



2008 Enterprise Risk Management Symposium

Enterprise Risk Management: Tools Used by Life Insurers

Banks and Insurers: Separate Paths but a Common Destination

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Definition

- Enterprise Risk Management
 - Casualty Actuarial Society, 2003
- “ERM is the process by which organizations in all industries assess, control, exploit, finance, and monitor risks from all sources for the purpose of increasing the organization’s short and long term value to its stakeholders.”

Forms of ERM

- Honest
 - Focus on exposures
 - What ifs
 - Involve planning dept
 - Look at upside/downside
 - Optimize results
- Dishonest/Naive
 - Focus on controls
 - What could happen
 - Run by Internal Audit
 - Limit downside

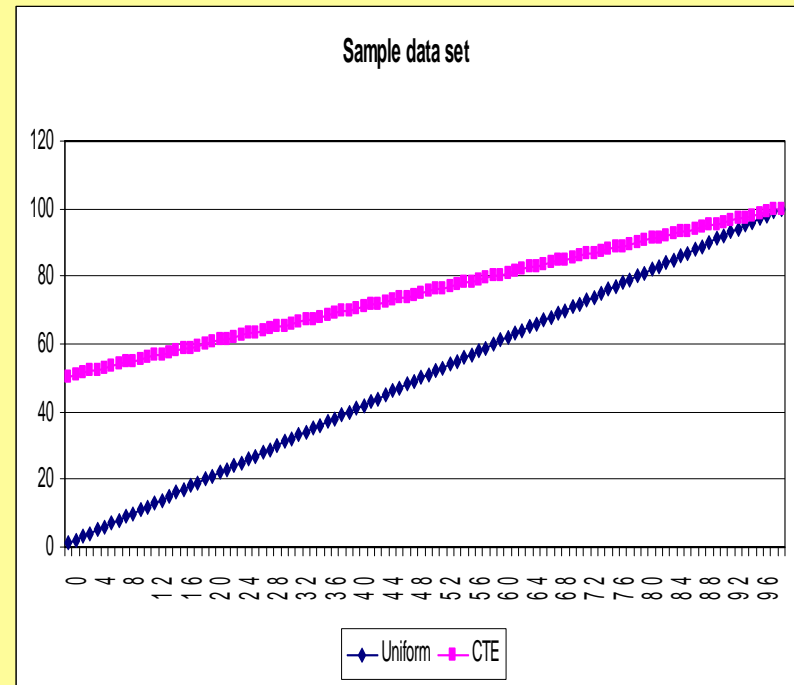
Insurance vs. Banks

- Time horizon
- Liability options
 - Policyholder driven
 - Mortality, Morbidity
- ALM
 - Profit center for banks
 - Constraint for insurers
- Similarities
 - Focus on market, liquidity, capital

