Embedded Value in Non Life Insurance – a suggested approach

08 June 2011

Group Audit

Zurich HelpPoint

Agenda

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1. Group MCEV
2. Usage of MCEV
3. Differences between Life and Non-Life Business
4. Definition of MCEV in Life Insurance
5. Modeling MCEV in Non-Life Business
   1. The Ingredients of the MCEV
   2. Steps to determine the ViF
   3. The main Drivers for Non-Life
   4. Movement considerations
6. Questions and Challenges
7. Next Steps
8. Further Questions from the Audience

Group MCEV
Zurich, Annual Report

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Insurance Group:
Life Insurance
Non-Life Insurance
Farmers

Group MCEV = Covered Business MCEV Methodology + Non-Covered Business -IFRS net asset value-

- The Group MCEV is presented as the Global Life covered business which is valued under the MCEV principles and the non-covered business which is valued as the unadjusted IFRS net asset value.
- Non-covered business includes the non-core life businesses managed outside Global Life and the remaining Group non-life business.

Group MCEV, 2010

in USD billions, as of December 31	Covered Business MCEV	Non covered business	Total Group MCEV
Opening Group MCEV	**16.8**	**17.0**	**33.7**
Opening adjustments[1]	0.0	(0.4)	(0.4)
Adjusted Opening MCEV	16.8	16.6	33.4
Operating MCEV earnings[2]	1.6	2.3	3.9
Non-operating MCEV earnings	(0.6)	0.0	(0.6)
Total MCEV Earnings	1.0	2.3	3.3
Other movements in IFRS net equity[3]	0.0	1.8	1.8
Closing adjustments[4]	(1.6)	(2.5)	(4.2)
Closing Group MCEV	**16.1**	**18.2**	**34.3**

[1] Opening adjustments refer to the opening balance restatement of December 31, 2009 in respect of a U.S. closed book of variable annuity products (see note 1 of the consolidated financial statements).
[2] For non-covered business this is set equal to the change in Net Income After Tax (NIAT) over the period.
[3] For non-covered business this is set equal to the change in Other Comprehensive Income (OCI) excluding the currency translation adjustment over the period.
[4] Closing adjustments refer to dividend and capital movements, non-controlling interests and foreign currency translation effects.

Group MCEV
IFRS, Solvency II

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Insurance Group:
Life Insurance
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Solvency II

MCEV in Non Life

In the internal Model the **available Solvency Margin** (ASM) is defined as the MCEV (Source: Deloitte)

All Contracts (Insurance and Investment contracts)

"Fulfillment Value" (not "Exit Value")

Swap Rate (not "Risk free,…")

…

Actuarial Assumptions:

- MCEV: Independent of supervisory standards (own company assumption) => Shareholder view
- IFRS: Market typical assumptions, for benchmark considerations => Comparability

“CEA- Groupe Consultatif (2007) Solvency II Glossary”

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- **Embedded value**
  An estimate of the value to shareholders of a book of insurance business at a given date, consisting of the following components:
  – Free surplus allocated to the covered business;
  – Required capital, less the cost of holding required capital;
  – Value of future shareholder cash flows from in-force covered business.

  The embedded value concept is applicable to general insurance, although it is more commonly encountered in the life context.

  The value of renewals of existing contracts is included, but the value of future new contracts is excluded.

  - *VIF is calculated using current actuarial, economic and operational assumptions and is part of the embedded value*

