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# ***Enterprise Risk Management***

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***Anurag Saksena***

Case Studies of ERM in Financial Regulation

CAS Conference

March 30, 2007

# *ERM Vision and Mission*

## **Vision**

Achieve leading-edge competency in enterprise risk management.

## **Mission**

Enhance the value of the firm by ensuring that business strategies and risk management objectives are aligned across the company. Foster a risk-aware culture to support business strategies.

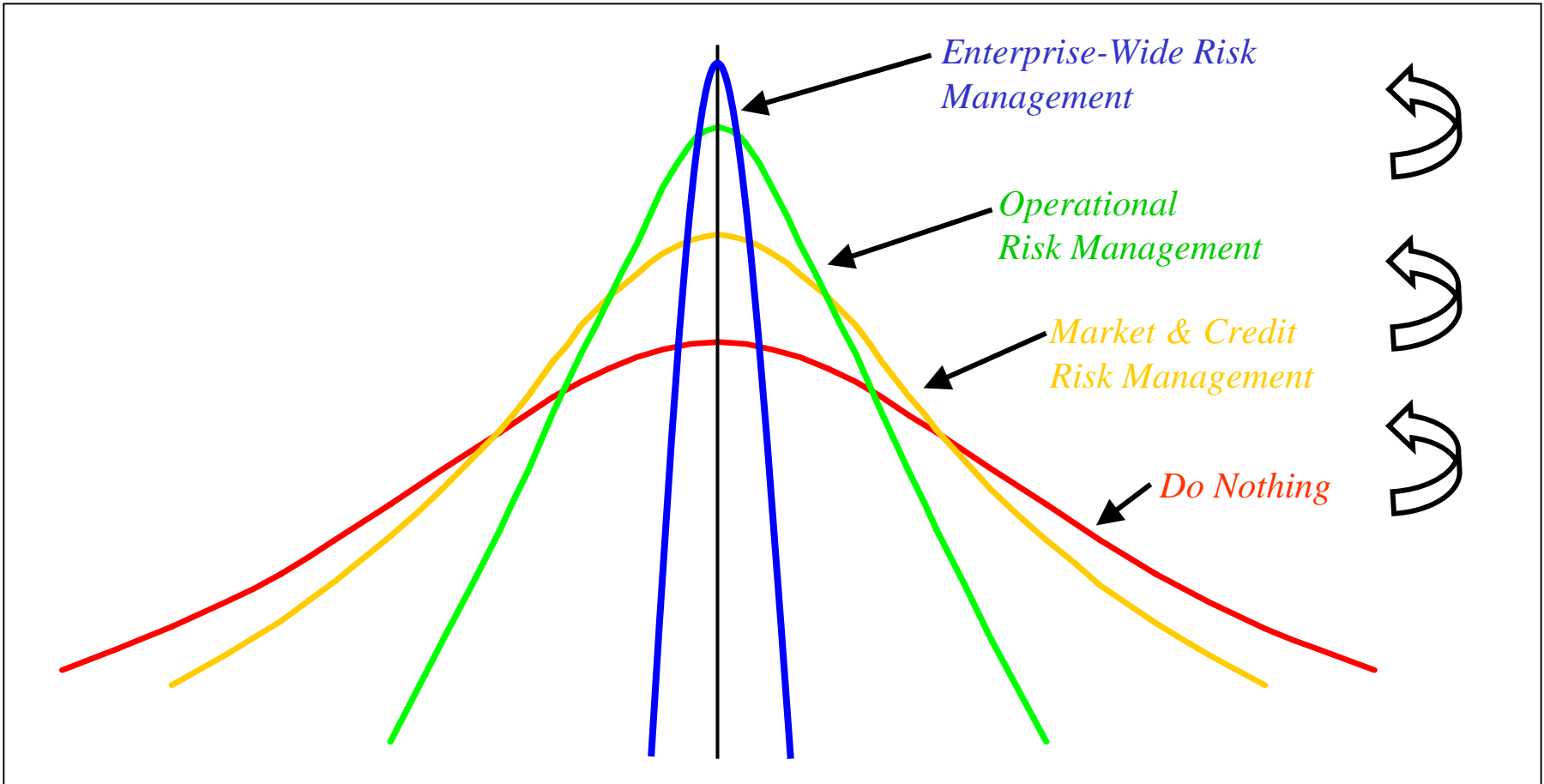
## *ERM Principles*

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- **Business Leaders are responsible for identifying, measuring, and managing risk inherent to their operations.**
  
- **Enterprise Risk Management:**
  - Partners with business areas to ensure alignment of business and enterprise risk management objectives
  - Provides tools, framework and independent oversight of risk-taking activities
  - Continuously benchmarks best practices
  - Balances the art and science of risk management.