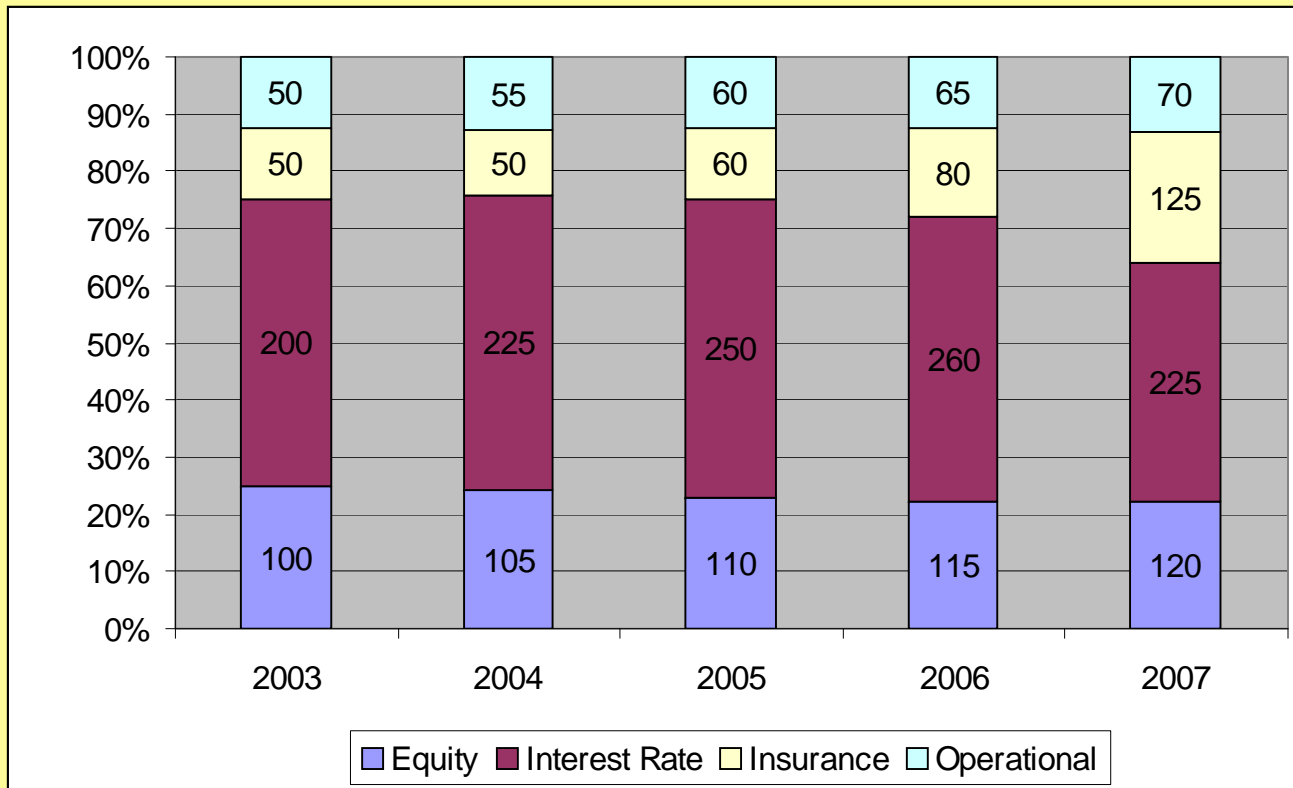
Tools

Statistical tools – VaR and CTE

- VaR
 - Value at Risk
 - used by banks
- CTE
 - Conditional Tail Expectation
 - used by insurers
- Graphics
