

# ERM: What Have You Done for Me Lately?

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# Overview

1. What is ERM?
2. How has ERM been used over the last few years?
3. Has loss reserving been incorporated into the ERM process yet?
4. How is ERM perceived in the market?
5. What is the future of ERM in general?

# Question 1

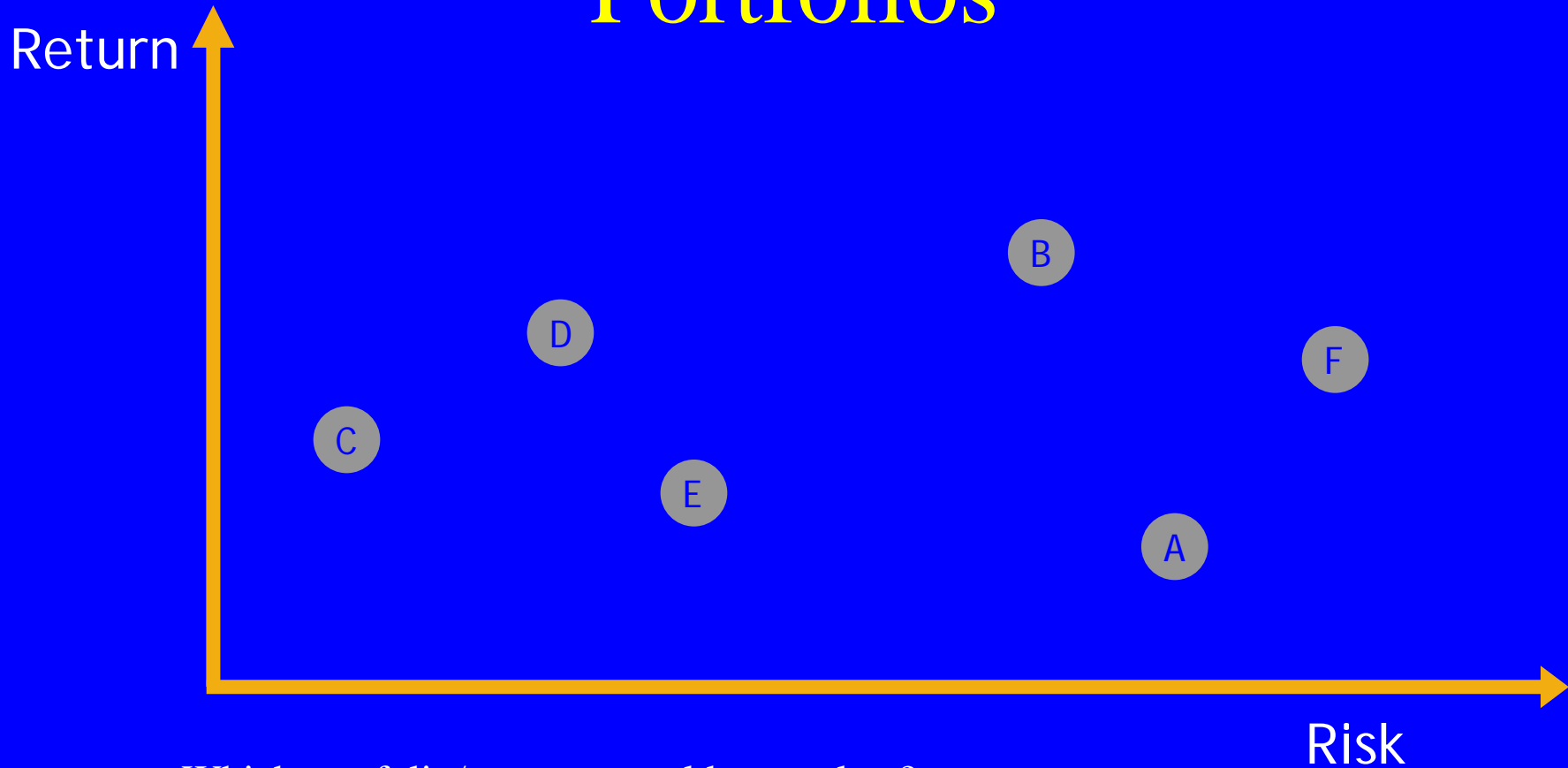
What is ERM?

How does it differ from the RM that insurance companies have always done?

