



**The Actuarial Profession**

making financial sense of the future

# ***ERM Framework and Perspective: Workshop E8***

***Cherry Chan, George Orros, Geoff Perry & Kartina Thomson***

34<sup>th</sup> ANNUAL GIRO CONVENTION - 2007

Newport, Wales

# Enterprise Risk Management Working Party

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- **Introduction to ERM**
- **Frameworks overview / ERM literature review**
- **Common theme of ERM frameworks**
- **Actuarial opportunity**
- **Discussion**

# What is ERM?

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- **Exchange Rate Management? NO**
- **A fancy management buzzword? NO**
- **Enterprise Risk Management is a tool for managers to identify, analyse, mitigate and monitor risks**
- **Encompass all risks affecting the company**
  - internal and external
  - insurable and non-insurable

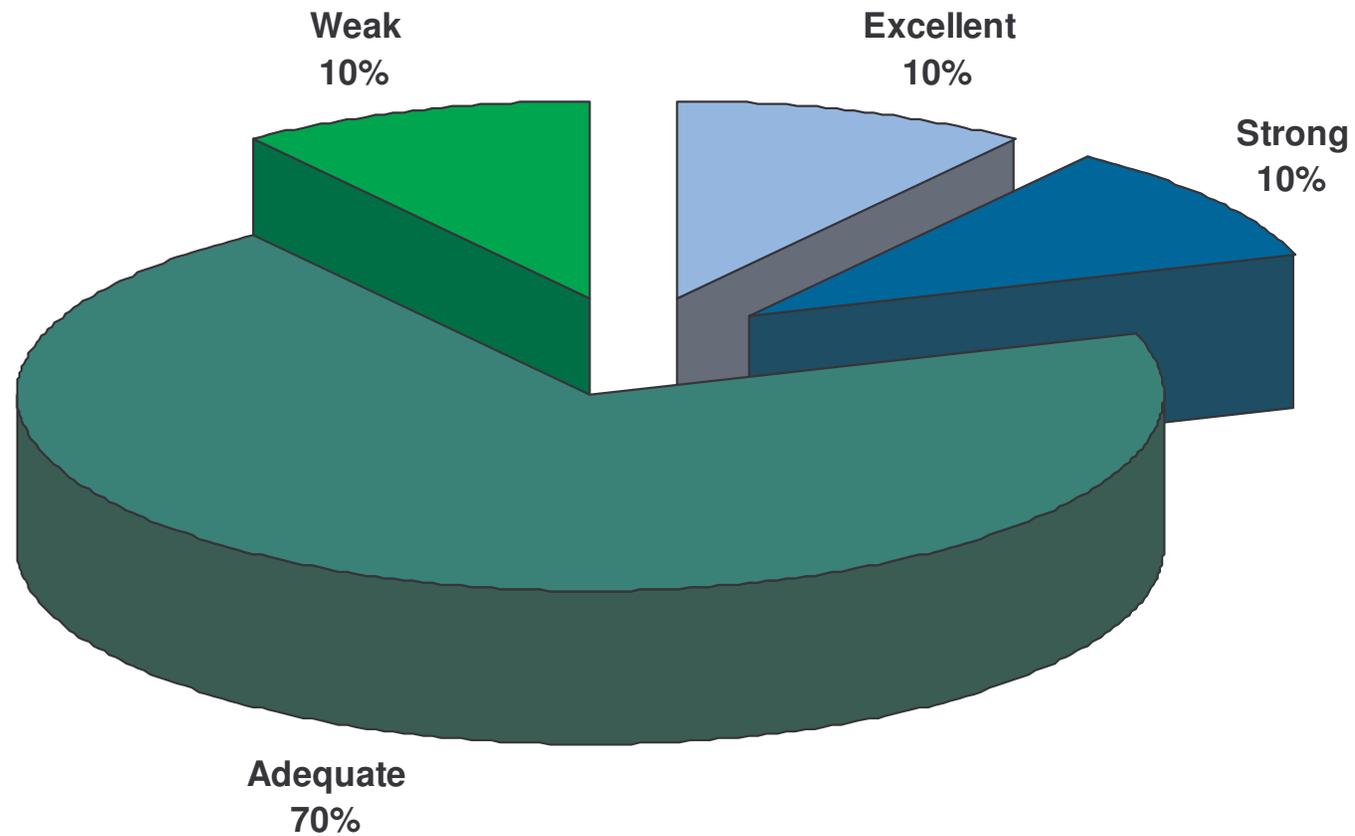
# Why is ERM Important?

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- **Change in legislation – Corporate Governance**
- **Change in regulation – ICAS, Solvency II**
- **Rating Agency – S&P, AM Best, Fitch Ratings**
- **Create a common risk language**
- **Focus resources on important issues**

# Overall ERM Evaluation

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(1) S&P, January 2007

# Risk Management Lowers Capital Need

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- Canadian Manufacturers Life raised to AAA from AA+ in Nov '06
    - A factor was Excellent evaluation on group's ERM
  - Munich Re raised to AA- from A+ in Dec '06
    - Strong evaluation on its ERM a driver
  - Zurich Financial Services raised to AA- from A+ in June '07
    - A rationale was “positive impetus from enterprise risk management program. ZFS' ERM program has improved to a strong level, providing management with an effective tool to maintain its risks at a level consistent with its risk tolerance.”
  - Japan's Major Banks upgraded June '07
    - Upgrades reflect banks' Adequate ERM, stable improvement in asset quality and capitalization backed by strong economy, and the diversification of revenue sources
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# Key Messages of our Paper

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- 1. There is no complete and widely accepted definition**
  - 2. ERM has to incorporate top down and bottom up approach**
  - 3. Identify opportunities as well as assessing the downside risks – value creation**
  - 4. Important to have management support**
  - 5. Expect the unexpected – Black Swan**
  - 6. ERM is not only about understanding and modelling risks but also mitigating them**
  - 7. Actuaries need to expand our current skills set**
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# What We Produced

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- Substantial review of the ERM literature
- An outline ERM framework based on best elements of other frameworks
- Summary of worldwide actuarial education
- A vision to challenge & stimulate thought
  - Case studies to promote thinking
  - Essays relevant to subject
  - Summary & ideas for next steps
  - Appendices with useful information

*Will be on the GIRO website – READ IT!!*

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# ERM Frameworks & Perspectives: A Literature Review

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1. Review of ERM Top 12 ‘must reads’
2. Review of 60 ERM texts
3. Listing of 60 ERM web sites
4. ERM Frameworks and Perspectives

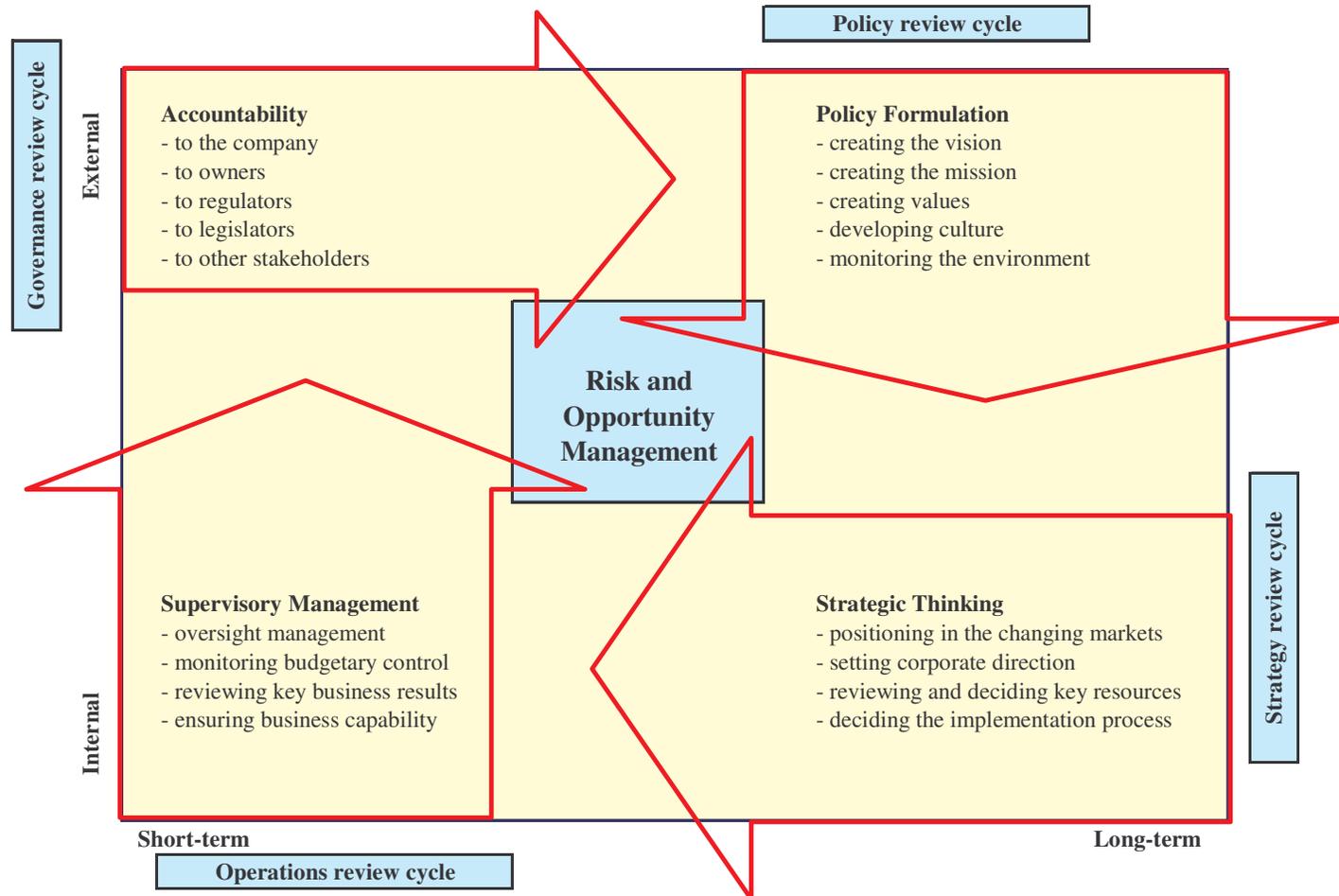
# ERM Top 12 'Must Reads'

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- 1 Bohn, Christopher and Kemp, Brian (2006). *Enterprise Risk Management Quantification - An Opportunity*
  - 2 Brehm, Paul et al. (2007). *Enterprise Risk Analysis for Property & Liability Insurance Companies*
  - 3 Cabinet Office (2002). *Risk Improving Government's Capability to Handle Risk and Uncertainty*
  - 4 Chapman, Robert J. (2006). *Simple Tools and Techniques for Enterprise Risk Management*
  - 5 COSO (2004). *Enterprise Risk Management - Integrated Framework, Application Techniques* , COSO
  - 6 COSO (2004). *Enterprise Risk Management - Integrated Framework, Executive Summary* , COSO
  - 7 Crouhy, Michel et al. (2006). *The Essentials of Risk Management*
  - 8 Lam, James (2003). *Enterprise Risk Management - from Incentives to Controls*
  - 9 Sharma, Paul et al. (2002), *Prudential Supervision of Insurance Undertakings*
  - 10 Standard & Poor's (2005). *Insurance Criteria: Evaluating The ERM Practices of Insurance Companies*
  - 11 Taleb, Nassim N. (2007). *The Black Swan: the Impact of the Highly Improbable*
  - 12 Wang, Shaun and Faber, Robert (2006). *ERM for Property-Casualty Insurance Companies*
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# ERM Impinges on 4 Main Board Functions

