

IAA AFIR Colloquium 2009

September 10th–11th, 2009



Breakout Session Topic 9: Asset / liability management

11 September 2009





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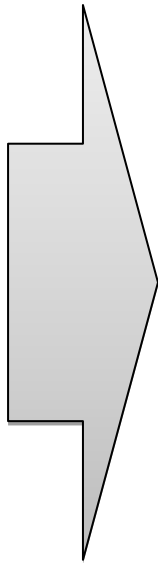


Market Consistent Embedded Value in Non-Life Insurance: How to measure it and why

AFIR Colloquium 2009
September 11th 2009
Topic 9

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1. What is a Market Consistent Embedded Value (MCEV)?
2. Why should we measure a MCEV in Non-Life Insurance?
3. How can we measure a MCEV in Non-Life Insurance?



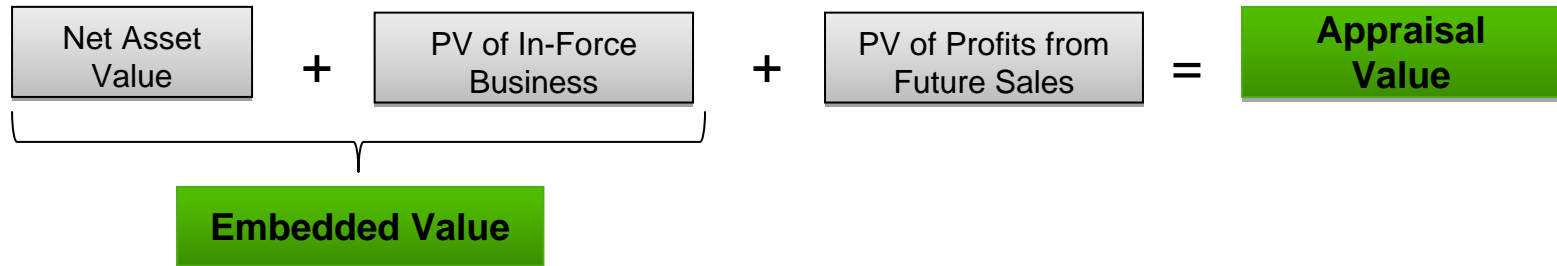
Outline

- (1) Introduction
- (2) Life Versus Non-Life
- (3) Modeling MCEV in Non-life
- (4) Application
- (5) Conclusion

(1) Introduction

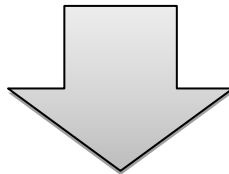
Embedded Value Methodologies

Valuation technique for Life Insurance business



Chief Financial Officers (CFO) Forum

- EEV Principles (May 2004)

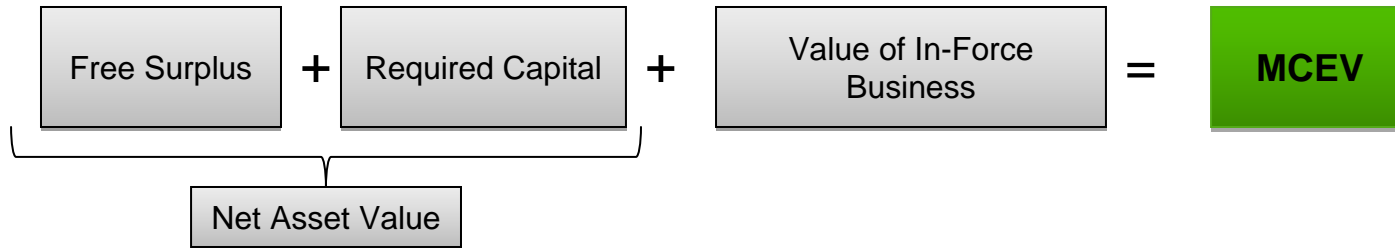


- Trend to market consistent valuation
- Improve consistency

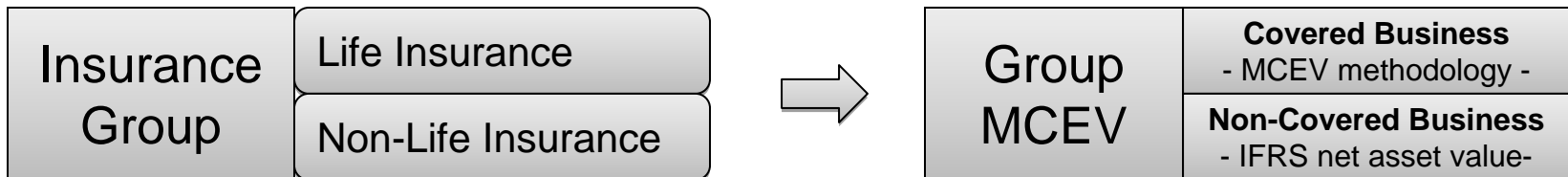
- **MCEV Principles (June 2008)**

Market Consistent Embedded Value

Present value of shareholders' interests in the **earnings distributable** from assets allocated to the **covered business** after sufficient allowance for the aggregate risk in the covered business.



