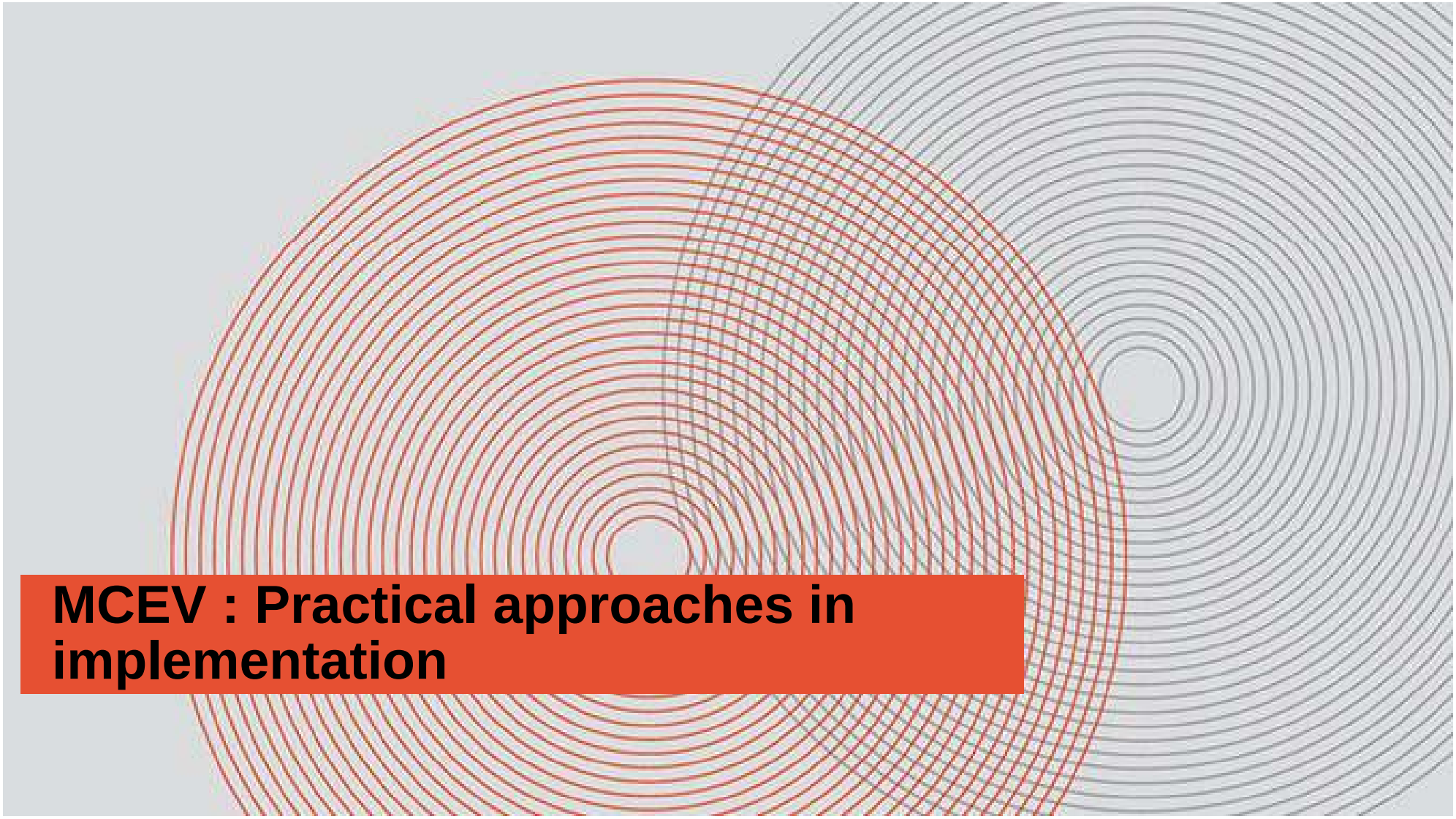


# MCEV : Practical approaches in implementation

**The 12th Global Conference of Actuaries, Mumbai**

**A presentation by Kunj Behari Maheshwari and Varun Mimani**

**18 February 2010**

TOWERS WATSON

# Agenda

- Introduction to the MCEV approach
- Issues in MCEV implementation :
  - Cost of residual non-hedgeable risk
  - Reference rates
  - Implied volatility
- Questions