# ERM

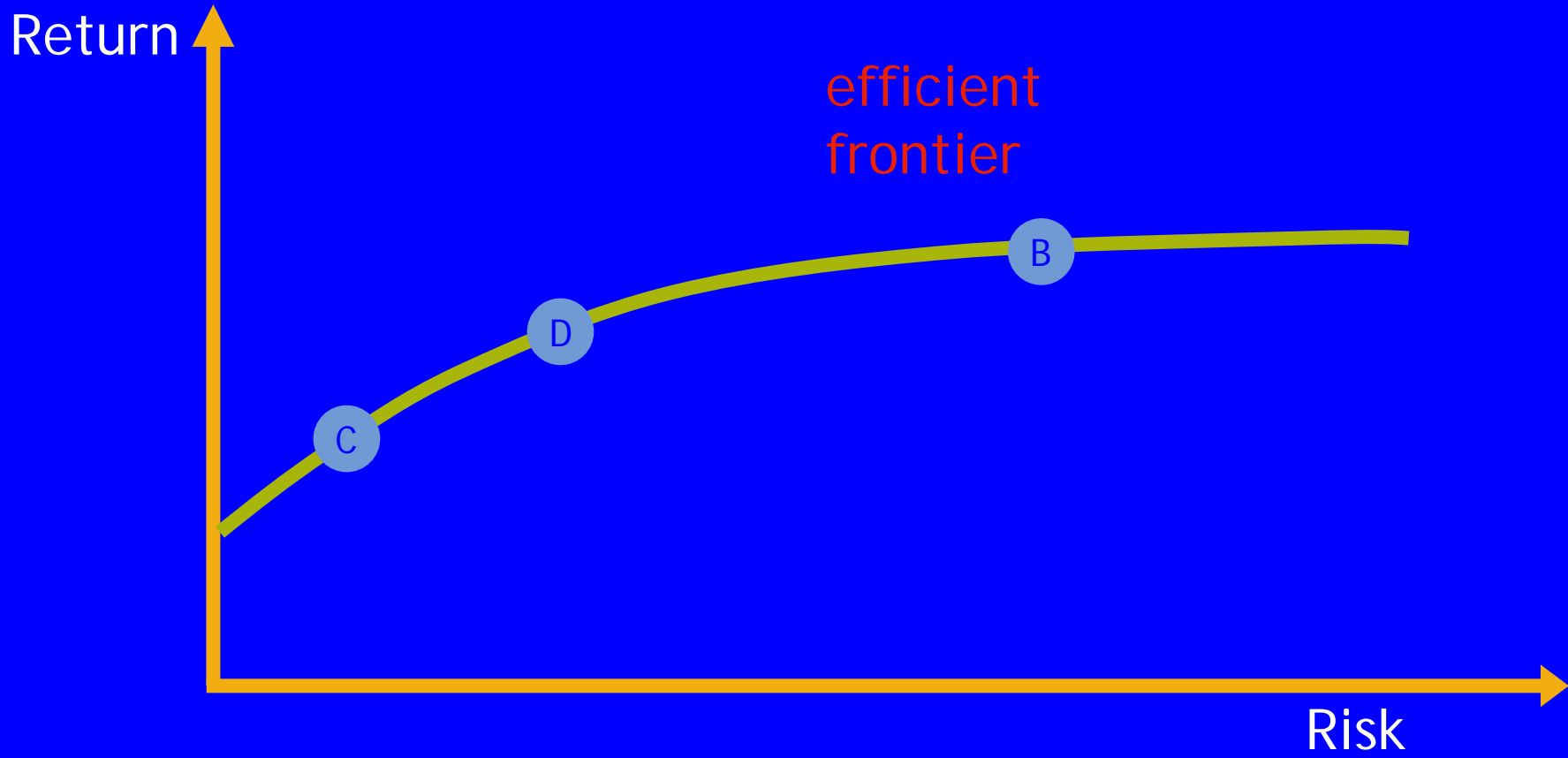
- ERM is the integration and aggregation of risk to optimize the value of an organization
- ERM differs from traditional risk management by viewing risk in a portfolio framework and considering the upside potential of a risky situation

# Risk and Return of Considered Portfolios



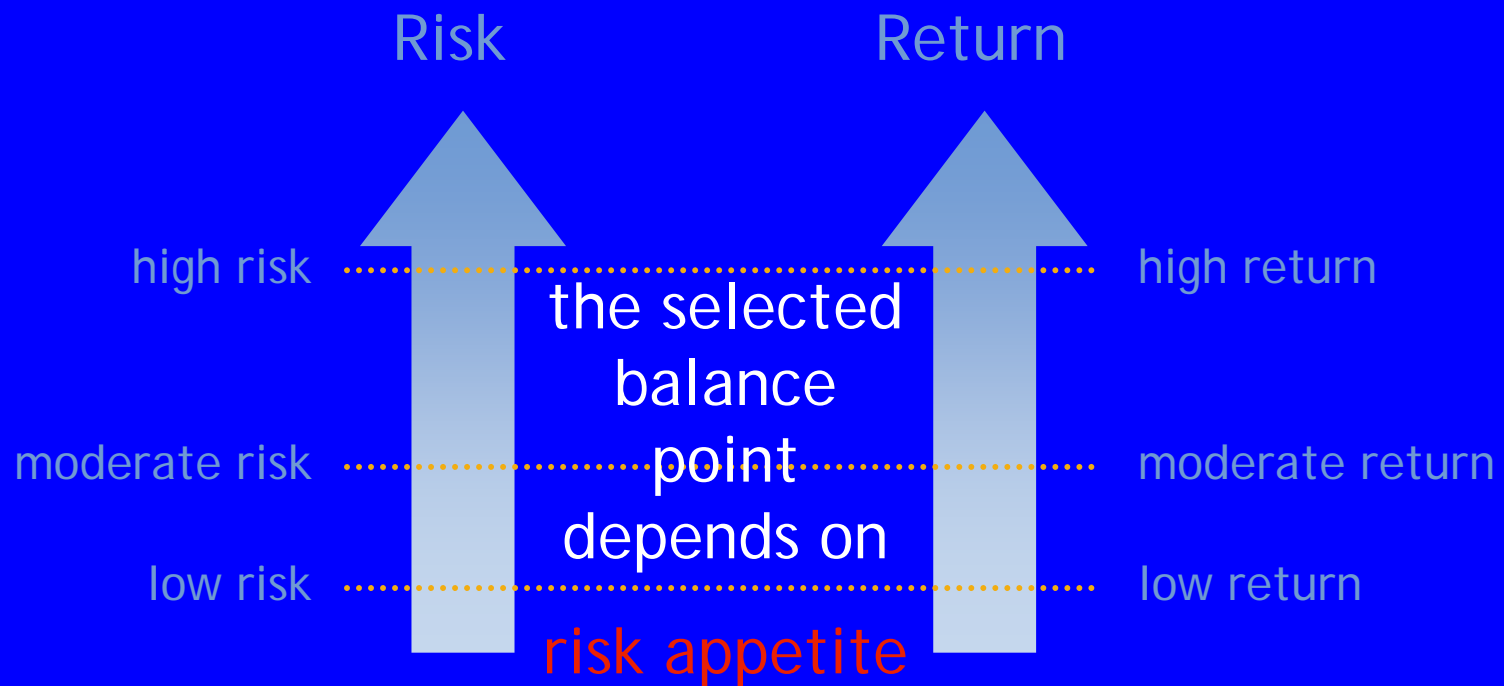
Which portfolio/strategy would you select?