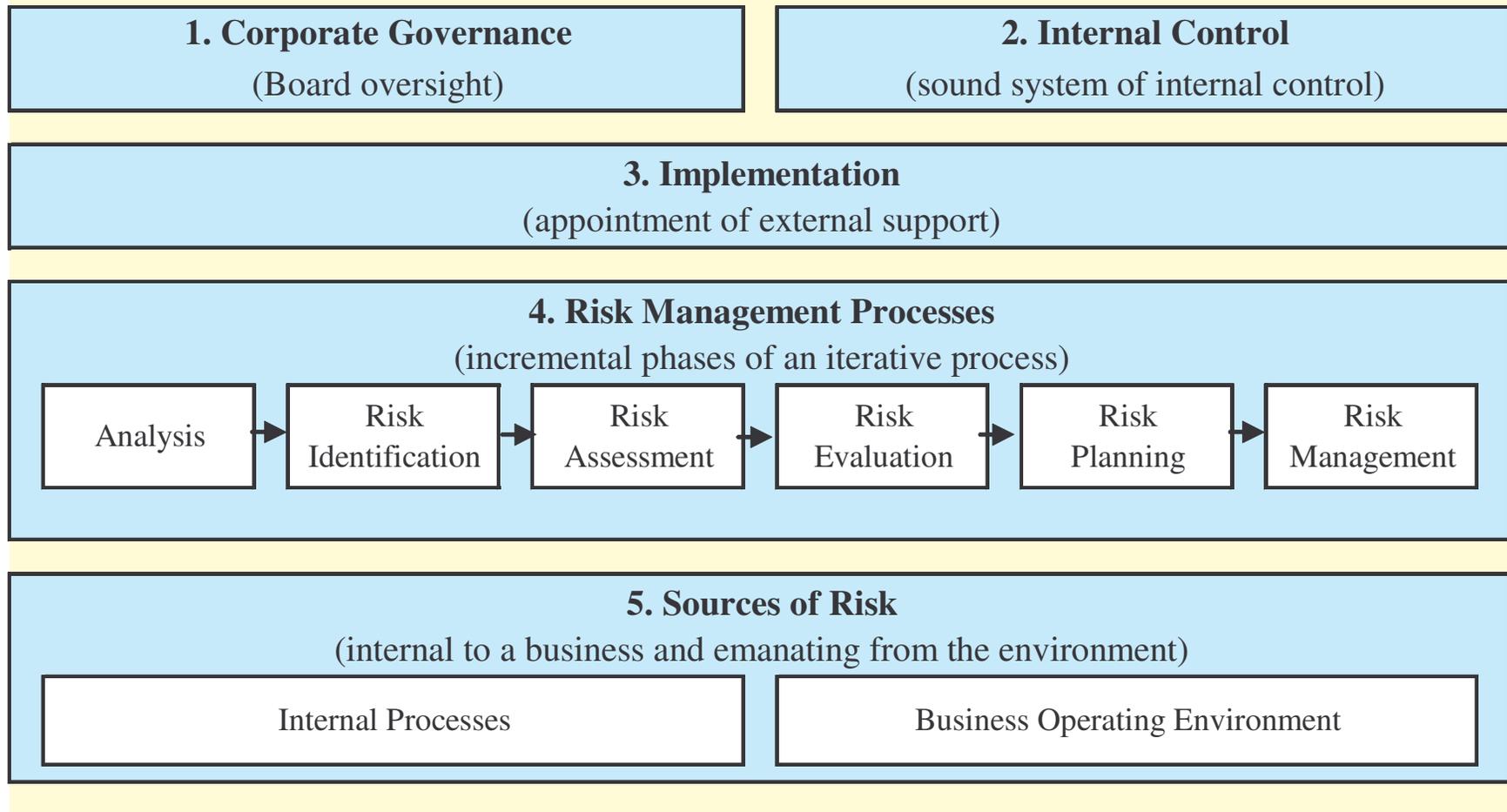
- Chapman locates ERM as axiomatic



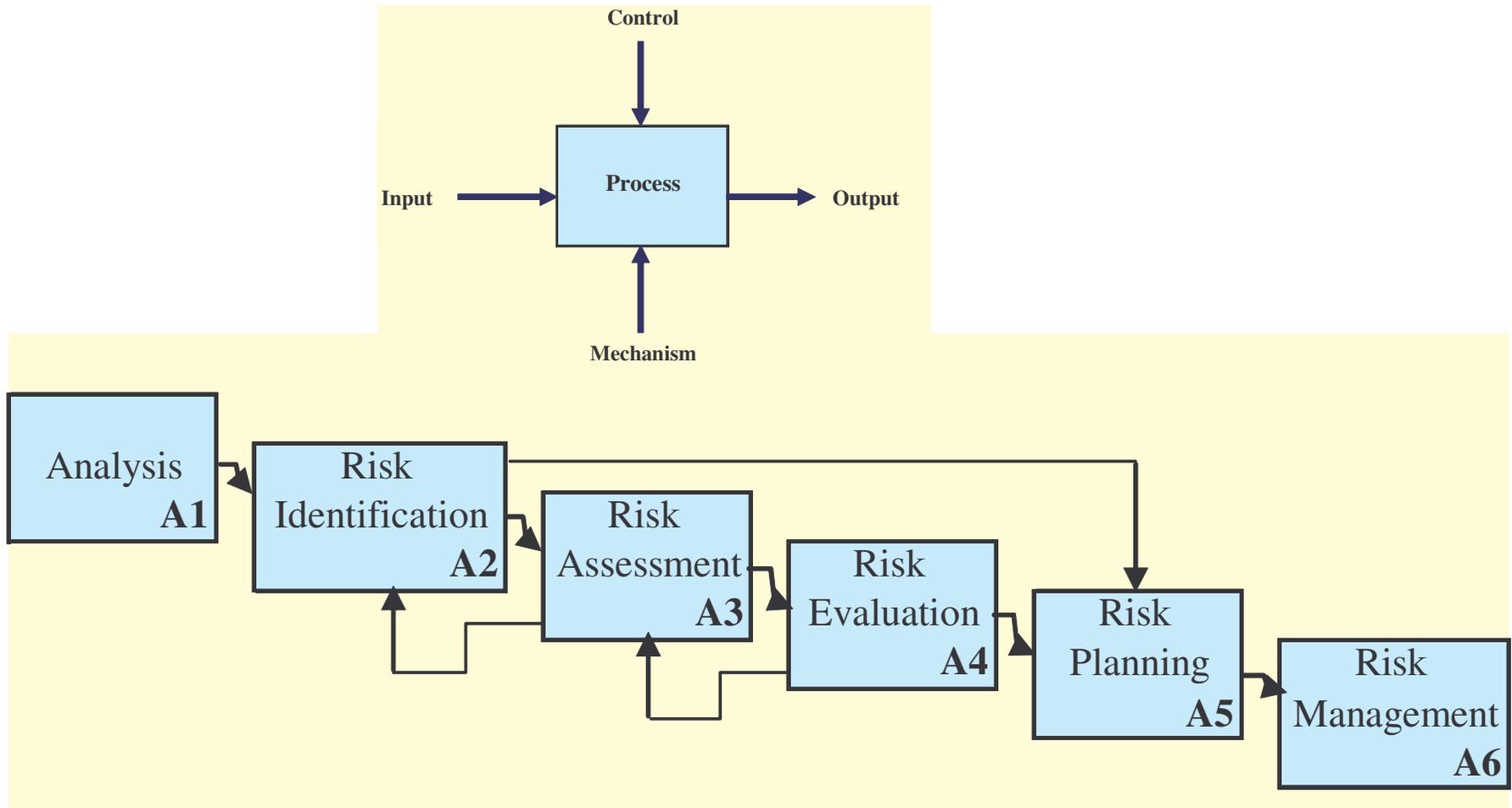
adapted from Garratt 2003, "The Fish Rots from the Head"

# Risk Management Processes

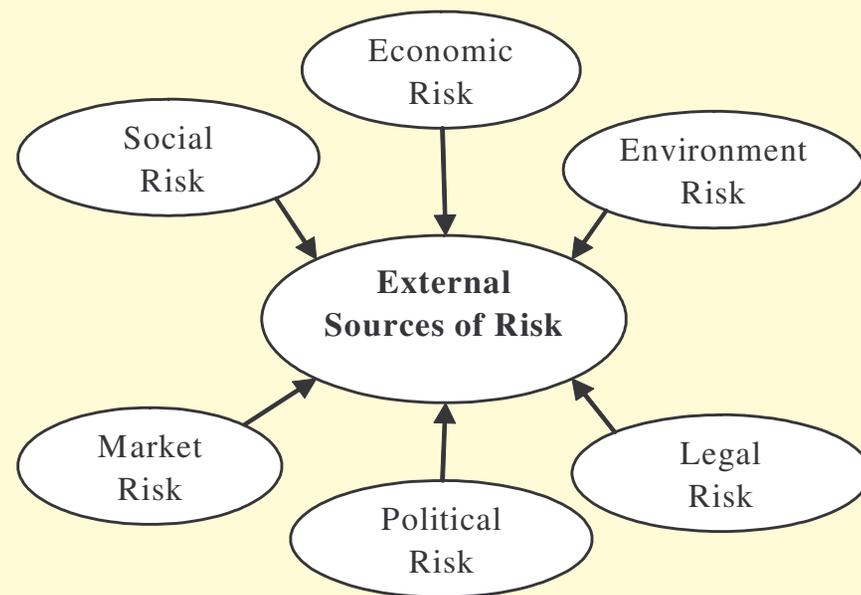
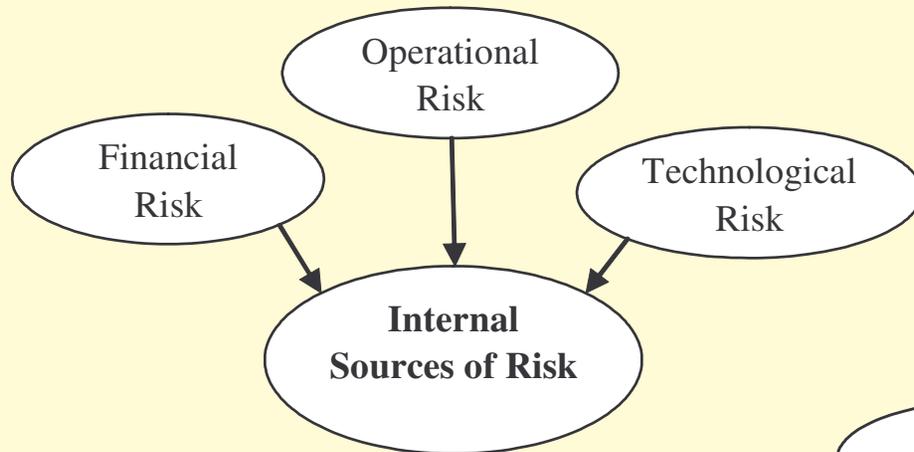
Chapman outlines 6-stage incremental & iterative process



