S&P Global
Ratings

Enterprise Risk Management and Economic Capital

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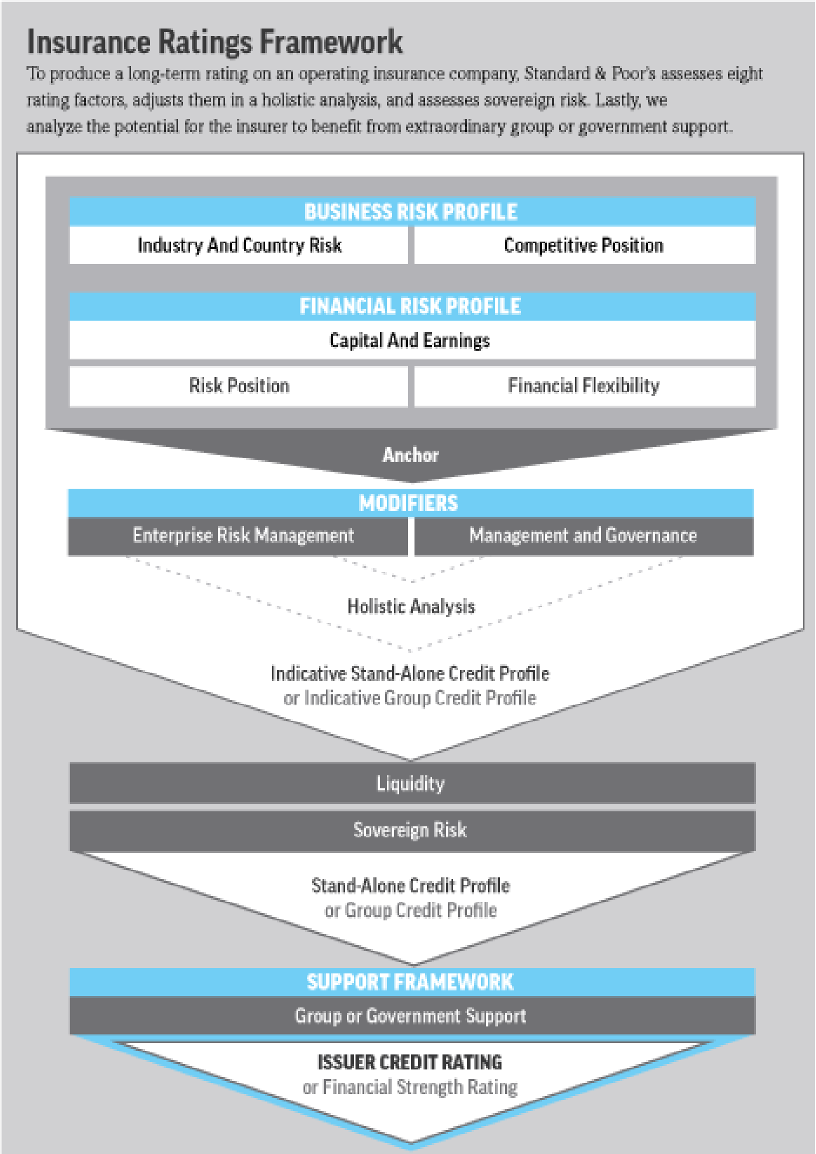
Insurance Ratings Criteria

New Criteria Framework



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Criteria Framework

Table 1: Anchor

Business risk profile (from table 3)	Financial risk profile (from table 12)									
	Extremely strong	**Very strong**	**Strong**	**Moderately strong**	**Upper adequate**	**Lower adequate**	**Less than adequate**	**Weak**	**Very weak**	**Extremely weak**
Excellent	aa+	aa	aa-	a+	a	a-	bbb+	bbb-	N/A	N/A
Very Strong	aa	aa-	aa- or a+	a+ or a	a	a-	bbb	bb+	bb	N/A
Strong	a+	a+ or a	a or a-	a-	a-	bbb+	bbb	bb+	bb-	b+
Satisfactory	a or a-	a-	a-	bbb+	bbb+	bbb	bbb-	bb	bb-	b
Fair	bbb+	bbb+	bbb+ or bbb	bbb	bbb	bbb-	bb+	bb	b+	b
Vulnerable	bbb-	bbb-	bbb-	bb+	bb+	bb+	bb	bb-	b	b
Highly vulnerable	bb-	bb-	bb-	bb-	bb-	bb-	b+	b	b	b- or lower

