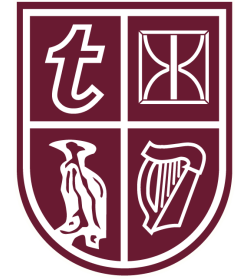


# Discount Rates



**Life reinsurance reserving and  
prudence in discount rates**

***Presented by:***

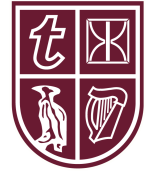
***Date:***

**Mike Claffey**

**23<sup>rd</sup> May 2012**

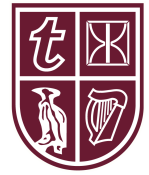
# Agenda

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- **Prevalence of discount rates**
  - **One concept, many uses**
- **Background**
  - **CBI requirements**
  - **Actuarial guidance**
- **Milliman review of EV reports**
  - **Methodologies used**

# Discount rates



Pricing  
versus  
reserving

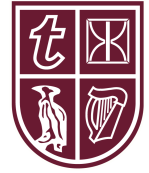


IFRS,  
EEV,  
MCEV



Budget  
versus  
matching  
approach

# Discount rate construction – result should be the same!



Top ↓ down

Market rate

- Liquidity premium

- Default premium

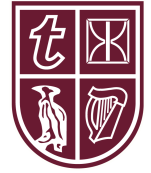
Bottom ↑ up

Unexpected default

Expected Default

+ Illiquidity Premium

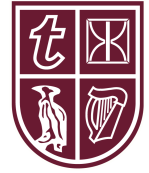
Risk Free Rate



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# **LIFE REINSURANCE RESERVING**

# “Reasonably be foreseen ...”



## THE SOCIETY OF ACTUARIES IN IRELAND

### ACTUARIAL STANDARD OF PRACTICE LA-11

#### STATEMENTS OF ACTUARIAL OPINION ON LIFE REINSURANCE BUSINESS

##### Classification

Mandatory

MEMBERS ARE REMINDED THAT THEY MUST ALWAYS COMPLY WITH THE CODE OF PROFESSIONAL CONDUCT AND THAT ACTUARIAL STANDARDS OF PRACTICE IMPOSE ADDITIONAL REQUIREMENTS UNDER SPECIFIC CIRCUMSTANCES.

##### Legislation or Authority

Requirements issued by the Central Bank of Ireland requiring Statements of Actuarial Opinion relating to life reinsurance business.

##### Application

Actuaries appointed by reinsurance undertakings to provide Statements of Actuarial Opinion relating to life reinsurance business pursuant to Requirements issued by the Central Bank of Ireland.

##### Version Effective from

1.0	30.12.2007
1.1	30.12.2009
1.2	01.11.2010
1.3	30.12.2011

##### Definitions

“ASP” means Actuarial Standard of Practice

“the Board” means the Board of the Company

“the Code” means the Society’s Code of Professional Conduct

“the Company” means the reinsurance undertaking by which the Signing Actuary is appointed to provide an SAO

