Institute of Actuaries of India

Changing Risks, Expecting the Unexpected

Role of Actuaries in ERM-

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In next 20 minutes, we would like to discuss how actuarial skills can be used in risk management not only in insurance but in wider field such as Banking etc.

Agenda

- Evolution of Enterprise Risk Management (ERM)
- Traditional strengths of Actuaries
- Role of Actuaries in Solvency-II
- Example of Insurance and Banking Sector where actuaries can make contribution
- Suggestions for Profession to take actuaries forward in wider area

Evolution of Enterprise Risk Management (ERM)

Introduction –*What is this about*

- Multiple failures in the risk events witnessed during the last two decades- brought risk management into sharp focus.
- It is into this backdrop that Enterprise Risk Management has emerged as a potent answer to the question posed by “Changing risks expecting the unexpected”.
- No longer Silo? Integrated risk culture has become a talking point.
- CRO who to *who is the CRO* ? The position of Chief Risk Officer has now been recognised as a critical one.
- Wider fields for actuaries in Insurance and elsewhere?

- This paper is about that and some more….

Evolution of ERM –*what went wrong?*

- Many debacles happened majorly in the last two decades leading to billions in claim settlements, lost revenue and bad reputation.
- Some of the few well known are

Company name	Period	Estimated loss/Fraud	Main reason for failure	Risk failure area
Barings Bank	1995-96	$ 1 bn	Operational check and controls, lack of understanding of business by top management	Operational/Market
MF Global	2008	$140 mn	Unauthorised bets on wheat futures	Market/Operations
Societe General	2008	Euro4.9 bn	Unauthorised bets on market movements	Market/Operations
Equitable Life	Mid 1990-2000	Closed to new business in 2000	Mispricing of Guaranteed Annuity Rates	Insurance (Pricing/reserving)
LTCM	1997-2000	$3.5 bn	Deviation of models from reality	Market
Bernard Madoff Investments Securities LLC	2008	$18-$65 bn	Ponzi Scheme –Fraudulent practices	Market
Bausch and Lomb	1993-95	$42 mn	Misreported revenue	Business

Evolution of ERM –why ERM?

- As can be seen that the issues are in all types of industries.
- To avoid such events it has been felt strongly that an integrated risk management culture needs to be made an integral part of all areas of the business thought process
- This will lead to a proper allocation of capital and performance measurement on risk adjusted basis.
- Insurers and other organisations are giving enterprise-level risk management increasing attention, high-level accountability and clear responsibilities befitting a legitimate strategic function and discipline
- *How do actuaries fit in----*

Traditional strengths of Actuaries

Strength of Actuaries-Where do actuaries excel?

- Key working areas historically -Pricing, Valuation, Modelling, Asset liability management (ALM), Experience analysis and Reporting.
- <u>Key strengths of Actuaries are</u>
  - **Long term understanding of financial business and cash flows**
  - **Applying the quantitative skills/tools while dealing with the risks**
  - **Good knowledge of insurance business**
  - **Long term Assumptions setting**
  - **Communicating complex results in simple terms to stakeholders**
  - **Dealing with large projects successfully such as Solvency-II.**

- However, over the last decade the playing field changed a lot with
  - Increasing risk based capital approach to Solvency in financial field, such as Solvency-II and Basel-II/III
  - Emergence of ERM

