

# Insurer Solvency Assessment

March 23, 2003

Financial Stability Institute,  
Basel (Switzerland)

IAA RBC Solvency Structure Framework Working Party

# Agenda

- Introduction
  - Earlier report of Solvency WP
  - Project status of current RBC WP
  - Next steps
- Overview of draft final report
- Preferred structure for solvency assessment
- Q&A and input on our progress

# Introduction

## Working Party Members:

Peter Boller (Germany & Switzerland)

Allan Brender (Canada)

Henk van Broekhoven\* (Neth)

Tony Coleman (Australia)

Jan Dhaene (Belgium)

Dave Finnis (Australia)

Marc Goovaerts (Belgium)

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Toshihiro Kawano (Japan)

Sylvain Merlus (France)

Glenn Meyers (USA)

Teus Mourik (Neth)

Harry Panjer (Canada)

Dave Sandberg (USA)

Nylesh Shah (UK)

Shaun Wang (USA)

Stuart Wason\*\* (Canada)

Hans Waszink (Neth)

Bob Wolf (USA)

\*\* Chair

\* Vice-Chair

# Introduction

- IAA Insurance Regulation Committee & the International Association of Insurance Supervisors (IAIS) co-operation on solvency issues
- IAA Solvency Working Party report delivered in early 2002 - key elements:
  - Classification of insurer risks
    - Underwriting
    - Credit
    - Market
    - Operational
    - Event
    - Liquidity
  - Risk assessment process overview

# Introduction

- IAA Solvency Working Party report delivered in early 2002 - key elements (cont'd):
  - Risk assessment process overview
    - Modelling tools
    - Key components of risk
    - Time horizon
    - Risk management
    - Combining risks
    - Distributions  $\Rightarrow$  assessment  $\Rightarrow$  risk measures
    - Implications for solvency assessment

# Introduction

- IAA Risk-Based Capital Solvency Structure Working Party formed spring of 2002
- Terms of reference:
  - describe principles & methods to quantify total funds needed for solvency
  - foundation for global risk-based solvency capital system for consideration by IAIS
  - identify best ways to measure the exposure to loss from risk & any risk dependencies
  - focus on practical risk measures & internal models

# Introduction

- Current WP progress (March 2002 to March 2003):
  - Meetings; numerous conference calls plus 2 face-to-face meetings of entire WP + many calls involving WP assignment groups
  - Wrap up meeting of WP scheduled next week (San Francisco)
- Deliverables to date
  - Presentation at EC event in Brussels June 25 together with GC
  - Presentation to IAIS Technical Sub-Committee Nov 20
  - Draft incomplete report with case studies and appendices totalling 140+ pages (November 2002)
  - Sought input on our progress from various parties and obtained broader member association input (on-going effort in this regard)

# Introduction

- Steps until delivery of draft final report in May 2003:
  - Consider final input from IAA Insurance Reg'n Committee and interested supervisory bodies (e.g. IAIS, EC, etc.)
  - Compile work presently done (focus on streamlining of text; Chapter 6; case study expansion etc.)
  - Face-to-face wrap up meeting in San Francisco at the end of March
  - Draft final report due in Sydney in May 2003



# Outline of draft report

- Table of contents:
  - Chapter 1 - Introduction - terms of reference
  - Chapter 2 - Executive Summary - (under construction)
  - Chapter 3 - Solvency, the Supervisory Challenge
  - Chapter 4 - Preferred Structure for Solvency Assessment
  - Chapter 5 - Insurer Risk Types & Measures
  - Chapter 6 - Factor-Based Approach
  - Chapter 7 - Internal Model Approach
  - Chapter 8 - Reinsurance
  - Chapter 9 - Total Company Approach
  - Glossary
  - Appendices (case studies, analytic methods etc.)