“DAC” means deferred acquisition costs

“DAS” means Data Accuracy Statement

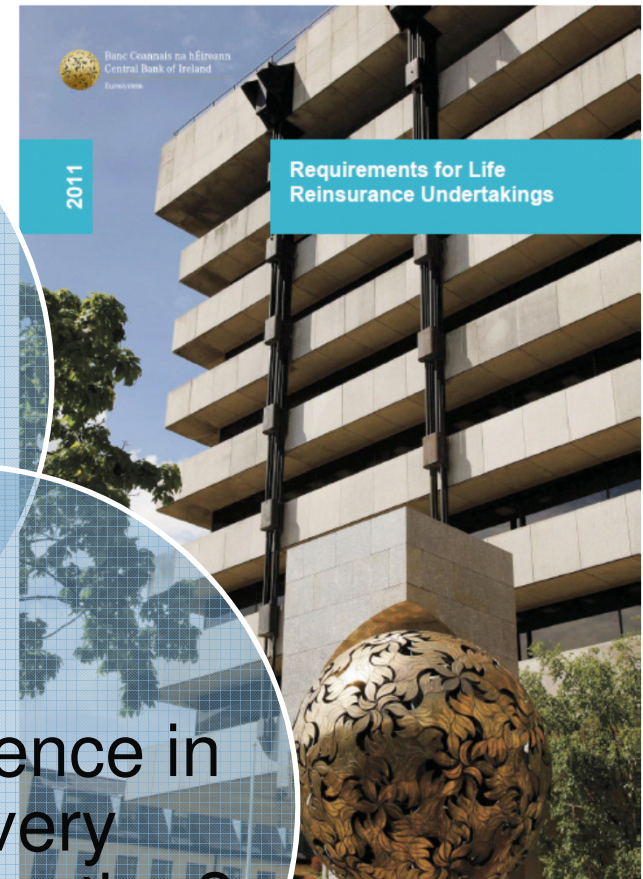
“financial reinsurance” means business classified by the Board of the Company as Financial Reinsurance pursuant to the relevant Regulatory Requirements

ASP LA-11 version 1.3

Irish GAAP or  
fair value  
under IFRS

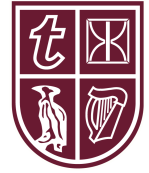
SAO life  
reins –  
prudent  
reserve

Prudence in  
every  
assumption?



## ASP LA-11 – discount rates

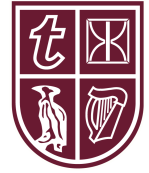
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- 2.6 The discount rates used by the Signing Actuary in his or her projections should normally be estimated **by reference to interest rates on assets corresponding to the liabilities as regards currency and duration.** If the rates used by the Signing Actuary are higher than any rates specified by the Central Bank of Ireland, attention must be drawn to this fact in the SAO and the Report.

# ASP LA-11 – prudence

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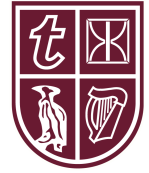


- 5.1.2 “...inclusion of **appropriate margins** for adverse deviation of the relevant factors”
- 5.7.5 In determining the appropriateness of any margin for adverse deviation as contemplated in paragraph 5.1, the Signing Actuary must pay regard to the **relationship between the assets and the corresponding liabilities**. The importance of this will vary widely from one situation to another, but experience suggests that this can be an area of particular importance.

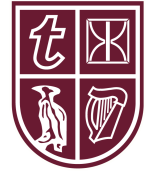


## ASP LA-11 – risk of default

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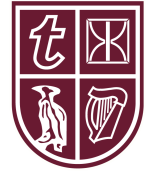


5.7.8 The Signing Actuary must have regard to the possibility of an asset default. When assessing the **deduction** to be made to the rates of interest used for reserving purposes to allow for default risk, it is appropriate to have regard to any differences in yield which arise from **differences in the marketability of the asset in question as compared with the risk-free alternative**. Provision for the possibility of default for credit-rated securities, including government and sovereign bonds, must be made on a prudent basis.



- 5.7.8 ... Making this provision will require the exercise of **professional judgement**. In all cases, including but not limited to government and sovereign bonds, the Signing Actuary must consider
- (a) historical default rates of similar securities with a similar credit rating, taking into account differences in credit characteristics that may not be reflected in ratings and
  - (b) alternative approaches, such as by reference to current and historical market based measures.
- Provision for the possibility of default for securities that are not credit rated must be made on principles at least as prudent as those adopted for credit rated securities.

# ASP conclusion?



- Discount rates for reserving should be calculated top down?

