Risk Management in Insurance

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Overview

• Personal background
• Insurance industry background
• Solvency II
• Principle Based Reserves (PBR)
• Outlook of risk management in insurance
Work and Education Background

• Aug 2010 to present – Colonial Life, Columbia, SC
• May 2009 to Aug 2010 – EagleEye Analytics, Columbia, SC
  – Predictive modeling for property and casualty (P&C) pricing
• 2007-2009 – IMBA, Darla Moore School of Business, USC
  – Finance concentration
  – Portuguese track
• Career transition from biological sciences research.
• 2004 – M.S. in Biology from Duke University
• 1999 – B.S. in Biology from Duke University
Financial/Insurance Exam History

• GARP Financial Risk Manager (FRM) Exam –
  – Levels I and II

• Society of Actuaries/Casualty Actuarial Society exams–
  – SOA/CAS 1/P, 2/FM, 3/MFE, and 3/MLC
  – Exam 4/C on Feb 23

• Chartered Financial Analyst (CFA) exams
  – Levels I and II

• Chartered Alternative Investment Analyst (CAIA)
What does an insurance carrier sell?

• An insurance company lives by its reputation. This is by far its biggest asset.

• An insurance company is selling a promise, and that promise is only as good as:
  – How well a company has delivered on that promise in the past
  – The faith that customers have that the company will be able to deliver on that promise in the future.
Insurance Companies in the U.S.

• Insurance companies have liabilities that are met long after receipt of revenue (premium).

• Mismatch of the revenue stream and liabilities in mid-19th century in U.S. lead to the prevalence of the mutual company as the initial successful model for insurance companies.

• Regulation later created an environment conducive to the formation of stock companies and non-destructive competition.
Insurance Regulation in the U.S.

- Each state has a Department of Insurance (DOI) with a state insurance commissioner.

The NAIC acts in more of a coordinating role, as regulations can be overturned at the state level.

- Recent health care legislation may be the first step towards increased federalization of insurance regulation; judicial review is pending.

- Statutory Accounting Principals (SAP) for insurance companies are typically more conservative than Generally Accepted Accounting Practices (GAAP).
Competitive environment

• Demand is somewhat inelastic in the P&C insurance industry - e.g. automobile insurance is compulsory in most states, home insurance is usually a prerequisite to home purchase.

• On the other hand, benefit ratios/loss ratios are regulated and closely monitored by DOIs.

• The landscape is changing for many carriers. Recent legislation threatens the profitability of many health insurers, while a decrease in employer provided benefits has lead to a growing market for voluntary benefits.
• Insurance is becoming increasingly commoditized.
• Companies will look to areas other than price for profits—investment return, risk management, operational efficiencies, et alia.
Solvency II

- Europe is creating supranational regulation of insurance.
- Solvency II is modeled from the Basel II and III framework designed for the banking industry.
- Designed to address capital adequacy and transparency in insurance industry.
The Three Pillars

Three-pillar approach

Pillar 1:
- Quantitative requirements
  - Balance sheet (including technical provisions)
  - Minimum capital requirement (MCR)
  - Solvency Capital Requirement (SCR)

Pillar 2:
- Qualitative requirements and supervisory review
  - Governance, risk management and required functions
  - Own risk and solvency assessment
  - Supervisory review process

Pillar 3:
- Reporting, disclosure and market discipline
  - SFCR and RSR
  - Disclosure
  - Transparency
  - Support of risk-based supervision through market mechanisms

Market-consistent valuation
Risk Based requirements

Business governance
Risk-based supervision

Disclosure
Transparent markets

http://www.fsa.gov.uk/pubs/international/3pillars.pdf
Effects of Solvency II

- A recent article from GARP’s Risk Professional magazine in October 2010 found that insurance groups plan to spend “EUR 50 million to more than EUR 100 million” per company on Solvency II implementation. ¹

- Solvency II requirements could force some European insurers to reduce foreign and long-tailed business exposure, leading to growth opportunities for U.S. companies.

