2nd Seminar on Finance & Investment 22nd May 2019

Actuary in Banking Risk Management

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MANAGEMENT
RISK
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EVALUATION
STRATEGY
COST
RETENTION
METHOD
CONTEXT
PRIORITIZATION
AVOIDANCE
PROJECT
SOLUTION
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INDEX
EVENT
BUSINESS
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OPPORTUNITY
SHARING
ANALYSIS
PROBABILITY
RESOURCE
UNCERTAIN
REDUCTION
KNOWLEDGE
IMPACT
MONITOR
PLAN
IMPLEMENTATION
ASSESSMENT
STANDARD
CONTROL

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Actuary in Banking

- *Emerging Sector for Actuaries internationally*
- *Indian context – Largely Unexplored*
- *Enormous scope as banking entails dealing with risk just like Insurance*

Banking and Insurance Synergies

- *Parent/Subsidiary relationship between Insurance companies and banks in India*
- *Complement each other*
  - *banks requires insurers to insure the collaterals and credit*
  - *Insurers require banking services and to hedge their financial risk*

Risk management in Banking

- BASEL Accord – Guidelines issued by Basel Committee on Banking Supervision (BCBS)
- Basel III - Framework based on three Pillars

  Pillar I - Minimum Capital Requirement

  Pillar II - Supervisory Review

  Pillar III - Market Discipline
- Quantitative and model based approach towards risk quantification and capital adequacy apart from documentation and disclosures
- ***Emphasis on Actuarial Techniques***

Capital Adequacy

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Emphasis on Capital Adequacy

- *To ensure banks are adequately capitalized to take care of Unexpected Losses, the pricing should take care of Expected losses*

$$\text{Capital Adequate Ratio (CAR) Formula} = \frac{\text{(Tier 1 Capital + Tier 2 Capital)}}{\text{Risk Weighted Assets}}$$

Some of the Actuarial Techniques used in Banks

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Credit Risk

Expected Credit Loss – an **actuarial technique**

$$LEL = \sum_{i=1}^{n} D_i(1 - PD_{i-1}) \,.\, PD_i \,.\, LGD_i . EAD_i$$

Where

LEL = Lifetime expected credit loss

D = Discounting factor (EIR)

PD = Probability of Default

LGD = Loss Given Default

EAD = Exposure At Default

i = Time bucket

n = Time bucket till maturity

Some of the Actuarial Techniques used in Banks

Corporate **:**

The methodology adopted for calculation of PD is based on **Transition Matrix.**

	AAA	AA	A	BBB	BB	B	CCC to C	D
AAA	94.50	5.50	-	-	-	-	-	-
AA	0.09	90.24	9.28	0.31	0.02	0.02	-	0.04
A	0.02	1.99	91.79	5.45	0.52	0.08	0.07	0.08
BBB	-	0.20	3.62	91.49	3.62	0.60	0.24	0.23
BB	0.02	0.05	0.10	8.49	81.35	7.04	1.66	1.29
B	-	-	0.24	0.45	9.50	83.18	4.28	2.35
CCC - C	-	-	-	0.20	2.40	18.76	50.90	27.74
	-	-	-	-	-	-	-	-

Some of the Actuarial Techniques used in Banks

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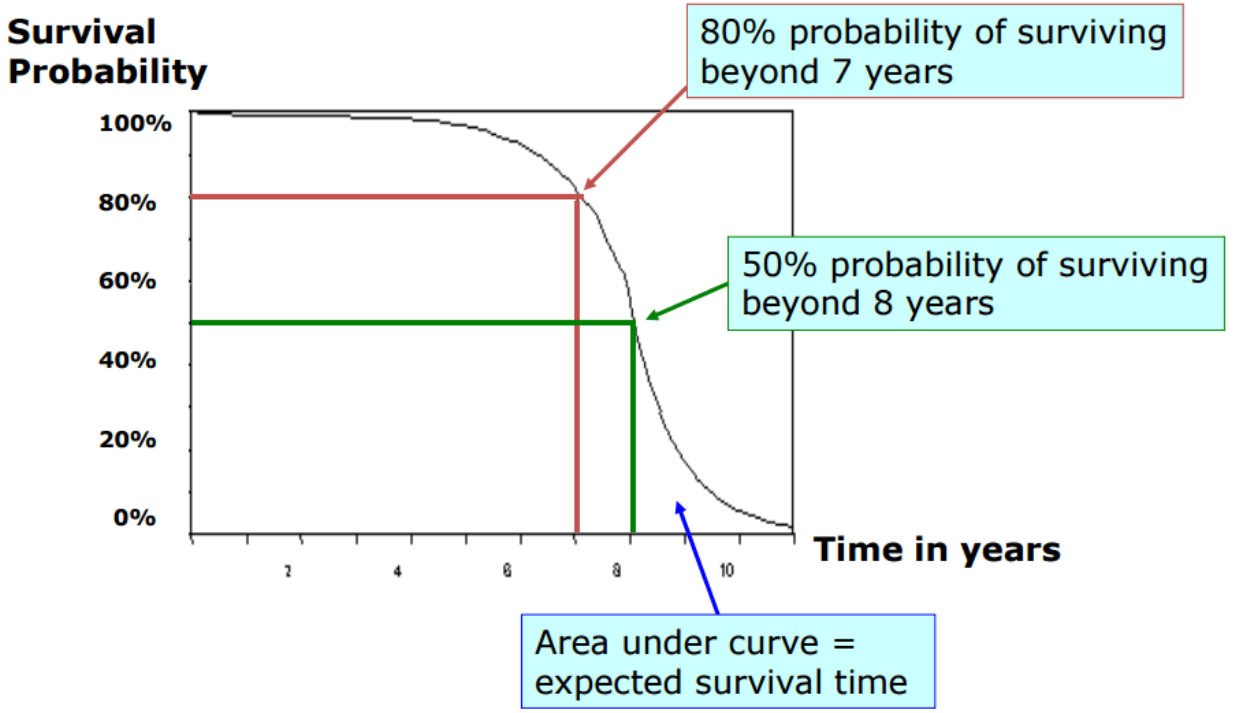
Retail **:**

