

LIFE INSURANCE RATING METHODOLOGY



**CREDIT RATING AGENCY OF
BANGLADESH LIMITED**



CRAB'S RATING PROCESS

- **An independent and professional approach of the CRAB is designed to ensure reliable, consistent and unbiased opinions.**
- **CRAB's rating represents the current opinion of a company's financial strength and ability to meet the insurer's obligation to policy holders.**
- **CRAB's rating is not a warranty of an insurer's future ability to meet obligations to policy holders.**
- **CRAB undertakes an Initial Rating of an insurer based on the audited annual report, actuarial reports and other available information.**
- **As part of the information collection, CRAB professionals hold discussions with the key management personnel of the company to have a clear understanding of the operational procedure and strategy of the organization.**

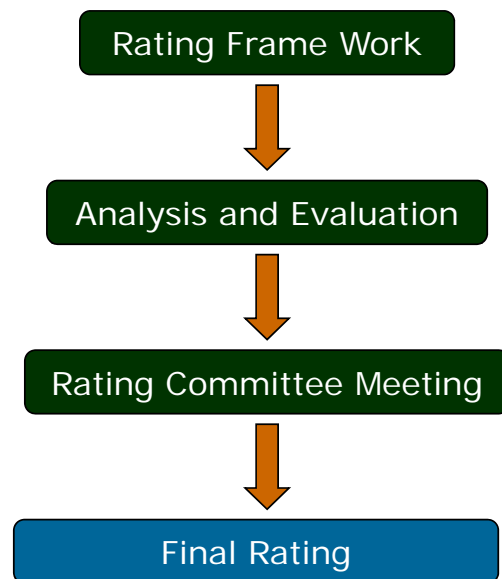
CRAB'S RATING PROCESS (contd.)

- **CRAB examines the nature of insurance regulation and the life insurer's performance with regard to the compliance of the various provisions of the Insurance Act 1938, the Insurance Rules 1958 and the related circulars and guidelines issued by the Department of Insurance from time to time, Companies Act 1994 and SEC Act.**

- **The competitive position of the life insurer in relation to other life insurers in the industry is evaluated.**

- **CRAB also evaluates the competitive position of the life insurers with other life insurers in the peer group.**

RATING PROCESS FLOW



Rating Framework

CRAB's "LIDataBase"

CRAB's "LIRatios"

Rating Scale

Rating of Individual Life Insurance

Weight

X

Analysis Output

Weight

X

Quantitative Rating

Weight

X

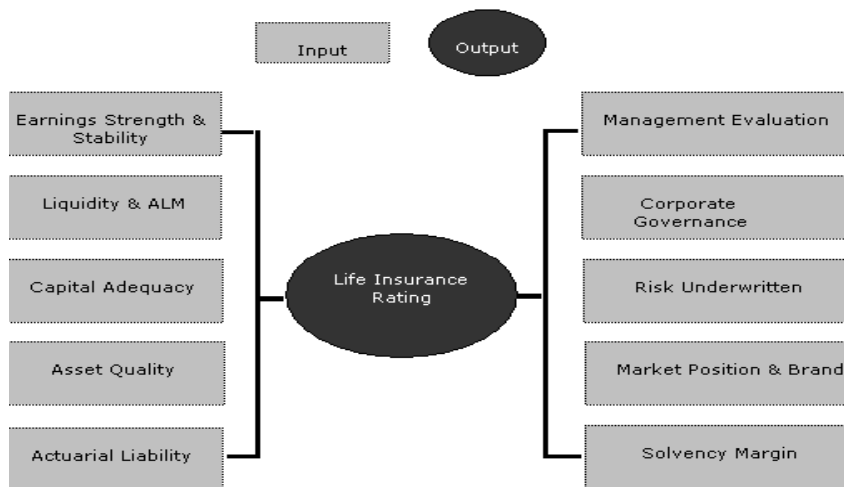
Qualitative Rating

FINAL RATING

5

Life Insurance Rating Methodology

CRAB's Life Insurance Rating Methodology [CARAMMELS MODEL]