**Everyone is a Risk Manager**

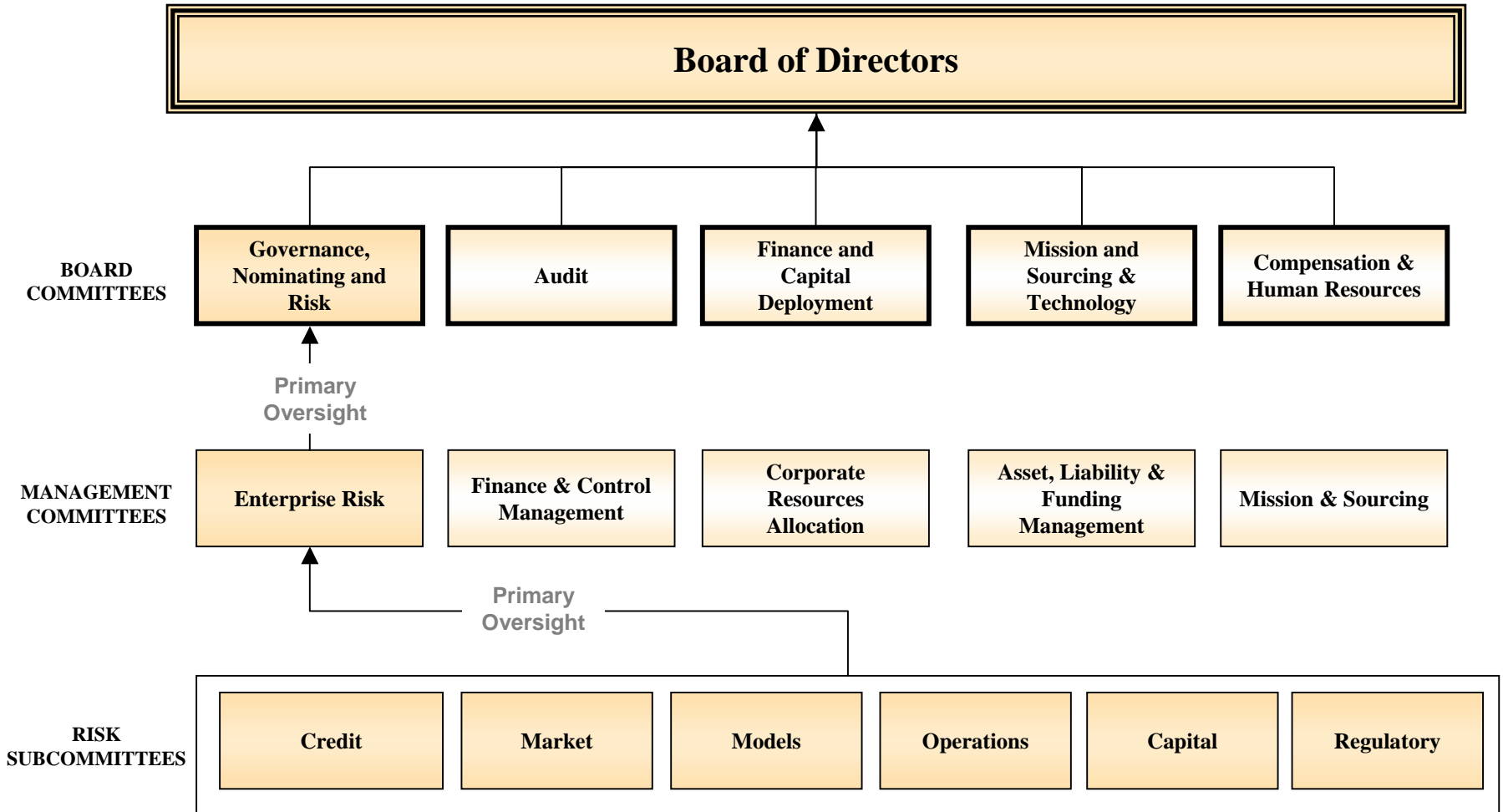
# What is Enterprise Risk Management ?



*Results*

*Risk Management is an Enterprise Asset*

# Enterprise Risk Management Governance



An Enterprise Risk Committee, supported by risk subcommittees, provides an independent, aggregate assessment of risks

# Enterprise Risk Inventory

Risk	Definition <i>Risk of loss or an adverse event resulting from . . .</i>
<b>Credit</b>	Failure of borrower or counterparty to meet contractual obligations.
<b>Market</b>	Adverse effects of moves in interest rate markets, lack of liquidity, or fluctuations in foreign exchange.
<b>Operational</b>	Failures or inadequacies involving people, processes, technology or external events.
<b>Accounting / Financial Reporting</b>	Errors in accounting policy or application, or from delays in financial reporting.
<b>Model</b>	Failure or errors in theory, statistical work, or computer code underlying a model; or risk arising from misapplication of model results.
<b>Strategic</b>	Business strategies that fail to provide adequate returns or corporate objectives.
<b>Reputation</b>	Decline in reputation in market.
<b>Regulatory</b>	Violations of or inability to meet regulatory requirements, which could result in criminal sanctions, fines, civil penalties or other adverse regulatory consequences.
<b>Legal</b>	Adverse legal judgments against the company, or failure / inability to protect our legal interests.
<b>Legislative</b>	Adverse legislative events.
<b>Systemic</b>	Market breakdowns due to interdependence of financial market participants.

Can be measured & managed

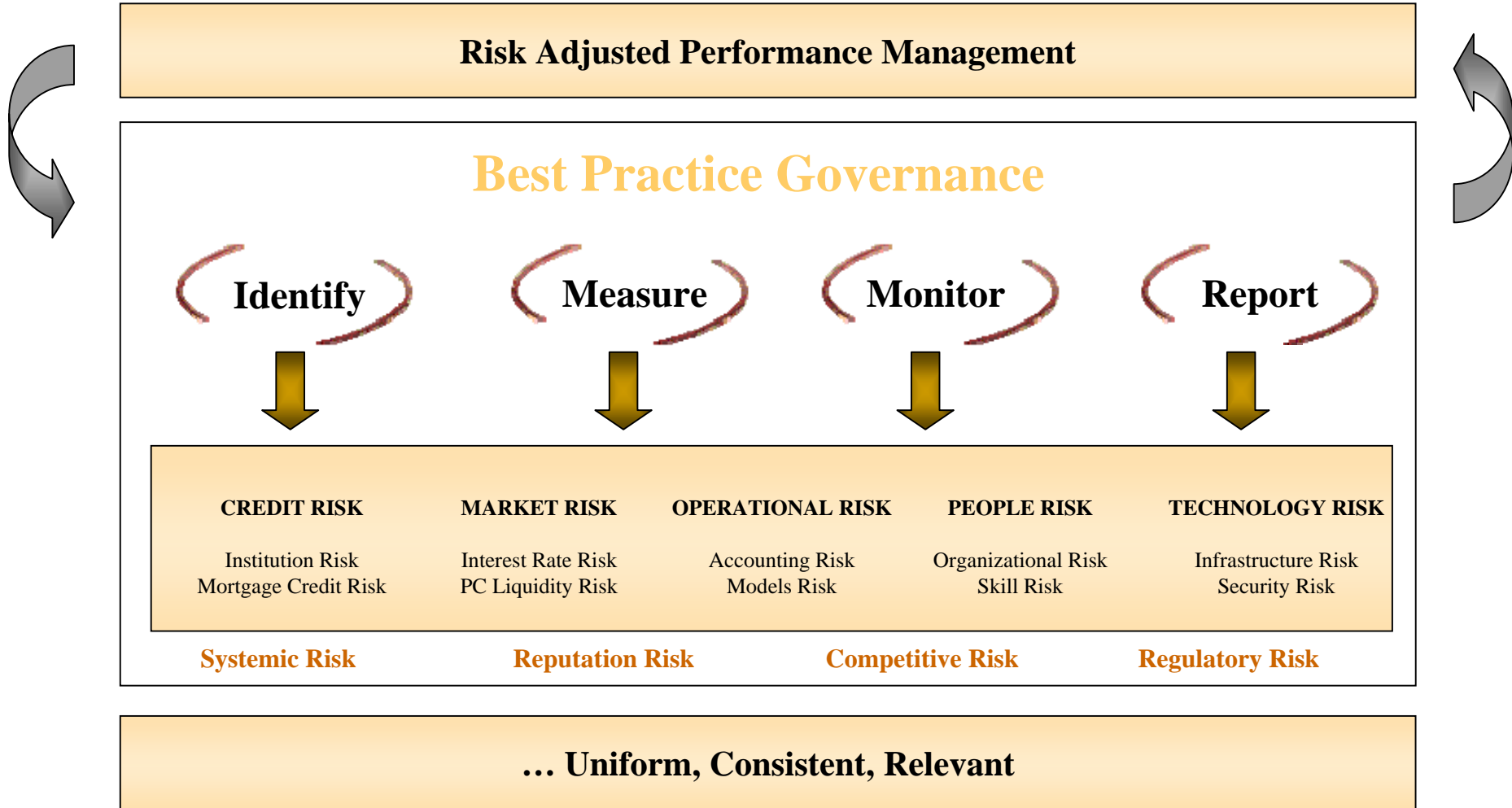
Can be managed, but not necessarily measured