Survival Analysis Methodology to compute lifetime PD. PD in each period is assumed to be independent



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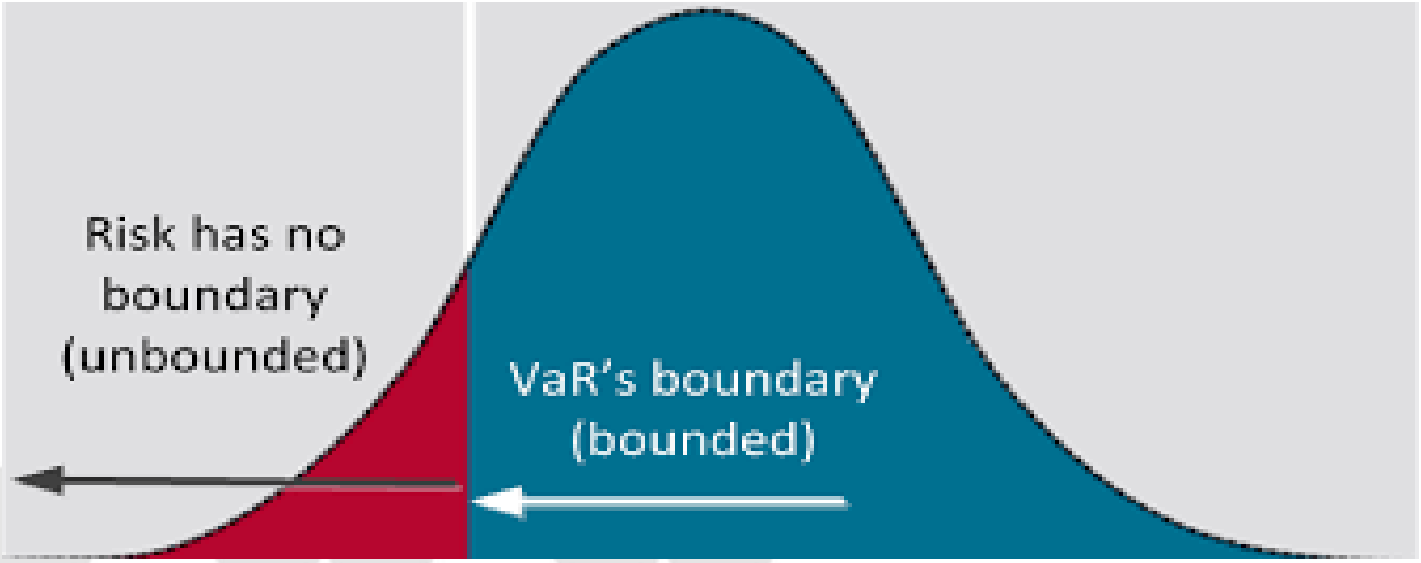
- Market Risk

Value At Risk (VaR): Maximum potential loss in value of a portfolio with a given probability over a certain time horizon.

$$\mathbf{VAR} = \mathbf{Z}\alpha\ \boldsymbol{\sigma}\mathbf{p}\ \sqrt{\Delta t} * \mathbf{FS}$$



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Market Risk

PV01 and duration based approaches:

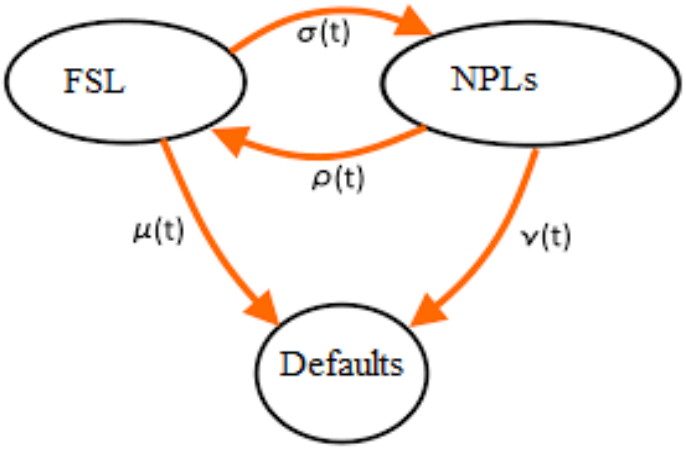
PV01: A measure of sensitivity to a 1bp (basis point) change in interest rates.

