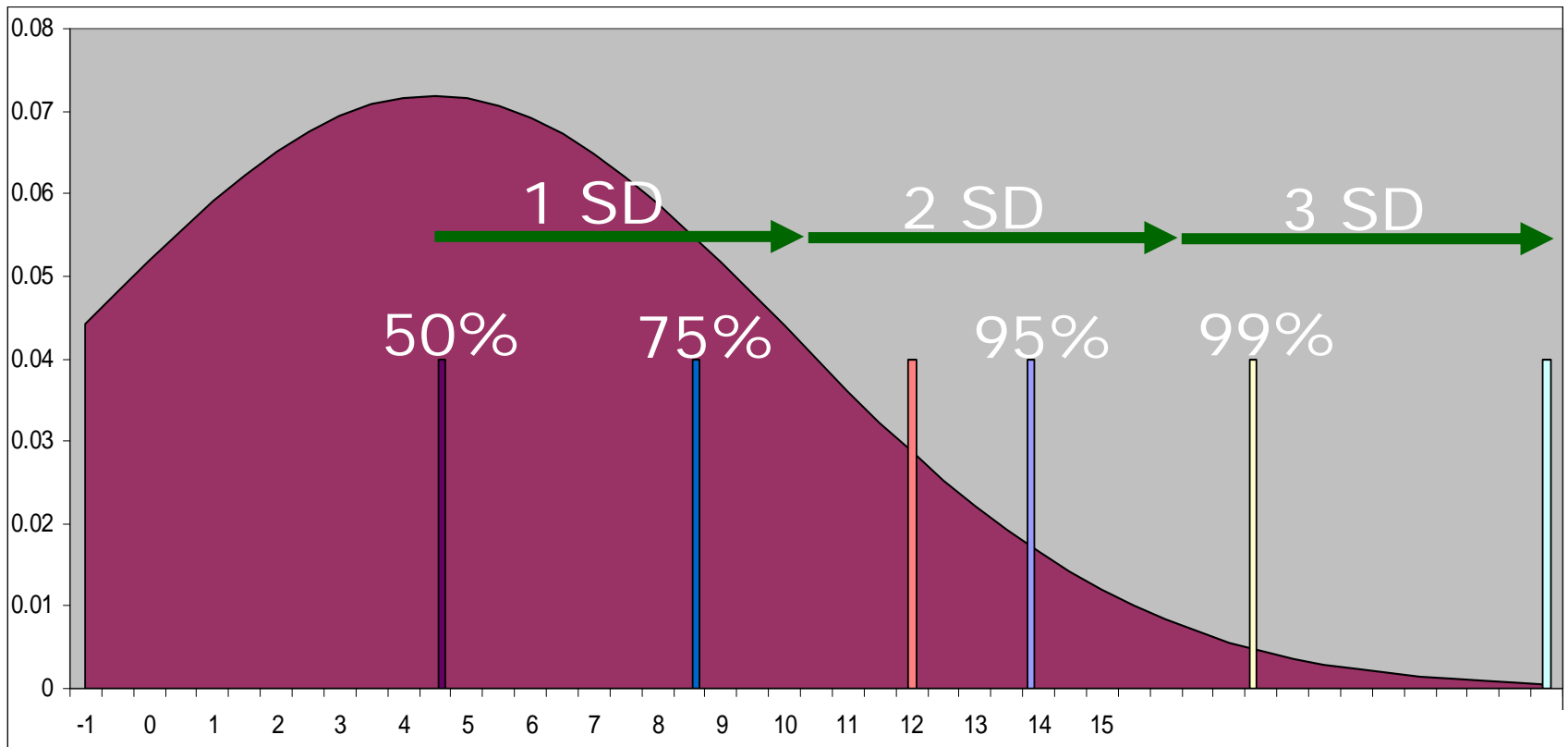
## Summary

- Opportunity - new and developing field
- Data limitations
- Models
  - Limitations
  - Do not manage risk - only means to end
- Active risk management
  - Prevention vs cure
  - Culture vs capital



# A Tail

Normal





# A Realistic Tail

Lognormal, match 50%ile and 75%ile