Can only be responded to

# Risk Category Characteristics

Features	Credit Risk	Market Risk	Operational Risk
Characteristics	<ul style="list-style-type: none"> <li>▪ Credit quality</li> <li>▪ Established accounting conventions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Securities; interest rate</li> <li>▪ Established accounting conventions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Processes</li> <li>▪ Behavior</li> </ul>
Nature of loss	<ul style="list-style-type: none"> <li>▪ Exposure at default x probability of default</li> </ul>	<ul style="list-style-type: none"> <li>▪ Exposure to change in market factors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Severity x frequency</li> <li>▪ Most “frequencies” can be controlled</li> </ul>
How it is managed	<ul style="list-style-type: none"> <li>▪ Scoring/portfolio limits</li> </ul>	<ul style="list-style-type: none"> <li>▪ Empirical testing</li> <li>▪ Market risk limits</li> </ul>	<ul style="list-style-type: none"> <li>▪ Collaborative</li> </ul>
Risk indicators	<ul style="list-style-type: none"> <li>▪ Downgrades</li> <li>▪ Delinquencies</li> <li>▪ Defaults</li> </ul>	<ul style="list-style-type: none"> <li>▪ Market action</li> <li>▪ Volatility</li> <li>▪ Illiquidity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Self Assessment/audit/exam results</li> <li>▪ Losses</li> <li>▪ Environmental and operational changes</li> </ul>
Exposure measures	<ul style="list-style-type: none"> <li>▪ Facilities/ratings</li> <li>▪ PD/LGD</li> <li>▪ EL/UL/stress tests</li> </ul>	<ul style="list-style-type: none"> <li>▪ Notional amounts</li> <li>▪ Sensitivity/stress test</li> <li>▪ VAR</li> </ul>	<ul style="list-style-type: none"> <li>▪ Scenarios</li> <li>▪ Scorecards</li> <li>▪ Common language</li> </ul>
Data availability for same confidence level	<ul style="list-style-type: none"> <li>▪ Decades of data on PD/EAD/LGD for each risk rating</li> </ul>	<ul style="list-style-type: none"> <li>▪ 250 data points per year per market factor</li> </ul>	<ul style="list-style-type: none"> <li>▪ Majority of industry has less than 5 years of data – mixed quality</li> </ul>

# Enterprise Risk Management Framework



# Case Studies in ERM and Regulation

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Charles Taylor  
Director, Operational Risk  
Risk Management Association

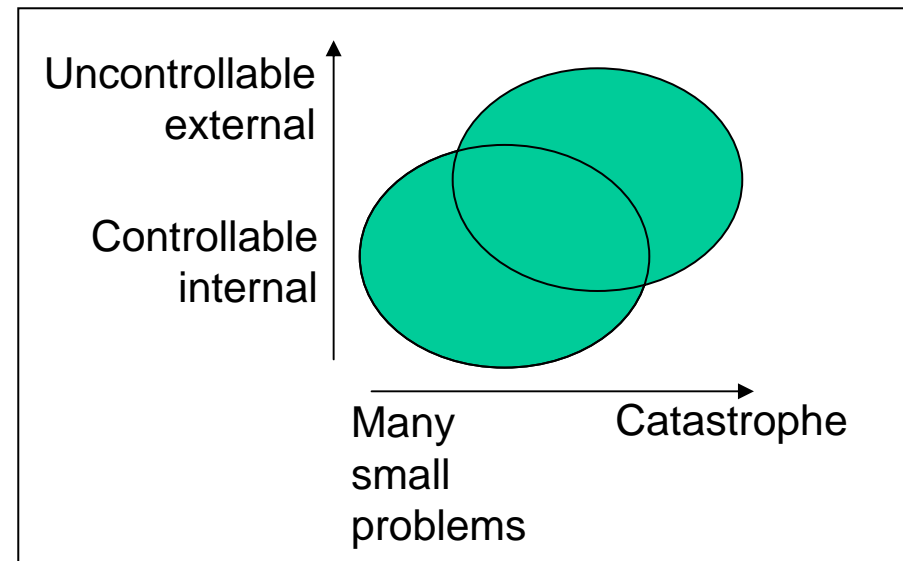
*ERM Symposium, March 30<sup>th</sup> 2007, Chicago*