# Methodology for each process stage and feedback control loops for entire risk management process - Chapman

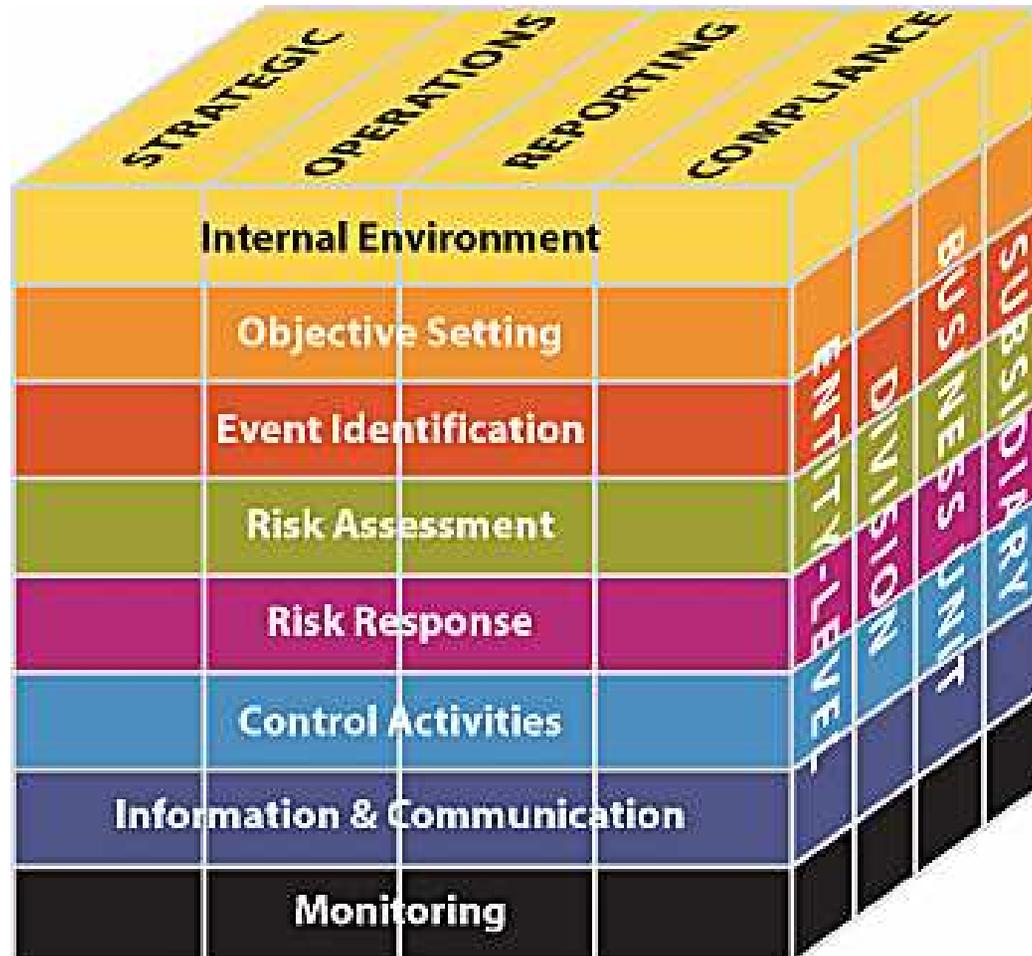


# Micro & Macro Risk - Chapman



# 3-Dimensional COSO ERM Framework – Generic Application across sectors & industries

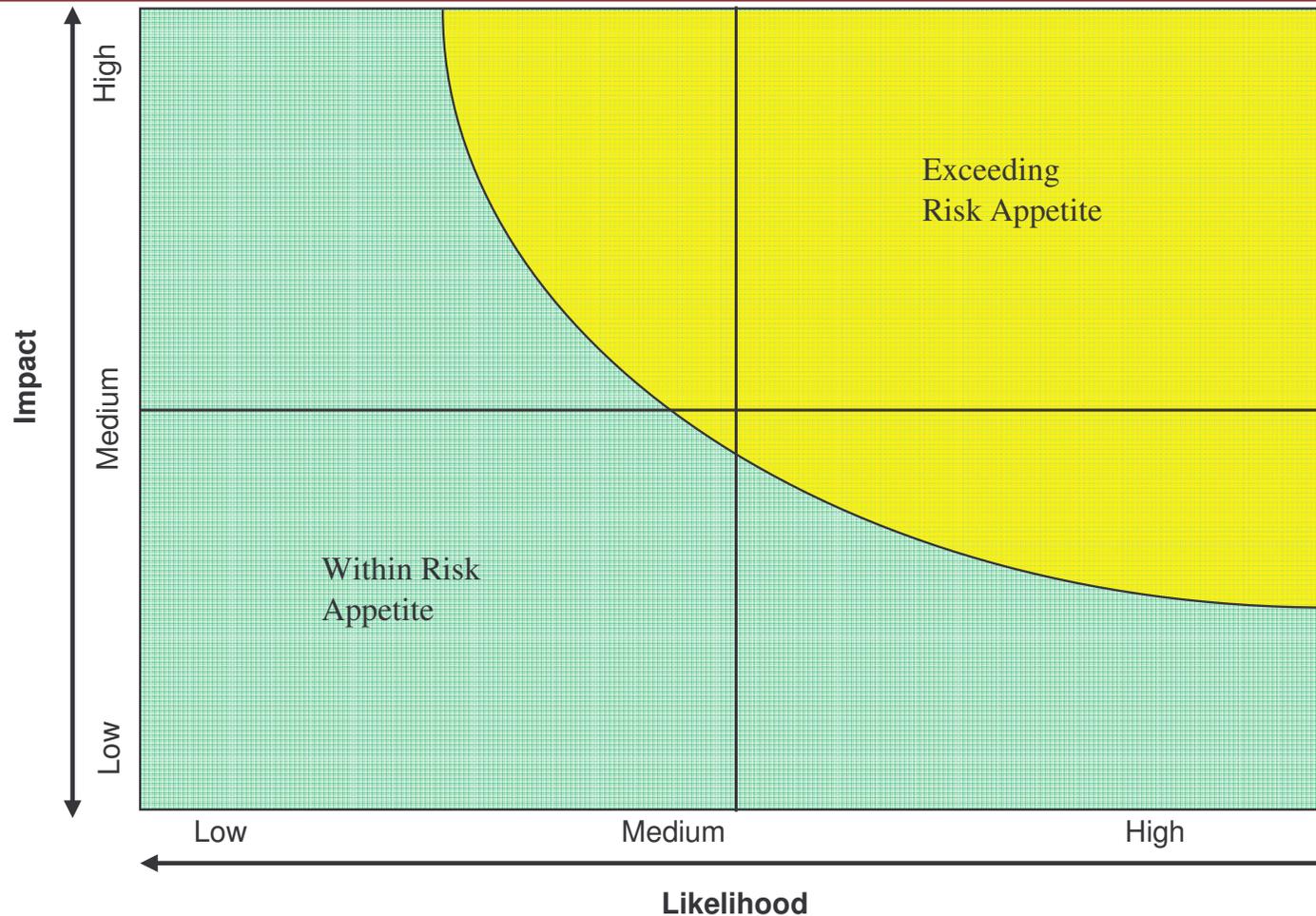
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# COSO ERM Framework is supported via a Suite of Application Techniques

