

CARE

Comprehensive Actuarial Risk Evaluation



Presented by: David Ingram, FSA, CERA
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CARE Report

Produced by the Working Group of the IAA Enterprise and Financial Risks Committee

- Dave Ingram (*Project Lead*), CERA, FSA, MAAA (USA)
- Andy White, FIA, FIAA (Australia)
- Xiaokai (Victor) Shi, FSA, MAAA (USA)
- Karen Adams, ACAS, MAAA (USA)
- Nicholas Albicelli, FSA (USA)
- Mei Dong, ACAS (USA)
- David Hopewell, FSA (USA)
- Lars Pralle DAV (Germany)
- Larry Rubin, FSA, CERA, MAAA (USA)
- Kailan Shang, FSA (China)
- Prabhdeep Singh CERA, ASA, MAAA (USA)
- Elliot Varnell, FIA (UK)
- Elizabeth Ward, FSA, MAAA (USA)
- Jeremy Waite FIA, AIAA, MAAA (Australia)
- Valentina Isakina, ASA, MAAA (USA)

CARE Report

- Idea:
 - To explore areas where there might someday be standards of practice for actuarial work in Enterprise Risk Management
- Additional such projects will be undertaken
 - Evaluation of ERM programs

CARE Report

- ◉ Why Care?
- ◉ Uses of Risk Assessment
- ◉ Multi-Dimensionality of Risk
- ◉ Market Consistent Value vs. Fundamental Value
- ◉ Accounting Basis vs. Economic Basis
- ◉ Regulatory Measure of Risk
- ◉ Short Term vs. Long Term Risks
- ◉ Known Risk and Emerging Risks
- ◉ Earnings Volatility vs. Solvency Risk
- ◉ Viewed Stand-Alone vs. Full Risk Portfolio
- ◉ Liquidity Risk
- ◉ Limitations of Risk Assessments
- ◉ Descriptions of A Care Report
- ◉ Conclusion

Why CARE?

- ⦿ Risks larger and more complex
- ⦿ Risks must be considered in the context of the core competency of the firm
- ⦿ Need objective assessment of risks
- ⦿ Must be Comprehensive - Risks in one part of the firm can bring down the firm

Why CARE?

- ⦿ Need to pay attention to:
 - Individual risks
 - Risk correlations
 - Risks on and off the corporate balance sheet
 - Economic risk position (as opposed to only the accounting view)
 - Risks both at the holding company level as well as the subsidiary level
 - Implications of risk position on the company activities and strategy
 - Risk controls and Risk mitigation

Why CARE?

- ◉ Set Risk Appetite at the Firm Level
- ◉ Satisfy Investors, Rating Agencies, Regulators, Policyholders
- ◉ Actuarial advice
 - Rigorous, designed to understand risk, recognizes complexities and uncertainties
 - Healthy respect for the limitations of models
 - Can balance judgment with calculations

Uses of Risk Assessments

Three Types of ERM Programs

1. Risk Controlling

- Traditional Underwriting, safety, ALM Systems
- Minimize risk to minimize losses
- ERM in most non-Financial Firms

2. Risk Trading

- Pricing Risk to assure profits from buying and selling risks
- Bank Trading and Insurance Pricing and Reserving
- ERM developed from desire to control Bank Trading Desks

3. Risk Steering

- Directing risk taking at the corporate level
- Risk Reward of Business and Capital Budget
- ERM required for Solvency 2 & Rating Agency

Multi-Dimensionality of Risk

- ⦿ **RISK IS ANY SITUATION WITH A POTENTIAL NEGATIVE OUTCOME**
 - To really Evaluate Risk - must look at ALL potential negative outcomes
 - If you define risk more narrowly that can make evaluation more convenient - but WRONG
 - Consequences of incomplete risk evaluation

LAW OF RISK AND LIGHT

Risks in the light shrink, Risks in the dark grow

Return for Risks in the light shrinks faster than the Risk

Return for Risks in the dark does not grow as fast as Risk

Market Consistent vs. Fundamental Value

- Usually measuring risk of future cash flows of uncertain timing and amount
- Those cash flows may be tradable / hedgeable or not
- Cost of Hedging or Transferring the risk - PRICE
 - No Arbitrage Market consistent models
 - Remember that models are always simplifications of markets
 - A Market Consistent model is not the MARKET

Market Consistent vs. Fundamental Value

- Fundamental Analysis
- Substitute analyst's judgment about uncertainties for market judgment
- All businesses use Fundamental Analysis to make decisions
 - Without Fundamental Analysis there would be no trading and no market

Market Consistent vs. Fundamental Value

- ⦿ Risk manager must be able to help to assess quality of Fundamental Analysis
 - Areas of Key Competency of the Firm ONLY
 - Provide transparency to management - identify where assessments are different and why
 - Otherwise should stay completely with market judgment of risks

Accounting vs. Economic Basis

- Many financial decisions are made based upon accounting based information
- Fair Value Accounting seeks to bring accounting based information closer to economic basis
- Accounting does not separate profits between risk margins collected vs. “alpha”

