Economic Capital 201
Modeling and Practical Concerns

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Capital Modeling at Allstate

- It's an ongoing process not a single effort
  – *Start with a simpler model and develop your skills*
- Keep the use-test in mind
  – *You will find more than one use for it and you should*
- Don't fall for one measure
  – *Different measures will give you different results*
- A fully integrated model is more work
  – *But in my opinion is more useful*

Allstate View of Economic Capital

- Allstate's economic capital is a long term process rather than a single project. Models, methods and standards evolve as management and staff develop more experience with the tools and techniques
- There are multiple measures of economic capital
- In general, Allstate reviews capital on a statutory basis. However, GAAP and MVA/MVL are playing a greater role in our analysis
- The target capital level of the company is a management decision which is informed by a number of metrics
- There is not a single correct definition of economic capital and that the right capital number for use in planning and decisions is a function senior management's risk appetite and judgment

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Capital Bases

Allstate has to address a number of different definitions of capital and the constraints of each. Allstate views a true economic capital value as the most realistic measure of the company's performance, however you can't only focus only on economic capital

GAAP Accounting	• "Shareholder's Equity": need to maximize return on this basis • Investors rely upon performance on this basis
Regulatory	• Stat RBC capital requirements and regulatory triggers • Sets minimums for capital levels of the companies • Calculated using prescribed formulas
Rating Agency	• Capital set by prescribed formulas •S&P may allow our model to influence capital required, if we receive a Strong or Better ERM rating
Economic Capital	• Capital to protect policyholders given our risk appetite and risk profile • Economic valuation of risk in liabilities and assets • Most realistic view of the business risks

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Terminology

- We think in that going forward **Economic Capital** will refer to some form of Market Value Assets – Market Value of Liabilities
- However, until the US moves to a IFRS or similar standard, we can't hold capital based on market values
- Therefore, we use the term **required capital** or **target capital** for the capital we would like to have to meet a certain risk appetite
- For Allstate, we measure required capital using statutory surplus
- We think you should look at both measures
  - MVA-MVL for long term value creation
  - Stat and GAAP capital for your shorter term capital adequacy

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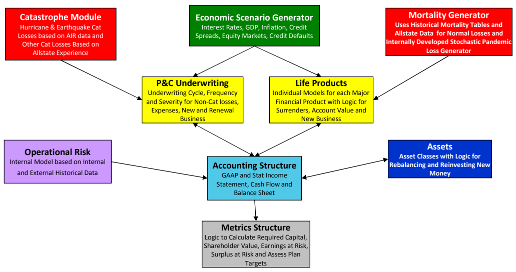
Capital Model Structure

Allstate uses a fully stochastic capital model for understanding our risk position on individual risks and aggregating the risks to an enterprise level

Allstate's Capital Model Structure



Allstate's Capital Model…

Is:

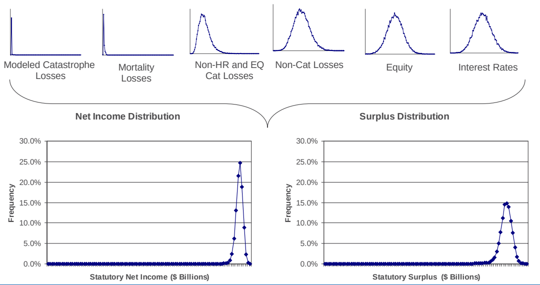
- Fully Stochastic, all risks are run at the same time and aggregated in financials
- With the exceptions of cat models, everything is built in the same tool
- Covers 50 segments of the P&C Business
- 10 major products on the Life side
- Simulates 5+ years of results in Annual Steps
- Flexible, designed to be used for multiple question not just capital
- Intended to capture mid-term risks to actual capital position

Is not:

- Intended to capture vey long (10+ years) changes in value of products
- The only view of risk in the company
- Is not the only factor used to assess required capital

Risk Aggregation

The overall risk of a company is driven by the underlying risks and the dependencies between the risks. Aggregating these individual risks in a realistic manner that considers those links is key to developing a complete understanding of the overall risk of the company.

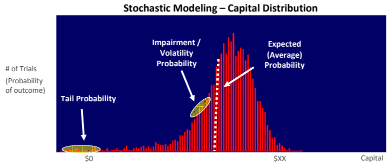


Note: Distributions do not represent any specific company

Risk and Capital Measures

Measures are important to determining risk appetite, companies need to be clear about what measures they are using. Risk and return decisions <u>will change</u> depending on the measure

Stochastic Modeling – Capital Distribution



Tail Probability

- Extreme tail event scenarios – bankruptcy
  - Major Catastrophe
  - Severe operational event
  - Market crash
- Used to set **Economic Capital** safety level

Impairment Probability

- Volatility event scenarios
  - Catastrophes
  - Market downturns
  - Combination of Events
- Used to set aggregate annual **volatility risk limits** / safety limits

Other Distribution Points

- Rating agency/stakeholder interest in other thresholds
  - Insurance department action levels
- Upside potential
- Expected results

Note: Distribution does not represent any specific company

Capital Measures Defined

It is useful to view risk exposures through multiple lenses to inform Capital level

MEASURE	DEFINITION
Value-at-Risk (VaR) 1. Risk of Ruin 2. Benchmark Capital Level (external capital raise)	Capital is set based on a designated tail percentile point, indicating risk of breaching threshold at a set probability 1. Risk of Ruin = Bankruptcy (zero statutory surplus) 2. Risk of falling below Benchmark = Regulatory action, raise capital
Tail Value-at-Risk (TVaR)	The average losses in the tail after a designated point
Shareholder Value Maximization	Capital held at level where the present value of cash flows in excess of capital (value added) is maximized, assuming a set risk tolerance (e.g. "Panning" method)
Market Consistent (Solvency II)	Market Value of Surplus = MV Assets – MV Liabilities, e.g. using VaR level for minimum required MV Surplus
Deterministic Stress Scenarios	Capital held to cover a defined risk event, or event impact measured along probability distribution

Risk Appetite

What is risk appetite?

