The Actuary CRO

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Agenda

1. Role of CRO for Insurance company

2. Types of Risk and relevance for Actuary

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Role of CRO

Ensure that all risks are managed timely

Ensure?	3 LOD / Independent Advise (Risk vs. Reward) Lead / Facilitate Influence Assurance to Stakeholders
For whom?	Customer Shareholders Regulators
Risk?	Not meeting business objectives Deviation / Losses (Top-line; bottom-line; solvency) Sustainability (withstand stresses)
Managed?	Identify Assess / Measure Manage (transfer, terminate, tolerate, treat) Monitor

Role of CRO

Ensure that all risks are managed timely

Typical quarter?	Review / Monitor	[30%]
	Collaborate / Influence / Advise	[20%]
	Assess / Quants	[20%]
	Meetings / Reports	[200%]

Skills?

Business acumen (big picture!)
Financial mathematics
Communication & Influencing
Analytical
Psychology

Experience?

Internal Audit / SOX
Compliance
Accountants
Actuaries

Risk buckets for GI

Insurance risk

- Premium
- Reserving
- CATs (Man-made and Natural)

Credit risk

- Investment portfolio (defaults)
- Reinsurance
- Receivables

Market risk

- Interest rate
- Currency
- Credit spreads
- [Equity / RE]

Liquidity risk

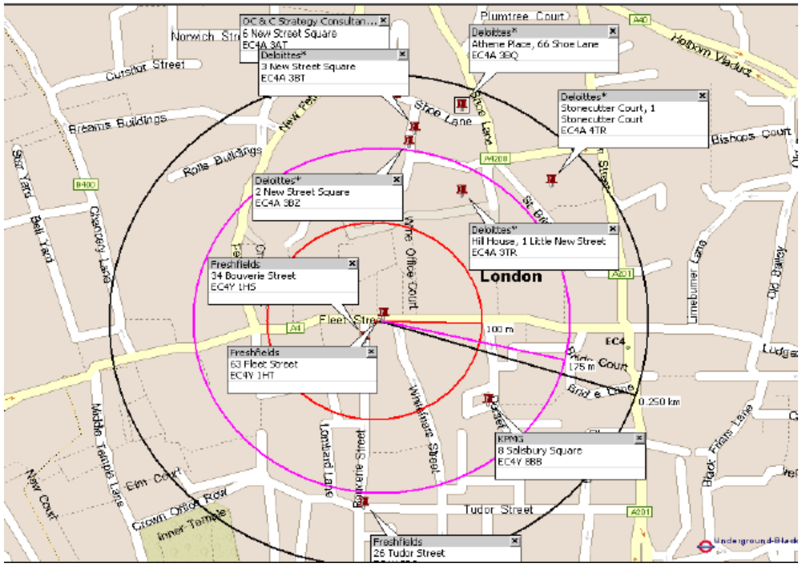
- Forward-looking LCRs / different stresses

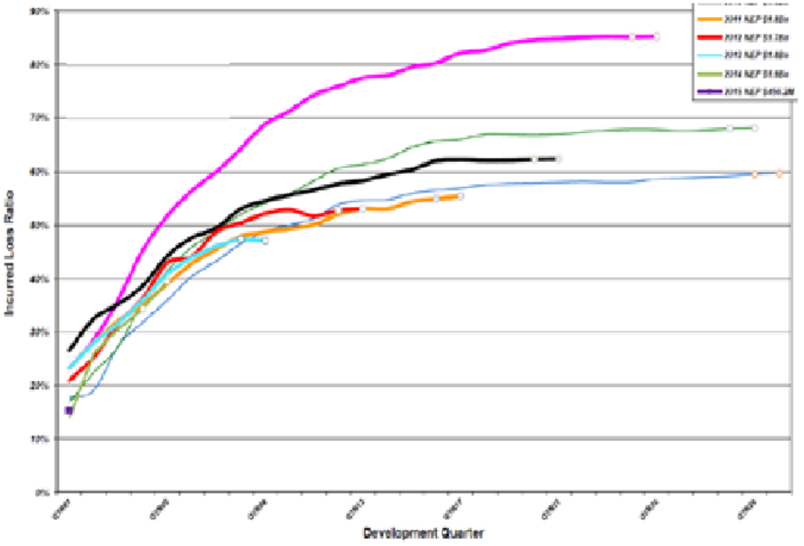
Operational risk

Losses due to failures in people / process / systems / external events

Insurance Risk

- Inherent uncertainties as to the occurrence, amount and timing of insurance liabilities.
- Key 1st line: Underwriters; Claims; Reinsurance.
- Actuarial: Line 1.5 (some independence & review)
- Key metrics: Loss ratios / reserve developments / CAT aggregation modelling / Risk Appetite
- Capital is important (typically largest capital driver)