# Identifying the Set of Portfolios with Max Return Given Risk



# “Portfolio View”: Risk and Return

Enterprise risk management involves selecting where to strike the balance, and then maintaining it



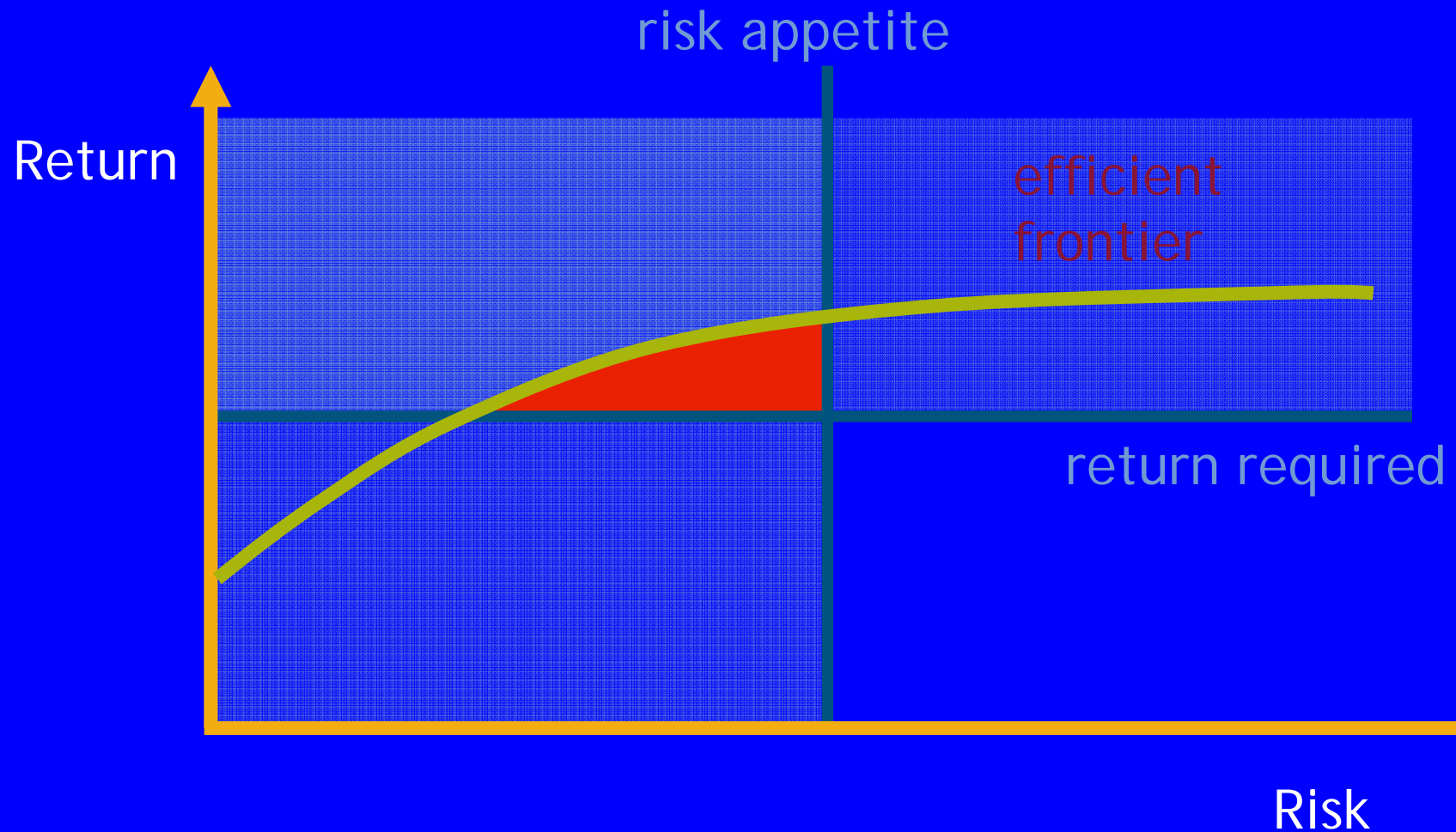
Enterprise risk management is NOT just risk reduction