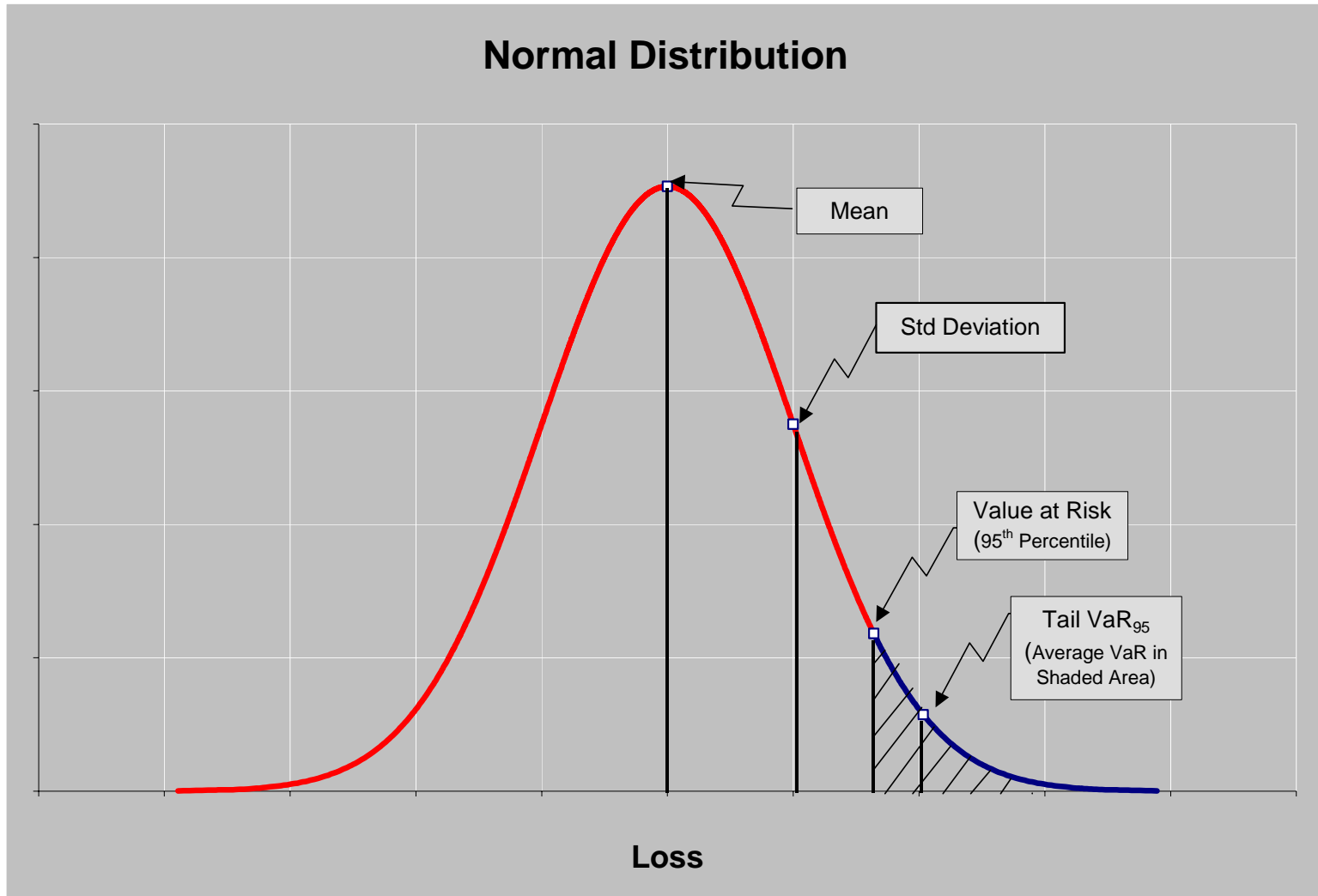
# Preferred Structure for Solvency Assessment

- Multi-pillar approach to supervision
  - set of capital requirements is necessary for solvency assessment but not sufficient by itself
- Types of risks to be included
  - all types of insurer risk to be included
- Principles vs rules based approach
  - “Principles-based” approach focuses on “doing the right thing” but requires reliance and risk-based supervision
  - “Rules-based” approach is objective & simple but may not capture an insurer’s risks appropriately - encourages “gaming the system”