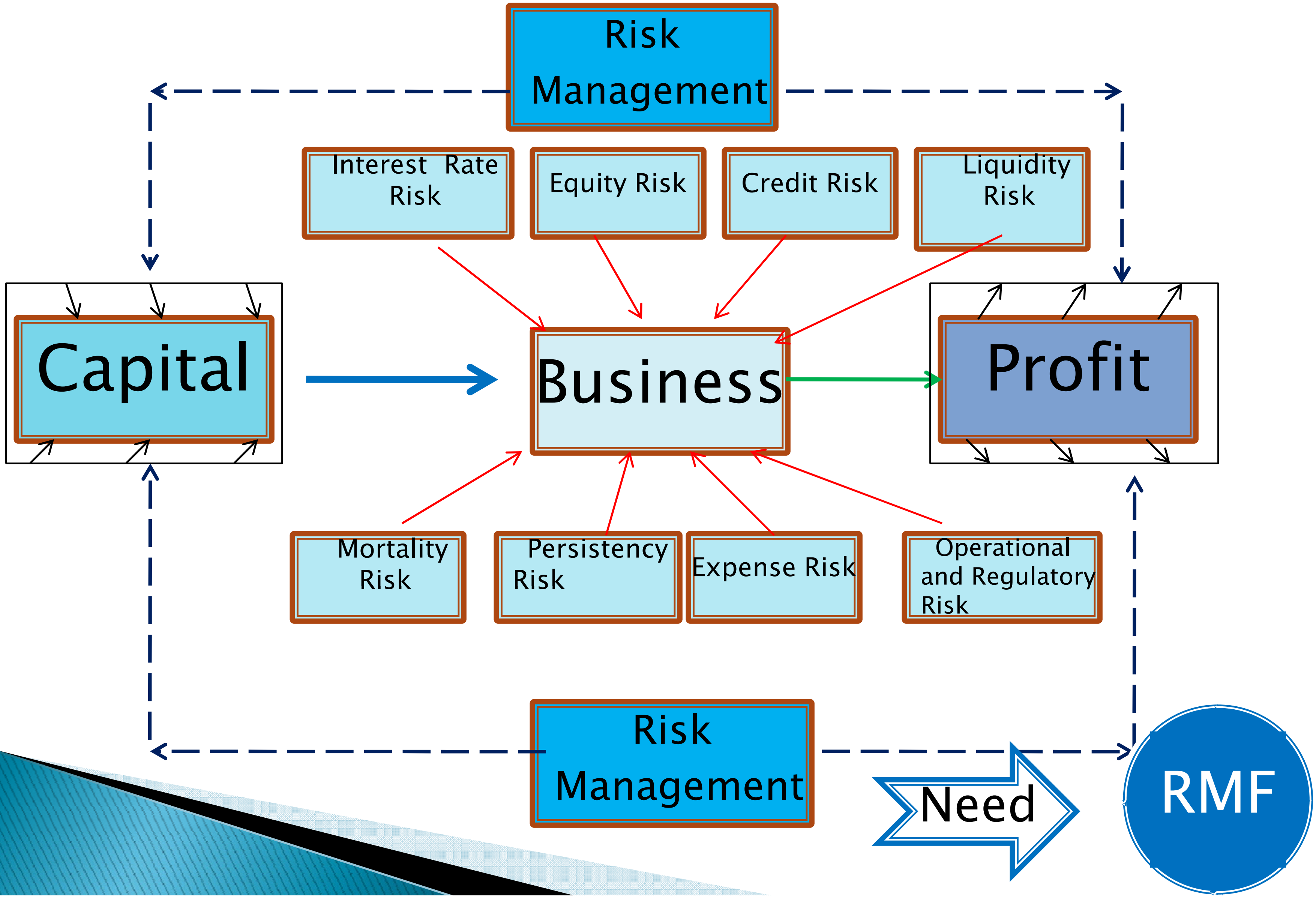
Role of Actuaries in Solvency-II

SII implementation- actuaries on forefront?

- **Solvency II** is based on economic risk-based solvency requirements across all EU Member States. The insurance companies are required to hold capital against market risk, credit risk, operational risk and underwriting (life, non-life and health) risk. The three pillars of Solvency-II
  - **Pillar I :** quantitative requirements and capital allocation
  - **Pillar II :** qualitative requirements ,supervisory activities, Own Risk and Solvency Assessment (ORSA),risk management processes and controls.
  - **Pillar III :**Disclosure requirements.
- ***Actuaries are involved in***
- the determination of economic capital under the **Pillar-I** based on risks of the company, using the internal model or standard formula.
- Risk Management under **Pillar-II** and
- Producing the end results templates for disclosure under **Pillar-III**

Q: What does this mean of Capital and Risk Management under Pillars I and II ?