# Enterprise Risk Management – Appetite and Strategies

- Risk appetite must be clearly defined by the board considering:
  - capital requirements
  - strategic objectives
  - ability to manage and monitor risk
  - alignment with risk management strategies available to the insurer
- Establish overall quantitative and qualitative tolerance levels
- Inform decision-making supported by an economic model and risk management



# Risk and Return



Risk

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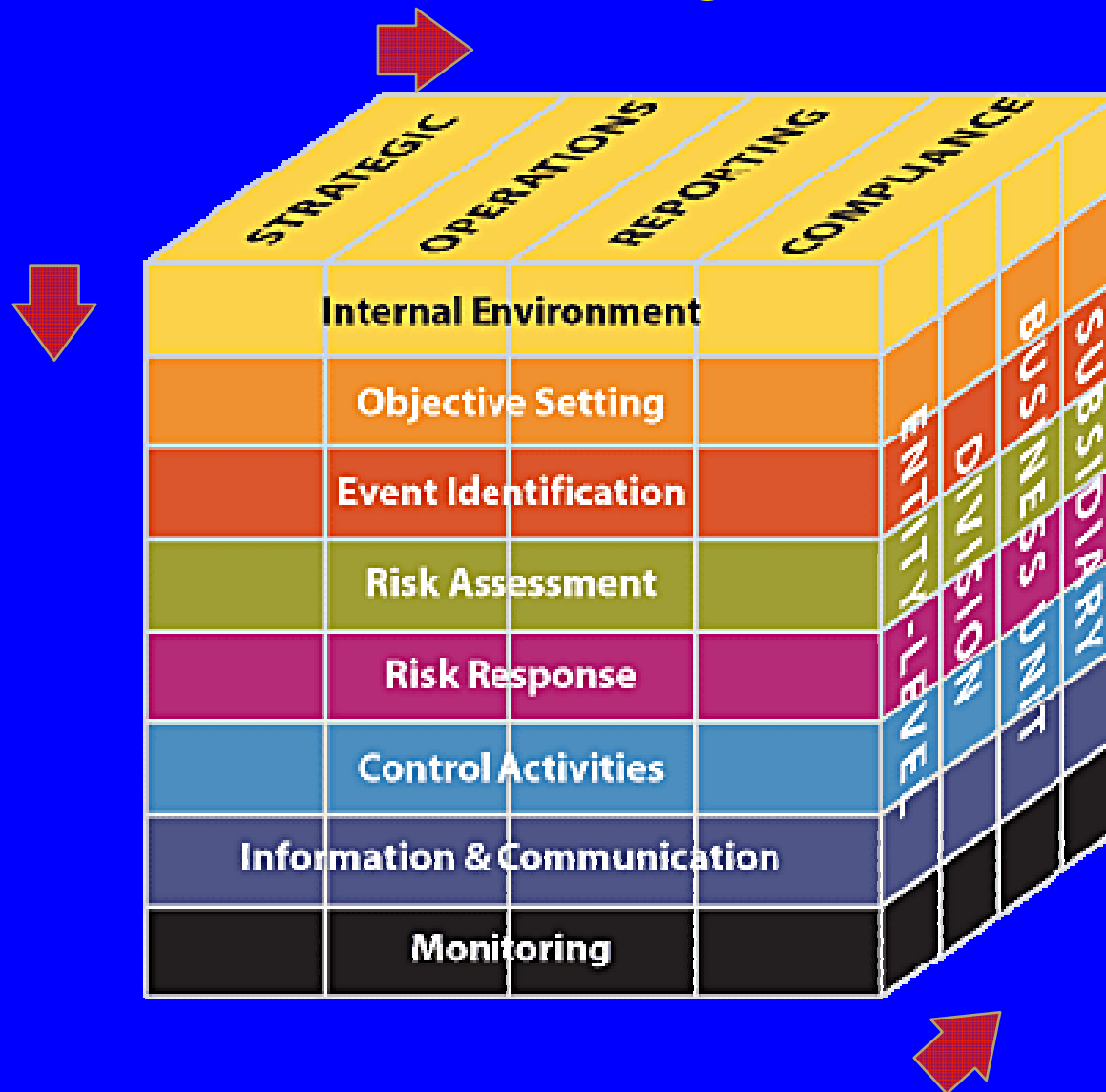
## Question 2

How has ERM been used over the last few years?

# ERM Growing in Importance

- Strengthened SEC Regulations (SOX) affecting ERM
- Rating agencies have moved along the learning curve
- Solvency II (effective 2012, new EU regulations on insurance industry)
- Gap analysis and qualitative ERM techniques, like identification and monitoring
- Quantification techniques most prevalent in reinsurance

# COSO - ERM Framework that Satisfies SEC Regs (SOX)



# Rating Agencies

- Agencies are influential drivers
- ERM adds value to the agencies more traditional quantitative assessments
- The formal incorporation of the quality of a firm's ERM framework into agencies' assessments inevitably affects the cost of capital for insurers
- To varying degrees all four of the major insurance rating agencies have incorporated ERM into their rating processes
- For the rating agencies how insurers deal with emerging risks is increasingly important
- It is anticipated that the agencies will continue to place greater emphasis on ERM as a ratings criterion

# Popularity of the “Gap Analysis”

- Apply to corporate objectives and take account of regulatory requirements
- Consider the size, shape and complexity of organization together with the main risks to objectives
- Understand the scale of the challenge and prioritize to deliver changes of the greatest value (or risk reduction) earliest
- Treat as an ongoing improvement journey recognizing the regulatory hurdles to be addressed
- Results of the gap analysis provide the basis for
  - high-level business requirements for ERM
  - the scope and scale of activity to be planned and undertaken
  - basis for prioritization