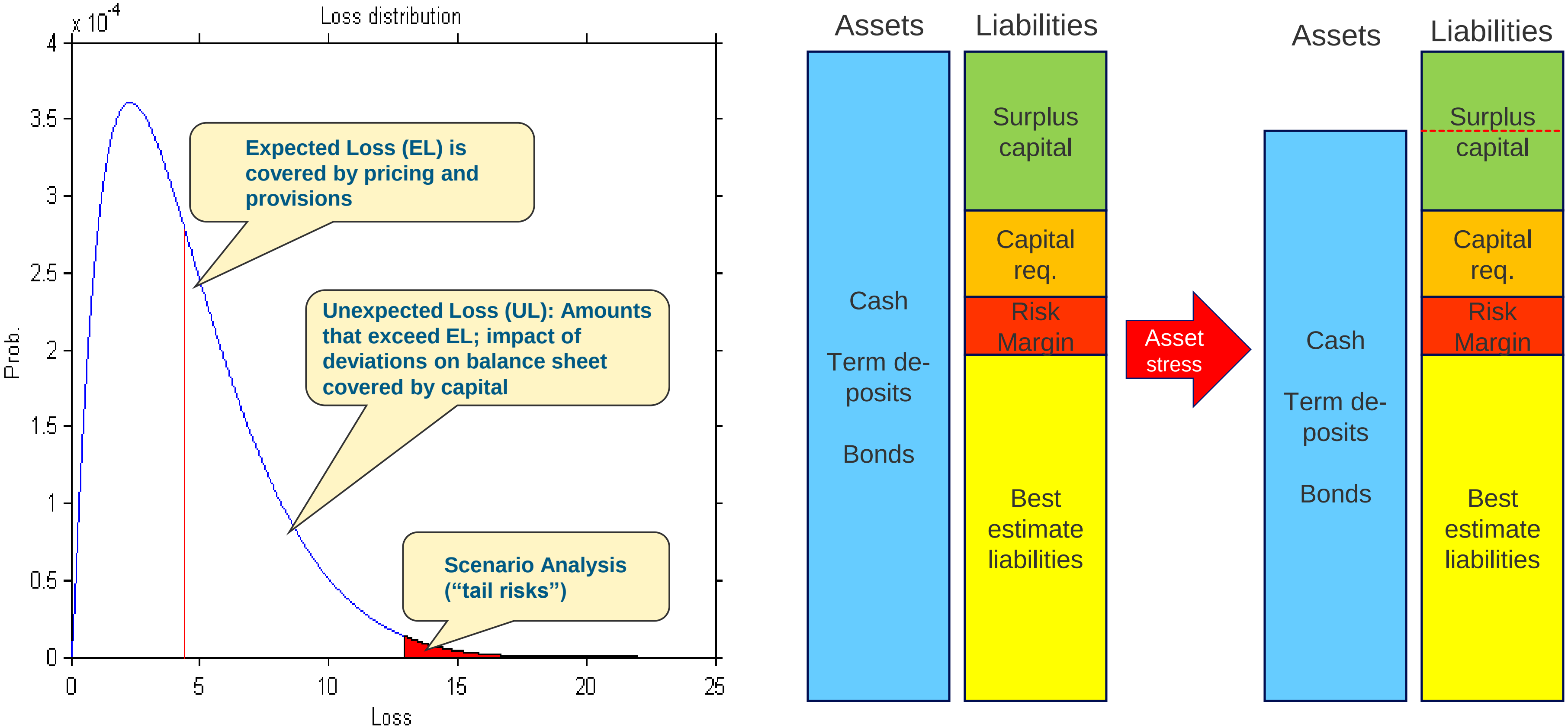


Market & Credit risk

- Risk of losses from market movements or due to default of 3rd parties
- Key 1st line: Asset management; Treasury; Reinsurance; AR; Finance plays oversight role
- Key metrics for market risk: Asset allocations; ALM
- Credit risk: Internal & external ratings; risk watchlist
- Capital is important (smaller than insurance risk)

- Increasing modelling of risk (VaR) – enable more sophisticated stress testing
- Finance profession playing increasing role
- Typical investment portfolio for GI is prudent (cash; fixed deposits; bonds; banks and sovereigns); with short duration for assets (aligned with liabilities)
- Income: Important element of P&L
- Liquidity forecasting (LCRs) – stressing cashflow

Impact of Insurance, Market, Credit risk: Balance sheet



Best fit for Actuarial profession to add value. Increasing modelling / data-science sophistication, together with AI (for example to monitor optimal reinsurance structures)

Challenge with Operational risk?