MCEV
Usage in Industry

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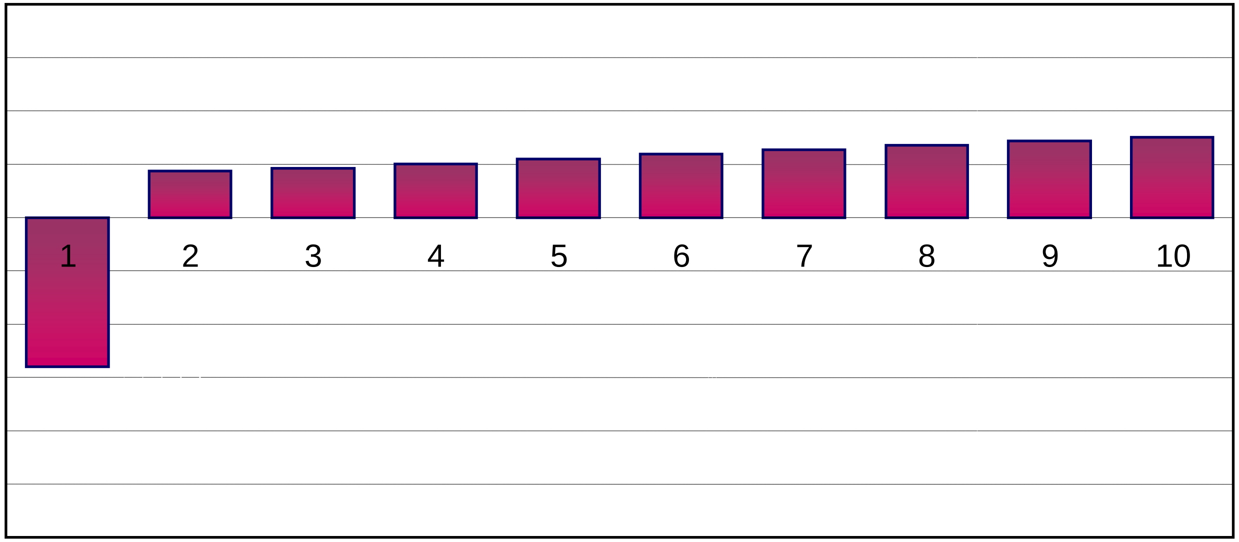
- Embedded Value is a way of reporting the value of the insurance business companies have with their customers (on a global level).
  For some time, this supplementary information varied by country and, in some cases, by company within a country making it difficult for investors to compare relative performance.
- The embedded value evaluates the insurance business as “goods” in a theoretical market according to modern financial market theory, meaning
  a) Risk neutral evaluation (Technical objective evaluation)
  b) Reproduction of market prices
  c) No Goodwill
- MCEV is an important variable to shareholders, as it helps to determine the value of their interest in the company.
- KPI (Key performance indicator) for management control
  (internally: Analysis of change (AoC)/ movements (New-business profitability)
- Used for Management decisions, risk and value driven

Payment Pattern for an Policy Insurance view



Contract/ Insurance Policy duration

Typically, losses initiated by acquisition costs are observed in the beginning. The **Embedded Value** follows the ***long-term*** view, applied to Life Insurance by not only taking into account the profit of one year but also the present ***value of all future profits***.

The Embedded Value (EV) of a life insurance company is the present value of future profits plus adjusted net asset value. The net asset value is calculated at market values for EV purposes. (MCEV)

Differences between Life and Non-Life Business Criteria Part 1

Criteria	Life	Non-Life
Contract Duration	many years	usually one year, but renewal on a rolling basis
Main Type of Services	Intermediation (saving and spend)	Risk pooling
Secondary Services	risk pooling, financial services	Intermediation, financial services
Structure of Assets	long-term-oriented portfolio	Short-term-oriented portfolio
Structure of Liabilities	**limited degree of uncertainty** with regard to claims payments and reserves (to the extent this is linked to underwriting risks)	**high degree of uncertainty** with regard to claims payments and reserves, especially in lines exposed to Nat Cat/ catastrophe risk (accumulation risks)
Duration of Liability	long	Short-term and long term (dependent on LoB)
Use of Reinsurance	limited use	substantial use, depending on the line
Required capital	Financial Market driven	Risk driven

LoB: Lines of business (e.g. motor, property,…)

Differences between Life and Non-Life Business Criteria Part 2

Criteria	Life	Non-Life
Surrender Value (Rückkaufswert)	Yes	Usually not
Cancellation Behavior	lazy	Depending on LoB, market, …
Change in contract	moderate	Common, including/excluding risks/ cover, change of insured risk,…
Reserves	policy reserves, reserve for premium refund (in some countries)	Claim reserves (case and per type of claim), equalization reserves,…
Diversification between Lines of business	typically very low, not many LoBs (Manageable)	typically very high, many LoBs (many different types of contracts), many types of risks
"History"	MCEV developed in June 2009	Embedded Value in Non-life: DAV-Working Group founded in 2008
Financial options and guarantees	essential part options: Policyholder cancels to invest in others Guarantees: minimum interests	unessential part Options: no investing part Guarantees: nothing guaranteed