# Risk Identification, the Risk Register and Monitoring

- Identification
  - Pivotal to effective risk management
  - All scenarios should be considered
  - All areas of the business should be involved (locally and globally)
- Classification
  - Assist risk identification as it provides a framework for considering risks and reduces chance of missing risks
- Quantification
  - A measure of the expected impact and likelihood given risk mitigation/controls
- Iterative monitoring of the key risks faced by the business is critical

# Capital Modeling Activities

- Some companies have been doing capital modeling for quite some time without pushes from externalities
- Bermuda: use capital models at the most granular level
- Globals: the bar has been heightened for those most sophisticated
  - Capital models are more able to handle complex relationships and unique corporate exposures



# Recent ERM Developments

- Positives
  - CROs
  - Board involvement
  - Risk aggregation
- Negatives
  - Rating agency/regulatory requirement purpose
  - Risk limits not enforced
- Positive/Negative
  - COSO

## Question 3

Has loss reserving been incorporated into the ERM process yet?

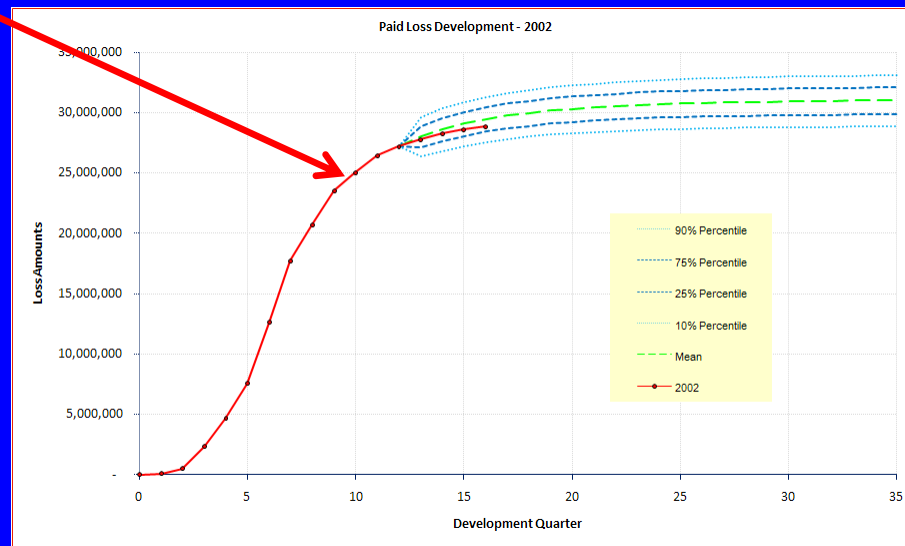
Can you explain how this has, or should, be done?

# Loss Reserving

- Not incorporated in ERM very well yet
- Some insurers ignore reserve risk
- Others view it as an independent distribution
- Should tie reserve risk directly into economic scenarios used for other risks
- Key concern - Inflation

# Reserves in Capital Modeling: Stopping the Clock

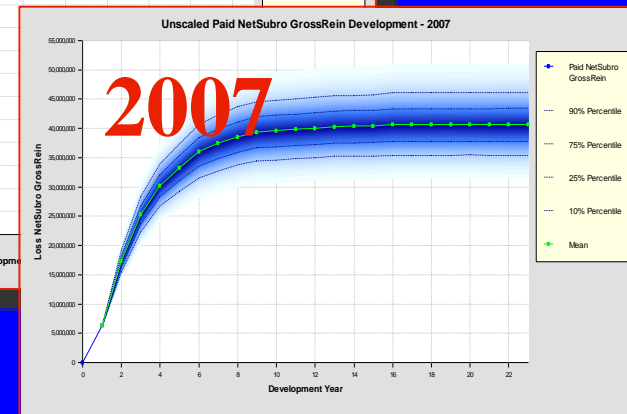
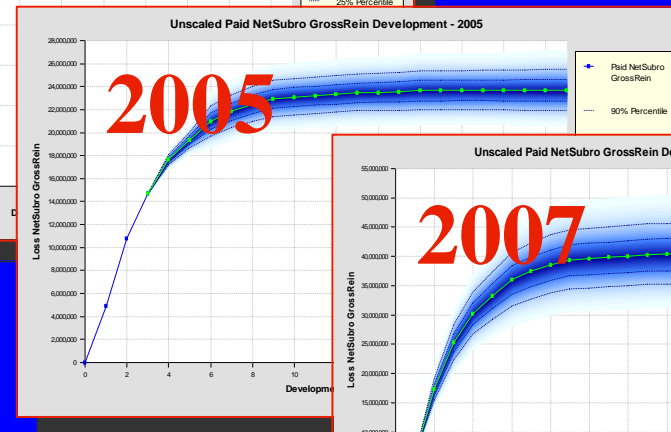
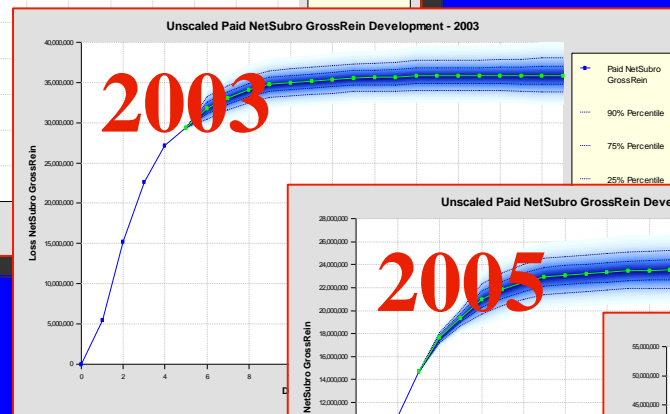
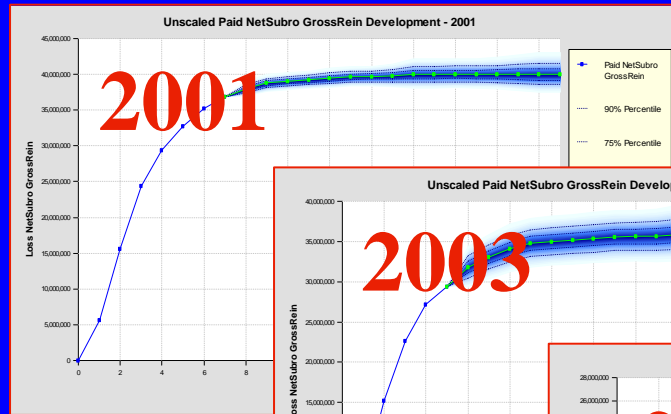
- One year versus ultimate perspective
  - Ultimate perspective examines how much the ultimate payment can vary from current estimate
  - One year perspective examines how much of the potential change will be recognized within one year
- How will the one year out distribution change conditional on a potential payment scenario?
- When to “stop the clock” depends on use of capital model
  - Regulatory
  - Business Mix