# Needed: a Causal Theory of Tail Events

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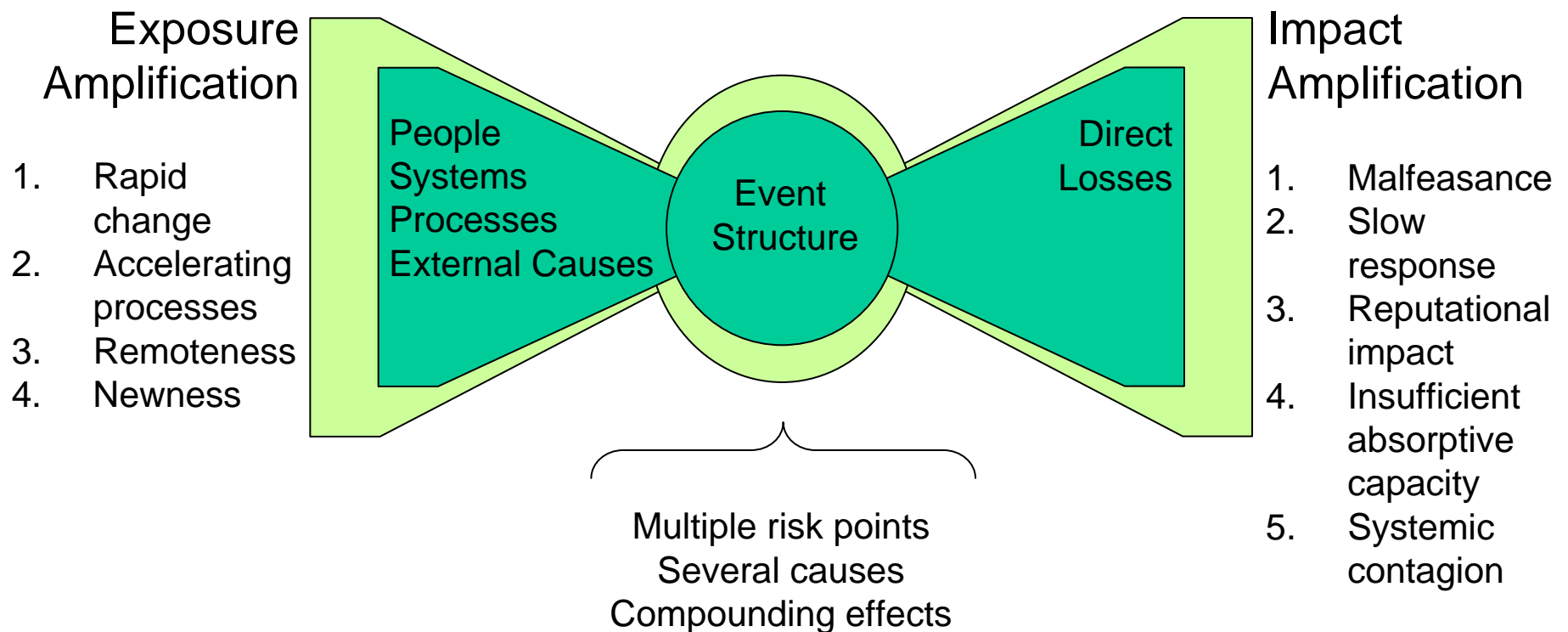
## Origins:

- Several controllable little internal mishaps
- An uncontrollable external catastrophe
- Amplifiers
  - A combination of the two
  - Malfeasance
  - Reputational impact
- Pattern