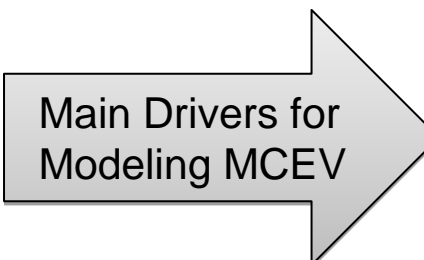
- Earnings Distributable → Profit arising under the local statutory basis
- Covered Business → Short and long-term life-insurance business



(2) Life Versus Non-Life

Criteria	Life Insurance	Non-Life Insurance
Contract Duration	many years	usually one year, but renewals
Main Type of Services	intermediation	risk pooling
Structure of Assets	long-term oriented portfolio	short-term oriented portfolio
Structure of Liabilities	limited degree of uncertainty	high degree of uncertainty
Options&Guarantees	essential part	no essential part

Main Drivers for
Modeling MCEV



Life Insurance

- Capital Market Conditions
- Options&Guarantees
- Biometric Risks

Non-Life Insurance

- Claim Number and Severity
- Modeling of Catastrophes
- Renewal Process

(3) Modeling MCEV in Non-Life

Starting Point:

- Statutory balance sheet (German local GAAP)
- Projection horizon of T years
- Payment patterns
- Certainty Equivalent Approach
 - Cash flows vary linearly with market movement
 - Deterministic framework
 - Use risk free yield curve (spot rates)

A	Statutory Balance Sheet	L
Assets backing Shareholders' Equity		Shareholders' Equity
Assets backing Liabilities		Equalization Reserves
		Claim Reserves

Modeling Steps:

- (1) Present Value of Future Profits
- (2) Required Capital
- (3) Frictional Costs of Required Capital
- (4) Cost of Residual Non-Hedgeable Risks
- (5) Free Surplus

MCEV Elements

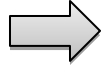
Free Surplus	Required Capital	Present Value of Future Profits			
		VIF	CRNHR	FCRC	TVFOG
MCEV					

(1) Present Value of Future Profits

$$PVFP = \sum_{t=1}^T NI_t \cdot dr_t \quad \Rightarrow \quad EBT_t = T_t + I_t$$

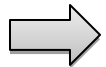
(a) Technical Result





Existing Business

- Unwinding of the existing business
- No future gross premiums earned
- Payment pattern for claims payments



Renewal Business

- Assumptions about development of the existing insurance portfolio
- Future gross premiums earned
- Payment pattern for claims payments

(b) Investment Result

- Investment return comes from forward rates
- Consider investment costs
- Unrealized gains and losses (UGL) remain constant

(2) Required Capital

- Assets backing shareholders' equity (distribution to shareholder is restricted)
- European Union Regulatory Rules (Solvency Capital Requirements)

(3) Frictional Costs of Required Capital

- Due to the fact that capital has to be held within the company (RC)
- Investment Costs and Taxation
- Released Capital over the projection horizon

(4) Cost of Residual Non-Hedgeable Risks

- Allowance for non-hedgeable risks
- Cost of Capital Approach
- Similar to Risk Margin under Solvency II

(5) Free Surplus

- Assets backing shareholders' equity not restricted

(4) Application

(a) Determination of MCEV

Starting Point:

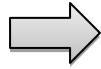
- Statutory balance sheet
- Payment patterns
- Risk free yield curve

Assets	Liabilities
Assets backing Shareholders' Equity € 48'236	Shareholders' Equity € 48'236
Assets backing Liabilities € 187'883	Equalization Reserves € 33'932
Claims Reserves € 153'951	
Total € 236'119	Total € 236'119

Scenario:

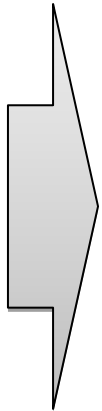
- Unwinding of the existing business
- Additional allowance for renewal business
- Cancellation Rate of 13%
- Future gross premiums earned

Scenario

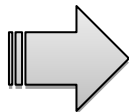


Free Surplus € 18'913	Required Capital € 30'288	VIF € 88'001
Market Consistent Embedded Value € 137'202		