S&P Insurance Capital Model Overview

Capital Analysis Across Regulatory Regimes

- **Accounting bases: Consolidated US GAAP and IFRS, NAIC Statutory Accounting Principles**
  - Many national GAAPs for liabilities
    - 28 different approaches within the EU under IFRS
  - Solvency focus in United States via NAIC SAP
- **Focus on Total Adjusted Capital (TAC)**
- **Measures how capital stands up to a combination of reasonably stressful of business, underwriting, reserve, credit and investment conditions**
- **Excess capital amount calculated**
  - Adjust capital to a globally consistent prudent level
  - Capital required depends on asset risk and types of business written
    - Calibrated to AAA, AA, A, BBB confidence intervals

How does S&P determine capital adequacy?

- **It is NOT all quantitative. Under S&P's insurance criteria, factors considered includes:**
  - S&P's capital model result
  - Regulatory modeling result (in US NAIC RBC)
  - Earnings forecast
    - Earnings that contribute to the growth/decline of capital in the next three years
    - Judgment is needed to determine the likelihood of meeting targets and macro-economic factors to impact forecasts
- **Representative of modeling**
  - Size adjustment
  - Captives
  - Complexity of the model/adjustments and our confidence in the adjustments
  - Other risks not already captured by standard model and adjustments
- **Other parts of our rating analysis also benefits from the capital model analysis:**
  - Help identify the weakest link, and exposure to various risks categories
  - Facilitate dialogues with insurers on their ERM, ALM, investment programs and actuarial issues

Determining capital adequacy (cont.)

- **Major risk categories Total Required Capital (TRC):**
  - **Asset risk**
    - Corporate bonds
    - Equity
    - Real estates
    - Structured securities
  - **Underwriting risk and loss reserve risks (for PC)**
    - Mortality
    - Morbidity
    - Longevity
    - P/C reserve risk by line of business
  - **Interest rate risk**
    - Asset liability mismatch – separate slide later on
    - Convexity
    - Variable annuity (C3-Phase II) – separate slide later on
  - **Operational risk**

- **Diversification benefits are given for:**
  - **Diversifying assets between Bonds, Equities and Real Estate.**
  - **Diversifying business lines between mortality and longevity risk, property and liability risk.**
  - **Diversifying segments between life and P/C business**

S&P's ERM Evaluation

- S&P's ERM reviews have three levels: Level I, II & III
- S&P's ERM Level I and II reviews consist of five components

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S&P's ERM Assessment Guidelines

- An insurer's ERM is scored as very strong (1), strong (2), adequate with strong risk controls (3), adequate (4) or weak (5) based on the assessments of the five sub-factors, which we classify as positive, neutral, or negative
- The analysis is evidence based- An insurer receives a neutral score for any of the five sub-factors where evidence is insufficient to assign either a positive or a negative score.

ERM Assessment

Score	Assessment	Guideline
1	Very Strong	Positive score for all subfactors and economic capital model (ECM) is assessed either "good" or "superior" under our criteria.
2	Strong	The risk management culture, risk controls, and strategic risk management subfactors are scored positive, one or both of the other two subfactors is scored neutral, and no subfactor is scored negative.
3	Adequate with strong risk control	The risk controls subfactor is scored positive, the strategic risk management subfactor is scored neutral, and no subfactor is scored negative.
4	Adequate	The risk controls and risk management culture subfactors are scored at least neutral; overall doesn't satisfy the requirement for adequate with strong risk control.
5	Weak	One or both of the risk controls and risk management culture subfactors are scored negative.

Components of S&P's ERM Evaluation

Risk Management Culture

- **The Company's philosophy towards risks**
  - Especially an insurer's risk preferences, risk appetite and risk tolerances
- **Governance and organizational structure**
- **Risk appetite framework**
- **Communications**
  - External Disclosures
  - Internal Communication
  - Robustness of risk reporting
- **Alignment of compensation structures and risk taking**
- **Embedding ERM in operations of the company**

Components of S&P's ERM Evaluation

Risk Controls

- **We evaluate controls around the following risks, where applicable, based on an insurer's risk profile:**
  - **Credit risk**
  - **Equity Risk**
  - **Interest rate risk/ALM**
  - **Insurance risk**
  - **Mortality/Longevity/Morbidity**
    - Policyholder behavior
    - Catastrophe
    - Underwriting and Product Development
  - **Underwriting/Pricing/Cycle Management**
  - **Reserve risk**
  - **Catastrophe risk**
  - **Operational risk**