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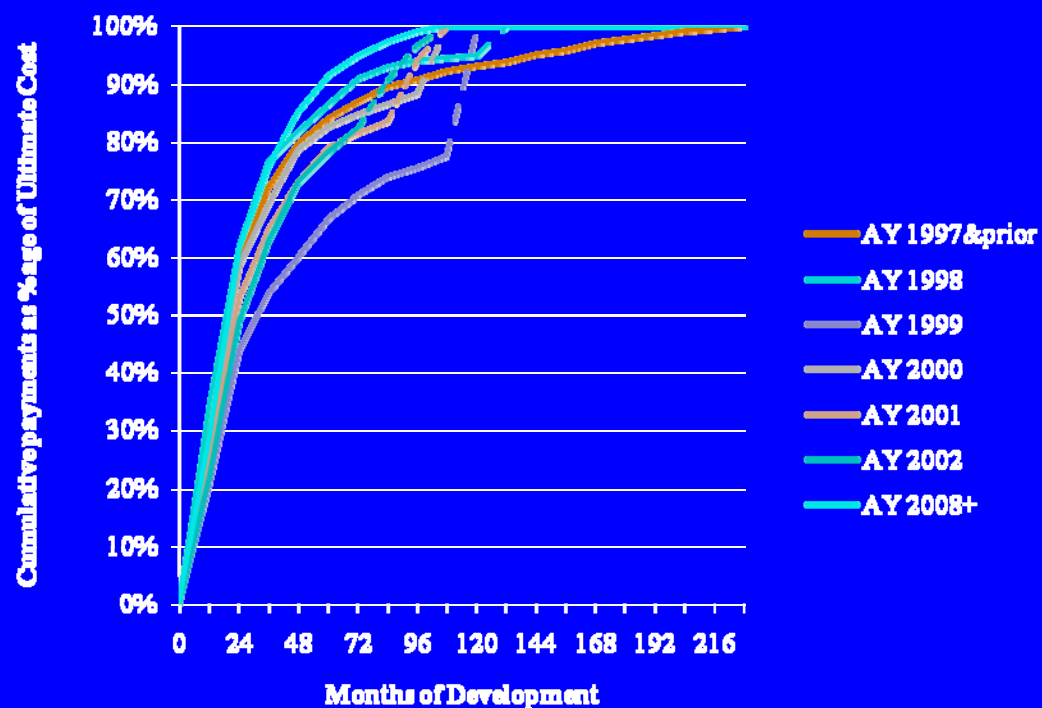
# Ultimate View: Annual Cash Flow Projections

- Evaluate the potential cash needs over a particular time period
  - Investment decisions
  - Liquidity issues