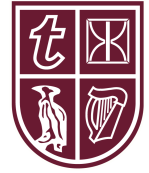
Top  down

Market rate

- Liquidity premium

- Default premium

# Actuarial papers



- SAI Discussion Paper on Sovereign Exposures May 2011
  - Referred to 1994 Framework Regs and ASP-LA3 (Appointed Actuaries)
- Useful Appendix 2 on various methods used to estimate credit risk

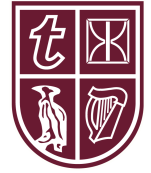
The results of the above approaches can be summarised as follows:

*Irish government bonds, as at 31 December 2010:*

Approach to estimating credit risk:	% of the excess spread that can be considered credit risk
Credit default swaps	>100%
Market based metrics	75% - 90%*
Solvency II illiquidity premium	92%
Historical experience approach	**
Bank of England's analysis on corporate bonds	>50%

\* Based on data at 15 February 2011

\*\* Depends on the analysis of historical experience.



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# IFRS AND EV APPROACHES

# FASB 2010 - Preliminary Views on Insurance Contracts (IFRS)

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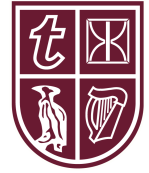


The carrying amount of an insurance liability would include the present value of the probability-weighted estimate of net cash flows at the end of each reporting period using **discount rates** that:

- a. Are **consistent with observable current market prices** for instruments with cash flows whose characteristics reflect those of the insurance contract liability (that is, in terms of timing, currency, and liquidity)
- b. **Exclude any factors** that influence the observed rates but are **not relevant to the insurance contract liability** (for example, risks that are not present in the liability but are present in the instrument for which the market prices are observed).

# Milliman research on 2011 EEV / MCEV reports

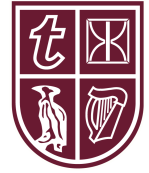
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- Majority of companies continue to use a bottom-up approach to determine the risk discount rate (25 from 28 companies surveyed).
- Around 60% use swaps as the underlying basis for the risk-free starting point, with the remainder using government bonds.
- Liquidity premiums have increased significantly where these have been applied. At year end 2011, more than nine companies had liquidity adjustments in excess of 100bps for certain regions or business compared to only one company at end 2010.
- In many cases, the liquidity premium was calibrated in a manner consistent with that described in the Fifth Quantitative Study (“QIS 5”) for Solvency II.
- Reinsurers (in the Milliman EV report survey) generally assumed zero liquidity premiums.

# Milliman research on 2011 EEV / MCEV reports

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- The continued debate and uncertainty regard to the so-called ‘matching adjustment’ and counter cyclical premium under Solvency II, may lead to future divergence between the reference rate used under embedded value and Solvency II reporting.
- 50% of companies disclosed that they had extrapolated the risk-free curve, most of these using an approach consistent with QIS 5. Again, extrapolation is another key area under the spotlight for Solvency II, which may have lead to the increased level of disclosures in this area.



# Milliman 2011 EEV / MCEV survey



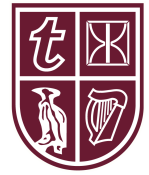
	Company	Principles	Risk Discount Rate Methodology	Underlying Basis for Risk Discount Rate	Liquidity Premium	Extrapolation of Risk-free Curve
CFO Forum Members	Aegon	EEV	Top Down	Gov. Bonds	Not disclosed <sup>3</sup>	Not disclosed
	Ageas	EEV	Bottom up	Swaps, -10bps for credit spreads	Yes, QIS 5 <sup>4</sup>	Yes, QIS 5 <sup>7</sup>
	Allianz	MCEV	Bottom up	Swaps, -10bps for credit risk	Yes, QIS 5	Yes, QIS 5
	Aviva	MCEV	Bottom up	Swaps	Yes, QIS 5 <sup>5</sup>	Yes, method not disclosed
	AXA	EEV	Bottom up	Swaps	Yes, QIS 5	Yes, QIS 5
	CNP	MCEV	Bottom up	Swaps, -10bps for credit risk	Yes, QIS 5	Not disclosed
	Generali	EEV	Bottom up	Swaps	Yes, QIS 5	Yes, QIS 5
	Hannover Re	MCEV	Bottom up	Swaps	No	Not disclosed
	Legal & General	EEV	Top Down	Gov. Bonds	Not disclosed	Not disclosed
	Lloyds TSB	EEV	Bottom up	Gov. Bonds	Yes, method not disclosed	Not disclosed
	Munich Re	MCEV	Bottom up	Swaps	No	Yes, other <sup>8</sup>
	Prudential	Other <sup>1</sup>	Bottom up	Swaps (Annuities) Gov. Bonds (Other)	Yes, method not disclosed	Not disclosed
	SCOR	MCEV	Bottom up	Swaps	No	Not disclosed
	Standard Life	EEV	Bottom up	Gov. Bonds	Yes, method not disclosed	Not disclosed
	Swiss Re	Other <sup>2</sup>	Bottom up	Gov. Bonds	No	Not disclosed
	Zurich	MCEV	Bottom up	Swaps	Yes, QIS 5	Not disclosed