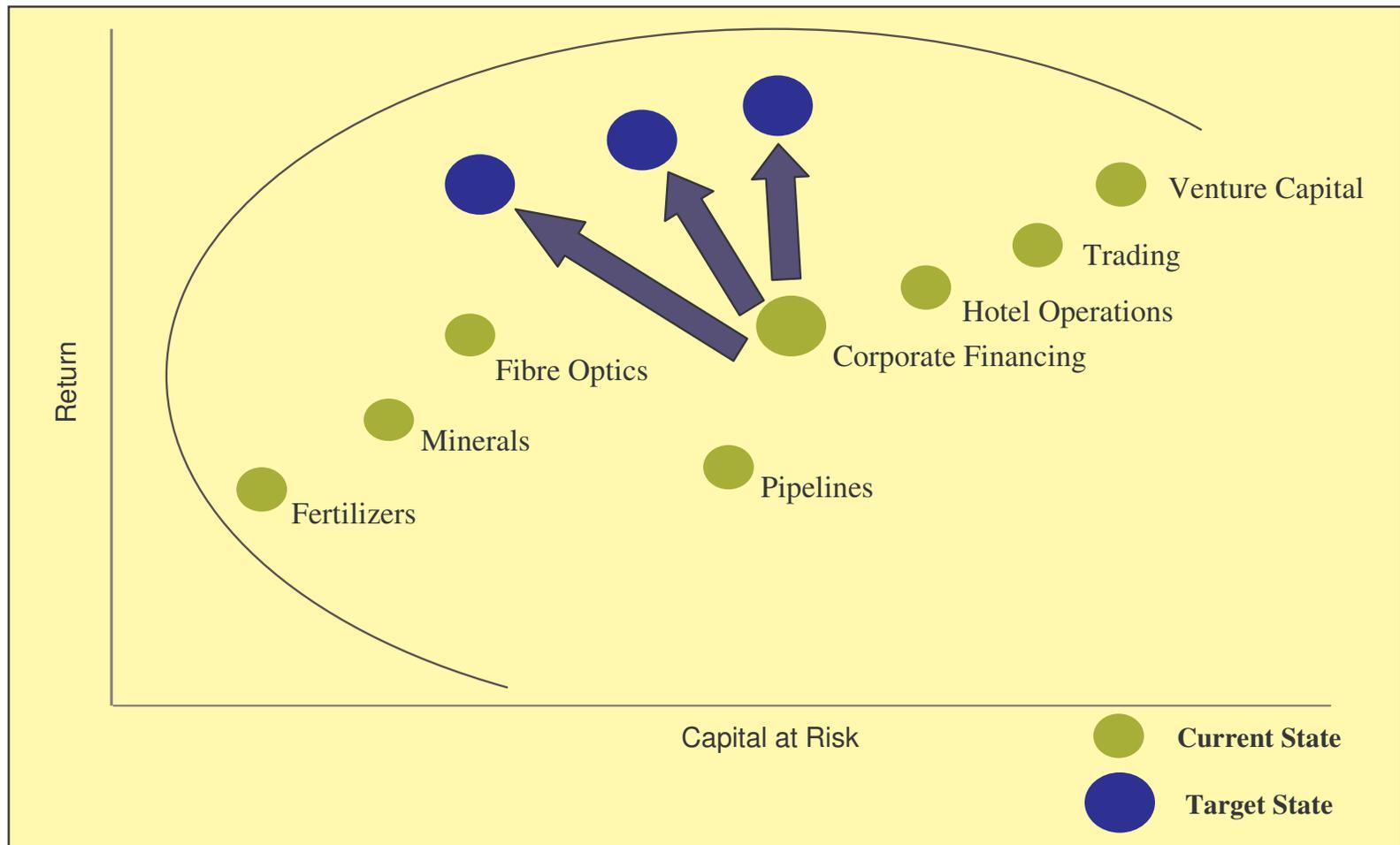


# Using a Risk Map to Express Risk Appetite – Any Residual Risk in yellow area exceeds firm's risk appetite - COSO

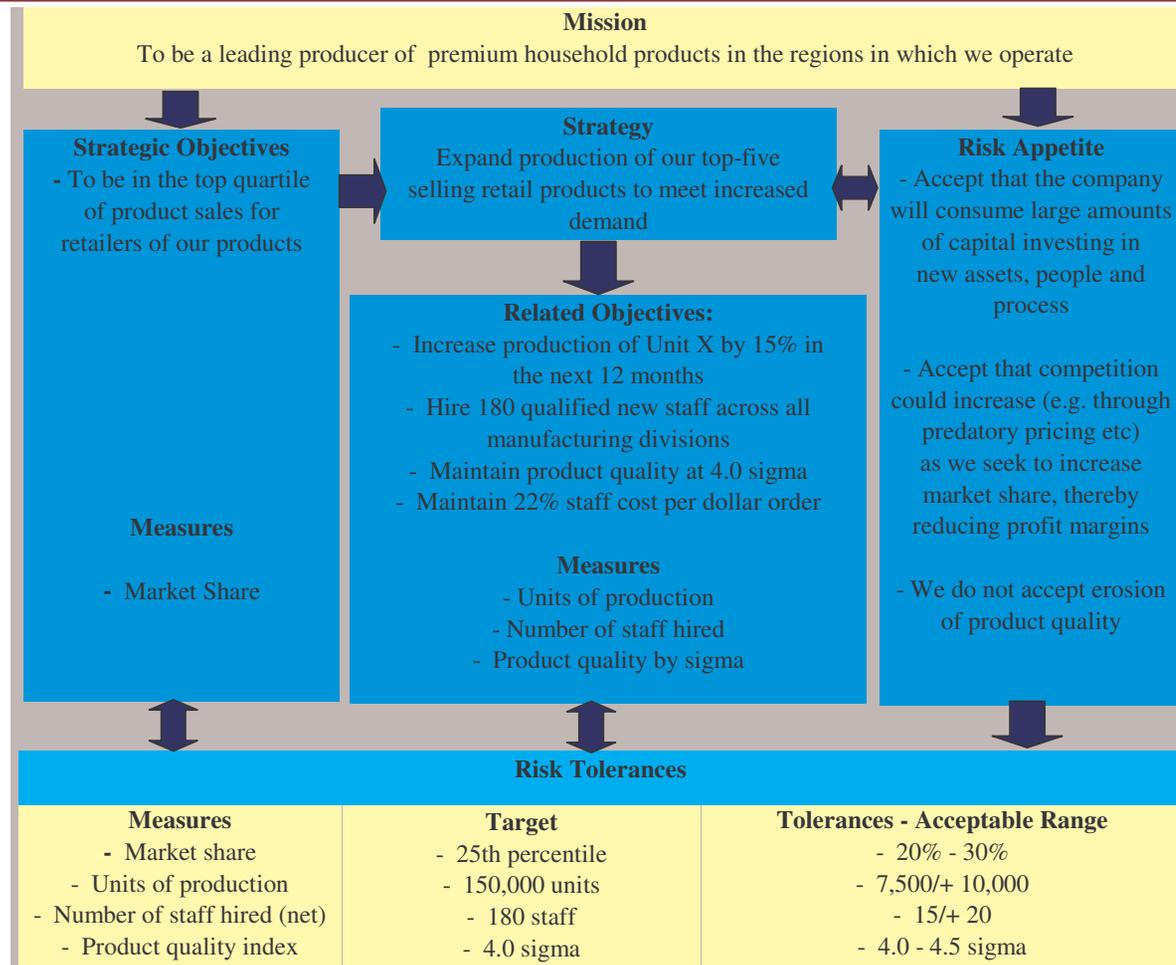


# Risk Appetite, Return & Capital at Risk

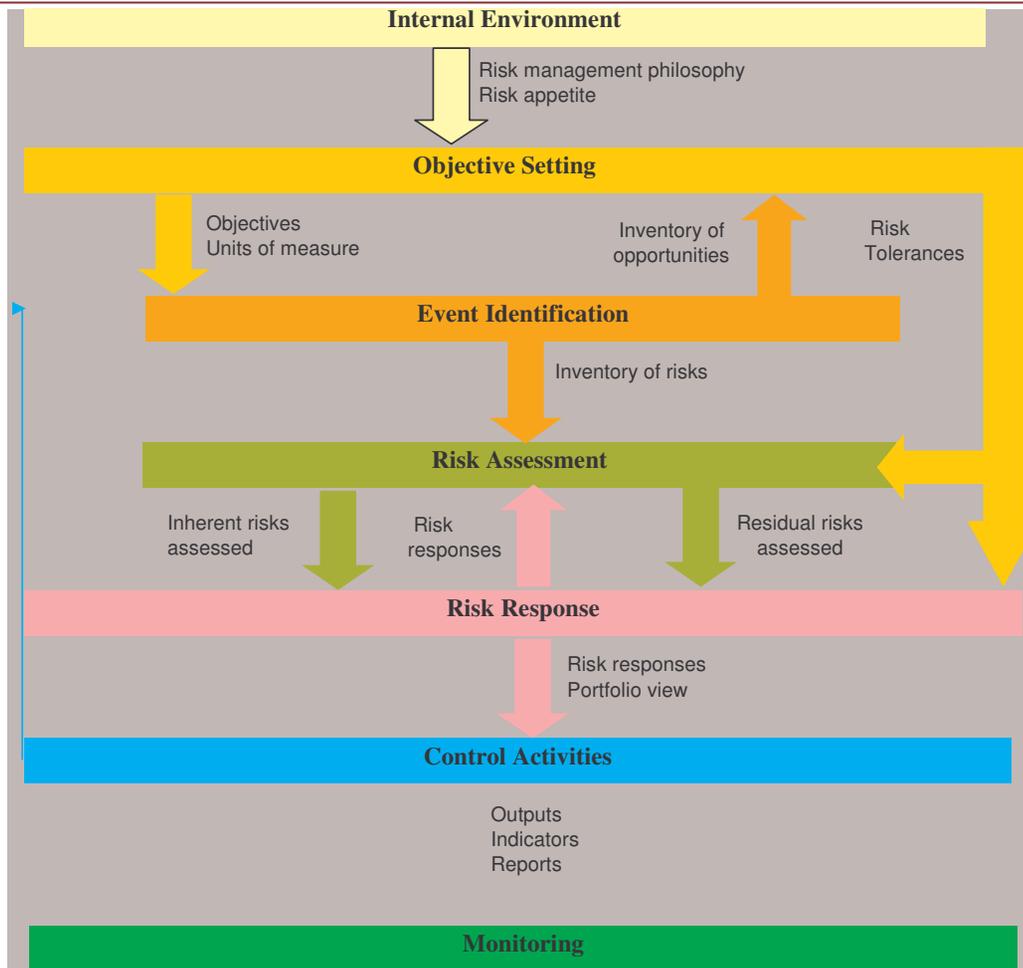
Firm diversifies portfolio to match target profile - coso



# Understanding the relationship between mission, objectives, appetite & tolerance - COSO

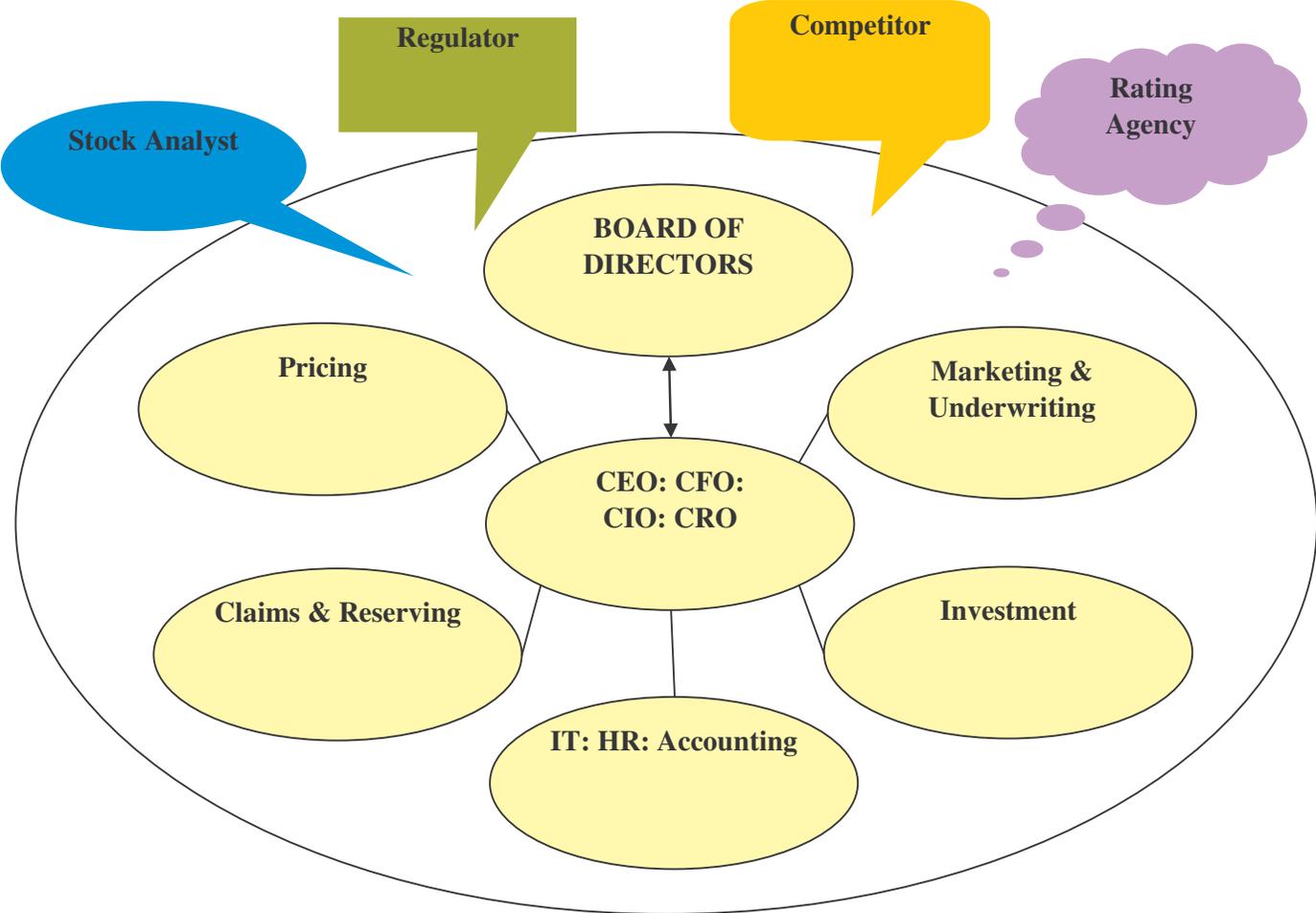


# Information Flows Within Enterprise Risk Management - COSO



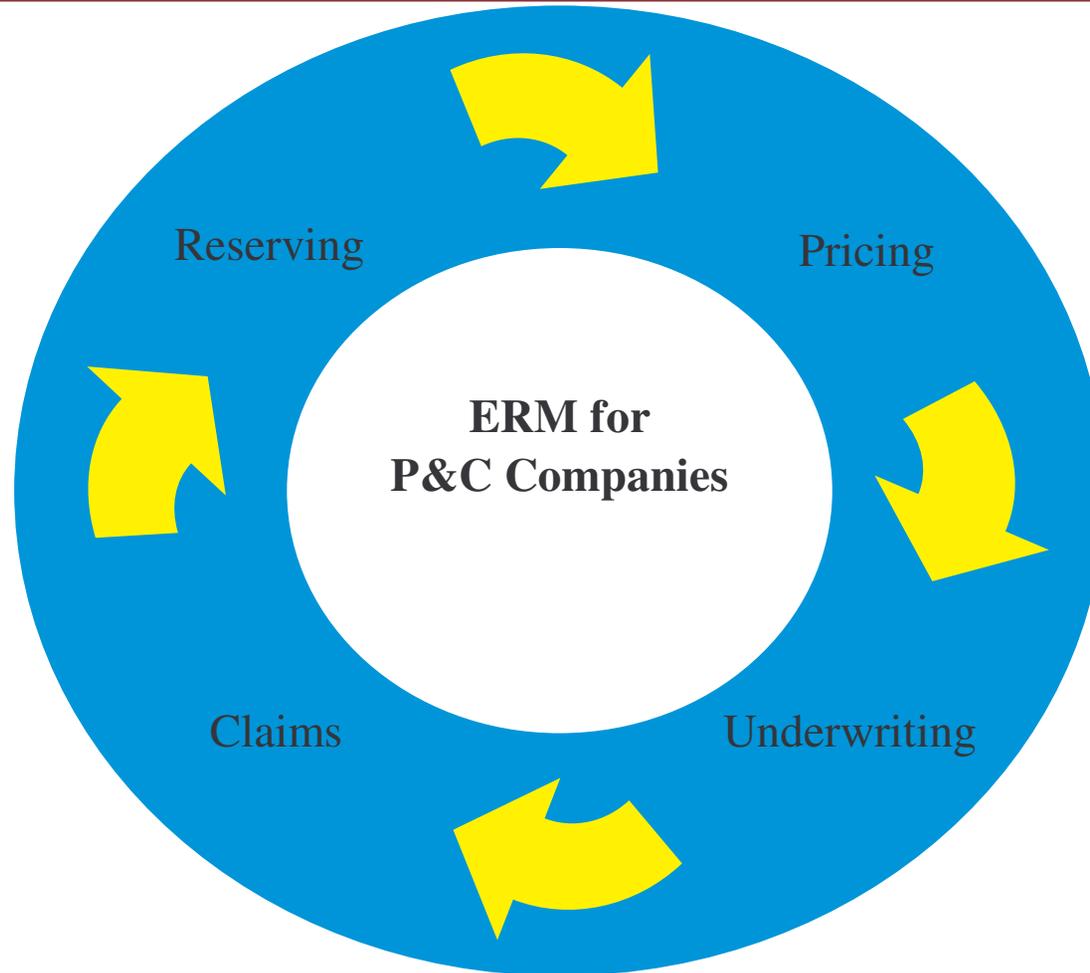
# Views Insurers as Systems of Risk Dynamics

with External & Internal Players - Wang & Faber



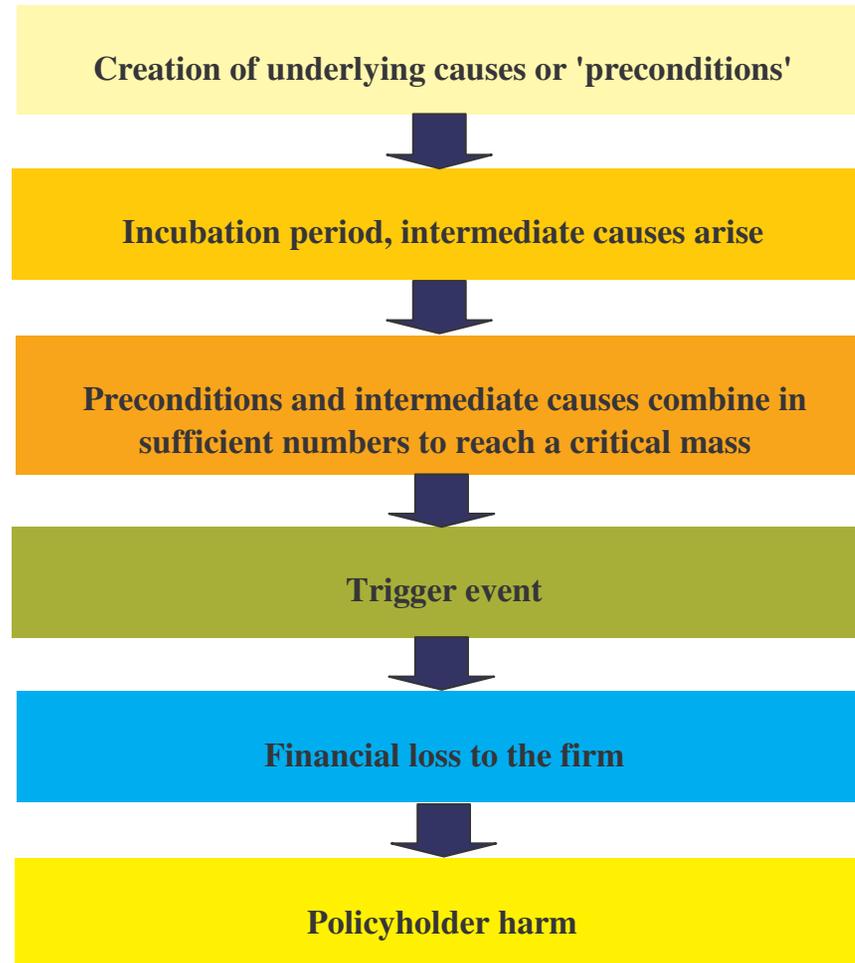
# Need to Build Integrated Internal Business Processes – Wang & Faber