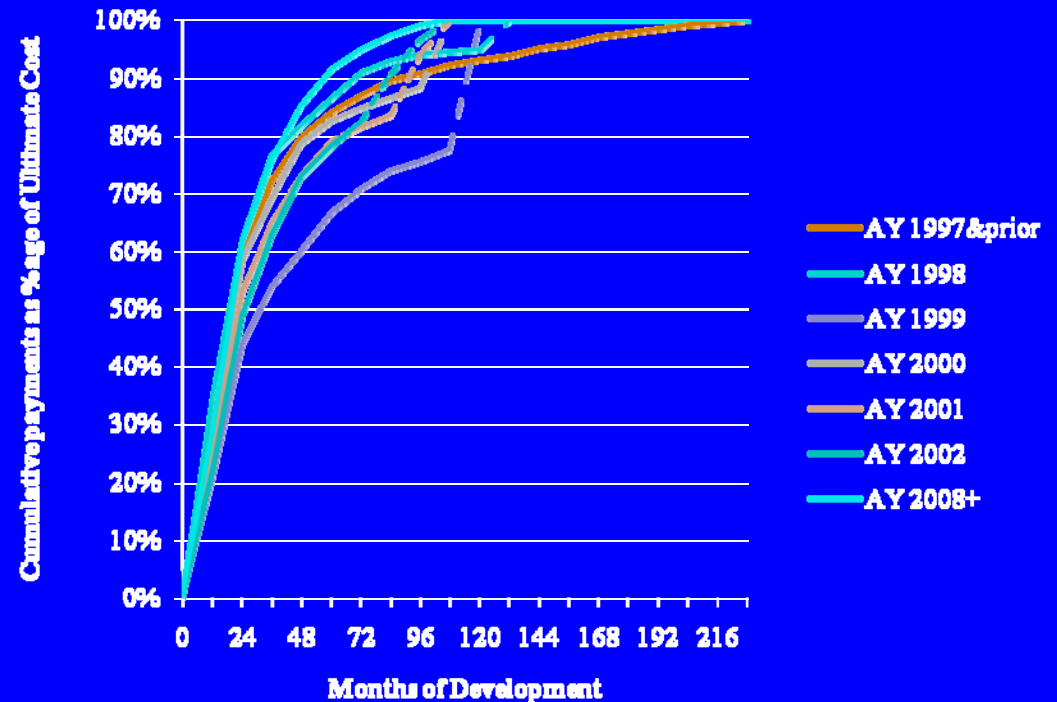
# Incorporating Reserve Risk in Capital Models

- Reserving Risk
  - Many models use a standard Mack-Bootstrapping method
    - Can result in over- (or under-) statement in variability
    - Payment pattern significant shorter than data suggests for some lines. For example, WC fully paid out after 9 years
  - Dashed lines represent projected future cash flows for each accident year
  - Have model include a fitted curve with stochastic parameters



# When Mack-Bootstrapping Results are Questionable...

- Insert BF techniques within bootstrapping when creating a simulated set of ultimates (that is then repeated 000's of times)
- Do separate analysis for small and large gross claims
  - Bootstrap small claims
  - Freq/Sev on large claims
    - Apply historical reinsurance



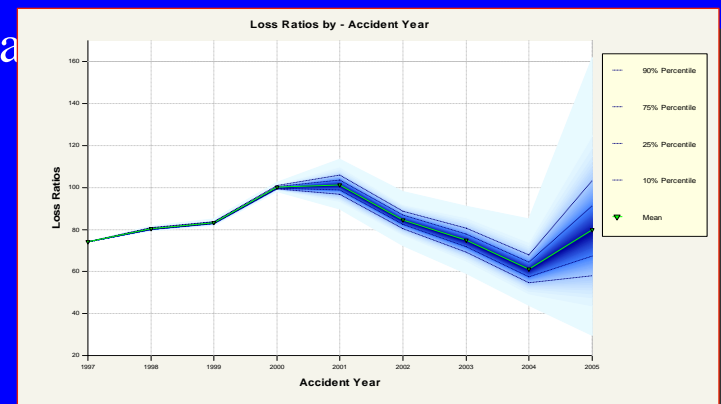
# Other Tips on Incorporating Reserving in ERM

- Reinsurance reserves
  - Linked to gross reserves variability more closely
  - Gross payout in sync with net
  - Non-alignment would show up in a gap analysis
  - Use un-inflated triangles
  - Historical AY payouts will be calculated before inflation is considered



# Using Reserves to Model Parameter Risk in Pricing

- How do pricing decisions consider variability in historical estimates?
- Deflated values and bootstrapping triangles develop 000's of sets of historical AY ultimates (use pure premiums or loss ratios)
- Trend each set to the projected period, and project the pricing for that given simulated set
- Result in 000's of projections for the coming period to make selections for the projected accident year
  - This distribution of the projected AY pure premium (or loss ratio) from the sets of simulations generated from the historical loss triangle helps us measure the parameter risk of the projected accident period
- Creates a natural correlation between reserves and pricing
  - Links historical reserves with pricing decisions



# Applying Projected Inflation Rates to Reserve Cash Flows

- ESG generates simulations of linked sets of projected financial metrics, including annual interest and inflation
- Use interest to value assets
- Apply inflation to each AY cash flow by CY
- True picture of:
  - Ultimate loss variation by AY
  - Long-tailed LOB's will be greatly impacted, mitigated by discounting effect
  - Correlation of assets and loss reserve liabilities

## Question 4

How is ERM perceived in the market?

How are economic capital models viewed,  
and what role do they play in ERM?