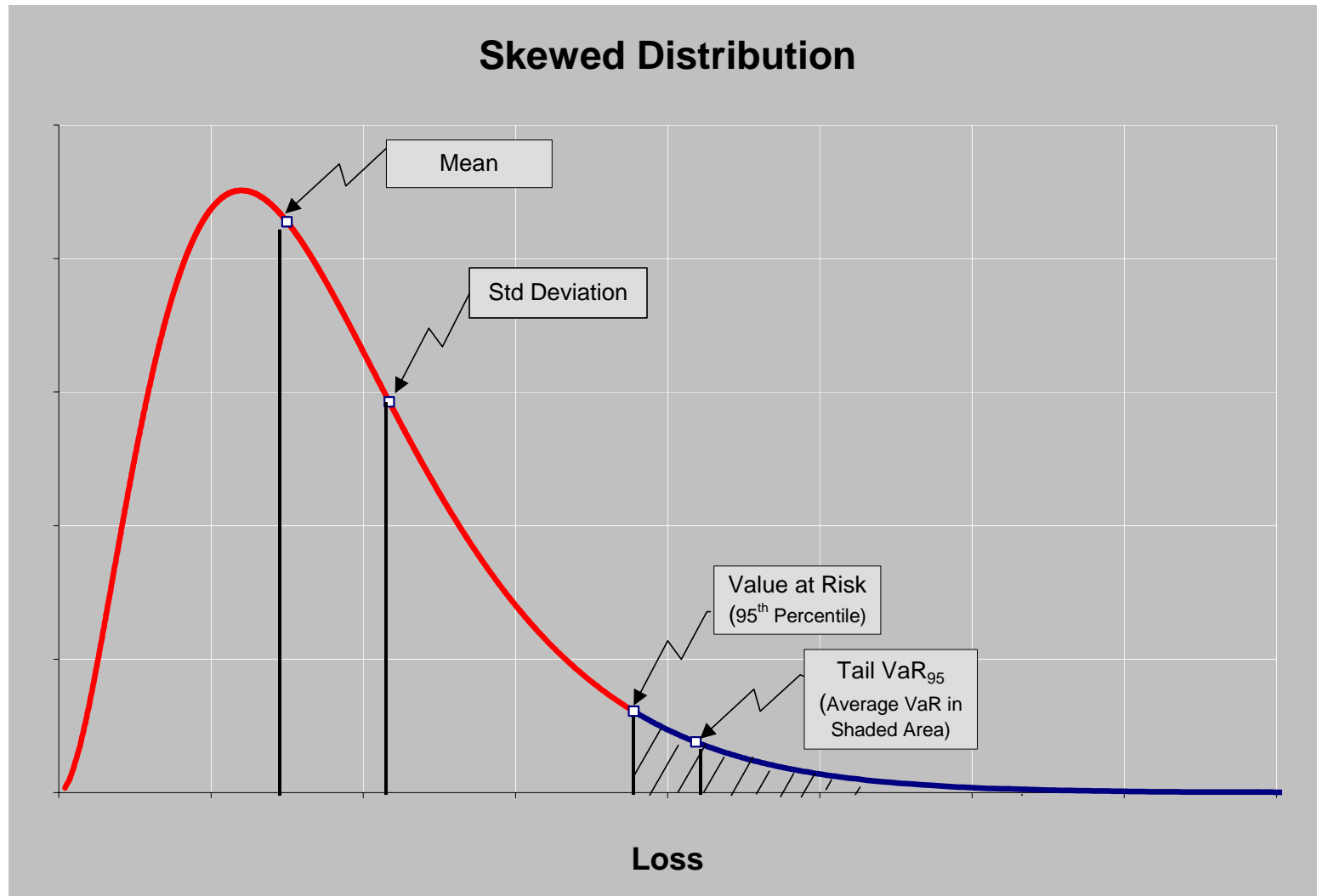
# Preferred Structure for Solvency Assessment

- Integrated balance sheet approach
  - insolvency s.b. determined on an economic basis as measured by difference between present value amount of insurer's obligations when valued at a high confidence level (e.g., 99%) and best estimate (fair?) value of insurer's assets
  - this amount of total capital margin (TCM) can be split between the margins held implicitly or explicitly in the assets and liabilities and the remainder amount, which is required surplus
- Appropriate risk measures
  - need to be clearly described
  - preference for consistent (e.g., coherent) measures such as TailVar