Links between Capital, Risk and Profit



Risk management control cycle (IMMMR)

- ***Risk Identification***-The key places of risk identification are at a time of business planning, product pricing, on going product management
- ***Risk Measurement-***This includes the question of whether a risk can be quantified, as well of the question of how to sensibly aggregate risks. The key techniques of risk measurements are calculation of Economic Capital, VaR, TVAR.
- ***Risk Management-***Methods are Retain, Reduce, Reject or Transfer Risk management is a key area in managing the residual risk and risks lying on extreme left tail of the distribution. Risk management is a key area in managing the residual risk and risks lying on extreme left tail of the distribution.
- ***Risk Monitoring***-Key risks are monitored through management information. Without this process, the risk management exercise would be incomplete.
- ***Risk Reporting-***Risk reporting is performed by informing the key stakeholders such as Board, and Board sub-committees such as ALCO, Risk Management Committees, Regulator, Rating Agencies and Policyholder/Bank customer and take decisions

Example of Insurance and Banking Sector where actuaries can make contribution

Application of IMMR in Insurance

- **Company -life insurance**
- **Products -Term, Non-par traditional product and unit linked**
- **Risk Identification**

Products Class	Key Risks
Term	Mortality Lapse Expense
Non-Par Traditional Product	Interest rate Lapse Liquidity
Unit linked	Equity risk Policyholder bear the most of the risk, however there are marketing risk, regulatory risk, mis-selling risk impacting revenue and reputation
In All Products	Operational, business risk etc

Actuaries are involved in above risk identifications

Challenge Operational Risk

Risk Measurement

Risk Measurement Tools	Application
Assets and Liability Management (ALM)	Interest Rate risk, Duration matching
Value at Risk (VaR)	Equity, Interest rate, Forex
Economic Capital (EC)	Similar to VaR on Each Risk
Stress and Scenario Testing (SST)	Pick extreme events, could be applied at Profit, Embedded Value, Solvency, Margins etc

VaR, EC and SST are developing

Risk management tools

Avoid Risk

Retain Risk

Reduce Risk

Transfer Risk

Risk management

Risks	Ways of Risk management in Life Insurance	Main Product group
Mortality	Underwriting, Reinsurance, Point of Sale control, Claim Management, experience analysis	Term
Interest Rate	Low guarantees, ALM	Non-Par Traditional endowment
Lapse	Point of sale control, Sales training, Retention efforts, monitoring	All (endowment)
Expense	Management control, monitoring	All
Equity	Active management	Unit Linked

Actuaries are involved in some areas and others are in the control of other functions

Risk Monitoring

Risks	Monitoring
Mortality	A/E ratio Underwriting, Reinsurance, Claim Management effectiveness
Interest Rate	Duration, Cash Flow mis-match
Lapse	A/E, Monitoring the effectiveness of Point of sale control, Sales training, Retention efforts,
Expense	A/E Expense Overrun
Equity	Active monitoring

Actuaries are involved in many areas

Risk Reporting

- ✓ALCO, Risk Management Committee,
- ✓Disclosures- Regulatory/Internal
- ✓Rating Agencies
- ✓Policyholder

IMMMR in Banking- Risk Identification

The key difference between the insurance and banking sector is the nature of assets and liability.

Insurance sector–liabilities are longer and assets are generally not as long as tenure of liability

Banking area– liabilities are of shorter tenure such as Savings and Current account, Fixed Deposits, Recurring deposits etc. whereas assets such as loan given to customers are longer in tenure.

Products Class	Key Risks
✓Savings and Current accounts ✓ Fixed Deposits ✓ Recurring account	✓Interest rate risk ✓ Liquidity Risk ✓ Credit risk ✓ Operational Risk ✓ Regulatory Risk

Risk Measurement

- Banks uses similar tools to measure the risks such as
  - ALM, VaR, EC and SST
- Key risks in banking are **Liquidity risk** and **Credit Risk**

Risks	Tools
Liquidity Risk	Net Liability Statement Peer Group Ratio Liquidity ratio
Credit Risk	**Qualitative** Rating of the Company Reputation Leverage Volatility Earning **Quantitative Way** Credit Scoring Model Linear Probability and Logit model Mortality rate derivation of credit Risk

Additional skills required

Risk Management, Monitoring and Reporting

Action Required

Management- tools are same

- Actuaries need to **increase their knowledge and understanding of the banking business to enable the risk management in these areas**.
- Some of the areas such as **ALM as used in life insurance** can be used in the banking sector by using the duration of assets and liability to address the interest rate risk.
- **Liquidity and Credit risk management** is the area requiring **more focus for actuaries** to be successful in this financial area.