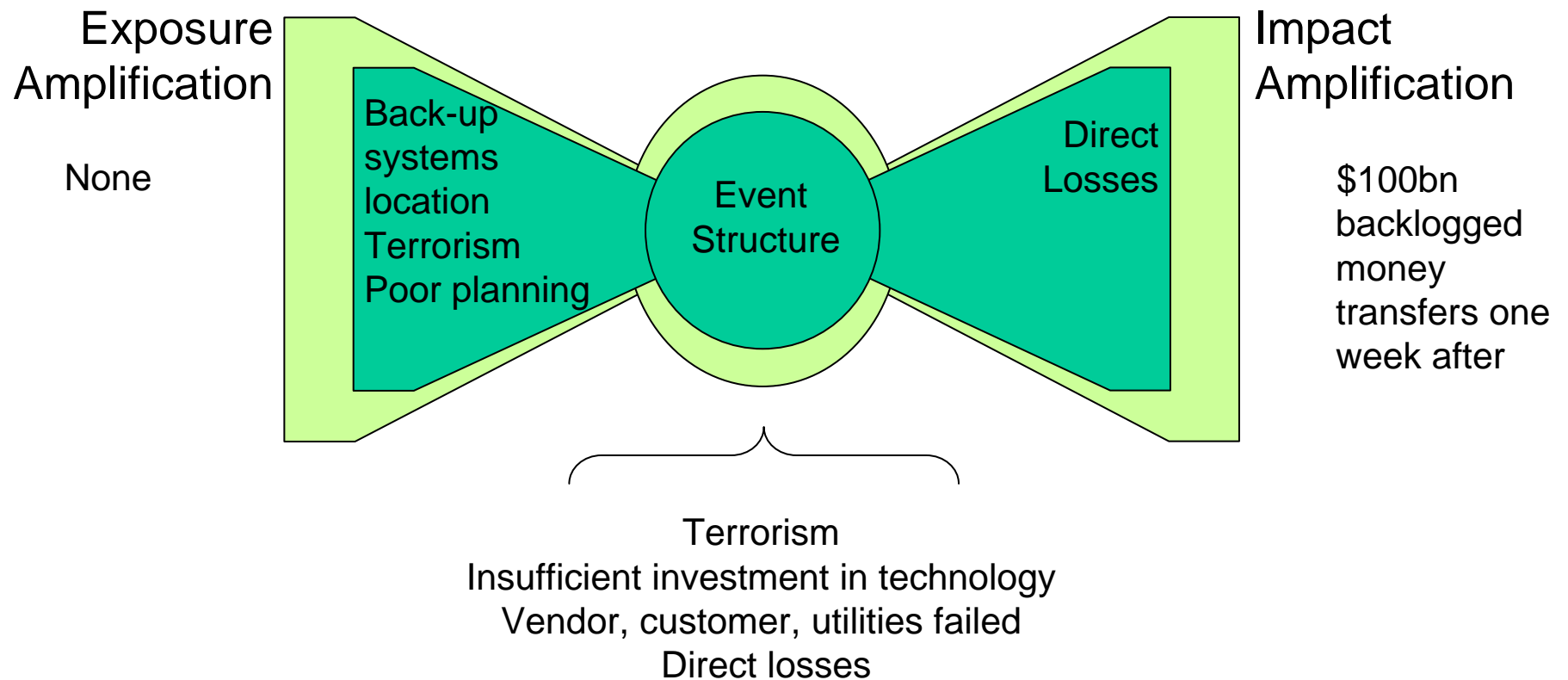


*Regulators have the stronger interest in the development of such a theory*

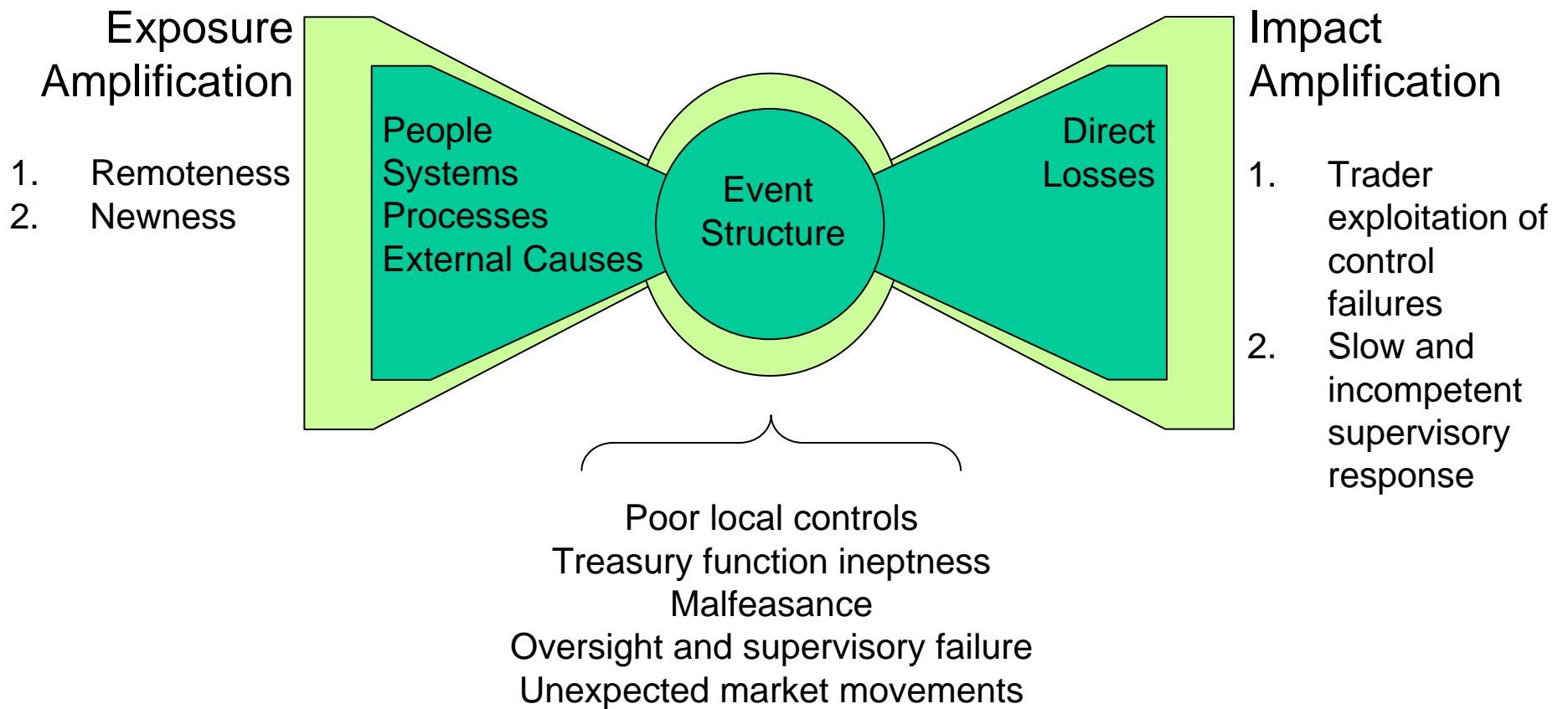
# The Tail Event Version of the Bow Tie Theory