 - Look at entire distribution
- Metric pros and cons



Required Capital Trend



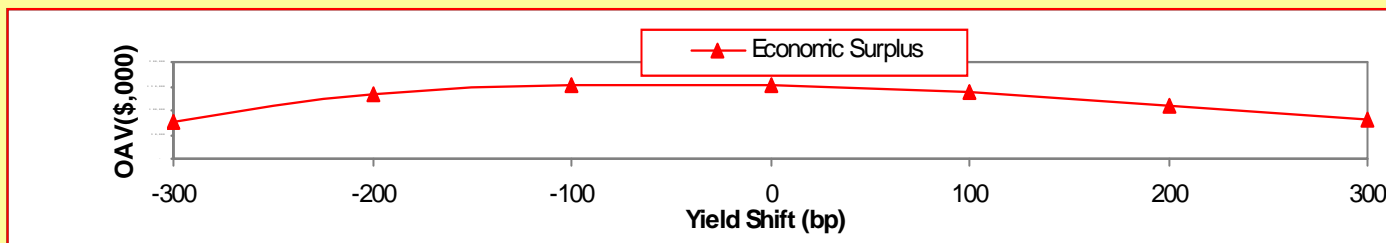
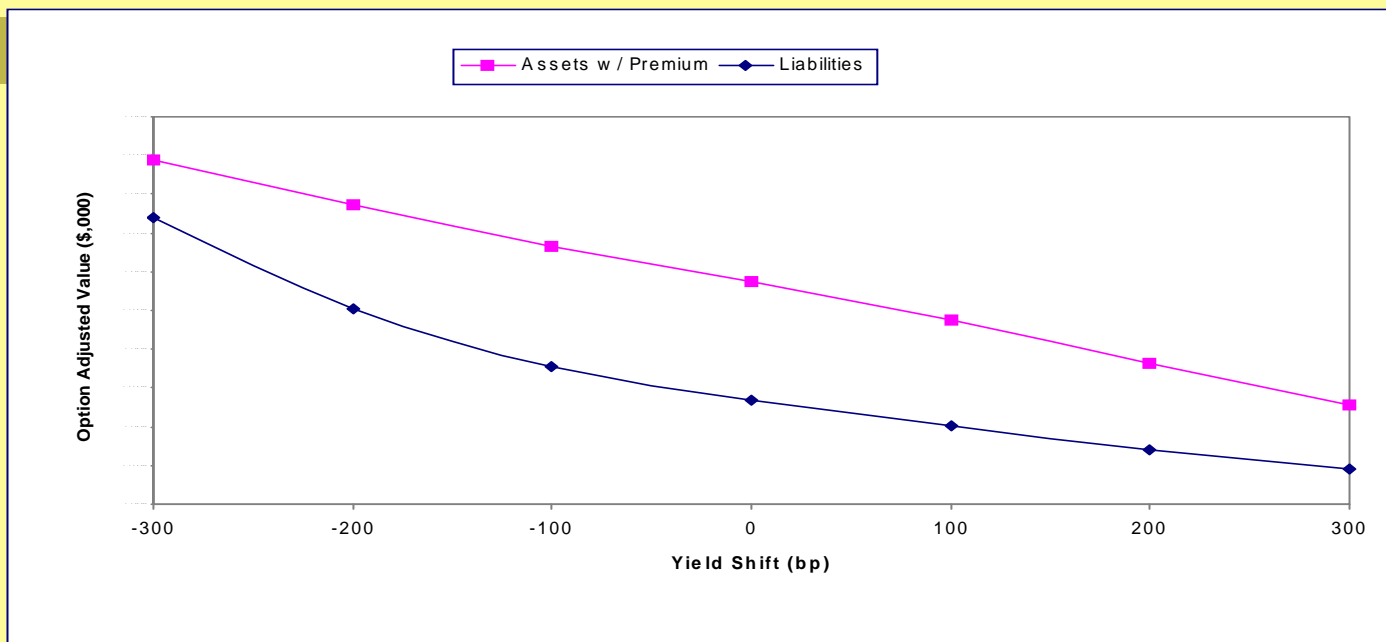
Risk Committee