# Milliman 2011 EEV / MCEV survey

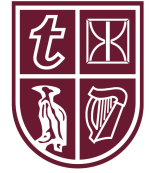


	Company	Principles	Risk Discount Rate Methodology	Underlying Basis for Risk Discount Rate	Liquidity Premium	Extrapolation of Risk-free Curve
Other companies	Chesnara	EEV	Bottom up	Swaps	Not disclosed	Not disclosed
	Achmea (Eureko)	EEV	Top Down	Gov. Bonds	Not disclosed	Not disclosed
	Resolution (Friends)	MCEV	Bottom up	Swaps	Yes, other <sup>6</sup>	Yes, method not disclosed
	Mediolanum	MCEV	Bottom up	Swaps	No	Yes, other <sup>8</sup>
	Old Mutual	MCEV	Bottom up	Swaps	Yes, method not disclosed	Yes, method not disclosed
	Phoenix	MCEV	Bottom up	Gov. Bonds, +10bps	Yes, method not disclosed	Yes, method not disclosed
	PZU	EEV	Bottom up	Gov. Bonds	Not disclosed	Yes, other <sup>9</sup>
	Royal London	EEV	Bottom up	Gov. Bonds	Not disclosed	Not disclosed
	St James's Place	EEV	Bottom up	Gov. Bonds	Not disclosed	Not disclosed
	Storebrand	EEV	Bottom up	Swaps	No	Yes, other <sup>10</sup>
	Swiss Life	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, QIS 5
	Vienna	MCEV	Bottom up	Swaps	Yes, QIS 5	Not disclosed

# Milliman 2011 EEV / MCEV survey notes



1	Prudential uses the market consistent approach for its UK Shareholder-backed Annuity business and non-market consistent EEV approach for all other lines of business
2	Swiss Re uses an Economic Value Management framework
3	An allowance for a liquidity premium can be regarded to be implicit within the spread over the risk-free rate for certain assets
4	QIS 5 methodology to deriving Liquidity Premium is to take 50% of (corporate spread over swaps less 40bps) if greater than zero
5	Aviva use 60% of (corporate spread over swaps less 40bps) if greater than zero for US business
6	Methodology stated as consideration of negative basis trade and structural models
7	QIS 5 methodology for extrapolation is the Smith-Wilson approach
8	Nelson-Siegel extrapolation methodology
9	Spot rates after a certain duration are set level and equal to the rate at that duration
10	Norwegian and Swedish swap markets deemed insufficiently liquid beyond 10 years. Equilibrium rate used for 20+ years with linear interpolation between 10 and 20 years



# Conclusions

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- Actuarial guidance is clear – must include a reduction for risk of default in calculating discount rates
- ASP's seem to promote a top down approach (or at least promote a top down presentation and communication of result)
- EEV and MCEV typically bottom up approach
- IFRS less clear – seems to be typically bottom up approach
- We suspect companies use a variety of methods – and 2011 credit spreads are forcing a rethink