# Appropriate Risk Measures



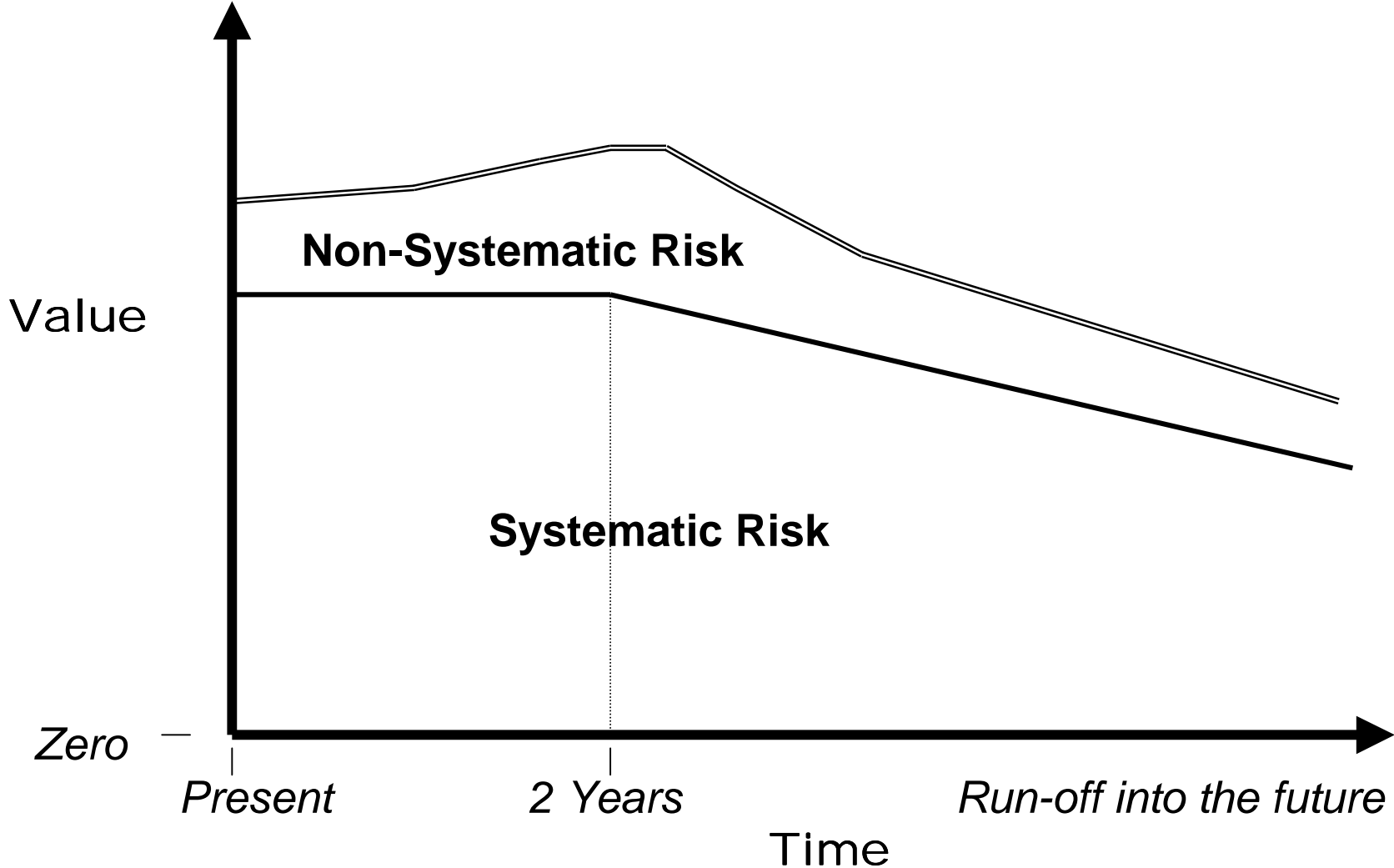
# Appropriate Risk Measures



# Preferred Structure for Solvency Assessment

- Appropriate time horizon
  - Need to recognize full duration of business
  - Need to ensure solvency over a suitable supervisory control horizon such as one or two years
  - **Systematic risk** arises from **uncertainty risk** (i.e., model specification error, parameter estimation error, structural risk error) and **extreme event risk** (i.e., high impact one-time shocks, events which may be completely unanticipated and not captured in model)
  - Uncertainty risk is generally considered to be non-diversifiable
  - **Non-systematic risk** (also called volatility risk or process risk) represents random fluctuations in experience and is considered to be diversifiable

# Time Horizon Illustration



# Preferred Structure for Solvency Assessment

- Risk dependencies
  - must recognize risk dependencies, concentration and diversification
  - Should put focus on tail dependency, ie. when “things get really bad”
  - mathematical concepts such as copulas can be used
- Risk management
  - solvency assessment should recognize the impact of risk management



# Case Study Results - General Insurance

Sample calculations demonstrate the difficulties inherent in assessing impact of reinsurance using factor-based approach

	Australian		Internal Risk Management	
	ABC	XYZ	ABC	XYZ
No Re	1.000	1.000	1.000	1.000
Cat Re	0.799	0.971	0.939	0.839
Full Re	0.756	0.922	0.800	0.500