- Key product officers from across the company
 - Aids succession planning by providing cross training
 - Builds team that is used to working together
- Chance for other experts to review in advance
 - Avoids some major mistakes
 - Checks and balances
 - Pricing discipline
 - Business units buy in
- Risks debated before accepted
 - Proactive

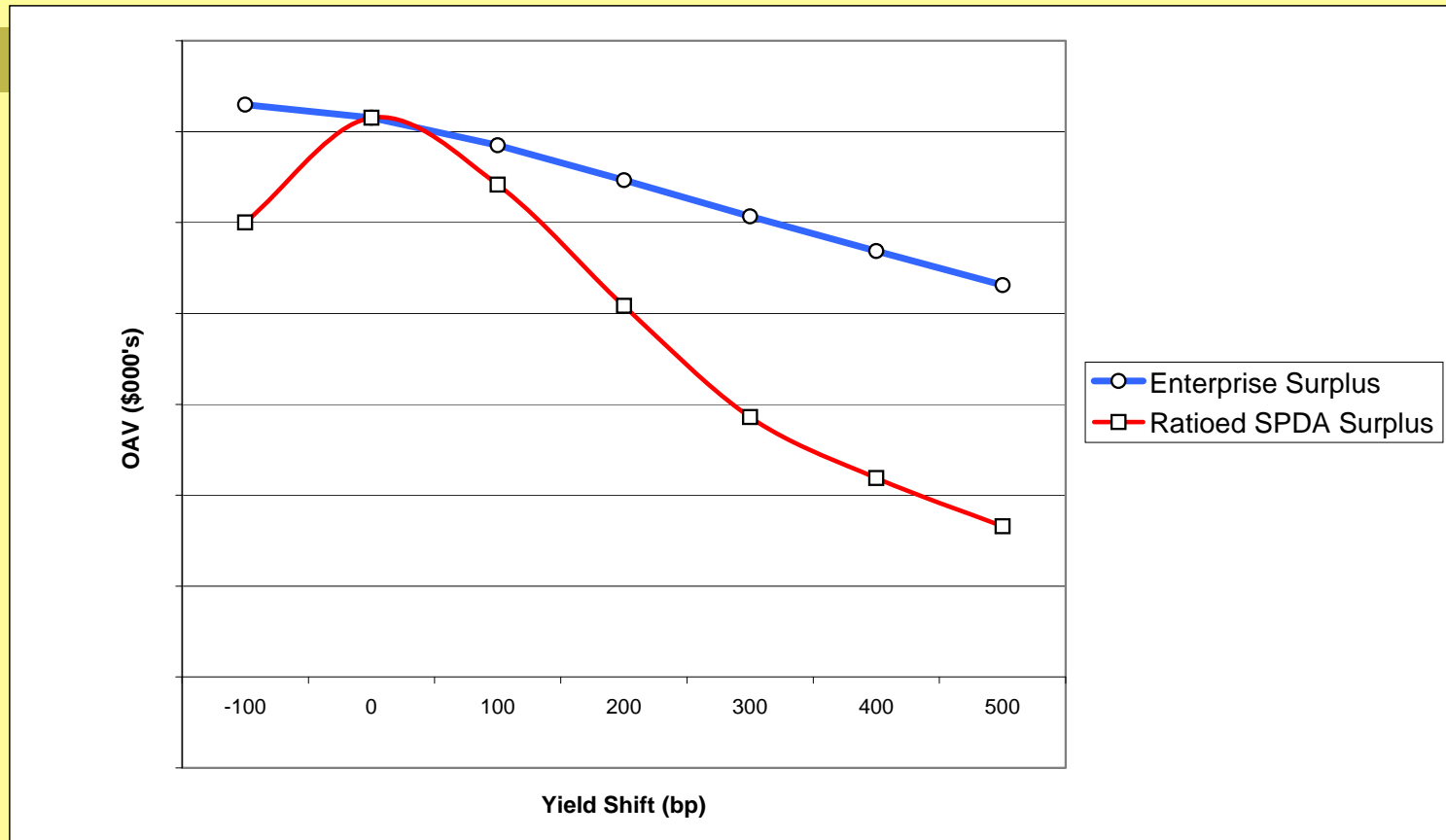
Economic Value

- Difference between the market value of future cash flows from assets (+), premiums (+) and liabilities (-)
- Often greater than GAAP equity (no conservatism in assumptions)
- Measures interest rate risk only
 - Assumes parallel interest rate shifts
- Fair value accounting: principles-based
- In force business only

Price Behavior Curves



Value of Economic Surplus



Duration

- Effective (option adjusted) duration
 - Matching duration probably not optimal
- Define inflows and outflows
 - Cash inflows are split out from cash outflows
 - No 'netting' of premiums, liabilities
- Mismatch long is common
 - Especially when curve is not flat/inverted

Enterprise Duration

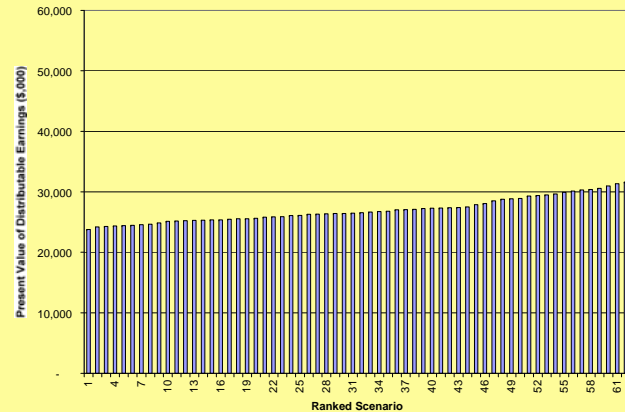
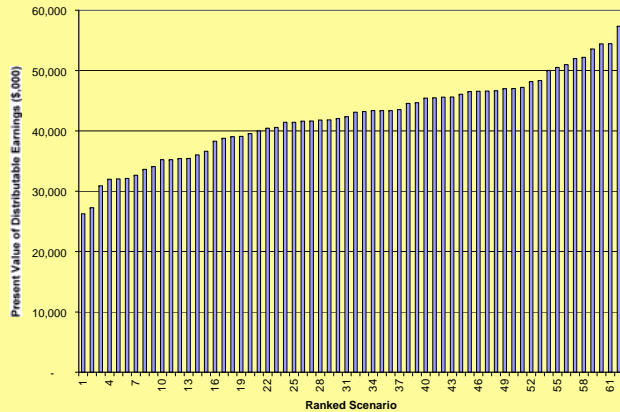
- $D_S = D_L + (D_A - D_L) * MV_A / MV_S$
 - D_S, D_A, D_L duration of surplus, assets, liabilities
 - MV_A market value of all company assets
 - MV_S economic surplus ($MV_A - MV_L$)
- Mismatch
 - $D_A - D_L$
- Leverage
 - MV_A / MV_S