Immediate impact on P&L – but also on all other risk types

It's personal!

How measure?

– Quantification is fuzzy at best, and near useless at worst
– RAG heatmaps (IxL); scenario testing; VaR

How manage?

– All about controls!
– RCAs / deep-dives
– Risk culture / training / event reporting (product life-cycle)

	Gross premium
less	Reinsurance premium
less	Expenses (fixed + variable)
less	Claims paid
plus	Reinsurance recoveries
plus	Investment income
=	Net income (before tax & divs)

ALL EMPLOYEES (Compliance, Legal, IA) – not natural fit for Actuaries, but…

ERM: Career path for Actuaries?

- Actuarial development path is ideal for Financial Risk Management of Insurer
- The analytical approach inherent in all good actuaries provide a solid base for Operational Risk Management (methodological approach; data-driven; inherent review cycles).
- Current typical career path for Insurance Actuaries: Reserving; some Pricing; Valuations (Life & Pensions); Capital Management / modelling
- Influencing / advise
- Future of Risk Management?
- Dead-end of 2^{nd} Line?
- ERM department vs. CRO = Actuarial+

Case study 1: Risk Culture

General Insurer; 2nd largest in Australia.

2000: 2m customers; GPW of A$2.8bn; Assets A$ 8bn; Liabilities A$ 7.1bn – solvent…

Actuarial: Warning - need more realistic / prudent reserves (especially for PYD).

Management: Buy more reinsurance (good for solvency in short-term, but erode RoE)

Reinsurance cover exhausted → Rating collapse → run out of liquidity → Liquidation!

6 month P&L: A$ 133m → -100m → -200m →

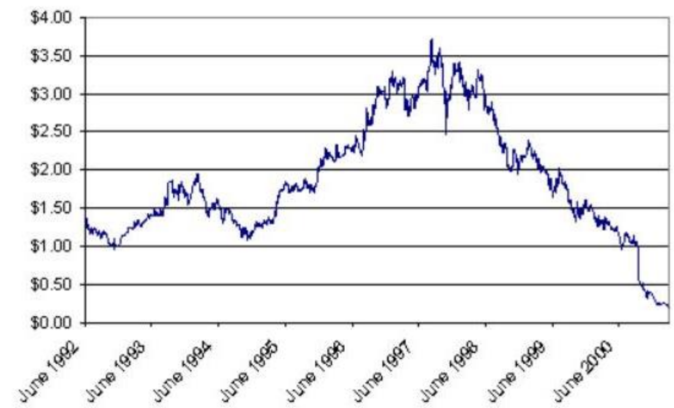
-300m → -800m!

Eventually, deficit of between A$3bn and 5.3bn

CEO / subsidiary CFO – jailed.

53 cases of criminal prosecution (jail / disqualification)

HIH: share price, June 1992 to February 2001



The Standard & Poor's rating of HIH, February 1997 to March 2001

Date	Rating
17 February 1997	AA–
15 August 1997	AA–
27 February 1998	A: credit watch developing
24 September 1998	A: credit watch negative
22 January 1999	A–: off credit watch
22 August 2000	A–: credit watch developing
13 September 2000	A–: credit watch negative
2 November 2000	BBB+: credit watch negative
26 February 2001	BBB–
15 March 2001	B: lowered and withdrawn

Case study 2: Failure of Risk Management?

“Essential in our approach to risk management is a **strong internal control** environment with multiple **overlapping and reinforcing** elements. Our Risk Management Division develops policies and procedures to **identify**, **measure** and **monitor** the risks involved…..Our approach applies **analytical rigor** overlaid with **sound practical judgment**….. We work **proactively** with the business…. “

“Developing and maintaining risk **quantification methodologies** supporting market, credit and operational risk — which includes VAR, stress tests, scenario analyses, potential credit exposures and capital allocation. ”

CEO: “It’s all about Risk Management! I expect everyone at the firm to be a risk manager.”

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Lehman Brothers: Assets of $639 billion > gross domestic product of Argentina; 10 x size of Enron → filed for bankruptcy in 2001.

Case study 3: Failure of Complex quantification?

"(Risk management team) that very carefully studies the risks taken by all trading desks and incorporates them into a **firm-wide risk analysis**.

It is staffed only by **quantitative PhDs** and very experienced ex-traders, and uses a lot **statistical and financial modelling tools**."

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Bear Stearns (Investment bank) - Sold to JP Morgan @ $10 per share (from $172)

Questions?