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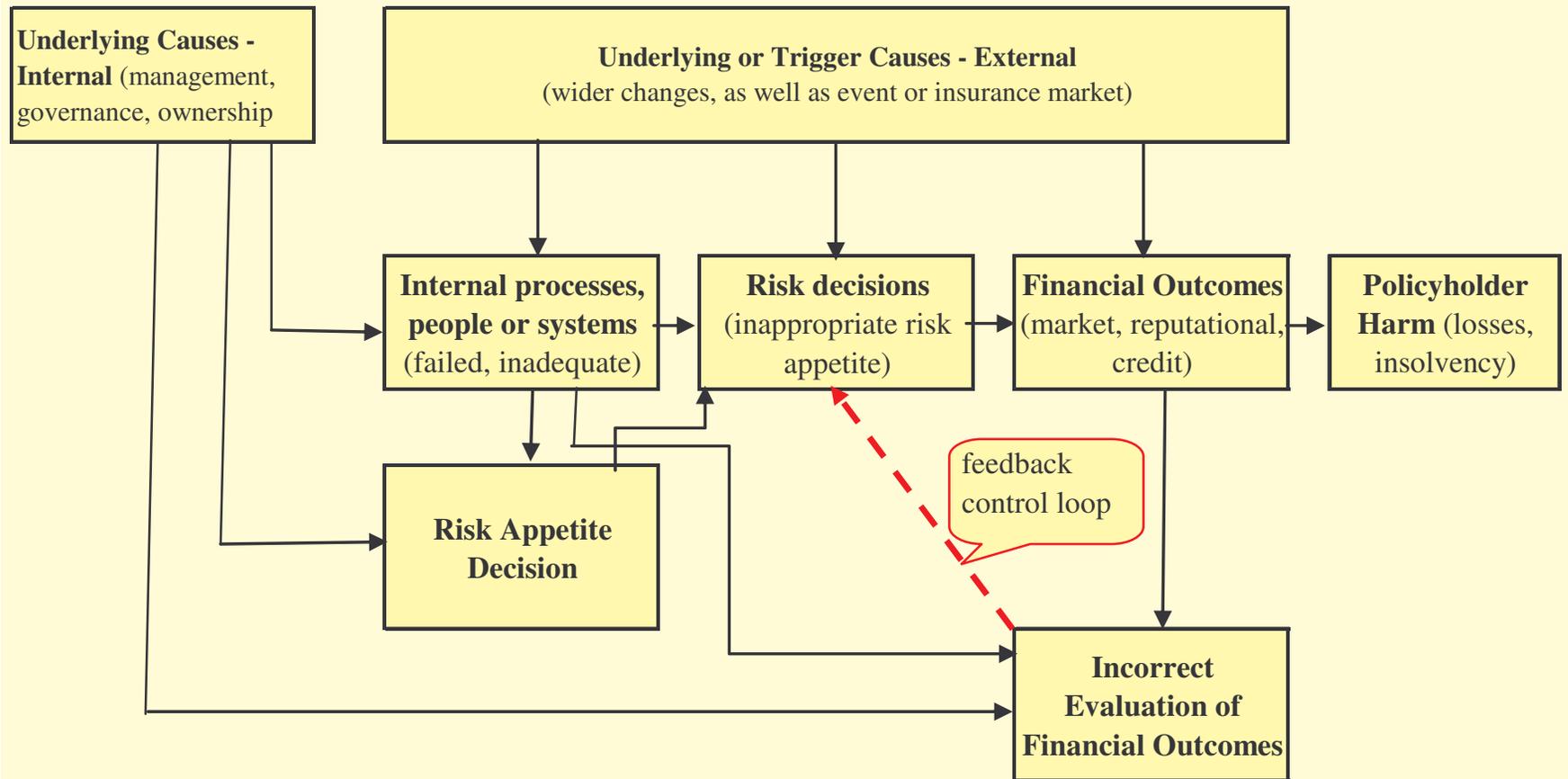
# Case Studies Identify Causal Chains - Sharma

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# Using a Risk Map Template to Map the Causal Chain - Sharma

## High Level Risk Map



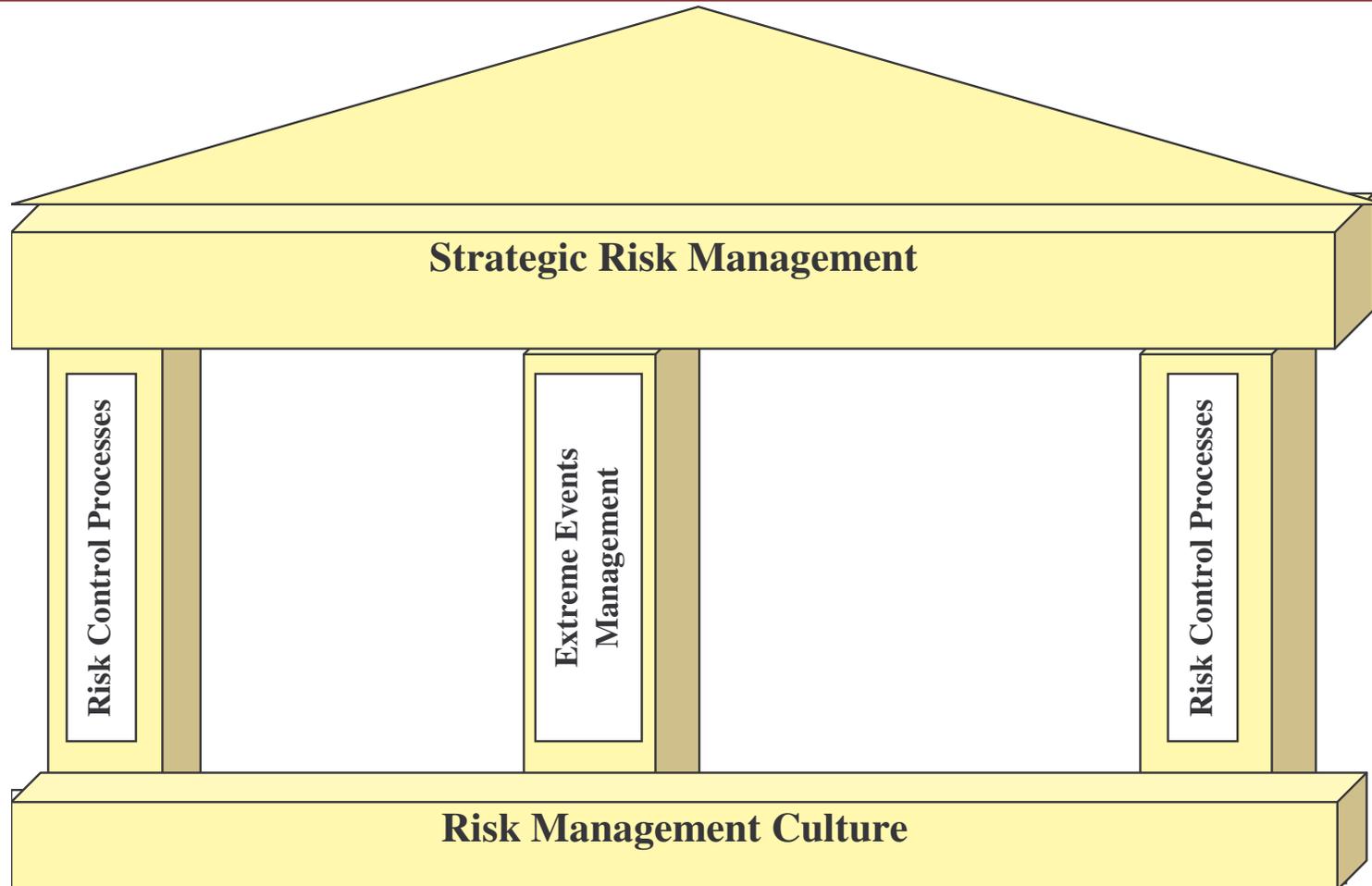
# ERM Evaluation Methodology for Insurers – Standard & Poors

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# Strategic Risk Management Pillars – Standard & Pools

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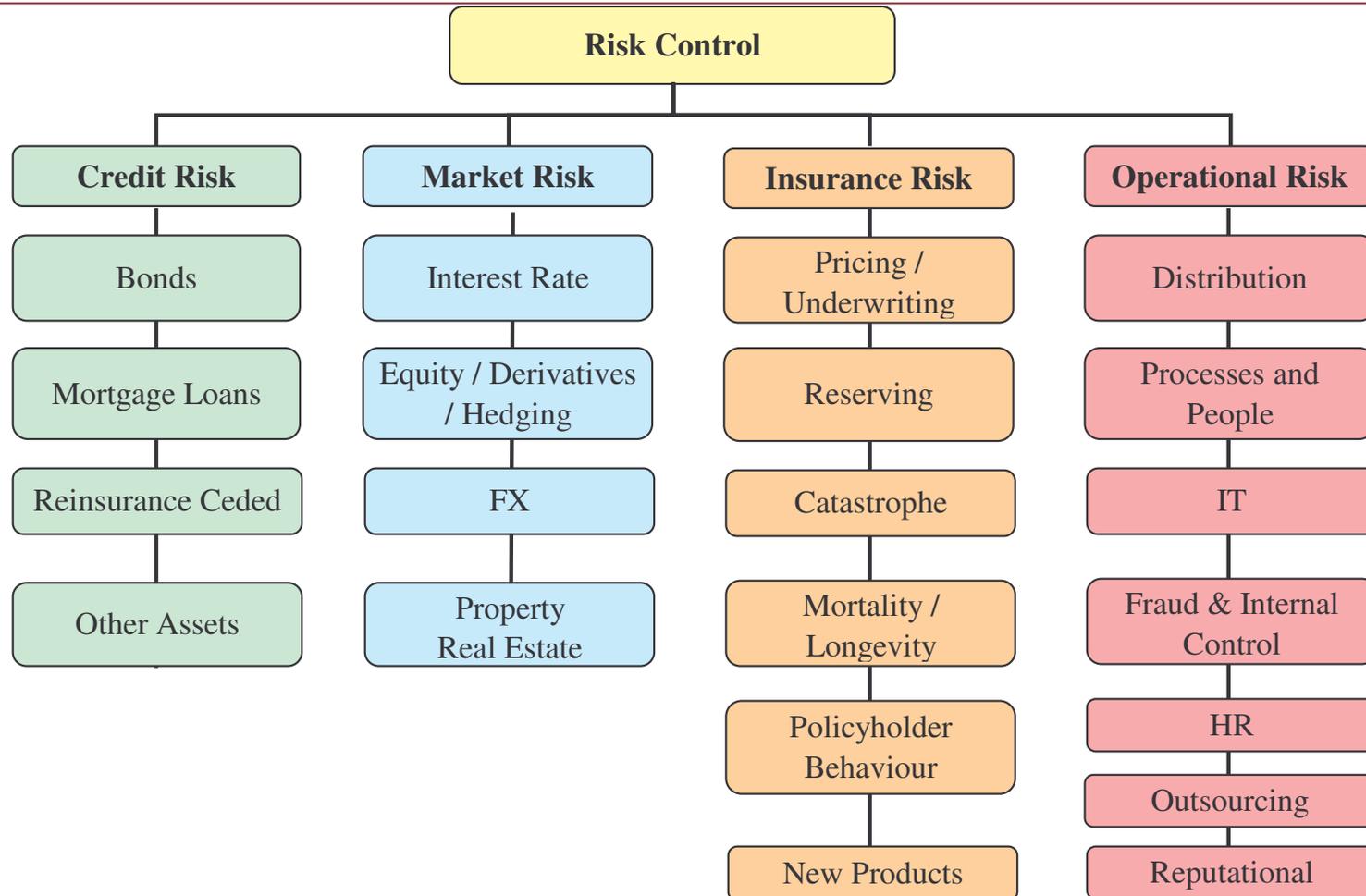