# Introduction to the MCEV approach

# The three landmarks


Apart from improvements in the calculation methodology, the development of MCEV from TEV was primarily to remove the subjective area of real world economic assumptions and risk discount rates from embedded values

# MCEV definition :
## CFO Principle 3

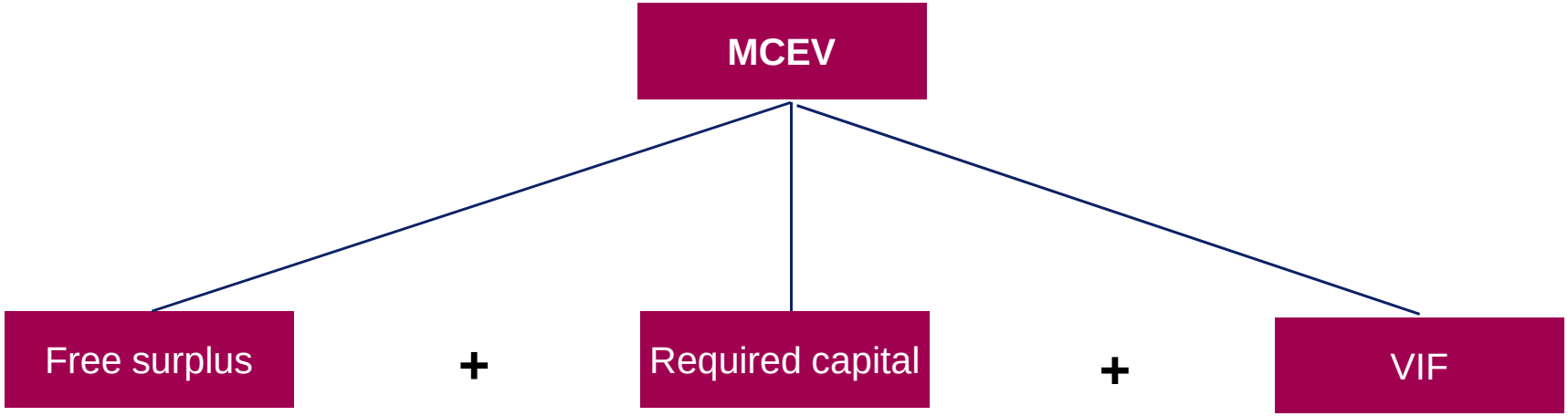
- Principle 3: “MCEV represents the present value of shareholders’ interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The allowance for risk should be calibrated to match the market price for risk where reliably observable. The MCEV consists of the following components:
  - Free surplus allocated to the covered business
  - Required capital; and
  - Value of in-force covered business (“VIF”)

- The value of future new business is excluded from the MCEV.”

# In simpler terms…MCEV

- Places a value on the expected future profits distributable to the shareholders

- Value as the market would place on the cash flows (“market consistent”)