# Bank of New York: 9/11: \$743mm

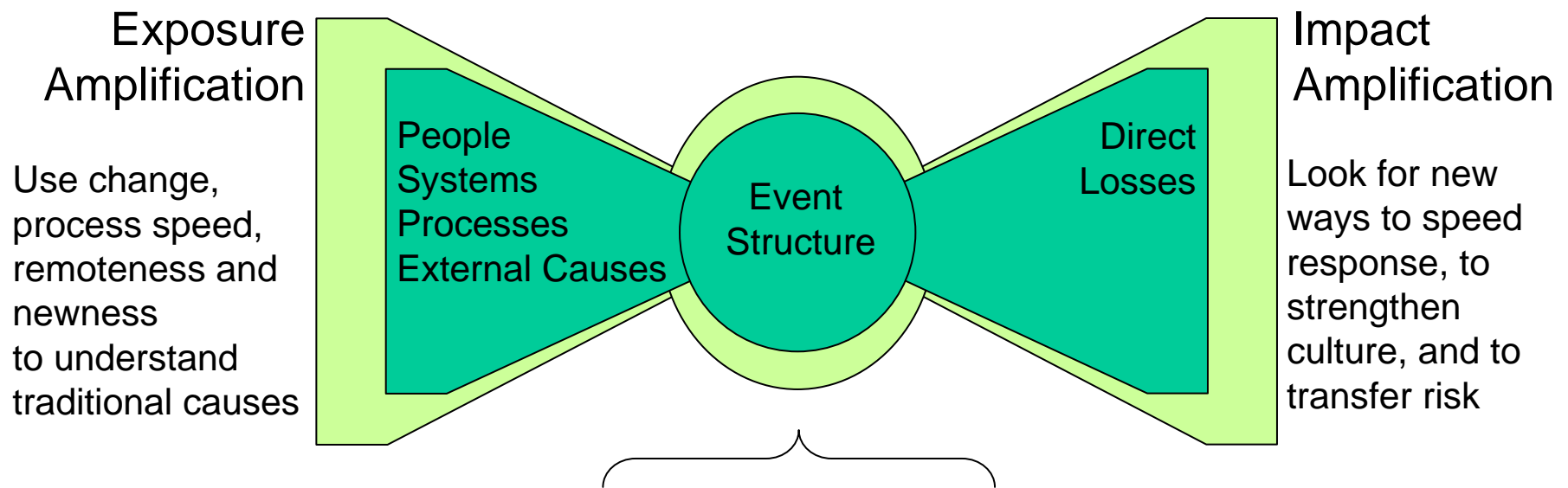


# Barings: Feb 1995: \$1.3bn



*The Bow Tie: Rick Cech, RiskBusiness International*

# Conclusions for ERM and Regulation



Understand limits of risk point taxonomies  
Define risk point neighborhoods in different scenarios  
Value of investigating small deviations from expectations  
Consider common extreme scenarios for contingency planning

**CASE STUDIES  
IN FINANCIAL REGULATIONS:  
Fannie Mae and Freddie Mac**



**James B. Lockhart III, Director  
Office of Federal Housing Enterprise Oversight  
Enterprise Risk Management Symposium, Chicago, Illinois  
March 30, 2007**

# Fannie Mae and Freddie Mac Mission

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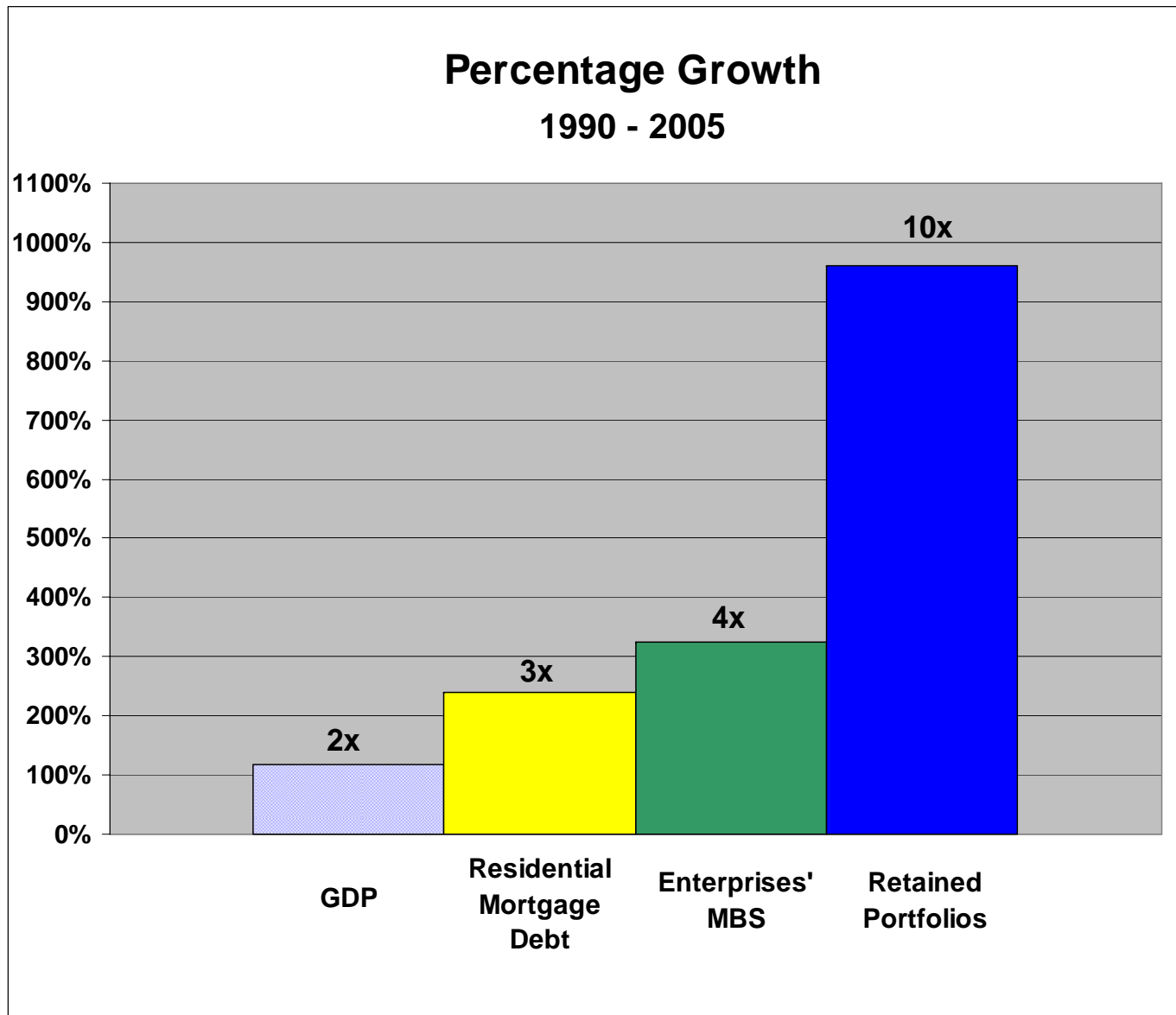


**To provide liquidity and stability to the secondary mortgage market while promoting affordable housing.**

**To effectuate their mission both:**

- **Provide stability in the secondary mortgage market.**
- **Respond appropriately to private capital markets.**
- **Provide assistance to the secondary mortgage market, especially affordable housing.**
- **Promote access to mortgage credit throughout the nation.**