**Economic
Balance Sheet**

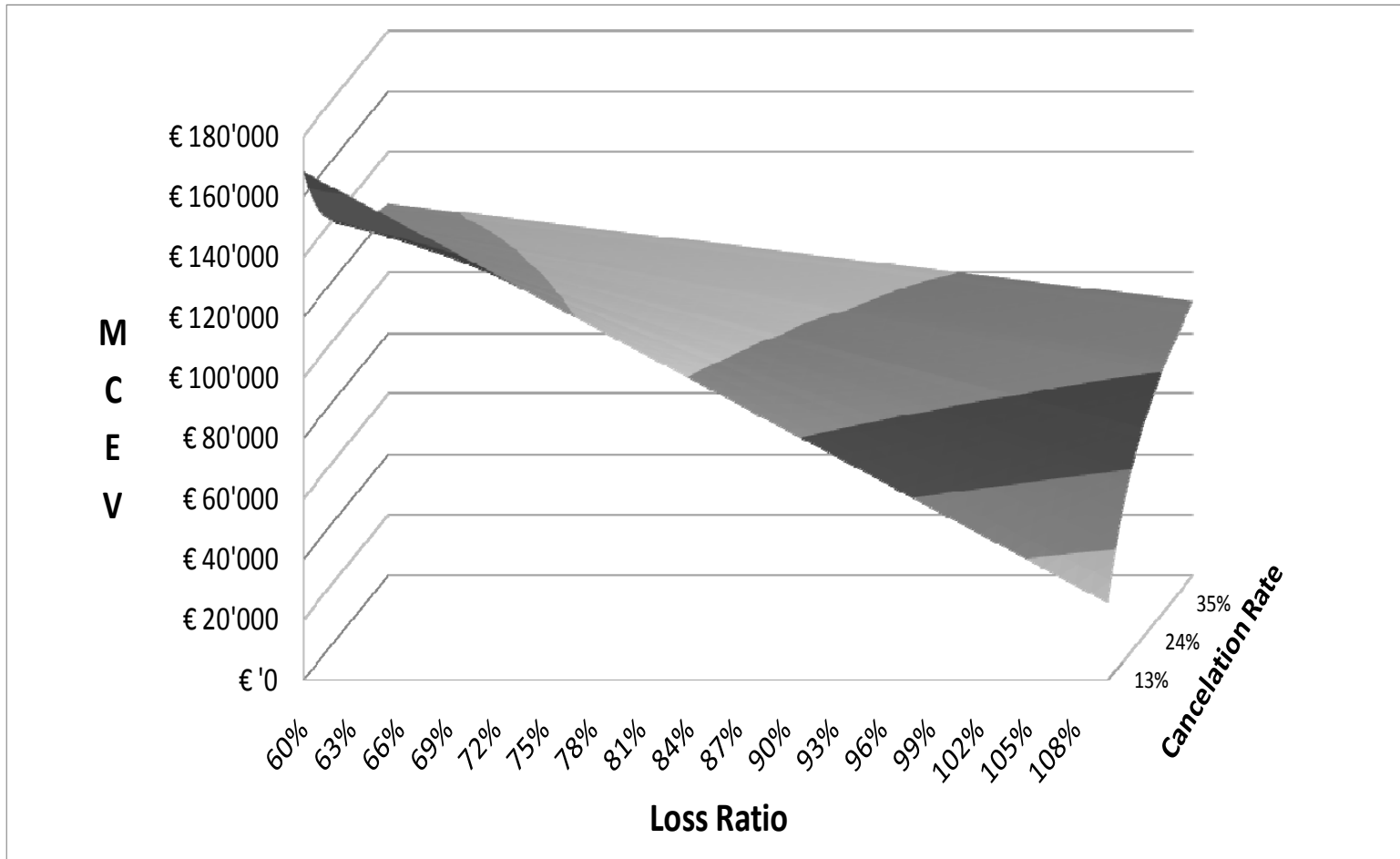


Renewals



Assets	Liabilities		
MV of Assets backing shareholders' equity € 49'201	Free Surplus € 18'913		MCEV → Shareholders
	Required Capital € 30'288		
MV of Assets backing liabilities € 191'641		VIF € 88'001	→ Staffs/Tax Office
	PFVP € 98'325	CRNHR € 7'489	
		FCRC € 2'835	
		Present Value of Taxes € 46'271	→ Tax Office
	Present Value of Costs € 79'988		→ Miscellaneous
Present Value of Future Premium Income € 392'651		Present Value of Claims Payments € 359'708	→ Policyholder
Total € 633'492	Total € 633'492		

(b) Sensitivity Analysis



(5) Conclusion

(1) Summary

- What is a Market Consistent Embedded Value? ✓
- Why should we measure a MCEV in Non-Life Insurance? ✓
- How can we measure a MCEV in Non-Life Insurance? ✓

(2) Contribution

- New and relevant information for stakeholders of Non-Life Insurance companies
- The model provides information comparable to MCEV in Life Insurance

(2) Future Research

- Extend the model in various directions
- Combine concepts of Life and Non-Life for a Group MCEV
- Use the Concept for **Value-Based Management** on a Group Level

Thank you very much for your attention!

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Coffee Break