CARAMMELS MODEL

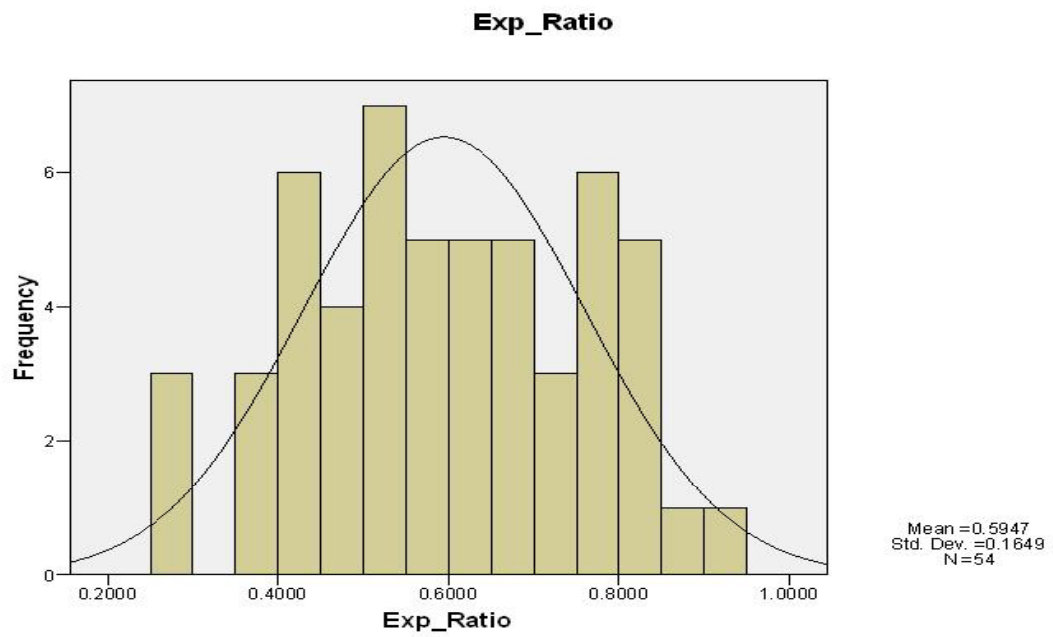
C = Capital Adequacy
A = Actuarial Liability
R = Risk Underwritten
A = Asset Quality

M = Management Evaluation and Corporate Governance
M = Market Position and Brand
E = Earnings Strength & Stability
L = Liquidity and ALM
S = Solvency Margin

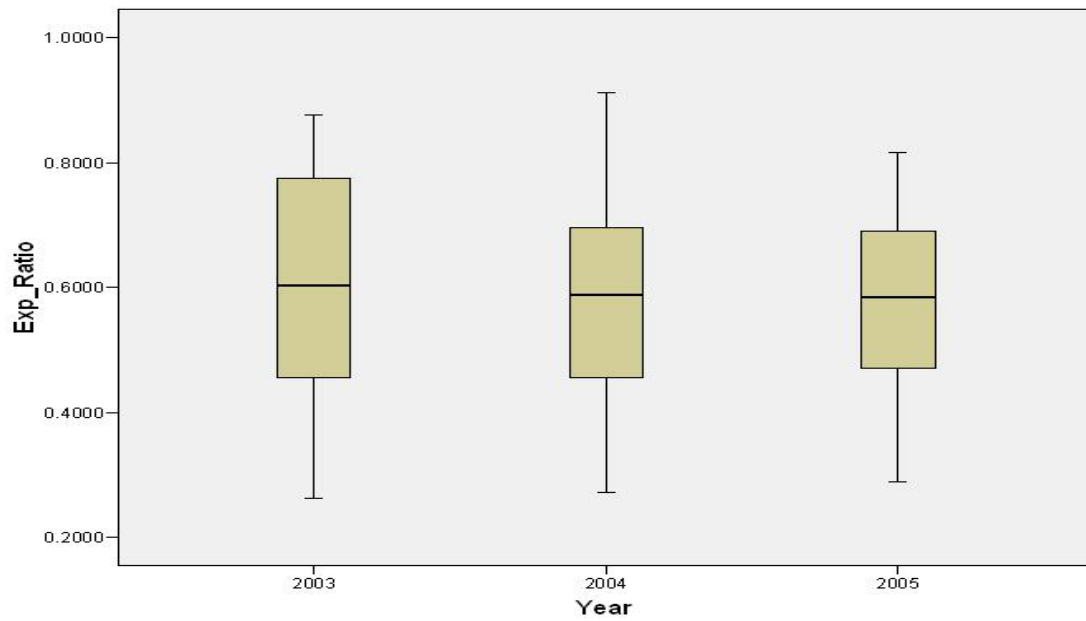
METHODOLOGY

- Choosing a limited number of financial statement variables in accordance with CAMELS Model.
- Calculate Ratios
- Observe Distribution pattern of industry ratios i.e through trend and cross section analysis
- Test the normality of the observed ratios
- Statistically derive the scales for each ratio (considering the global standard and country specific norms).
- Fit the individual life insurance company's ratios into the model
- Derive the model specific scores
- Mapping the score into CRAB's Ratings i.e AAA to D.

