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Good luck with the exam!

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Embedded Value

- A performance measurement system
- Equals the sum of the value of in force business and adjusted net worth
- Value of in force business is calculated as the present value of projected after-tax earnings minus the change in required capital, discounted at the cost of capital
- Adjusted net worth is the market value of assets supporting statutory surplus plus the present value of the cost of capital for holding required capital
- Based on “best estimate” assumptions that are “entity specific”

“Embedded Value: Theory and Practice” Sections 1 & 3;
Valuation text Ch. 1, pg 9; ILA-C121-08 pp 11-12

Gross Premium Reserve

$$\sum_{s=t+1}^{\infty} [B_s + E_s - P_s] v^{s-t-1} {}_{s-t-1}P_{x+t}$$

B_s = Benefits

E_s = Expenses and Taxes

P_s = Premium net of commission

$V=1/(1+i)$, where i = post-tax investment income rate

ILA-C102-09 pg 32

How to Select the Appropriate Risk Adjustment Technique under IFRS Draft

Portfolio Characteristic	Best Technique
Skewed probability distribution	Conditional tail expectation
Long duration	Cost of Capital
Wide probability distribution	Conditional tail expectation
Uncertainty of estimates	All techniques will work by taking this fact into consideration
Emerging experience	All techniques will work

ILA-C127-11 pp 79-80

Fair Valuation – Equivalent Valuation Approaches

Approach	Equations
Discount true probability-weighted cash flows at risk-adjusted discount rates.	$S = \frac{pS_u + (1-p)S_d}{1+r+\lambda\sigma_s}$
Modify probabilities of risky future cash flows to account for risk, then discount at risk-free rate.	$S = \frac{\pi S_u + (1-\pi)S_d}{1+r}$ $\pi = p - \lambda\sqrt{p(1-p)}$
Modify risky cash flows to account for risk, then discount at risk-free rate.	$S = \frac{pS_u + (1-p)S_d - Z}{1+r}$

“Fair Value of Liabilities – The Financial Economics Perspective”
pp 12-13

Reinsurance-Legitimate & Illegitimate Treaty Terms

Legitimate:

1. Reinsurer obliged to pay benefits
2. Reinsurer receives experience-based gains
3. Reinsurer may not unilaterally terminate inforce treaty
4. No event automatically terminates treaty
5. Interest paid/credited is market-realistic
6. Significant risk transfer to reinsurer
7. Ceding company doesn't repay losses except for voluntary termination

Illegitimate

1. Scheduled reinsurer gains regardless of experience
2. Reinsurer never pays benefits, instead accrues payable liability
3. automatic reinsurer option to terminate if:
 - ceding company insolvency
 - ceding company management change
 - business reinsured becomes unprofitable

Reinsurance text Ch. 5, pp 181-182

Reasons Embedded Value is Expected to Grow in Importance

- Widely used in Europe
- Used by buyers to substantiate take-over price
- Allows investors to split company's value between new and in-force business
- Good test of recoverability of intangibles
- Represents a good minimum value for an insurance company
- Can help validate stock prices
- Routinely used as performance measurement for executive compensation and profitability analysis

Atkinson/Dallas Ch. 16, pp 943-944
“Embedded Value: Practice and Theory” Section 1

Conditional Tail Expectation

CTE(90) is the average of the required capital for the 10% of the scenarios with the highest capital requirement

Valuation text Ch. 16, pg 279
ILA-C127-11 pp 75-76