# Strategic Risk Management Pillars

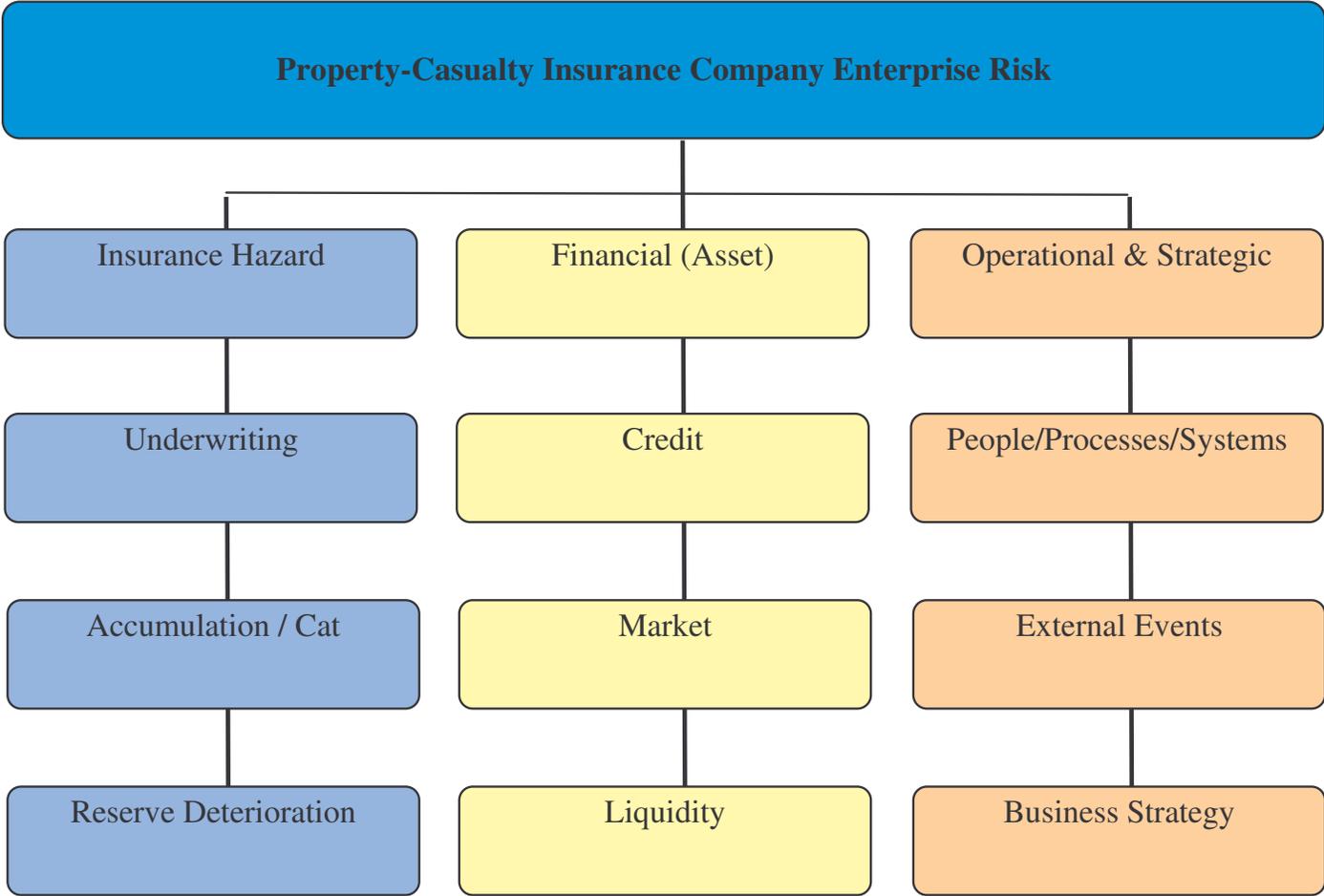
## – Standard & Poors



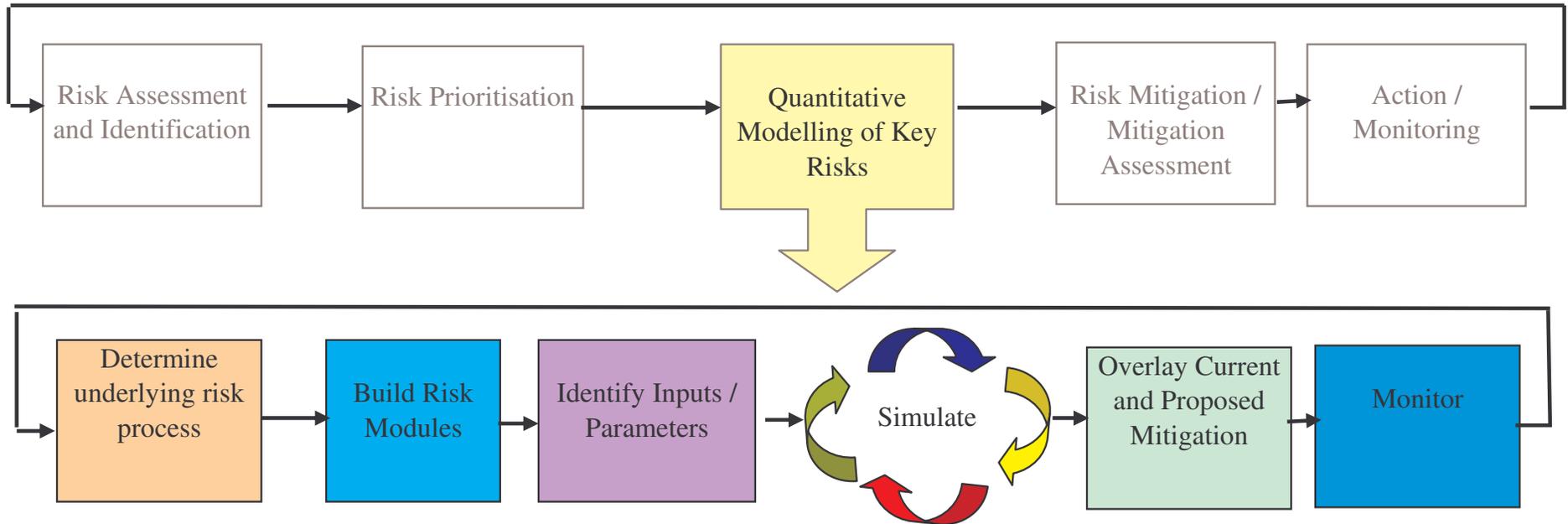
# Comprehensive Risk Control Process – Standard & Poors



# Enterprise Risk Taxonomy Applicable to a Property - Casualty Insurer – Brehm et al

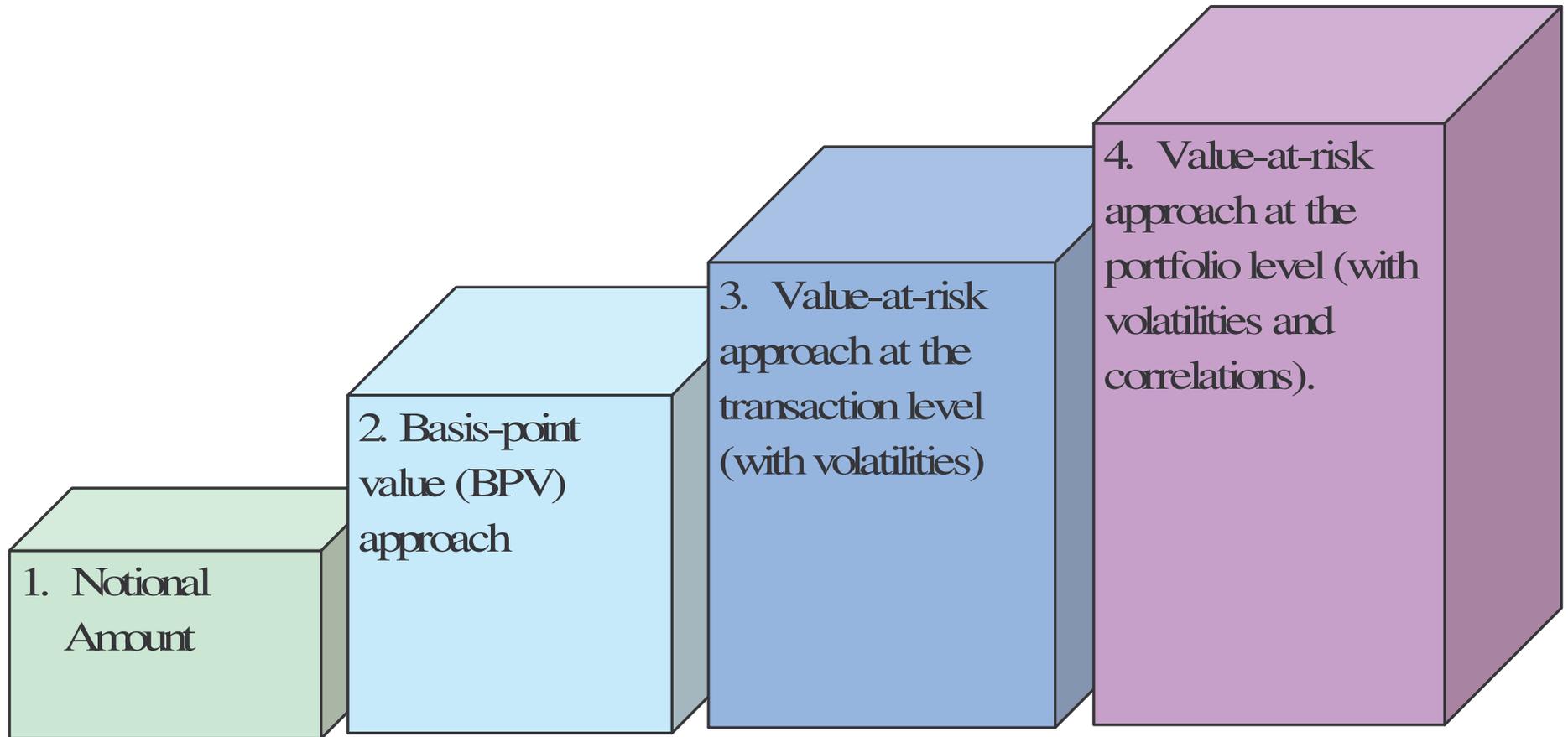


# Risk Quantification Process in Context of COSO Framework– Bohn & Kemp



# Banking Sector & Derivatives Markets Perspectives on Evolution of VaR measurement methodologies – Crouhy

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# ERM Holistic System – Lam

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## 1. Corporate Governance

Establish top-down risk management

2. Line Management  
Business strategy alignment

3. Portfolio Management  
Think and act like a 'fund manager'

4. Risk Transfer  
Transfer out concentrated or inefficient risks

5. Risk Analytics  
Develop advanced analytical tools

6. Data and Technology Resources  
Integrate data and system capabilities

7. Stakeholders Management  
Improve risk transparency for stakeholders

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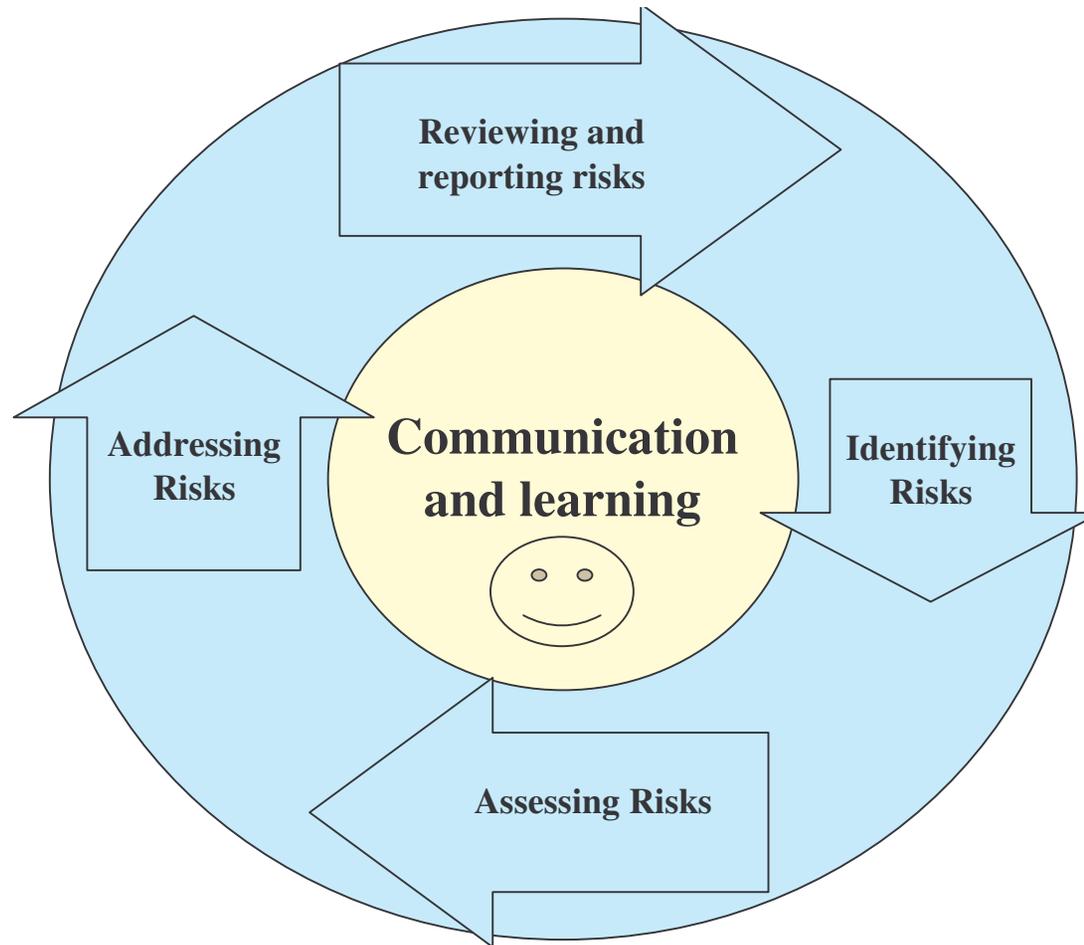
# ERM Embedded in Strategic Decision-Making – UK Cabinet Office