Components of S&P's ERM Evaluation

Emerging Risk Management

Risk Identification

- Emerging risks appear slowly, are difficult to identify, represent an idea more than facts
- An established formal process

Risk Monitoring

- Early warning system, Key risk indicators
- Consistently gather existing information to amass preliminary evidence

Risk Management

- Depends on the degree of concentration of risks
- Depends on the correlation of the risks in an insurer's portfolio
- Use reinsurance/hedging strategies 'deep in the tail'

Risk Learning

- Incorporating Lessons learned to improve emerging risks management framework

Components of S&P's ERM Evaluation

Risk Models

- **Robustness and completeness**
- **Validation (Static and Dynamic)**
- **Stress tests**
- **Existence of Economic capital model**
  - Definition
  - Scope of risks
  - Approach to calculation of risk capitals
  - Diversification benefit
- **Incorporation of results in decision making processes ("Use Test")**

Components of S&P's ERM Evaluation

Strategic Risk Management

- **Strategic Risk Management: Risk/reward mentality and how the company prioritizes strategic options**
- **Review of evidence to demonstrate:**
  - Company has allocated capital to liabilities with risks consistent with a realistic assessment of its capital needs and risk profile.
  - Examples of how risk-adjusted pricing is applied in practice
  - Decisions regarding strategic options are truly made based on economic risk/reward metrics
- **Management's demonstrated use and understanding of model results**
- **Evidence to suggest optimization of risk adjusted strategic options and optimal allocation of capital**

Differences in framework

	S&P model	NAIC RBC model
Measure/Focus	• Gradation of financial strength (investment grade)	• Solvency
Use/Purpose	• Together with earnings projections, it forms a key input in our financial risk profile within our rating analysis • AAA-BBB	• Different regulatory actions at different pre-defined levels • Earning is a separate consideration • Company Action Level (150%-200%) • Regulatory Action Level (100%-150%) • Authorized Control Level (70%-100%
Output	• Absolute redundancy/deficiency in $ at rating levels • S&P captures size bias through representative of modeling	• A relative ratio • Company size is not factored in
Spectrum	• Non-linear measure (99.9% CL to 97.2% CL) CL=confidence level	• Linear measure (<70% to >200%)
Scope	• Includes all entities deem to carry risk, regardless of geographic jurisdiction • IFRS/GAAP model on a consolidated basis includes holding companies • Factors in quality of capital through debt funded/debt+hybrid double leverage, and surplus notes threshold	• Standalone legal entity basis (can be approximated on a combined basis in certain cases or if there is combined statements) • Regulators focus in their own jurisdiction • Capital adequacy of offshore captives are not captured

Emerging Trends in Quantitative Risk Management

1. **Demonstration Of Model Ownership**
   - **Economic Scenario Generators**
   - **Catastrophe models**
2. **Model Validation**
   - **Triangulation exercises**
   - **Scenario Analysis**
   - **Documentation**
3. **Casualty Catastrophes**
   - **Cyber**
   - **Inflation**
4. **Correlation / Causation / Diversification**
5. **Capital Allocation**

Linkage between ORSA requirements and our current ERM Framework

ORSA Requirements

Section 1- Description of the Insurer's Risk Management Framework

- Risk Culture & Governance
- Risk Identification & Prioritization
- Risk Appetite, Tolerances, Limits
- Risk Management & Controls
- Risk Reporting & Communication

Section 2- Insurer's Assessment of Risk Exposure

- Relevant risk categories include credit, market, liquidity, u/w, operational risks

Section 3- Group Assessment of Risk Capital and Prospective Solvency Assessment

- Definition of Solvency
- Accounting or Valuation Regime
- Lines of Business Included
- Time Horizon
- Risks Modeled
- Quantification Method
- Risk Capital Metrics
- Defined Security Standards
- Aggregation & Diversification

ERM Framework

Subfactor 1 - Risk Management Culture

- Risk governance and organizational structure
- Risk appetite framework
- Risk reporting and communication

Subfactor 2 – Risk Controls

- Risk identification
- Risk measurement & monitoring

Subfactor 2 – Risk Controls

- The main categories of an insurer's risk controls are credit, interest, market, insurance and operational risks

Subfactor 3 – Emerging Risk Management

Subfactor 4 – Risk Models

- Analysis of stochastic and deterministic stress scenario analyses

Subfactor 5 – Strategic Risk Management

- View of required capital with a well-defined process for capital allocation
- Assessment of regulatory and accounting considerations