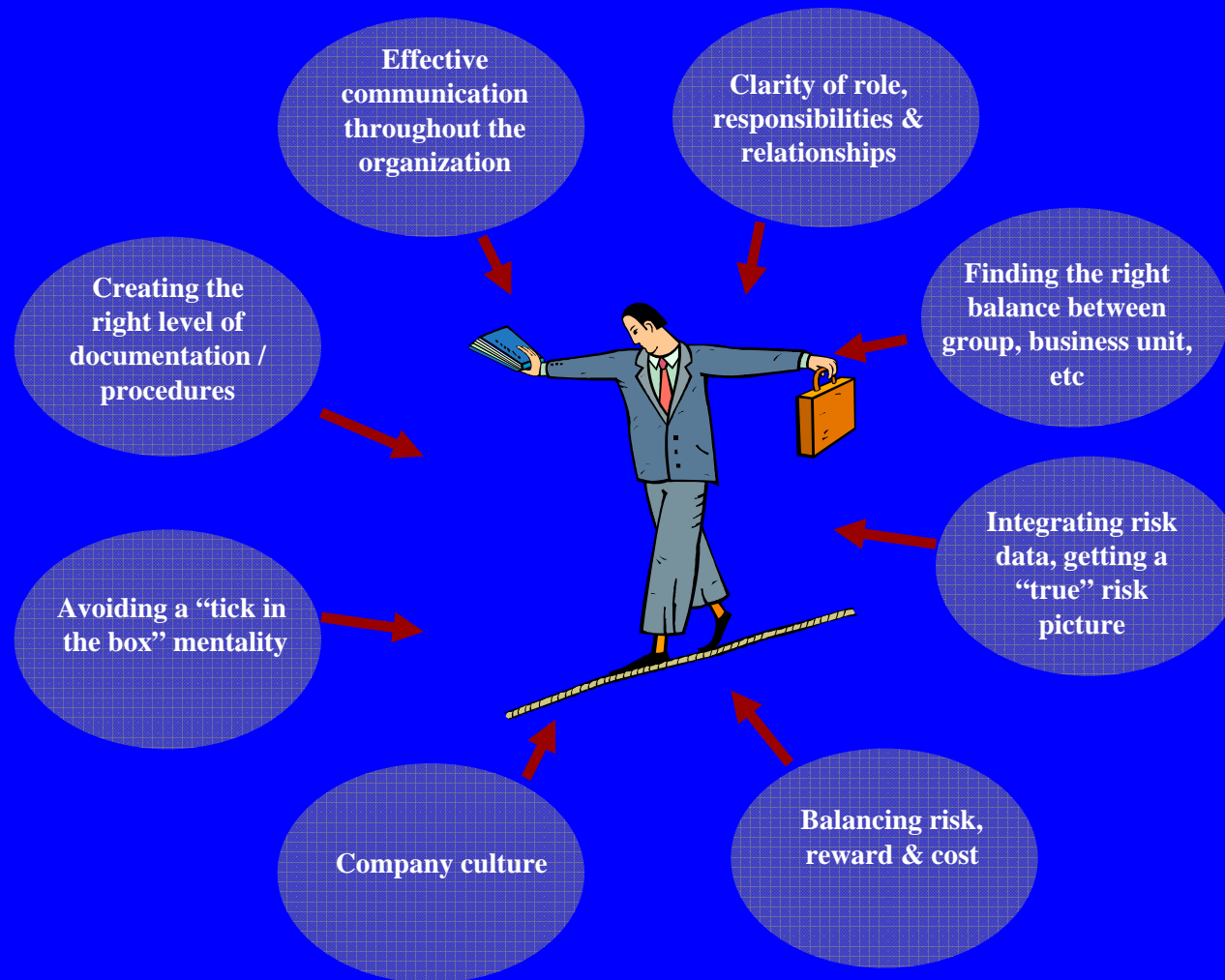
# Capital Modeling – What is it?

- Quantitative representation of the entire business entity
- Generates stochastic cash income and outflows
- Building blocks for projected income statements, cash flow statements, and balance sheets
- Statutory, GAAP, and economic balance sheets, using same set of generated cash flows
- Financial projections are generally annual; and project one year or multiple years, depending on company's needs

# To what extent can the model be relied on?

- What should the model tell you?
  - What level of capital is required for regulatory and economic capital purposes
  - Impact of holding different levels of capital on ratings, return etc
  - The potential impact on risks and capital of alternative business strategies and investments
  
- What the model may not tell you – in isolation
  - Is the data used within the model correct?
  - Does it reflect the risk appetite set by the board?
  - Have all your material risks been quantified?
  
- ... Judgment is still required, needing an understanding of what the model output means – and its limits

# Key Risk Management Challenges: No Cake Walk



# Question 5

What is the future of ERM in general?

# Rise of the risk agenda in insurers

- Risk & reward decision making
- Risk metrics
- Risk interdependency
- Risk management
- Stakeholder risk awareness

**All of the above are driving a need for companies to take risk seriously and to specifically deal with the issues and publicize what they are doing in the press statement, analyst briefing and annual reports**



# Insurers will Capitalize on the Regulatory/Rating Agency Environment

- Imperative for transparency through disclosure within an ERM framework
- There is no 'standard' correct solution to ERM. To be effective, an ERM framework must be tailored to the individual firm:
- Proportionate to its size, complexity and nature of its risks
  - Integrated and embedded within its existing operational and management approach
  - Providing an effective tool for managing the specific business
- The transition to the ideals underlying the precepts of regulation like Solvency II will involve a cultural journey

# Future

- Effective risk sharing could be as important a boost to economic development as
  - Insurance
  - Capital markets
- Risk would be understood by all and assumed by those entities that can handle it most efficiently
- Standing on the door of another economic innovation

# Your Questions



# To Learn More about ERM

CAS Online ERM Course

October 2 – 19, 2009

Instructors:

Steve D'Arcy and Rick Gorvett

Enterprise Risk Management and Modeling (ERM<sup>2</sup>)

October 19 – 20, 2009

Chicago, IL

Instructors:

Abbe Bensimon and Steve D'Arcy