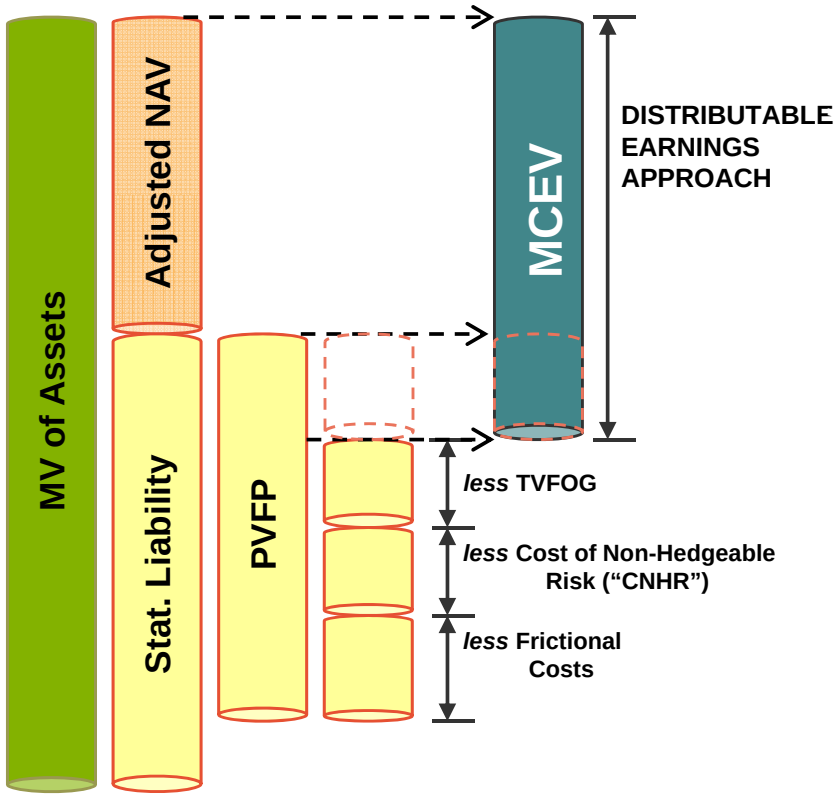


# Diagrammatic representation of MCEV

**DISTRIBUTABLE EARNINGS APPROACH**

*add (*ANAV (free surplus + required capital) + PVFP)

*less* (TVFOG + CNHR + Frictional costs)



# Issues in MCEV implementation

## Cost of residual non-hedgeable risk

# Cost of residual non-hedgeable risk ("CNHR")

These are risks where deep and liquid markets do not exist so as to be able to hedge them.

• Financial : markets not developed. Risks that are not accounted for in TVFOG

• Non-financial : mortality, longevity, operational risks

**Issues**

- CFO forum does not prescribe a methodology to calculate this. Principle 9 only states that an "appropriate " method should be adopted by companies
- Lack of consistency in approaches adopted by different companies

**Broad approaches adopted by companies**

- The bottom-up approach, based on company specific assessment of the underlying sources, costs and asymmetries of non-hedgeable risk; and
- The top-down approach, i.e. calculating a cost of capital using observations or estimates of non-hedgeable risk allowances in market transactions

# CNHR contd…
# Methodologies adopted by some insurers

| Company | |
|---|---|
| Allianz | Top down approach. Capital charge of 3.6% |
| Aviva | Bottom up approach. Capital charge of 2.5% |
| CNP | Top down approach. Capital charge of 3.1% |
| Hannover Re | Top down approach. Capital charge of 4.5% |
| Old Mutual | Top down approach. Capital charge of 3.25% |
| Storebrand (Norway) | Combination of top down and bottom up approach. Capital charge of 2.6% |

**Industry view**

- A survey of 28 leading insurers across Europe, originally published by Watson Wyatt, a Towers Watson company (together Towers Watson), revealed that 68% of respondents felt that further guidance on cost of non-hedgeable risk was necessary to harmonise approaches
- The survey also suggests that the range of the percentage capital charge could vary from as low as 0.5% to 6% with the average charge around 3%

# CNHR contd…
# Industry view and Indian perspective

**Challenges for Indian insurers**

- The difficulty in modelling the needed economic capital models, given relative lack of modelling expertise in India; and
- The difficulty in calibrating or setting such economic capital models. Here, consideration will need to be given to the current availability of capital and the nature of the risk e.g. its correlation with market risk, the shape of the risk distribution and the market's appetite for the particular type of non-hedgeable risk

**Way forward for Indian insurers**

- Balance theoretical accuracy with practical application
- Use of sensible approximations based on materiality
- Methods from some other countries such as simple risk driver approaches or economic capital proxies in place of accurate capital forecasting

# Issues in MCEV implementation

## Reference rates

# Reference rates

For a market consistent valuation, cash-flows must be discounted at a theoretical "risk-free" rate given the view that any additional risks inherent in the cash-flows would be suitably rewarded by higher expected return and greater expected volatility in the market. MCEV principle 14 prescribes that the reference rate, as a proxy to risk free rate must be the ***"swap yield curve"*** (with an inclusion for liquidity premium if liabilities are not liquid)