Mismatch / Leverage Examples

Liability Duration	Mismatch	Leverage	Surplus Duration
4	4	5	24
4	2	5	14
4	0	5	4
4	-2	5	-6
4	4	10	44
4	2	10	24
4	0	10	4
4	-2	10	-16

- Surplus duration = $D_L + \text{Mismatch} * \text{Leverage}$

Risk/Return Profile



Deterministic Scenarios

Scenario Planning

- Deterministic scenarios
 - Worried about a specific event – What If?
 - Once per century hurricane or pandemic
 - Emerging risk – be creative
 - Modeling constraint
 - I don't know how to do it
 - Time constraint
 - I can't do it based on lengthy run time

Scenario - Event Risk

- Influenza pandemic
 - 25% morbidity, 0.6% mortality in OECD
- Risk to life insurer
 - Business continuity
 - Claims
 - Liquidity (assets down/claims up)
 - Counterparty (reinsurer solvency)

Practical Uses

- Marginal impact
 - Organic growth
 - Project (aging) current portfolio
 - Introduce new product
 - Reinsurance (with and without)
 - Asset mix
 - Acquisition

Emerging/Catastrophic Risks



New? Exposures

- Financial
 - Soc Gen
 - Sub prime
 - Municipal insurers
 - Commercial Mortgages

Catastrophic Risks

- RMS
 - Terrorism - Anthrax in Chicago
 - Trains in Chicago – Industrial Accident
 - LA – earthquake
 - Terrorism – truck bombs
 - Pandemic

Other Risks

- Political assassinations
- Water poisoning
- Others – audience participation!

Financial Risk Management Failures

- 1973: Equity Funding Fraud**
- 1983: Baldwin United Shell Game**
- 1984: Continental Illinois Bank Run**
- 1986: The ZZZ Best Carpet Scandal.**
- 1988: Equitable (NY) GIC losses.**
- 1989: The US S&L Crisis.**
- 1991: Salomon Brothers Bond Scandal.**
- 1991: BCCI Scandal.**
- 1991: Executive Life / First Capital Life Junked**
- 1991: Mutual Benefit Liquidity Squeeze**
- 1991 – 1996: Lloyd’s Asbestos Liabilities**
- 1994 – 2002: Japanese Real Estate & Banking**
- 1994: Orange County Default**
- 1994: Kidder Peabody Fiasco.**
- 1994: Confederation Life Failure**
- 1994: Monarch Life Seizure**
- 1995: The Barings Derivatives Scandal.**
- 1996: Sumitomo Copper Scandal.**
- 1997: The Natwest Hole.**
- 1997: The Bre-X Mining Scandal.**
- 1997: Smith Barney Investor Fraud.**
- 1997: Bank of Tokyo-Mitsubishi Derivatives Loss.**
- 1997: UBS Derivatives Model Problems.**
- 1997: Prudential Insurance US Market Conduct**
- 1997: Nissan Mutual ALM Failure**
- 1998: Griffin Trading Bond Futures losses.**
- 1998: Russian Bond Debacle.**
- 1998: The LTCM Risk Model Failure.**
- 1998: Asian Economic Flu Crisis**
- 1999: Toho Mutual & Daihyaju Mutual**
- 1999: General American Liquidity Failure**
- 1999: Korea Life ALM Losses & Failure**
- 1999: Unicover Fiasco**
- 2000: Equitable UK Pension guarantees**
- 2001: American Express CBO Losses**
- 2001: World Trade Center**
- 2002: Enron & Worldcom**
- 2002: Consecoco chokes on Green Tree**
- 2002: HIH Surprise**
- 2002: Amer Skandia VA problems**
- 2003: Parmalat Accounting Scandal**
- 2003: Allmerica VA reserving**
- 2003: Annuity & Life Re Overgrowth**
- 2004: Marsh Contingent Commissions**
- 2005: AIG Finite Re**
- 2006: Scottish Re Tax Asset**
- 2006: Hurricane Katrina**
- 2007: Bear Stearns/Countrywide/??? Sub Primes**

Enterprise Risk Management (ERM) Key Points

- Get paid for the risks you take
 - Know your competitive advantages
- Best solutions are unique to your company!
- Leverage existing models
- Use cash flows as drivers



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Thank you!

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