An Example- Variable Selection Process

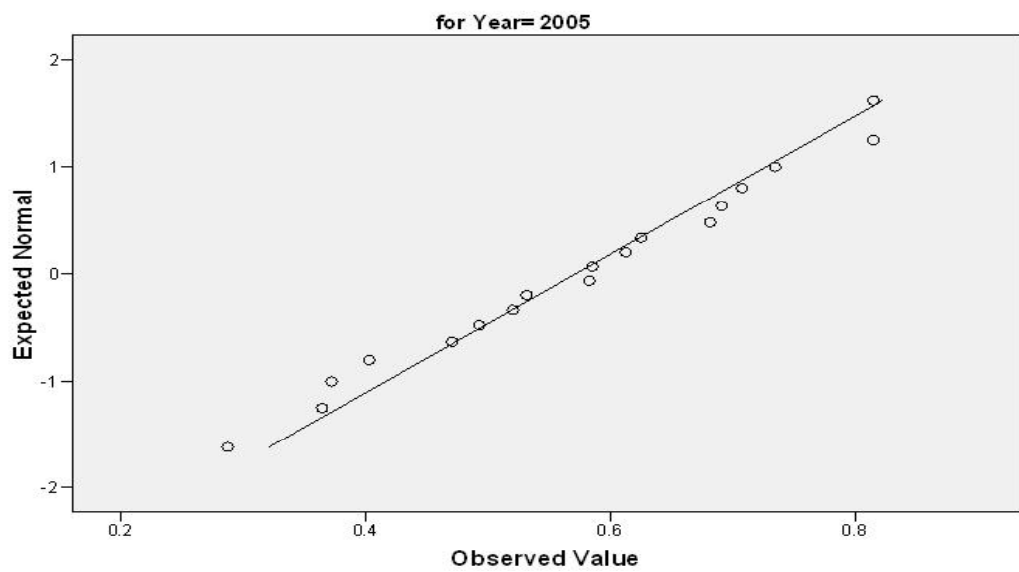


An Example- Variable Selection Process

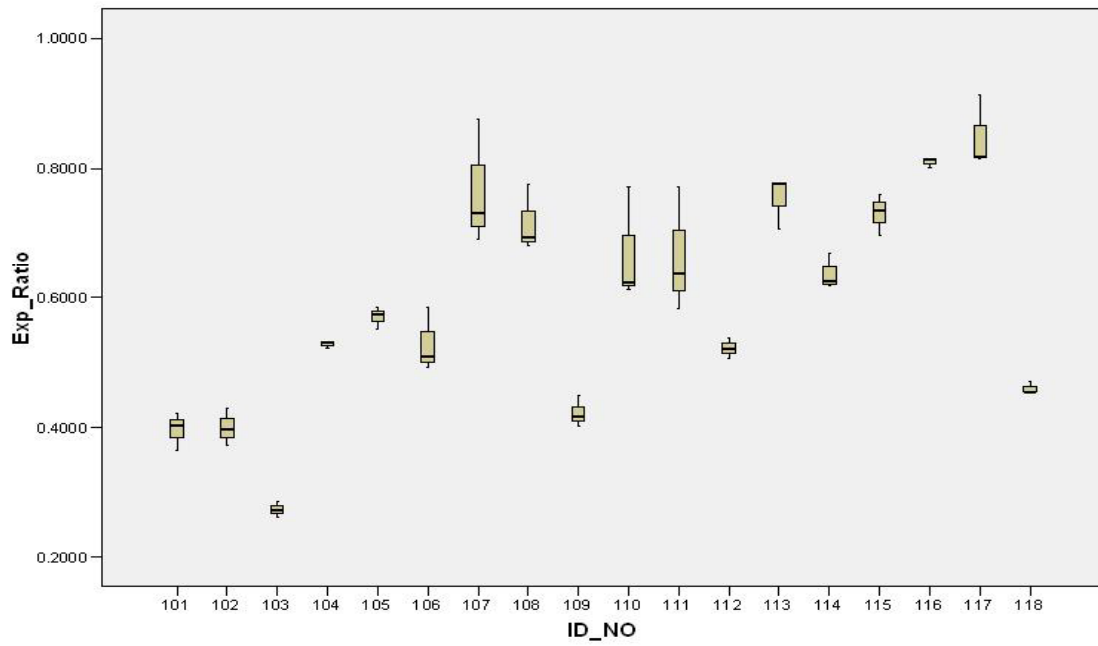


An Example- Variable Selection Process

Normal Q-Q Plot of Exp_Ratio



An Example- Variable Selection Process



11

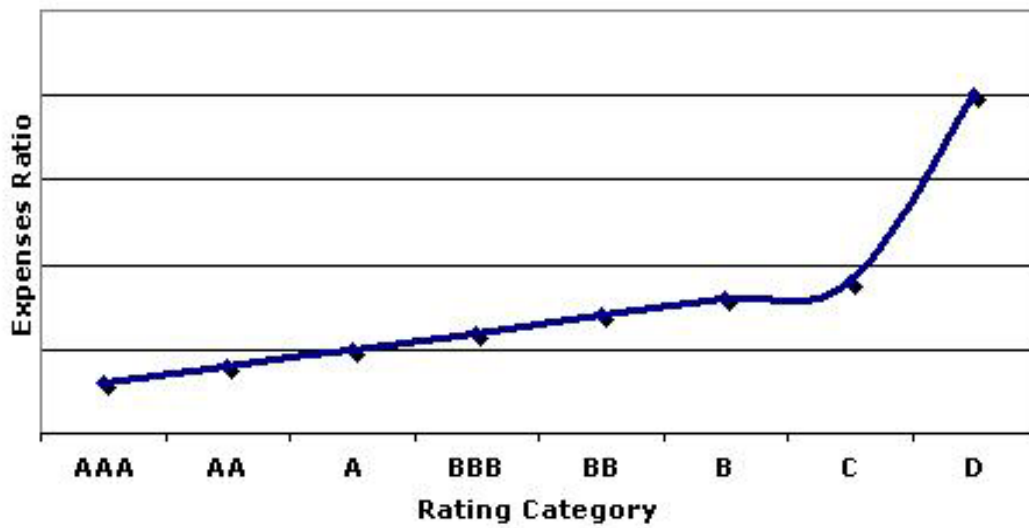
An Example- Variable Selection Process

Statistics		Claim_Premium	Exp_Ratio	Combined_Ratio	Claim_LF
N	Valid	54	54	54	54
	Missing	0	0	0	0
Mean		12.86%	59.47%	72.32%	12.70%
Std. Error of Mean		1.63%	2.24%	1.57%	0.98%
Median		9.30%	58.58%	74.36%	10.79%
Std. Deviation		11.98%	16.49%	11.52%	7.21%
Minimum		0.85%	26.22%	49.11%	2.51%
Maximum		54.20%	91.21%	101.31%	31.42%
Percentiles	10	1.90%	38.54%	57.92%	4.43%
	20	2.79%	42.93%	59.99%	6.22%
	25	3.21%	45.58%	61.55%	7.38%
	30	3.95%	50.02%	64.77%	8.04%
	40	6.38%	53.31%	70.86%	9.98%
	50	9.30%	58.58%	74.36%	10.79%
	60	13.43%	63.67%	75.84%	12.37%
	70	17.90%	70.25%	78.08%	14.94%
	75	19.58%	74.12%	80.15%	16.41%
	80	20.60%	77.18%	80.80%	19.37%
	90	28.31%	81.40%	88.41%	25.10%

12

An Example- Variable Selection Process

Expenses Ratio's Behaviour with Rating



FACTOR: EARNINGS STRENGTH AND STABILITY

- **The excess of life fund of an insurer over the net liability as valued by the actuary is the surplus generated as at balance sheet date.**
- **The surplus after provision for taxes is distributed among the shareholders and the policy holders on the recommendation of the actuary.**
- **CRAB examines the trend of surplus as at balance sheet dates and also during the inter valuation periods.**
- **CRAB examines the profitability and long term financial viability of the insurer by looking at numerous financial ratios and other qualitative measurements.**

EARNINGS AND PROFITABILITY (contd.)