Monitoring- Process is same

- **Actuaries** in the past have been using this tool for **setting the long term assumption and have been the key strengths of the actuaries**. As actuaries use their judgement after looking at the past experience enables them likely future differentiates them from other profession.
- **Actuaries can use their skill and help the banking industry in setting up assumptions** either long term or short term. For example, based on the withdrawal pattern from the savings and current account similar to **lapse rate** used in insurance, actuaries can arrive at the withdrawal rate pattern in the banks to enable bank help in managing the liquidity risk so that they can reduce the cost of raising the short term liquidity issues.
- Similar to the lapse investigation, the methodology used in the **expense investigation** in life insurance industry can be explored in the banking sector and allocating the expense loading in different line of business.

- Banks- Reporting similar to insurance industry in Committees
- Disclosure as per Basel-II/III norms

Opportunities for actuaries and Suggestions for Profession to take actuaries forward in wider area

Opportunity for Actuaries in Banking Why?

- Structural commonality between the banks **long term of assets** and life insurance Company's **long term nature of liabilities**.
- Both have commonality of **default of paying premium** (lapse rate) in life insurance and default of **loan re-payment in banks** (apart from common risk of change in interest rate).
- Actuaries can help banks in managing and **forecasting the expected default rate** similar to assumption of lapses and build into the price of the loan and in risk adjusted pricing of loans.
- Capital requirement/management is based on the **risk based capital under the three pillar approach**.
- Actuaries understand the **linkages between risk and capital** better due to their prior involvement in managing the solvency of the company, they can help banks better understand and manage the risk of insolvency based on risk and how reduction of risk can optimize the capital consumption.

Opportunity for Actuaries in Banking Why?

- Both the industries **face similar issues on interest rate risk and operational risk**.
- As the traditional products are getting popular in the Indian market with embedded **guarantees on maturity**, **actuaries can benefit from banking friends on the management of interest rate risk**
- **Operational risk** is another area where **no consistent approach** has been agreed due to the nature of the risk. However, **actuaries have used extreme value theory** and other statistical tools to model operational risk. Banks can benefit from this exposure
- **Both industries use some common tools** such as

Stress and Scenario testing (SST)	**Identify the tail risk**
Value at Risk	**Quantification of market risk**
Economic Capital	**Capital calculation and setting the risk appetite**
Cash flow projection	**ALM , liquidity risk**
Stochastic modelling	**Use to price risk and understand the risk distribution**

Opportunity for Actuaries in Banking Why?

- **Actuaries** may venture into the banking industry by **enhancing their risk management skills in the financial risk area.**
- Liquidity, Credit and market risks such as volatility in FX, Commodity rates risks, IT risks involving several applications which may not be interfaced are some areas where the profession needs to focus more if actuaries are to foray and work in these financial areas.
- Actuaries can contribute significantly using their skills in handling Solvency II or RBC,EC related areas.
- The other key area in Banking is the behaviour of low cost Savings and Current Accounts (CASA). Behaviour of CASA and term deposits are performed through simulation exercises – the type of exercise the actuaries are comfortable with.
- **Interest rate swaps (IRS) and credit line** with other banks are to judiciously exercised by the fund managers in the Banks to optimise the profitability. As Actuaries understand the pricing mechanism well, they can contribute heavily in offering advise in ALM and investment areas.

Suggestions for Profession

- Actuaries are well suited to play a role in ERM not only within the insurance industry but also in other industries but some suggestions are here to bridge the skills gap that in our opinion exist .
  - To have a **ERM committee to oversee the development** in the ERM in India and recommend and prepare extra reading material or new letter in a directional basis for interested parties
  - To discuss the skills of actuaries to wider field in financial market for its marketing.
  - Increase the **emphasis on Financial Risk Management through seminars**
  - **Widen scope of the study materials**-Add recent India specific case studies .As India has very different challenges so such case studies will go a long way in understanding what is required in the Indian context.

Way forward –some suggestions

- **Capacity building seminars** should be held with exhaustive debates on latest tools and techniques of measuring risks.
- Experts from the related area can be invited to deliver lectures. New tools can be established that will provide new or improved information that will lead to more targeted strategies
- **Risk specialist certification** given only after demonstration of specific skills to clearly establish this as a separate branch-This can be done via a project presentation as is done in IFA seminars.
- **Senior risk specialists** to contribute in national level magazines suggesting solution to risk issues faced by the financial industry (including insurance). This will enhance visibility of actuaries.

Thank you for listening