Accounting vs. Economic Basis

- ⦿ Accounting statements are not Risk Adjusted
 - Capital models are required to identify risks that are not clearly reported
 - Accounting rules will always include compromises
- ⦿ Risk Evaluator must be aware of the ways that accounting deviates from market basis and from cash flow

Accounting vs. Economic Basis

- Definition and Use of an Economic Balance sheet
 - Market consistent view of replicable assets and liabilities
 - Management View of Risks & cost of risks for non-replicable (Insurance)

Regulatory Measurement of Risk

- Solvency Capital Frameworks
 - RBC, MCCR, Solvency II, Basel II, Rating Agencies
- When Firm's view of risk is less than Regulator View
 - May ignore Regulatory view - which could lead to problems with meeting regulatory standards

Regulatory Measurement of Risk

- ⦿ When Firm's view of risk is greater than Regulatory view
 - May use lower Regulatory view - which could lead to excess risk taking

- ⦿ Appendix with details of Solvency Standards

Short Term vs. Long Term Risks

- ⦿ Short Term Risks happen and exposure ends quickly
- ⦿ Long Term Risks may emerge slowly and/or exposure may extend for an long period of time.

Short Term vs. Long Term Risks

- ⦿ Showing all risks over a single time horizon is needed to compare
 - Ending value is key to longer term risk evaluation in that case
 - May allow discretion for longer term risks that is not available for shorter term risks
 - Favorable evaluation of longer term risks may cause shift to taking more of those risks
 - Non-traded risks will be treated as more stable than market traded risks

Known Risk and Emerging Risks

- ⦿ There is a degree of Knightian Uncertainty in all risks
 - Rather than “known” vs. “unknown” binary delineation
 - There is a continuum of degrees of uncertainty
- ⦿ Emerging Risks usually unknown frequency
 - Taleb’s Black Swans not exactly the same
- ⦿ Techniques for assessing Emerging Risks
 - Scenario Analysis
 - Delphi Techniques
 - Monte Carlo

Earnings Volatility vs. Solvency Risk

- Frequency vs. Severity Risk
 - Statistical techniques work well for high frequency / low severity risks
 - Not as well for low frequency / high severity
 - Convert low frequency / high severity risk into credit risk using reinsurance
 - Risk management tends to focus on frequency risk

Earnings Volatility vs. Solvency Risk

- Severity Risk is on the continuum towards emerging risk
 - Need to be appropriately skeptical towards modeled quantification
 - Judgment is essential

Viewed Stand-Alone vs. Full Risk Portfolio

- ⦿ Look at risks both ways
 - Adding risk to a portfolio always adds risk
 - 1/100 loss from risk factor A does not change no matter whether there are other risk taken or not
 - Likely components of a 1/100 firm loss are of course impacted by the different risks taken

Viewed Stand-Alone vs. Full Risk Portfolio

- ⦿ Disaggregated (individual risk) view of risk
 - Allows user of risk evaluation to more readily assess exposure to shifts in outside factors
- ⦿ Diversified View (Portfolio risk) view of risks
 - Allows top management to direct the risk taking of the firm
- ⦿ Risk Controlling, Risk Trading and Risk Steering all benefit from information about risk from both stand alone and portfolio basis

Liquidity Risk

- ◉ Liquidity Risk is different from Accounting, Economic or Regulatory views of risk
 - Access to cash or cash equivalents when needed
- ◉ Liquidity Risk may differ for different time frames
- ◉ Evaluate Liquidity risk primarily via Stress Scenario Tests
 - Keep track of market liquidity
- ◉ Rating Agency Tests of Liquidity
 - Scenario tests

Limitations of Risk Assessments

- ⦿ Any model is a simplification of reality
 - It is just as important to know what a model does not do as to know what it does.
 - Important to use models, stress tests and expert judgment together in assessing risk
 - Degree of uncertainty is key

- ⦿ Over-reliance on models caused by:
 - Overconfidence
 - Survivorship bias
 - Abandonment of Judgment
 - Extrapolation to tails

Communicating Limitations

- ◉ Clearly identify situations where data was insufficient
- ◉ Disconnect between market and model
- ◉ Implicit Assumptions
- ◉ Changes in Behavior

Description of a CARE Report

- ⦿ Purpose of the report.
 - ⦿ Qualifications of the actuary preparing the report .
 - ⦿ Expected users and usage of the report as well as limitations of the report,
 - ⦿ Statement of adherence to actuarial standards
 - ⦿ Discussion of data used for the analysis:
 - Description of methods and assumptions used for the analysis:
 - ⦿ Reasons for choosing these methods and assumptions
 - ⦿ Presentation of results of evaluations:
 - Risk types and dimensions
 - Ranking of various risks by risk measures:
 - Comparisons of different risk measures
 - ⦿ Conclusions and recommendations
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- ⦿ CARE Report is primarily an expository report

Conclusion

- ⦿ This report is intended to be the start of a discussion of what would encompass the unique role of the actuary in the area of risk evaluation.
- ⦿ The view put forward here is of the actuary as the professional who can and will deal with the multi dimensional characteristics of risk evaluation utilizing a combination of complex models, stress tests and professional judgment. Will appropriate consideration of the limitations of each approach.
- ⦿ The working group looks forward to the reactions of those within and outside of the actuarial profession to this vision.