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# ERM - Continuous Communication & Learning Processes – UK Cabinet Office

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# ERM & Black Swan Logic - Taleb

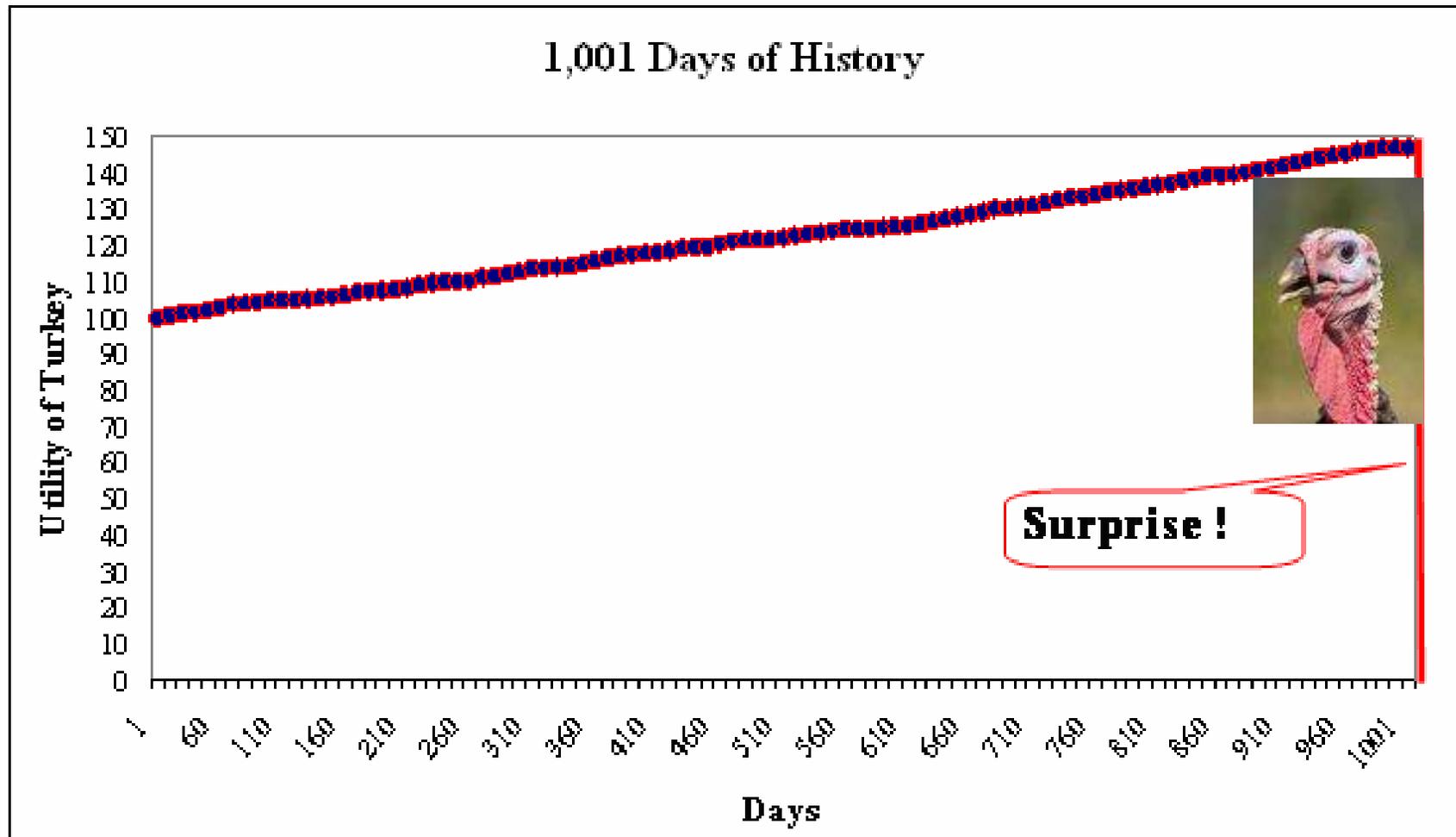
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People generally severely underestimate the possibility of unexpected events. Non-Australians used to be convinced that all swans were white, an unassailable belief from empirical evidence. The sighting of the first black swan illustrated the fragility of our knowledge. One single observation of a black swan invalidated a general statement derived from millennia of confirmatory sightings of millions of white swans.

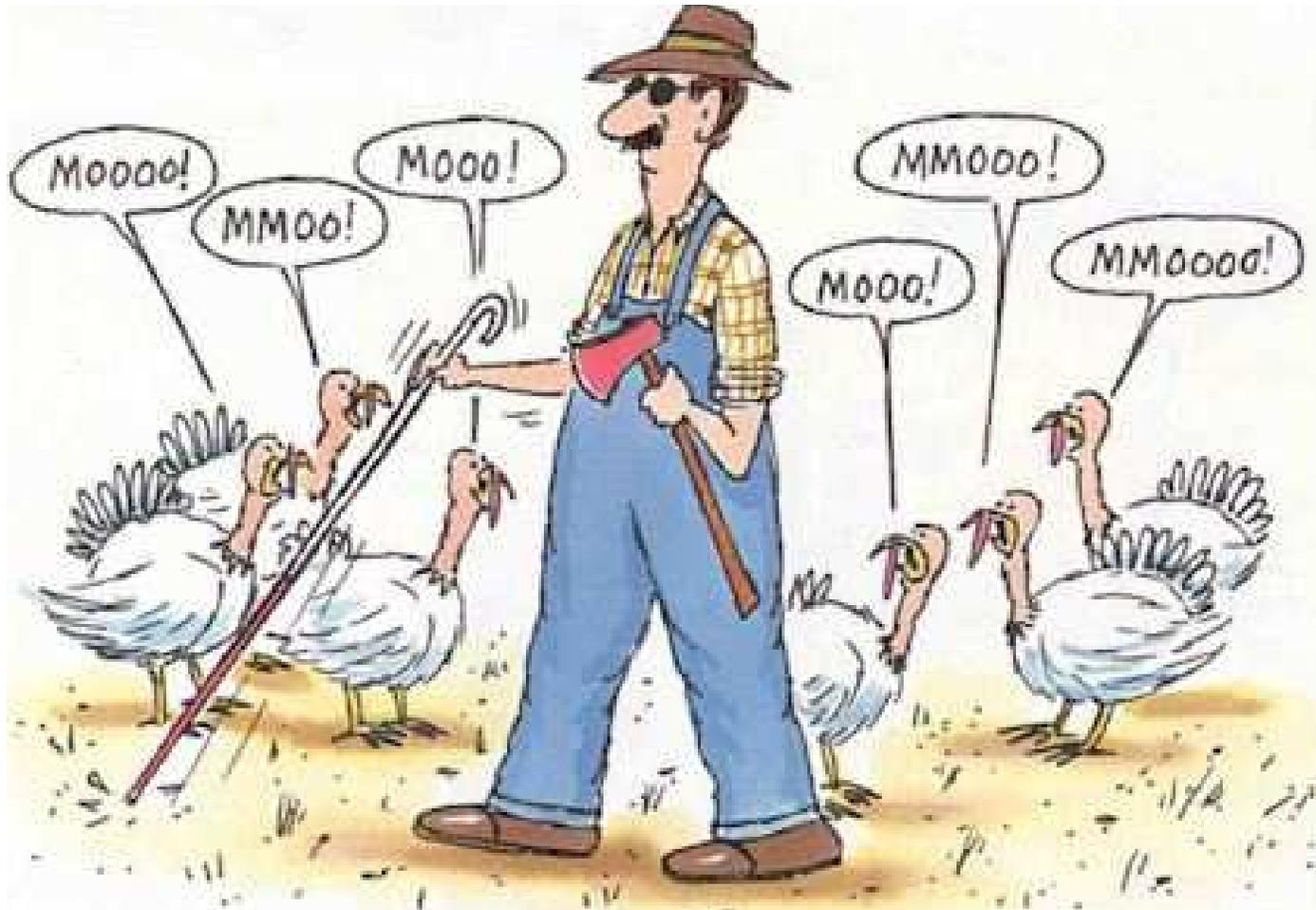
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# Problem of Inductive Knowledge & Revision of Belief - Taleb



# The Problem of Inductive Knowledge

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# On-Model Risks versus Value of Black Swans - Taleb

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Black swans swamped casino ERM model risks by 1,000 to 1



Qualitative & Quantative inputs  
External & Internal  
Aware 'Statistics are artefacts'  
Consider 'off-model' risks

4 largest losses incurred fell outside of casino's sophisticated ERM models:

1. \$100m loss when irreplaceable performer in their main show was maimed by a tiger.
2. Disgruntled contractor hurt during construction of the hotel annex to casino; so offended by the settlement offered him that he made an attempt to dynamite the casino.
3. Employee supposed to send IRS gambling wins returns, but hid them in boxes under his desk. As tax violations are crimes, casino faced the near loss of its gambling licence.
4. Kidnap of casino owner's daughter led him to fund ransom by dipping into casino cash.

# Donald Rumsfeld at Ground Zero

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# Donald Rumsfeld – Unknown Unknowns

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Donald Rumsfeld 'news briefing' on 12<sup>th</sup> February 2002:

*“Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns -- the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter category that tend to be the difficult ones.”*

# Risks of Relying on the Unconditional Benefits of Past Experience - Taleb

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Those unbelievers who rely on the unconditional benefits of past experience should consider the following pearls of wisdom that were allegedly voiced by a famous ship's captain:

***“But in all my experience, I have never been involved in any accident ... of any sort worth speaking about. I have seen but one vessel in distress in all my years at sea. I never saw a wreck and never have been wrecked nor was I ever in any predicament that threatened to end in disaster of any sort”.***

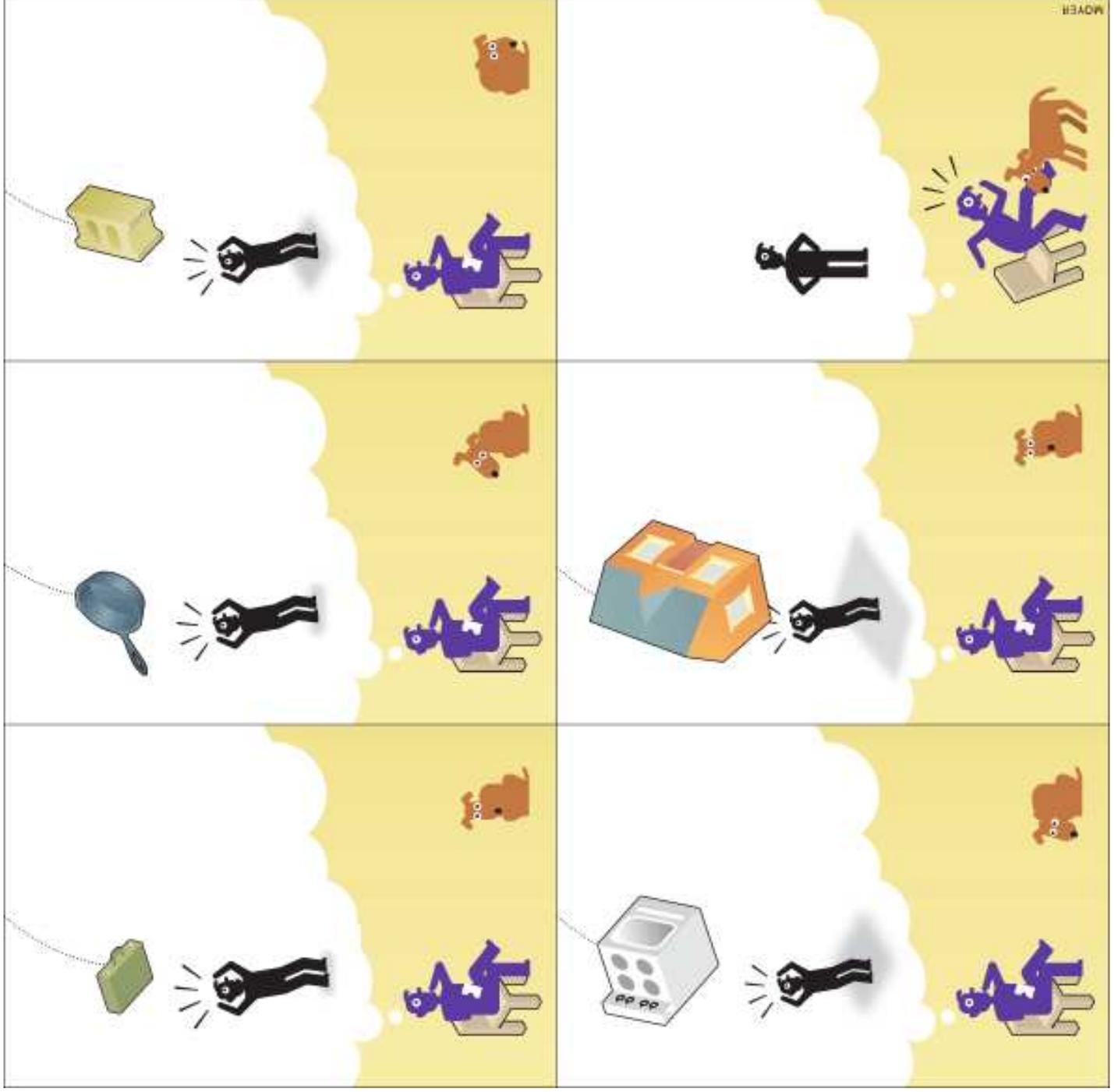
Source: E.J. Smith, 1907, Captain, RMS Titanic