# Preferred Structure for Solvency Assessment

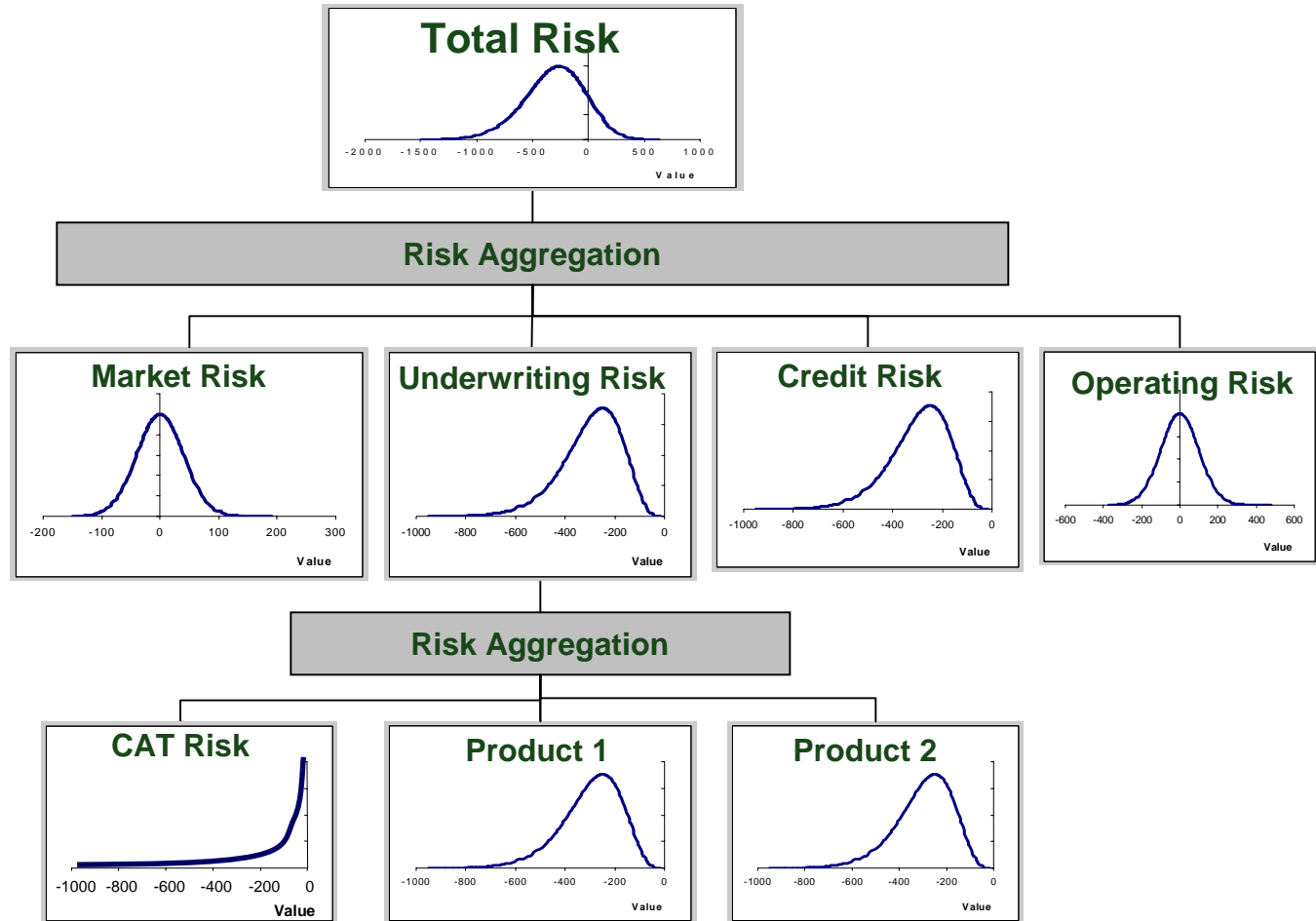
- Internal models
  - useful for modelling all quantifiable risks and risk dependencies
- Factor-based approaches
  - WP suggests the conditions needed for simple vs complex risk measures

# Preferred Structure for Solvency Assessment

Total  
Company  
Risk

Risk Type

Products



# Working Party report in May 2003

- Key principles for preferred insurer solvency assessment framework defined
- Preferred framework makes use of a combination of either internal risk models or a factor-based approach along with a process for aggregating these to form a total company capital requirement
- Appropriate risk measures are defined
- Appropriate aggregation processes are defined
- Case studies illustrate how solvency assessment can be done
- Discussion of how preferred framework would have lessened the likelihood of prior insolvencies
- Work to calibrate factor based approach to individual jurisdictions would be an additional next step

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