- The overall level of risk that management views as acceptable when balancing risk, return, and strategic objectives

Why is risk appetite important?

- Provides a simple way for thinking about risk and return goals
- Provides focus for an organization
- Allows for a consistent measure for decision making

How to develop risk appetite?

- Understand and measure the risks you are taking
- Develop a link between individual risk factors and the total corporate risk level

Developing Risk Appetite

Developing a risk appetite is a process of both understanding your risks and your stakeholders' views on appropriate levels of risk

Risk appetite is dependent on management and other stakeholders view of risk. Issues include:

- Bankruptcy
- Ratings downgrade
- Financial distress (urgent need to raise capital)
- Missing income targets
- Change in shareholder value

Models and aggregation need to provide a full view of the enterprise risk profile

- Distributions of outcomes
  - Income
  - Capital
  - Shareholder Value

It may be difficult to get management to express risk appetite

Implied Risk Appetite

Instead of first picking a risk appetite, it may be easier to work with management around overall capital levels and use that as the basis for risk appetite

Selecting an economic capital level by using multiple metrics allows for a very direct conversation with management with tangible values

- Capital level selected will imply management risk appetite
- Once capital is selected, the risk values can be used for decision making
  - Different measures may result in different answers for the same question, you will need to weigh all measures
  - Determination of capital actions
- Qualitative measures need to be evaluated at the same time
  - Stress tests, black swans, etc
- Required capital should be an ongoing discussion

Once a capital level has been selected, strategic business decisions and actions plans can be pushed out across the organization, often through capital allocation

Capital Selection Example

1.Risk of Ruin (insolvency)

- Minimum surplus threshold of zero (over 1, 3 years)

($bil)	1/500	1/750	1/1000	1/2000	"Max Loss"
VaR-1yr	2.5	3.5	4.0	4.5	7.0
VaR-3yr	4.5	5.0	5.5	6.5	13.5
Rating	BBB/A	A/AA-	A/AA+	AA/AAA	AAA

2.Benchmark Capital Level

- Benchmark surplus threshold ~ rating / regulatory (over 1 year)

($bil)	1/50	1/100	1/250	1/500
Regulatory *	4.9	5.8	6.0	7.5

* Regulatory level of $3.0B = 250% NAIC RBC

3.Shareholder Value Maximization

- Range of surplus that maximizes overall corporate value balanced by risk of ruin

($bil)	Low	High
Optimal Range	3.5	5.0

* Based on: Managing the Invisible, William H. Panning, Willis RE, April 2006

Note: Numbers do not represent any specific company and are for illustration only

Capital Model Uses

Beyond required capital, the models can be (and should be) used for many other decisions and analyses

Identify and evaluate enterprise wide risk opportunities

- Enterprise strategic asset allocation
- Parent/ subsidiary capital support
- Mortality capacity/ life reinsurance
- M&A Decisions

Other analysis and support

- Capital management strategies: equity dividend and share repurchases
- Property reinsurance analyses
- Risk adjusted returns
- Capital allocation decisions
- Probabilities of achieving planned results and impacts to valuation
- Specific scenario planning
- Planning and performance assessment

Capital Allocation

To illustrate implications of allocating Capital, we focused on a stand-alone view and benchmark capital thresholds for major lines

Capital Allocation on a Stand-Alone Business

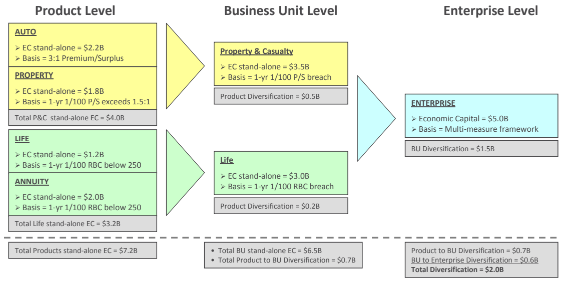
- Each product line viewed as a stand-alone business, with Capital set based on likelihood of breaching benchmark capital level at 1/100 over 1 year

What to do about diversification?

- One option is to use diversified enterprise capital, and allocate diversification credit to lower level segments
  - Reduces capital of the segments; can view as higher likelihood of breaching benchmark levels
- Alternatively, removing the diversification amount, total enterprise capital = sum of stand-alone segments' required capital
  - Can be viewed as charging back the segments for the additional risk capital held at the top

Capital Allocation Example

Putting it all together, an enterprise view informs management of the required capital and diversification credit in the portfolio of businesses, enabling economic capital to be strategically allocated



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Questions