

# IAA LIFE Colloquium 2009

September 7th–8th, 2009



# Coffee Break

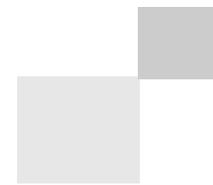


## Breakout Session Topic 4:

# Solvency, accounting and the evaluation of life insurance business

8 September 2009





# **Economic Measurement of Insurance Liabilities:** ***The Risk and Capital Perspective***

---

**Larry Rubin**  
**September 8, 2009**



# How insurance company creates shareholder value



- ❑ Sell policies at or in excess of their economic value
- ❑ Acquire policies below their economic value
- ❑ Exit( sell/ transfer/clear) business above
- ❑ Enhance value through various investment activities or efficient operation
- ❑ Risk management activities

## Key question:

- **Whether this value exists?**
- **When to recognize the value created?**



# MCEV vs. Fair Value

## Difference in three key areas

### 1 The Definition of non-market assumption

MCEV	Based on company specific best estimates
Fair Value	Market consistent

### 2 The calculation and calibration of risk margins

MCEV	Does not explicitly refer to risk margin
Fair Value	Market Consistent

### 3 The use of internal model for determining capital in lieu of the market value of cost

MCEV	Use a capital rate applied to the appropriate level of capital
Fair Value	Market Consistent



# Market Consistent Embedded Value (MCEV)

---

## Improvement from EV

- Guarantees and options are explicitly valued using financial economic technique
- Modelled stochastically
- Or using closed form approaches such as the Black-Scholes formula
- A risk-neutral approach is adopted for setting investment assumptions and discount rates.

## For example:

- It was noted that a guaranteed minimum death benefit( GMDB) on a variable annuity was the same as a traditional put option with the minor inconvenience that the owner of the option must die to exercise it
- Therefore, model was calibrated to recreate the traditional put option prices observed in the market then used to determine the value of the GMDB.



# MCEV

- ❑ Although still under debate, MCEV has gained momentum
- ❑ More major European companies used MCEV approach in last few years.
- ❑ The move to MCEV has increased transparency and comparability
- ❑ So, what are the implication of this move for the investors' risk margin calibration?



# Approach to determining risk margins

---

Risk margin determination can mean many different things to interested parties:

- IASB suggested that risk margins should be determined such that they compensate entities for bearing risk
- For life insurance company, includes compensation for the guarantee and options provided to policyholders



# Determining risk margins

## Imagine a perfect frictionless world:

- No regulations
  - No transactional costs or liquidity concerns
  - Perfect readily available information
- 
1. Investors in insurance enterprise– would want to receive the highest possible return for bearing risk.
  2. Insurance seeker– would look to pay the lowest return.
  3. The market clearing price in a transaction- acquisition cost – include risk margin.



## Determining risk margins

**However, in the real world, there are:**

- Various regulatory restrictions
- Various actual and perceived competitive advantages
- Significant disparities in information
- A variety of frictional costs
- Insurance contract have the additional complication of having very different value to different individuals.
- Policyholder emotional drive



## Two arguments on GAI and NGAI

Therefore, why would we assume policyholder would demonstrate any more efficiency in the purchase of insurance contract?

These inefficiencies in the market bring to two arguments

- ❑ Gain at Issue (GAI)
- ❑ No Gain at Issue (NGAI)



## Argument of Gain at Issue (1/2)

### □ Policyholders' inefficiencies in purchasing insurance are Insurer's advantages:

- More information than individual
- Comparative advantages over competitors
  - Proprietary investment strategies
  - More efficient distribution network
  - Regulatory advantages
- Determine the minimum price they would accept for bearing the risk in insurance contract
- The ability to capture the economic rent represented by the present value of the difference between what they expect to receive from the policyholder and the minimum amount the investors would require to enter a new transaction



## Argument of Gain at Issue (2/2)

- ❑ The activity of selling an insurance contract also represents an economic activity
- ❑ The sales process should reflect a return on the capital invested in distribution
- ❑ Insured may accept a higher price
  - Lack of complete information
  - Being convinced of the value of the transaction by the sales process.



## Model used to determine the explicit risk margin

Model used to determine the explicit risk margin:

1. Include thousands of potential economic scenarios
2. Include a variety of demographic scenarios
3. Process countless path-dependent calculation
- 4. Theses scenarios reflect the insurers' view of the risk and not the market view of risk.**
- 5. Market clear premiums**



## Model used to determine the explicit risk margin

- ❑ If economic rents do exist, whether a reliable and credible method can be developed to measure them?
- ❑ Even assuming economic and demographic scenarios are appropriate, it is hard to confirm the path-dependent calculation are appropriate.
- ❑ Assumption are based on unobserved information.
- ❑ Role of accounting is to record past activities



Gain at Issue might be subjective and not consistent with role of accounting



# Investor Benefits

## GAI

Demonstrate these additional gains through income

Calibrate the risk margin to the market clearing premium

Provide significant additional disclosure to investors

- How the company determine its risk margins and economic capital
- What the key assumptions are
- How they are determined
- How experience has evolved relative to those assumption.