- U.S. companies with European subsidiaries will need to have those subsidiaries comply with European regulations.

NAIC’s Principle Based Reserves

• Implementation projected for 1/1/2012

• Major areas include reserving, capital adequacy, corporate governance, financial reporting, and financial examination.

• A focus on Risk Based Capital with covariance benefits

• Scenario analysis requirements for low frequency events as well as stochastic reserving requirements with conditional tail expectation (CTE, aka tail Value at Risk or t-VAR) thresholds
Solvency II vs. PBR

• With Solvency II, firms will have a choice between using a standard formula or an internal model to measure capital adequacy (similar to Basel II and III regulations).

• Parts of Solvency II may be at odds with current National Association of Insurance Commissioners (NAIC) risk based capital measures.²

• Will this be a step toward global convergence of insurance regulation, as we are seeing in accounting?

² [http://www.contingencies.org/marapr08/trade.pdf](http://www.contingencies.org/marapr08/trade.pdf)
Unintended Consequences

• With both Basel I and Basel II, there was regulatory arbitrage, as banks looked to exploit capital requirement loopholes – this may have played a role in actually increase risk at some financial institutions.

• It is difficult to design regulations to minimize regulatory arbitrage.

• It remains to be seen to what extent Solvency II and Basel III will positively affect risk management.
What FIVE factors are most important when assessing a hedge fund manager?

Source: 2009 Deutsche Bank Alternative Investment Survey
Increased attention to financial risk management

• Rating organizations are increasingly considering Enterprise Risk Management (ERM) programs as part of their rating criteria, although this has been difficult to implement. ³

• The position of Chief Risk Officer (CRO) is becoming an increasingly visible position.

• The board of directors will be responsible for explicitly stating and approving its company’s risk tolerance and appetite.

FRM students in the insurance sector

- GARP publishes a list of organizations with 5 or more FRM students in 2010.

- Consulting firms such as Oliver Wyman and Towers Watson

- Rating firms Standard and Poor’s, Moody’s, and Fitch

- Firms that sell a mix of financial and insurance products, such as Manulife, Prudential, Hartford Financial, and Genworth Financial

- Less penetration in traditional P&C insurers or accident and health insurance
Society of Actuaries

• In response to an increased focus on ERM is focus in many corporations, the Society of Actuaries to create a new credential – the Chartered Enterprise Risk Analyst (CERA).

• Many requirement overlap with Associate (ASA) and Fellowship (FSA) credentials.

• Acceptance of this new certification remains to be seen.
FSA, FCAS, and FRM

• Associate or Fellowship level in SOA or CAS is required for a statement of actuarial opinion.

• The FSA, FCAS, and FRM program have many overlapping and complementary ideas.

• Actuaries have a long history of dealing with events with non-normal distributions and maintaining capital for rare or long-tail aggregate events, such as those created by model risk.

• Although methodologies are changing, traditionally:
  – Actuaries have focused more deterministic risk measurement rather than stochastic simulation.
  – Actuaries have been conservative in recognizing diversification benefits.
  – Actuaries have focused more on measureable and frequent risk events, which is difficult to do with operational risk events (low frequency, high severity).
Financial Risk Management in Insurance

• Investment returns make up an important part of profit for insurers.

• Areas of cross-applicability in mathematical methods include VAR, CTE, Extreme Value Theory (EVT), Monte Carlo methods, and copulas (their uses and abuses).

• The insurance sector can learn much from the implementation of Basel II in the banking industry.

• New derivatives, such as longevity swaps, offer both risk mitigation opportunities and counter-party, market, and operational risks for insurance carriers.
New paradigm for insurance risk managers

• Insurance companies are no longer looking for actuaries or financial managers who operating only within a single area of expertise, but individuals who can work across departments (e.g. underwriting, marketing, sales, legal, and IT).

• Firms are looking to not only reduce the operational risk of the firm, but to make sure that they are only accepting non-operational risks in the context of their total portfolios.
Questions?