The use of an Economic Capital Model within an Enterprise Risk Management framework

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Agenda

• Standard & Poor's view of ERM
• The use of Economic Capital Models within ERM
Standard & Poor’s view of ERM

The Value of Good Risk Management

The purpose of Risk Management is to…
1) Identify and monitor significant risks
2) Set risk limits for each risk to reflect the company’s risk tolerances, competencies and resources
3) Design program to measure all risks consistently with fundamental objectives of the enterprise.
4) Execute the risk management programs to limit losses to within the company’s risk tolerances

The product of Good Risk Management is a controlled risk taking environment
What Is the Difference Between Risk Management and ERM?

An *ERM Program* comprehensively applies *Risk Management*:
- Across **ALL** of the significant risks of the Enterprise
- **Consistently** across the risks
- Consistently with the **fundamental objectives** of the enterprise

An *ERM Program* reflects **risk capital in**:
- Strategic decision making
- Product design and pricing
- Strategic and tactical investment selection
- Financial performance evaluation

The *product of a fully-realized ERM Program* is the **optimization of enterprise risk adjusted return**

ERM Evaluation Components

- **Risk Management Culture**
  - Risk Control Processes
  - Emerging Risks Mgmt
  - Risk & Economic Capital Models

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### ERM Quality Classifications

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<th>Class</th>
<th>Features</th>
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| Excellent | - Advanced capabilities to identify, measure, manage all risk exposures within tolerances  
|           | - Advanced implementation, development and execution of ERM parameters  
|           | - Consistently optimizes risk adjusted returns throughout the organization |
| Strong    | - Clear vision of risk tolerance and overall risk profile  
|           | - Risk Control exceeds adequate for most major risks  
|           | - Has robust processes to identify and prepare for emerging risks  
|           | - Incorporates risk management and decision making to optimize risk adjusted returns |
| Adequate  | - Has fully functioning control systems in place for all of their major risks  
|           | - May lack a robust process for identifying and preparing for emerging risks  
|           | - Performing good classical "silo" based risk management  
|           | - Not fully developed process to optimize risk adjusted returns |
| Weak      | - Incomplete control process for one or more major risks  
|           | - Inconsistent or limited capabilities to identify, measure or manage major risk exposures |

Our findings

#### 2006 All ERM Scores Global

- **241 Insurers**

- **Excellent**: 3%
- **Strong**: 10%
- **Adequate**: 82%
- **Weak**: 5%

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The use of Economic Capital Models within ERM

ERM Evaluation Components – where is ECM used?

ECM as risk measure when optimizing risk/returns
ECM part of our ERM review
ECM to define risk limits
ECM to define risk tolerance
What do we look for?

- Highly qualified risk management staff
- Regular communication with board on risks positions and risk management programs
- Clear and wide known risk management policies and procedures
- Manager’s compensation is linked to the achievement of risk management objectives (RoEC, RoEV)
- Company’s governance structure supports effective risk management
- Risk measurement and monitoring is independent from risk taking and management
- Clearly articulated risk preference, appetite and tolerance, translated into risk limits
Process to set Risk Tolerance & Limits

1. Risk Appetite
2. Risk Tolerance
3. Risk Limits

Risk Preferences

We don't want to lose more than 10% of previous year's net income.

We don't want to lose more than 25% of our surplus.

EC EC limit

EaR EaR limit

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ERM Within Risk Control Processes

Strategic Risk Management

- ECM to define risk limits
  - Risk Control Processes
  - Emerging Risks Mgmt
  - Risk & Economic Capital Models

Risk Management Culture

ECM in Risk Limits

- EC by risk equal limit by risk
- EC = 1 year VaR

<table>
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<tr>
<th>EC</th>
<th>Limits</th>
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<tr>
<td>Market</td>
<td>Equity, Interest VaR</td>
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<tr>
<td>Insurance</td>
<td>Exposure, reinsurance limits</td>
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<td>Credit</td>
<td>CVaR</td>
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- Limits expressed in other terms than EC are then checked against overall EC tolerance and adjusted
  - Rating for credit risk, % of assets for market risk, premium for exposure?
- Risk positions tested against EC and EaR tolerances
- EC assigned to subsidiaries and/or business divisions
- **Return Adjusted Limits**
ERM Evaluation Components – where is ECM used?

Strategic Risk Management

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ECM as risk measure when optimizing risk/returns

Risk Management Culture

ECM within Strategic Risk Management

What do we look for:

- Consistent view across all risks
- Capability to assess trade-offs between different risk types
- Assessment of risk adjusted returns
- Capital budgeting
- Strategic investment allocation

Objective: To Optimize Risk-adjusted Returns
ECM within Strategic Risk Management

**Consistent view across all risks**

**Economic Capital to measure risk + chosen measure of income or value**

Risk adjusted return to compare on a consistent basis

different activities in different businesses & regions
thus allowing informed strategic decisions.