LoB: Lines of business (e.g. motor, property,…)

Differences between Life and Non-Life Business
Development pattern in Non-Life

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- Claims payment pattern (long-, short-term)
- Claims reserve pattern (Reserve setting, case reserves, Equalization reserves, e.g. for NatCat)
- Premium Payment pattern (policyholder premium)
- Expense pattern (commission,…)
- …

- Discount factors
- Interest curves
- Inflation curves
- …

NatCat: Natural Catastrophes, Events

Embedded Value Life Insurance
Definition MCEV

Value of In-Force

European Embedded Value = Net Asset Value **(NAV)** − Cost of Capital **(CoC)** + Present Value of Future Profits **(PVFP)** − Time Value of Options and Guarantees **(TVOG)**

EV

The **Market Consistent Embedded Value** is the Total/ Difference

- **All components included in European Embedded Value (EEV)**
- **But add on market consistent evaluation**
  - Capital model free of arbitrage and reproduces market values by options
  - Consistent evaluation of options and guarantees analog to pricing of derivatives on the capital market
  - Impartial solution to solve the dilemma of the choose of risk and the risk discount rate (optimization of the return of investment)
- **Add on explicit consideration of costs for non-hedgeable risks**

Source: DAV Presentation, 10 Nov. 2009

Embedded Value Life Insurance => Non-Life Business
Definition MCEV

European Embedded Value = Net Asset Value **(NAV)** − Cost of Capital **(CoC)** + Present Value of Future Profits **(PVFP)** − ~~Time Value of Options and Guarantees **(TVOG)**~~

$\underbrace{\text{Cost of Capital (CoC)} + \text{Present Value of Future Profits (PVFP)} - \text{Time Value of Options and Guarantees (TVOG)}}_{\text{Value of In-Force}}$

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- **Add on explicit consideration of costs for non-hedgeable risks (e.g. motor claims)**

Embedded Value Life/ ~~Non-Life~~ "Ingredients", MCEV

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Free Surplus + Required Capital + Value of In-Force business (VIF) = MCEV

Net Asset Value

Market Value of Asset backing Shareholders' Equity (*)		Market Value of Assets backing Liability (*)				
Free Surplus	Required Capital	Present Value of Future Profits (PVFP)				Best Estimate of liabilities
		Value of In-Force business (VIF)	CRNHR	FCRC	~~TVOG~~	

CRNHR = Costs of Residual non-hedgeable Risks (~ Risk margin)

FCRC = Frictional Costs of required Capital

~~TVOG~~ = Time value of Financial Options and Guarantees

Best estimate of Liabilities: Claims Payments, Taxes, costs,…

(*): Taxation; differences between booked and market values,… has to be considered as well

MCEV - The ingredients
Determination of the Value of In-force business (VIF)

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Value of in-force business

- Non-Life: Claims reserves plus Equalization reserves
- Delimitation of new and renewal business (Cancellation behavior) => technical result evaluation
- Premium development depending on market cycle
- Assumptions:
  - Cash flows vary linearly with market movements
  - Use of risk free yield curves or swap rate

	Non-Life
In-Force Business / Renewal	• Written Business including expected renewal Business (realistic assumptions)
“New Business”	• New Business, last 12 Month
Existing Business	• In-force Business, End last year (existing for evaluation date)
Future New Business	• Expected new business / Goodwill not part of MCEV!!
...	