**Issues**

- Use of swap curve or other appropriate curves such as the government yield curve (particularly in markets where swap curves are either not available or not considered sufficiently robust);
- Extrapolating or extending the chosen yield curve for longer durations;
- Accounting for liquidity premium within the chosen curve

CFO forum revised its original principles to include ***liquidity premium***. The rationale behind this change is that investors who hold bonds to maturity are unaffected by liquidity concerns and mark to market volatility

# Reference rates contd…
# How to extrapolate curves and account for liquidity premium

**Extrapolation of curves (guidance 14.2)**

- Assuming that either spot or forward rates remain level at the longest available term; or
- If there exists a relevant government bond yield curve which is longer than the financial market data used to set the reference rate, this could be used to extend the data by maintaining a constant margin from the end of the available data and assuming it remains level thereafter

**Methods to account for liquidity premium**

- Merton-type models can be used to model theoretical prices. However, the model requires judgment to be made regarding some of its parameters which could result in lack of consistency
- The liquidity premium can be based on the yields available on covered bonds. However, these bonds are of relatively shorter durations and companies may adopt different methods when extrapolating these to longer durations

# Reference rates contd…
# Methodologies adopted by some insurers

| Company | |
|---|---|
| Allianz | Use of swap curve |
| Aviva | Use of swap curve and government bond yields (where the swap curve was not available. Allowed for a liquidity premium. |
| CNP | Use of swap curve. Allowed for a liquidity risk premium. |
| Hannover Re | Used unadjusted swap yield curves |
| Old Mutual | Use of swap curve. Allowed for a liquidity risk premium. |
| Storebrand (Norway) | Use of market interest rate curves with other adjustments |

For countries that have control over its money supply – such as **India** - government bond yield curve may be considered a valid choice for the reference rate. This is because; given control over its money supply, the government can, at least in theory, always print money to meet nominal liabilities expressed in its own currency

# Issues in MCEV implementation

## Implied volatility

# Implied volatility

MCEV ***Principle 15*** specifies that "volatility assumptions should, wherever possible, be based on those implied from derivative prices rather than the historical observed volatilities of the underlying instruments." Further guidance states that most recent market data must be used to calculate implied volatility i.e. market prices of traded derivatives as at the valuation date should be used.

**Issues**

- Situations where deep or liquid markets do not exist and when markets display unusual characteristics as at the valuation date
- Volatilities based on market prices are observable in the market at the short term. However, most insurance liabilities including options are guarantees are long term in nature.

For the December 2008 valuations, the CFO forum concluded that market conditions displayed unusual characteristics to use implied volatilities as at that date.

# Implied volatility contd…
# Methodologies adopted by some insurers

| Company | |
|---|---|
| Allianz | Used 30 September 2008 values |
| Aviva | Used 31 August 2008 values |
| CNP | Used average of implied volatilities over 2008 |
| Hannover Re | Used 30 November 2008 values |
| Old Mutual | Used 31 December 2008 values except for USA where 30 September 2008 values were used |
| Storebrand (Norway) | Used average of implied volatilities over 2008 |

Due to mismatch in duration of implied volatilities and insurance liabilities, extrapolating to longer terms requires companies to use an external model or some judgment regarding the volatility surface. One possible way to derive this in the ***Indian context*** would be to define a very long term volatility assumption based on historic analysis and expert judgment and then interpolate as necessary

# Contact details


- **Kunj Behari Maheshwari**
  - Consultant
  - Towers Watson
    404B | 4th Floor | Centrum Plaza
    DLF Golf Course Road | Sector 53 | Gurgaon
    Haryana | India | 122002
  - +91 124 432 2822
  - Kunj.Maheshwari@towerswatson.com

- **Varun Mimani**
  - Consultant
  - Towers Watson
    404B | 4th Floor | Centrum Plaza
    DLF Golf Course Road | Sector 53 | Gurgaon
    Haryana | India | 122002
  - +91 124 432 2827
  - Varun.Mimani@towerswatson.com