Strategic Risk Management

**Why are we making SRM so important?**

- There are some companies with Superior Risk Management that we don’t consider having Strong ERM:
  - Companies with Superior Risk Management (Controls) will have volatility of earnings and incidence of losses within their tolerances
  - Companies with Strong/Excellent ERM will have low volatility of earnings, low incidence of losses **AND will maximize their risk/return relationship!**

- **Strategic Risk Management is the UPSIDE of Risk Management**
Strategic Risk Management Practices

- **Impact of Strategic Decisions on risk profile and risk appetite is key part of the strategic decision making process.**
  - Risk Limits that are tied back to risk appetite & risk tolerance
- **Optimize the risk-reward result from a very quantitative approach.**
  - Activities with lower risk adjusted returns are regularly reviewed to either increase returns (or reduce risk)
- **Strategic Asset Allocation** – performed not just with regard to risk reward choices among investments but also reflecting the entire risk profile of the insurer, especially the aspects of the insurance liabilities that have a high correlation to capital
- **Risk-adjusted product pricing** including market consistent pricing of features that can be replicated by market traded instruments.
- **Capital budgeting** that is incorporates information about risk reward choices
  - Also includes decisions on dividends/stock buy-backs and other capital raising and distributing activities
- **Performance recognition and incentive compensation** linked to risk-adjusted financial results

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**Pricing for Risk – is ECM Enough?**

**Risk & Reward**

- Insurance Pricing (RDE)
- Linear (market)
- Insurance Pricing (Std Dev)

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### Strategic Risk Management - Examples

**For Life Insurers:**

- Strategic trade-offs between products with:
  - Credit Risk
  - Interest Rate Risk
  - Equity Risk
  - Insurance Risks
    - Based on long term view of risk adjusted returns of products
    - Choosing which to write, how much to retain and which to offset

- Strategic trade-offs in Investment Selection
  - based on risks embedded in products
  - plus long term view of risk adjusted returns of investment choices

**For Non-Life (P&C) Insurers:**

- Strategic Trade-offs among insurance coverages AND investments
  - based on long term view of risk adjusted return
  - Recognizing significance of investment risk to total risk profile
  - Recognizing ceded reinsurance credit risk
  - Selecting which risks to write and which to retain over the long term

- Some Insurers have 40% or more of their total capital tied to Investment risks
  - An Insurer with Strategic Risk Management will be able to say why they chose to take that much Investment risk
    - Including discussing relative risk reward of Insurance choices and Investments
    - With consideration of diversification impact of Insurance vs. Investments

- For Multi-line insurers/reinsurers
  - Trade-offs between all investment & Insurance risks
    - Trade-offs between Life & non-life
ERM Evaluation Components – where is ECM used?

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ERM part of our ERM review

Risk Management Culture

For Insurers with Strong or Excellent ERM

- Standard & Poor’s will develop robust processes for evaluating insurers’ internal economic capital models
- To be performed only for companies with effective ERM
- Evaluations of economic capital will be used in conjunction with existing static, risk-based measures
- Dynamic approach will enhance our existing and prospective view of capital adequacy

Standard & Poor’s can incorporate benefits of uncorrelated risks (diversification)
Overview of S&P’s Economic Capital Model Review


ECM Review is the next step in the evolution of our credit analysis

– Deepen our assessment of risk management
– Advance our analysis of insurer’s capital needs
– Develop a more accurate and forward-looking view of credit

Description of ECM Review Process

Economic Capital Model (ECM) Review Steps:

• Desktop review
  – quantitative and qualitative approach
  – detailed review of existing documentation
  – interviews with management
  – limited review of the model inputs, methodologies and validations
  – not an audit of a company’s model

• Enhanced quantitative analysis
  – May include quantitative analysis of sub-components of the model
  – where deemed necessary by S&P

• Capital adequacy determined
  – using both the S&P Capital model and insurer ECM results
  – modified by analyst adjustments
What Are We Delivering?

Objective: Determine our degree of reliance on Insurer’s ECM

Review will focus on insurer’s ability to:

- estimate capital needed in extremely adverse situations
- demonstrate control processes with the input data
- validate processes for the output for subtotals within the model
- use the model to drive major management decisions

Detailed Report:

- Documentation of review
- Description of areas viewed more and less favorably
- Stated confidence level in model
- Adjustment to S&P’s measure of capital adequacy

Conclusion: the Evolution of ERM and the Role of ECM

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<td>Return optimization</td>
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