- Company's economic capital and market clearing premium

## NGAI



# Market Consistent Economic Capital (1/4)

- ❑ Current economic capital model focuses on “Fat tailed events”
- ❑ Under Solvency II, economic capital is defined to absorb all losses within a year with a 99.5% probability.
- ❑ Northern Rock, a British bank, demonstrates the difficulties of re-capitalizing, without taxpayer assistance, after a loss event.
- ❑ An alternative view of economic capital: “mark-to-market” economic capital.



## Market Consistent Economic Capital (2/4)

- ❑ In 1999 the Shadow Financial Regulatory Committee of the American Enterprise Institute advocated requiring banks to issue a mandatory minimum level of subordinated debt to serve as a market mechanism for bank regulation.
- ❑ This proposal was further developed in a paper by Mark E. Van Der Weide and Satish M. Kini entitled "*Subordinated Debt: A Capital Markets Approach to Bank Regulation*" and a comprehensive study by staff of the Board of Governors of the Federal Reserve System was somewhat supportive of subordinated debt requirements to enlist the bond market into efforts to supervise banking institutions.



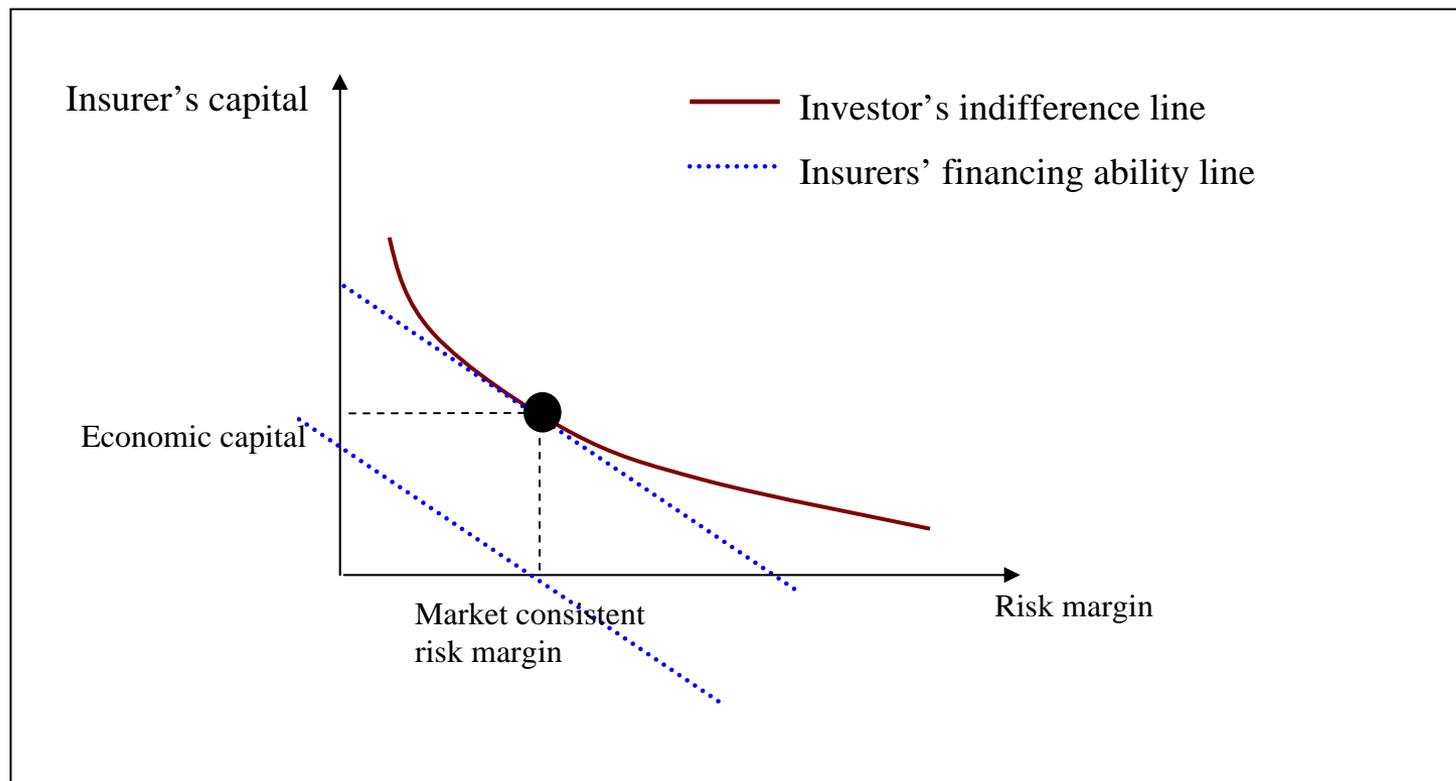
## Market Consistent Economic Capital (3/4)

- ❑ At a recent Refocus conference John D. Johns, CEO and President of Protective Life Insurance Corporation proposed an alternative to Principles Based Reserves. His proposal was that insurance companies be required to sell surplus notes equal to 10% of peak economic reserves.