- **In particular, CRAB looks at the following:**
- **Gross and net yields on life fund during the inter-valuation period**
- **Net liability (reserves)**
- **Amount of surplus allocated to policyholders**
- **Amount of surplus allocated to shareholders**
- **Amount of surplus remain unallocated / unappropriated**
- **Trend of actual and allowable management expenses**
- **Trend of renewal expense ratios**

FACTOR: EARNINGS STRENGTH AND STABILITY

Indicators

Profitability	=	Actuarial Surplus as % of Life Fund
Volatility	=	Sharpe ratio of Growth in Premium [Absolute value of the mean of the company's growth in premium divided by the standard deviation of growth in premium (5 years period)]
<u>Efficiency:</u>		
ME/NP	=	Management Expenses as % of Net Premium
EME/NP	=	Excess Management Expenses (EME) as % of Net Premium [EME= Allowable Management Expenses - Actual Management Expenses]
Loss Ratio	=	Net Claim as % of Net Premium
Dividend Policy	=	Dividend Trend & Policy

FACTOR: LIQUIDITY & ASSET LIABILITY MANAGEMENT

- **The long term nature of life insurance business means that liquidity considerations are not as critical as with non-life business.**
- **Liquidity risk is the exposure to risk in the event that insufficient liquid assets will be available from amongst the assets supporting the policy obligations to meet the cash flow requirements of the policy holders obligations when they are due.**
- **It would be inappropriate for too large a proportion of a fund's assets to be invested in marketable and illiquid assets.**
- **It would also be dangerous for too great a concentration in unquoted assets with values which are difficult to ascertain.**

LIQUIDITY (contd.)

- In particular, CRAB examines the following:
 - ⇒ Liquidation value at risk
 - ⇒ Capital market risk
 - ⇒ Compliance with the investment regulation

Relevant Financial Metrics:

Liquid Assets as % of Life Fund – cash, short-term assets, bank deposits, investment grade bonds, preferred stock, and common stock as % of Life Fund

FACTOR: CAPITAL ADEQUACY

- **Capital Maintenance Ratio (CMR) = Capital Position as % of Regulatory Required Capital**
- **Capital as % of Assets**

FACTOR: ASSET QUALITY

- Quality of assets has to be of excellent standing to ensure high rate of return on investment.
- CRAB evaluates rate of return on each class of asset and the risk associated with each class.
- CRAB considers the following factors while analyzing the asset quality
 - Investment Strategy
 - Diversification
 - Credit Risk
 - ⇒ Business credit risk (Policy holder Loan)
 - ⇒ Investment asset credit risk
 - ⇒ Political risk
 - ⇒ Sovereign risk

ASSET QUALITY (contd.)

- **Market Risk**
 - ⇒ **Interest rate risk**
 - ⇒ **Equity and property risk**
 - ⇒ **Reinvestment risk**
- **ALM Risk**
- **Provisioning against loss on investment**

Key Indicators

Indicators

Risky assets as % of Invested Assets
Actual Investment as % of Regulatory Required Investment
Investment Portfolio Limit Position
Investment Yield

FACTOR: ACTUARIAL VALUATION OF LIABILITIES

- **Section 13 of the Insurance Act 1938 stipulates that every insurer shall cause an investigation to be made by an actuary into the financial condition of a life insurer.**
- **CRAB does not carry out actuarial valuation of liabilities; rather it uses the results of the valuation made by the life insurers actuary.**
- **Actuary's management report, if available, is also used to evaluate the insurer's current financial position and likely scenarios that may emerge under different set of assumptions.**
- **CRAB also reviews the valuation methodology and valuation assumptions.**

ACTUARIAL VALUATION OF LIABILITIES (contd.)

• In particular, CRAB reviews the following elements of valuation:

- **Valuation Assumptions**

- ⇒ **Mortality**

- ⇒ **Rate of Interest**

- ⇒ **The proportion of annual premiums reserved as a provision for future expenses and profits bears to the total of the annual premiums.**

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Shahrowardi, 5/16/2007

FACTOR: MANAGEMENT EVALUATION

- **Management quality is a very important factor, which can make substantial difference to the life insurers performance.**
- **CRAB evaluates the performance of the management team by focusing on policy administration, actuarial management, data management and compliance of statutory obligations. Each of the components are subdivided as follows:**

MANAGEMENT (contd.)