**Footnote:** Captain E.J. Smith's ship sank on 15<sup>th</sup> April 1912.

# Risks of Relying on the Unconditional Benefits of Past Experience – Captain E J Smith

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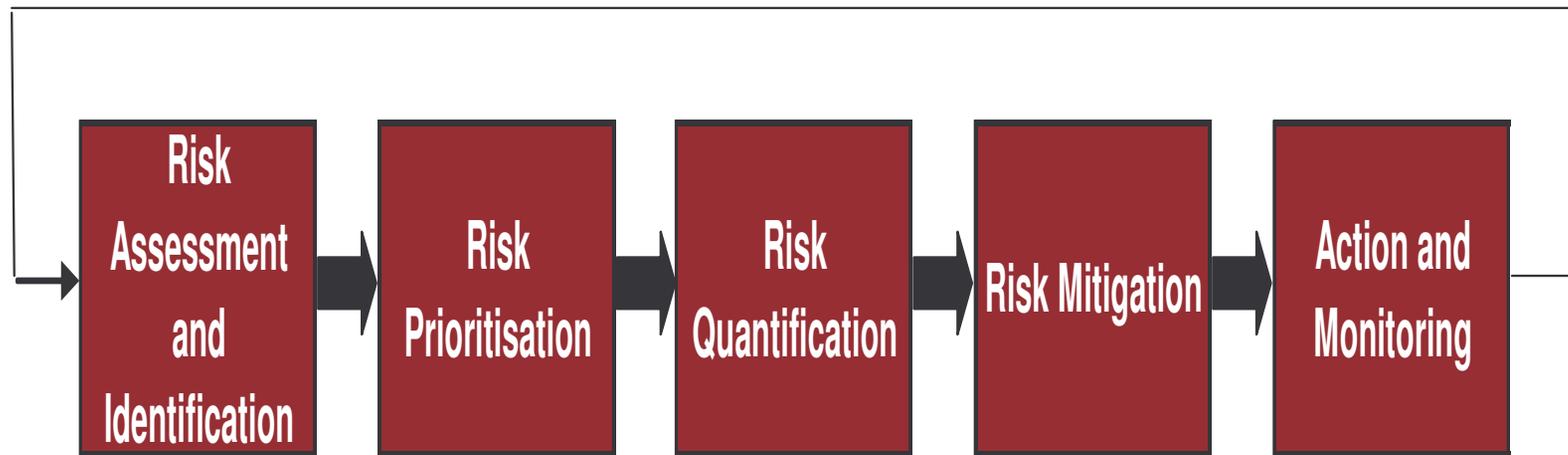
# Common Theme of ERM Frameworks

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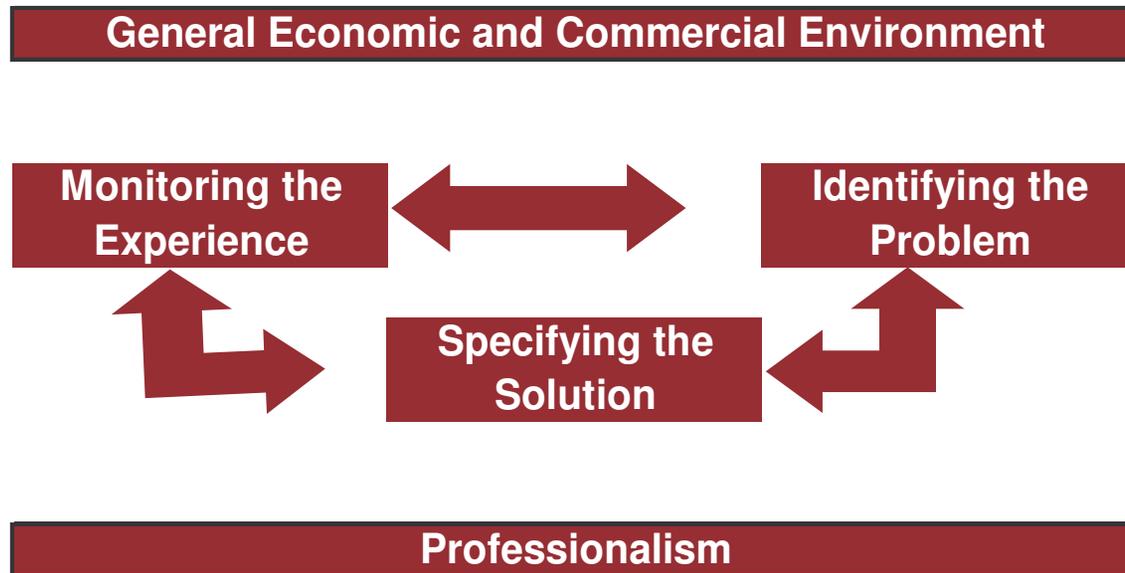
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**LOOKS  
FAMILIAR?**

# Common Theme of ERM Frameworks

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## *Actuarial Control Cycle*



# Parallel Development

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- Increasing global development of Actuarial ERM development
  - UK profession keen to rebrand actuaries as risk advisors and managers
    - FIRM development in UK
    - UK exam system from 2009
  - CAS – ERM Liaison forum
  - In USA Separate ERM conferences – since 2004
  - Banking ERM/ORM conferences

# Parallel Development

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- Actuarial Professions development
  - UK exam system from 2009
  - CAS
    - DFA from 2000 (exam 8), evolved into a section on ERM (exam 6) along with DFA
  - SOA – pioneered inclusion of ERM in syllabus
    - ‘Chartered Enterprise Risk Analyst’ from July 2007
  - Australian
    - 5 day CPD course planned for later this year
  - International Actuarial Association
    - Discussions are being held with the aim of introducing a global actuarial risk management qualification

# Parallel Competition

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- Other professions
  - GARP - Global Association of Risk Professionals
  - PRIMA – Professional Risk Management International Association
  - IRM – Institute of Risk Management
  - ERMII – ERM International Institute – Universities and professionals
  - CII/ Cass – joint MSc in Insurance & Risk Management
  - CPCU - American Institute for CPCU (Chartered Profession Casualty Underwriter)
  - IAA - Insurance Institute America
  - Risk & Insurance Management Society (RIMS)

# Qualities of Actuaries

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## Current

- **Quantitative skills**
- **Ethics**
- **Risk management skills**

## Additional

- **Communication skills**
- **Thought leadership**
- **Decision making**
- **Empathy**

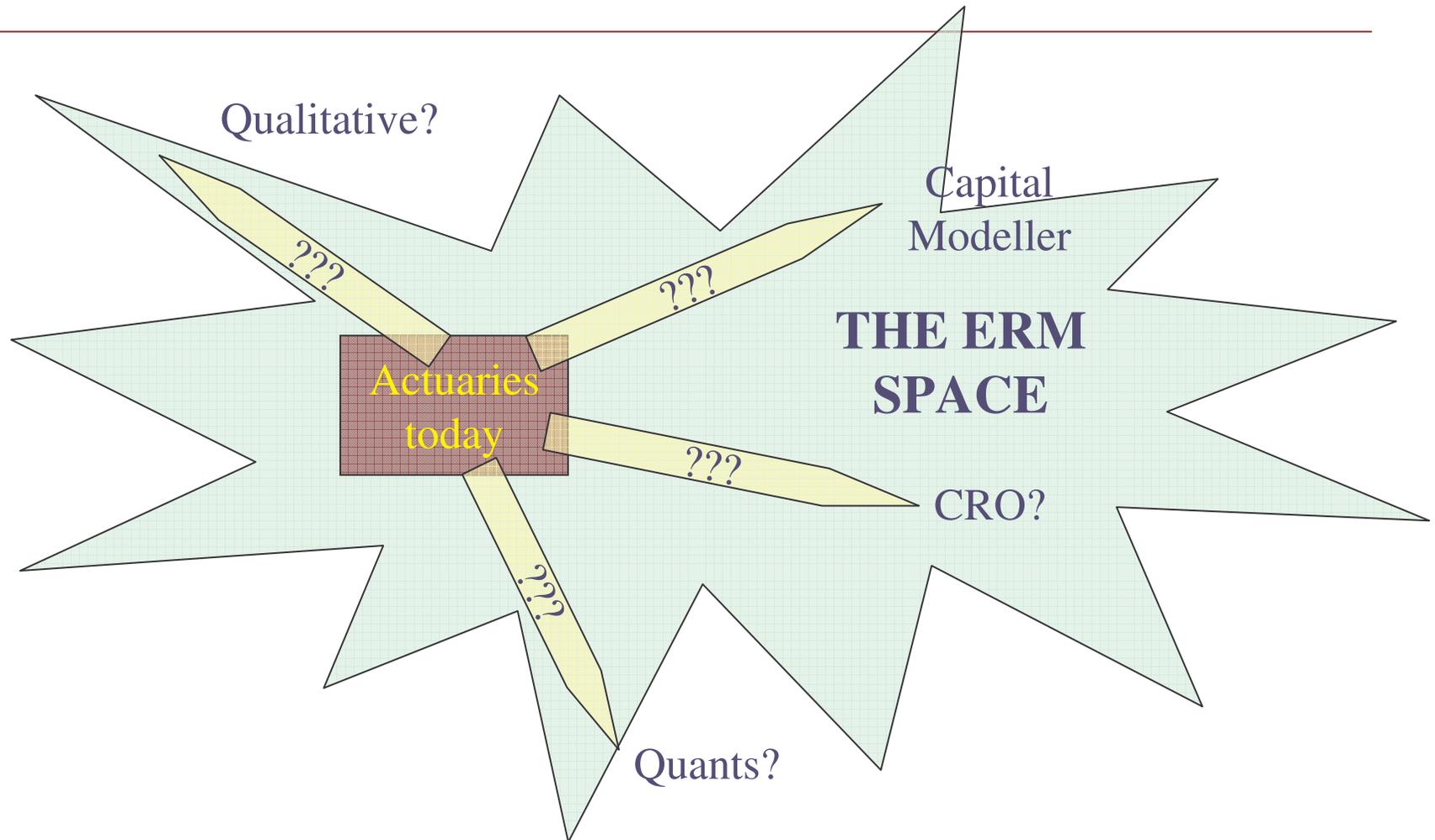
# Few Observations

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- **Many risk managers have accountancy or compliance background**
- **However, CRO positions are increasingly taken up by actuaries**
- **ERM development in GI industry is lagging behind other sectors such as manufacturing, energy**

# What Does This Mean for Us?

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# Proposed Next Steps

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- Form GIERM group
- Produce paper for Sessional Meeting
- Develop best practice, Solvency II compliant, Framework
- Participate in FIRM RMSIG and other groups
- More active links to USA, Australia and then India, China and other emerging countries?
- Challenge thinking about what an actuary is?

# Discussion

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- Do you think there is a need for actuaries to be involve in the ERM process?
- If yes, should the actuaries be a leader or a follower?
- How to implement ERM in practice?
- Difficulties faced by risk managers/actuaries/CRO
- Success stories
- Best practice?



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