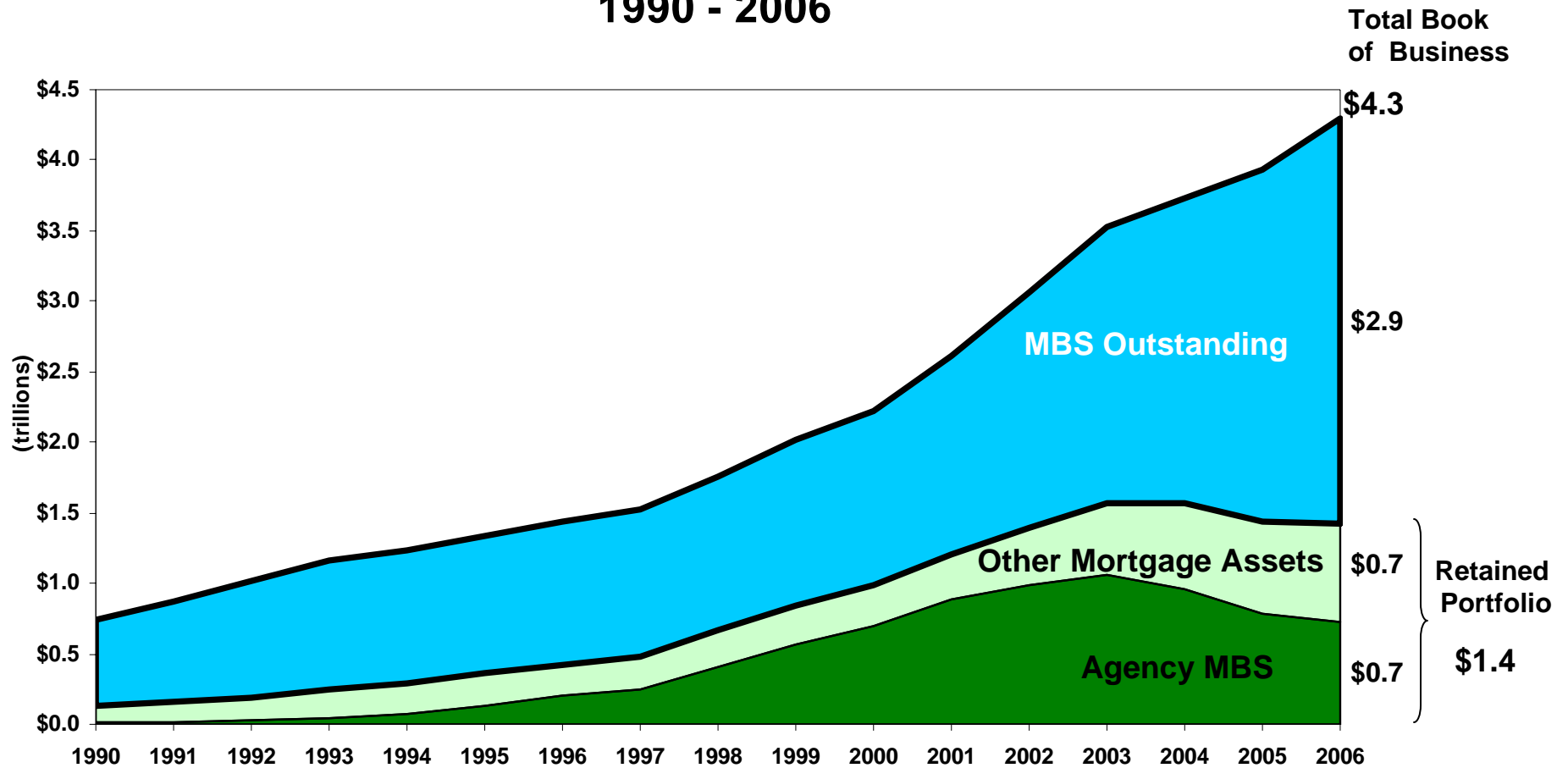
# Enterprises Have Grown Very Rapidly



# Combined Book of Business Continues to Grow



## Enterprises' Combined Total Book of Business 1990 - 2006



# Matters Requiring Significant Supervision



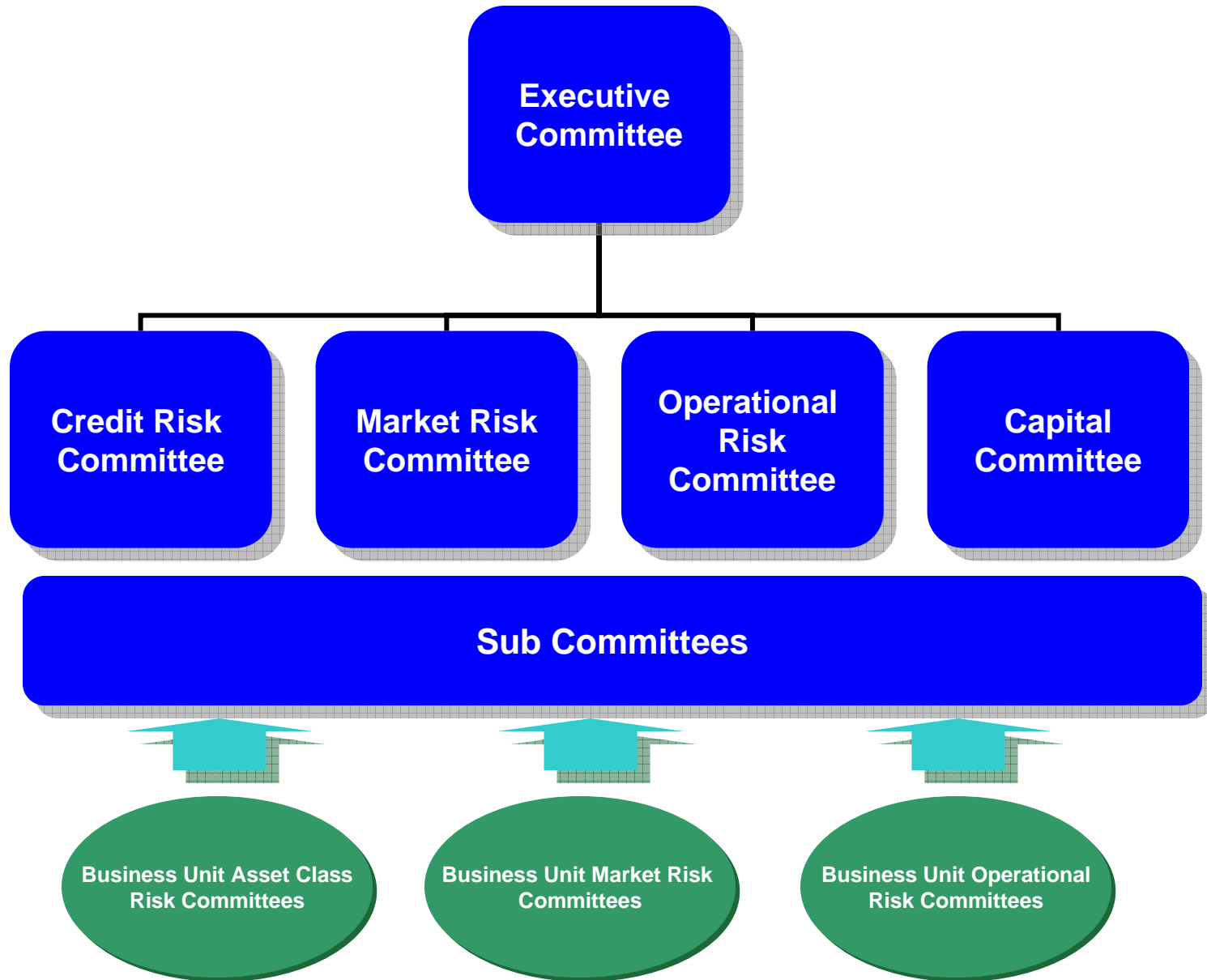
- **Both Enterprises suffered through years of mismanagement and underinvestment in infrastructure which facilitated earnings manipulation.**
- **They have not been regular timely filers of audited financials for four years and it may take another year.**
- **Each Enterprise is spending billions on remediation.**
- **Although some progress has been made, significant issues requiring OFHEO oversight include:**
  - **data integrity**
  - **internal controls**
  - **risk management**
  - **accounting and operating systems.**