CoC = Cost of Capital (debit dividends to shareholder), negative Value

Free Surplus	Required Capital	Present Value of Future Profits (PVFP)			
		Value of In-Force business (VIF)	CRNHR	FCRC	~~TVOG~~

MCEV – The ingredients
Determination of Investment results: Net asset value

Net asset value (asset backing shareholder equity)

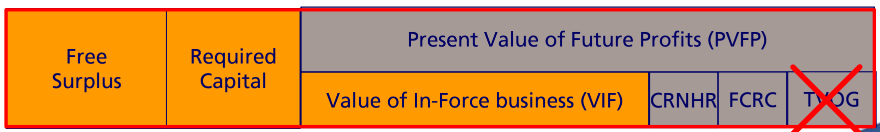
- Assets, not used for covering liabilities, spitted into:

Required capital

- Limited usable
- Minimum following the Solvency capital requirements
- Restricted distribution to shareholder

Free surplus

- Independent of other requirements available for usage
- Not restricted



MCEV - The ingredients
Determination of Investment results: Rest

Present Value of Future Profits (PVFP) = VIF – FCRC – TVOG – CRNHR

- VIF = e.g. Claims reserves plus Equalization reserves

- FCRC = e.g. Taxation and investment costs, fact that capital has to be held within the company
- CRNHR = e.g. Motor claims, cancellation behavior of customer in Life Insurance, similar to Risk Margin under Solvency II
- ~~TVOG~~ = e.g. Options: Policyholder cancels to invest in others;
  Guarantees: minimum interests

Free Surplus	Required Capital	Present Value of Future Profits (PVFP)			
		Value of In-Force business (VIF)	CRNHR	FCRC	~~TVOG~~

MCEV - The ingredients
Steps to determine the Value of In-Force Business

Step	Life	Non-Life
1. Modeling the environment (external)	a) Modeling the capital market (conditions) b) Modeling biometric risks c) Modeling cancellation behavior and implicit options and guarantees	a) Modeling the capital market b) Modeling claims and Cat events (Number, severities, accumulation,…) c) Modeling renewal (implicit options and guarantees less relevant)
2. Modeling the insurance company (internal)	a) Based on Step 1, modeling the cash inflow and cash outflow for existing insurance contracts, considering capital markets, cancellation behavior, and biometric risks b) Allow for company-specific factors such as costs and taxes c) The remainder goes to the shareholders or other parties	a) Based on Step 1, modeling the cash inflow and cash outflow for existing insurance contracts, considering capital markets, renewals and claim statistics. b) Allow for company-specific factors such as costs and taxes c) The remainder goes to the shareholders or other parties
3. Determining value of the in-force business	Reduce the present value of future profits (PVFP) by - the time value of financial options and guarantees (TVFOG) -the frictional costs of required capital (FCRC) -- the cost of residual non-hedge able risks (CRNHR)	Reduce the present value of future profits (PVFP) by - the time value of financial options and guarantees (TVFOG) -the frictional costs of required capital (FCRC) -- the cost of residual non-hedge able risks (CRNHR), e.g. motor claims