# Market Priced Economic Capital (4/4)

## □ Illustration – Market Priced Economic Capital





# Market price of risks is probably higher than Solvency II definition (1/2)

## Solvency II definition of economic capital:

The amount that an insurance company needs so that it can absorb all losses within a one-year time horizon with 99.5 percent probability.

## Compare market price of risks vs. Solvency II level capital (internal model approach) by looking at A rated bond:

- ❑ Use historical default rates and rating transition probabilities published in Moody's study (Feb 2008)
- ❑ Simulate the loss distribution of this bond. Capital was set equal to the 99.5 percentile of this distribution over average loss (i.e. the 50th percentile of credit losses) over one year period.
- ❑ Run the model using a 5-year time horizon
- ❑ Define the average excess historical spread over expected defaults was the market consistent return on capital (for A-rated bond issuers)
- ❑ Assume cost of capital 9%



	Basis Points of Notional Amount
Market price Economic Capital	265
99.5% Percentile over one year	65
99.5% Percentile over five years	122



# Market price of risks is probably higher than Solvency II definition (2/2)

## Implications from prior slide:

- ❑ The economic capital defined under Solvency II is significantly lower than the market implied economic level of capital.
- ❑ Even under a 5-year loss (Solvency II defines one year) time horizon, the internal EC is lower than the market priced number, although the gap is narrower.

## There are a number of reasons for the differences:

- ❑ The historical data represents only one sample of potential outcomes that could have happened and is not necessarily the mean;
- ❑ The market is pricing risks that are currently unknown (such as black swans and paradigm shifts).
- ❑ Economic Capital modeling may have failed to adequately consider the level of liquidity risk that is priced for in the market



# Market Consistent Cost of Capital

- ❑ Rich Carbone, Chief Financial Officer of Prudential Life Insurance Company when interviewed from this paper stated that the purpose of economic capital is to right size equity
- ❑ However under MCEV the cost of capital is the weighted average cost of Capital
- ❑ If Rich Carbone is correct then MCEV significantly understates the Cost of Capital
- ❑ This understatement may be producing an unrealistically high gain at issue
- ❑ The follow example illustrates this



# Market Consistent Cost of Capital

- ❑ Cost of capital should be a market consistent number as well
- ❑ If economic capital is funded by equity, then cost of capital should be market consistent cost of equity!

**Economic capital**    \$100

**Total Capital**        \$150

(meet rating agency or regulatory requirements)

**WACC  
Method**

70% Equity with 500bp over LIBOR  
30% Debt with 50bp over LIBOR

Company's weighted average cost  
capital = LIBOR  
+3.65%\*(0.7\*5.00%+0.3\*0.50%)

Risk charge = \$100\*3.65% = 3.65%

**Proposed  
Method**

Cost of Capital is based on the price of  
equity times economic capital+ the price  
of debt times excess capital

Risk charge =  
\$100\*(100%\*5.0%)+(\$50\*3.65%)  
= 5.25%



# Reasons of different level of economic capital between Market and Model

---

- ❑ Information disparity
- ❑ Frictional costs and operational risks
- ❑ Unknown Unknowns



## Performance Measurement Approach (1/2)

Develop an approach to determine the appropriate level of economic capital:

- ❑ This approach should maximize the use of market information and be as transparent as possible while recognizing that all internally created models will not be explicitly or objectively capture all the risks.
- ❑ The minimum capital to satisfy a target debt rating may serve as a source.
- ❑ The capital set aside in securitization deals or in financial reinsurance transactions provides some direct evidence of the appropriate level of capital.



## Performance Measurement Approach (2/2)

- ❑ Economic capital created from an internal projection of cash flows can be adjusted for risk premiums observed in more liquid markets.
- ❑ The market will ultimately reach a consensus on these values resulting in a market view on the exit value of risk margin.
- ❑ Finally, any changes in these values from one period to the next need to be transparent.
- ❑ Companies will need to develop stable and understandable analytics to enable this work.
- ❑ For example, these analytics could split the market and non-market information or could attempt to address each of the relevant risk margins individually.



## Conclusion

- ❑ Measuring performance, or capital adequacy, of an insurance company depends on the type, amount and transparency of information.
- ❑ Economic capital based on market view of risk becomes more transparent and comparable across entities.
- ❑ Theoretically every company should have the same economic capital requirement for a given type and level of insurance risk assumed.
- ❑ The difference in approach to assuming risk and assumptions in estimating the theoretical value would create market differences.
- ❑ Insurance industry has many tools available to assist in providing clearer, cleaner and useful information to interested parties.



The ideas of this presentation are fully developed in the following paper:

**“Economic Valuation of Insurance Liabilities: The Risk and Capital Perspective”**

**Thank you**

**Larry H. Rubin**

[larry.rubin@us.pwc.com](mailto:larry.rubin@us.pwc.com)

646-471-4017



# IAA LIFE Colloquium 2009

September 7th–8th, 2009