# Enterprise Risk Management

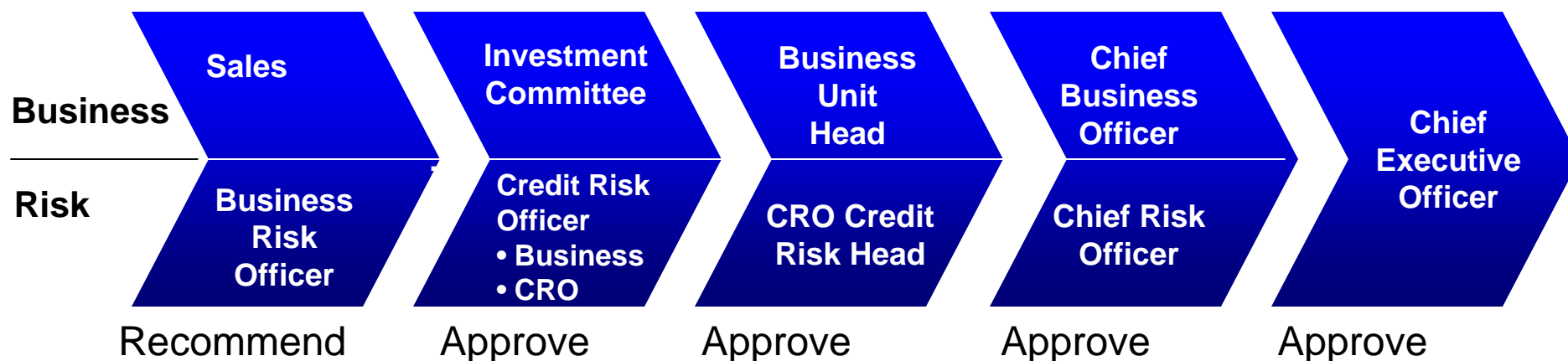
Enrico Dallavecchia, Chief Risk Officer  
Fannie Mae  
March 30, 2007  
ERM Symposium

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# Governance Design for Enterprise Risk Management



# Governance in Action – Large Transaction



- Delegations of Authority
  - Determine Approval Levels
  - All Large Transactions or Significant Risk Exposures Require Both Front-Office and Risk Approval
  - Transaction Size Determines Approval and Escalation Requirements
- Credit Risk Committee Review (Business Unit Level and Chief Risk Office Level)

# Governance in Action – New Initiative



- Assessment Occurs Before Initiative Launches
  - Level of Review Commensurate with Level of Risk
  - Functional Areas, Such as Credit, Market, Legal and Operations, Finance, Approve Initiative Risk Controls
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# Governance in Action—Operational Risk



Functional Area	Role
<ul style="list-style-type: none"><li>Operational Risk Committee</li></ul>	<ul style="list-style-type: none"><li>Review Policies, Framework, and Risk Position</li></ul>
<ul style="list-style-type: none"><li>Business Units</li></ul>	<ul style="list-style-type: none"><li>Effective Execution of Risk Management Responsibilities</li></ul>
<ul style="list-style-type: none"><li>CRO/Operational Risk Oversight</li></ul>	<ul style="list-style-type: none"><li>Develop Policy, Framework and Tools for Managing Operational Risk</li></ul>
<ul style="list-style-type: none"><li>Division Risk Office</li></ul>	<ul style="list-style-type: none"><li>Business Unit's Risk Management Arm for Execution</li></ul>

# Governance/Delegation of Authority Philosophy

Risk Committees	Individuals
<ul style="list-style-type: none"><li>● Review, Advise, Recommend, Escalate (Chair), Syndicate and Solicit</li><li>● Report or Recommend to Parent Committee</li><li>● Appoint and Receive Reports or Recommendations From Subcommittees</li><li>● Limited Approval Authority</li></ul>	<ul style="list-style-type: none"><li>● Approve Enterprise-Wide Management Programs, Policies, and Standards</li><li>● Approve Limits and Exceptions – Corporate and Business Unit</li><li>● Monitor Enterprise-Wide Risk Exposure</li><li>● Approve Economic Capital, Methodologies, and Metrics</li><li>● Conduct Independent Model Reviews</li></ul>

# Thank You

**Please Note:** This presentation is designed to provide an overview of general concepts relating to enterprise risk management structures of financial companies and is not intended to reflect Fannie Mae's current [or future] risk management structure or policies.

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