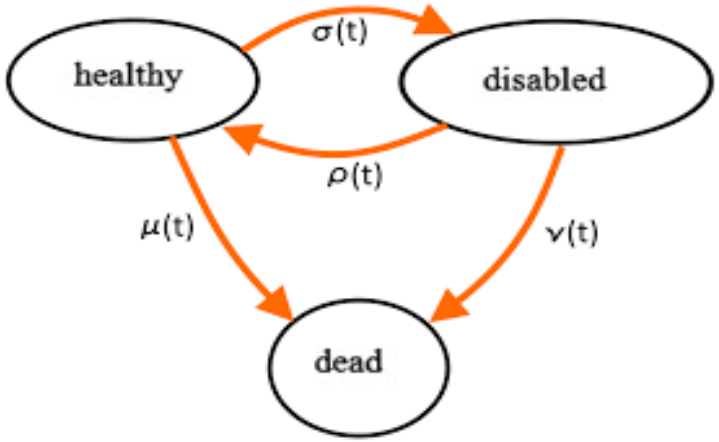
Duration: Duration is an approximate measure of a bond's price sensitivity to changes in interest rates.

$$\text{Macaulay Duration} = \sum_{t=1}^{n} \frac{(PV)\,(CF_t) \times t}{\text{Market Price of Bond}}$$

Similarities in Insurance and Banking Actuarial Concepts

Banking	Insurance
Probability of default	Probability of Claim
Exposure at Defult	Sum Assured
Loss Given Default	Insurance Claim





FSL - Fully Srviced Loan

NPL- Non performing Loan

Actuaries in Banking – International Scenario

- *Significant presence of Actuaries in Banking field.*
- *Actuarial Bodies abroad are proactively promoting the Actuarial Profession in Banking*
- *Actuarial Society of South Africa has a separate fellowship exams in banking*
- *Recognising the need for Actuaries in Banking IFOA is proposing to launch ST 10 (Banking Paper)*

Actuaries in Banking – International Scenario

Institute / Region	Qualified Actuaries	Students	Total
IFoA (United Kingdom)	157	150	307
ASSA (South Africa)	70	430	500
IAAust (Australia)	Not Available	Not Available	300

**Qualified Actuaries include Fellows, Associates and Affiliates*

Source: Websites of respective Institutes / Reports / Presentations

Actuaries in Banking – International Scenario

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In South Africa Actuaries are largely employed in following areas in Banking sector:

- *Credit scorecard development*
- *Credit risk management and reporting*
- *Design and pricing of all banking products*
- *Provision model development*
- *Balance sheet management,*
- *Pricing and trading of derivative products.*
- *Capital modeling*
- *Credit, operational and market risk modeling*

Indian Banking Scenario

- Dominated by 18 Pubic Sector Banks, 22 Private Banks, 46 Foreign Banks, 45 RRB apart from significant number of Co-operative banks
- Outstanding Deposits of Indian Banks is ~USD 1.87 Trillion and advances are ~USD 1.30 Trillion
- The sector is in the cusp of change with technology disruptions and M&As.
- Indian Banking sector is forecasted to be the fourth largest in 2030 with asset size of USD ~ 7.8 Trillion (Source : www.statista.com)
- The growth in sector will translate into opportunities for professionals including risk professionals, Actuaries

Opportunity for Actuaries

- **Modelling** - specially when the banks move towards IMA. Banks have limited human resources when comes to quantitative specialist
- **Validation of risk management framework** in the banks starting from data, analysis, modelling and reports providing greater assurances to the stakeholders
- **Advisory** roles in the risk management field
- **Project Finance**
  - Assumptions validation
  - Model Audits
- **Advisory functions** – Investments, Forex, commodities, *Risk Management (Quantitative techniques and Actuarial approach)*.
- Credit Ratings
- Capital Planning and Capital Raising – With consideration to suitability, regulatory requirement and cost optimisation

Current Scenario in India

- *Very low presence of Actuaries in Banks*
- *Banks employ professionals like CA, FRM, MBA, Engineers, MSc Agriculture, etc. majority of whom do not possess modelling skills to the extent required to qualify as an actuary. CA2 is a mandatory subject to qualify as an actuary. R is another programming language for mathematical and statistical modelling.*
- *Actuarial profession is not finding place in the current manpower planning in the banks across India*
- *Information Gap*

Way Forward

- Create Awareness - Bridge the information gaps
- Proactive Initiatives from IAI in engaging with key stakeholders
- IAI to market its profession in Banking and allied Sectors
- Broaden the scope of actuarial profession and start looking beyond insurance alone
- Student Actuaries should dare to branch out of insurance field and move into Finance and Banking field (specially in Risk Management).
- Actuaries to upgrade their skillset in Banking and allied fields

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