MCEV Non-Life
Main drivers

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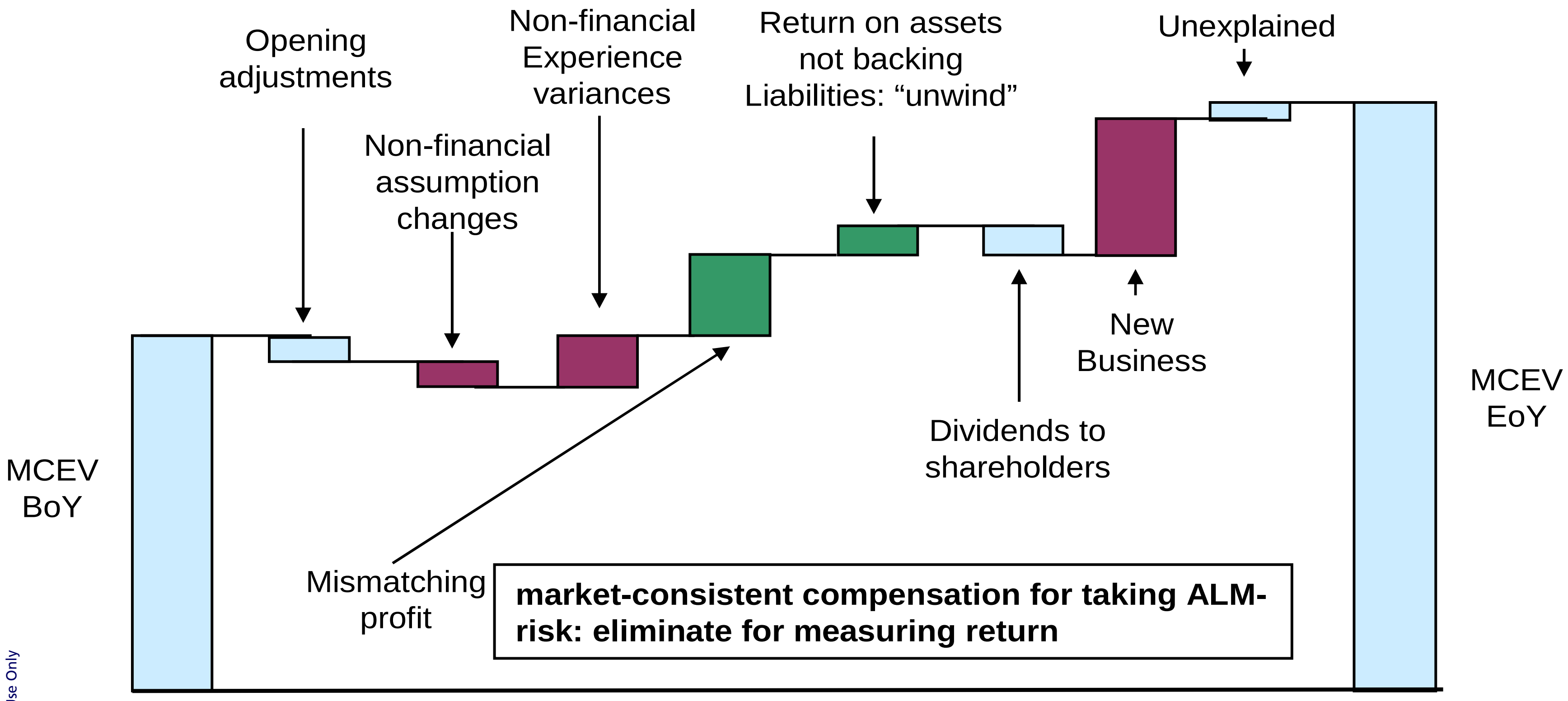
- Non-life reflecting Market Asset model / Capital Market conditions
  => Market consistent capital market model
- Present value of cash-flows
  => Interest curve for discounting
- Best-Estimate Cash-flow for technical results
  => Claims reserves, changes within In-force Business
  => Average premium (e.g. Zurich: Actual Premium – Technical Price)
- Consideration Management rules
  => Correlations assessed within MCEV
- Considerations on Single Contract level
  => Granularity of Data and Factors
- …

MCEV
Movement Considerations



Source: DAV Presentation, 10 Nov. 2009

MCEV Non-Life
Questions and Challenges

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- What is the quality of Renewal/ in-force and New Business assumptions and delimitations?
- How does the MCEV helps us to detect/ evaluate/ explain the differences between MCEV – IFRS – Solvency II?
- Are all data available needed to calculate the MCEV for Non-Life (Market related, LoB-specific, costs and expenses, …)?
- Are all models and model parameters available (Payment-pattern, market cycle, net asset value, capital-market,..)?
- What about parameters, subjective set? How much does experts knowledge helps? What about sensitivity testing for risk margin and CoC (Cost of Capital)?
- How to capture the Unwinding of the existing business?

MCEV Non-Life
Next Steps

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1. Inventory of data and their quality and granularity already in place:
   a) Reserving, Pricing, Finance, Accounting
   b) Solvency II, IFRS, HGB,….
2. Take a sample-portfolio for testing
3. Calculation of results with the help of DAV-Excel-Tool
4. Simulation of the market model that fits to Non-Life Business behavior
5. Discount factors: Market consistent
6. Comparison of IFRS/ Solvency II/ MCEV-values for Non-Life by explaining the differences and showing the rationality for substitute one against the other depending on the question to be answered

Further Questions?