- **Policy Administration**
 - ⇒ Method of premium collection
 - ⇒ Policy servicing
 - ⇒ Claims settlement
 - ⇒ Marketing
- **Actuarial Management**
 - ⇒ Product design
 - ⇒ Reinsurance policy
 - ⇒ Expense monitoring
 - ⇒ Investment policy

MANAGEMENT (contd.)

- **Statutory Obligations**

- ⇒ Audited financial statements (balance sheet, revenue account etc.)
- ⇒ Actuarial reports and abstracts (summary of valuation reports as per requirement of CRAB if detailed report is not made available)
- ⇒ Other statutory reports

- **Data Management**

- ⇒ Quality of management information system
- ⇒ Level and quality of computerization of accounting and valuation data
- ⇒ Level and quality of computerization of business operations

FACTOR : CORPORATE GOVERNANCE

Key Analytical Area

- *Corporate Governance*

- Relationship between the BoD, Management and Shareholders
- Degree of relationship to balance effectively shareholders and creditors interest
- Board Effectiveness
- Board Independence
- Ownership and Organizational Complexity
- Management Compensation
- Key Personnel Risk
- Insider and Related Party Risk
- Integrity of Accounting and Audit

FACTOR : RISK UNDERWRITTEN

- **CRAB examines the nature of risks underwritten by a life insurer.**
- **CRAB considers the following factors while analysing the nature of risks:**
 - **Pricing of Insurance Products**
 - **Underwriting Risks**
 - ⇒ **Underwriting process risk**
 - ⇒ **Claims risk**
 - ⇒ **Economic environment risk**
 - ⇒ **Policy holders behavior risk**
 - ⇒ **Reserving risk**

RISK UNDERWRITTEN (contd.)

- **Reinsurance**
 - ⇒ **Terms of reinsurance arrangement**
 - ⇒ **Credit worthiness of the re-insurer**
 - ⇒ **Net retention**

CONTROLS AND RISK MANAGEMENT

- ***Risk Governance:***
 - Involvement of directors in reviewing risk appetites and control effectiveness, director's awareness of risks, relevance of their backgrounds to assess risks
 - Collective and individual responsibilities of and awareness by executive management on risk matters, integration of risk considerations in budgeting, capital allocation, and determination of capital adequacy
 - Organization, staffing, resources, enterprise -wide role of risk function(s)
- ***Risk Management:***
 - Risk control process- mandates of units controlling credit and operational risk, practices to ensure limit disciplines
 - Relationship of risk to earnings, capital, limit setting, portfolio mix and diversification
 - Risk mitigations
- ***Risk Analysis and Quantification:***
 - Quantification, measures used for setting of limits and running the business, stress testing, capital determination
 - Monitoring and Reporting- rigor, appropriateness and usefulness of reports and alert systems
- ***Risk Infrastructure and Intelligence:***
 - Risk infrastructure – information and knowledge systems
 - Risk intelligence – validity of scorecard and data used

FACTOR : MARKET POSITION AND BRAND

Indicators

Market Share Ratio = Premium as % of Industry Premium
Relative Market Presence Ratio = Premium relative to the average industry premium by the country

- **Competitive Advantages**
- **Line of business**
- **Distribution**

FACTOR : SOLVENCY MARGIN

- **In its broad sense, solvency represents the excess of an insurer's value of assets over the value of its liabilities. Valuation of its assets and liabilities plays an important role in the determination of solvency of an insurer. Risk associated with reserving are also taken into account.**
- **Actual solvency margin is the actual excess of an insurer's value of assets over its value of liabilities.**
- **Required solvency margin is the required excess amount of an insurer's value of assets over its value of liabilities as defined by the regulatory authority.**
- **Solvency Ratio**
- **Statutory Requirement of Solvency Margin**
- **CRAB's Test of Solvency**

Solvency Calculation- Life Insurance

- CRAB has applied standard methodology to assess the solvency of SLICL.

Adjusted Value of Assets

- **Asset minus** agent balance, outstanding premium, sundry debtors, stock & stationary, furniture & fixtures

Adjusted Value of Assets

- Adjusted value of liabilities comprises mathematical reserve and cost of bonuses. |

Required Solvency Margin

- Required solvency margin is taken as 4% of adjusted liabilities.

*Required Solvency = Adjusted Liabilities x 4.0%

*Available Solvency = Adjusted value of assets -
Adjusted value of liabilities

* Solvency Ratio = Available Solvency / Required
Solvency