



Society of Actuaries in Ireland

Mitigation and Optimisation of Investment / ALM risks

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Context

- Generating **long-term guarantees** with supporting investment strategies remains a strategic function of insurance (even non-life), I believe
- The analytical understanding of the **market-risk dynamics of insurance liabilities** has increased infinitely since the late 90s (in context of MCEV, S-II)
- The focus should now move to designing and executing ALM in a difficult market. I am going to talk you through **three typical ALM strategies**, their design principles and risks



Focus is on three typical ALM strategies

- **The Traditional Way** – Cash-flow matching of guaranteed liabilities
- **See how it goes...** – manage assets v liabilities dynamically
- **Static Hedging** – Using structured capital-markets instruments to immunize the liability value



1. Cash-flow matching of fixed liabilities

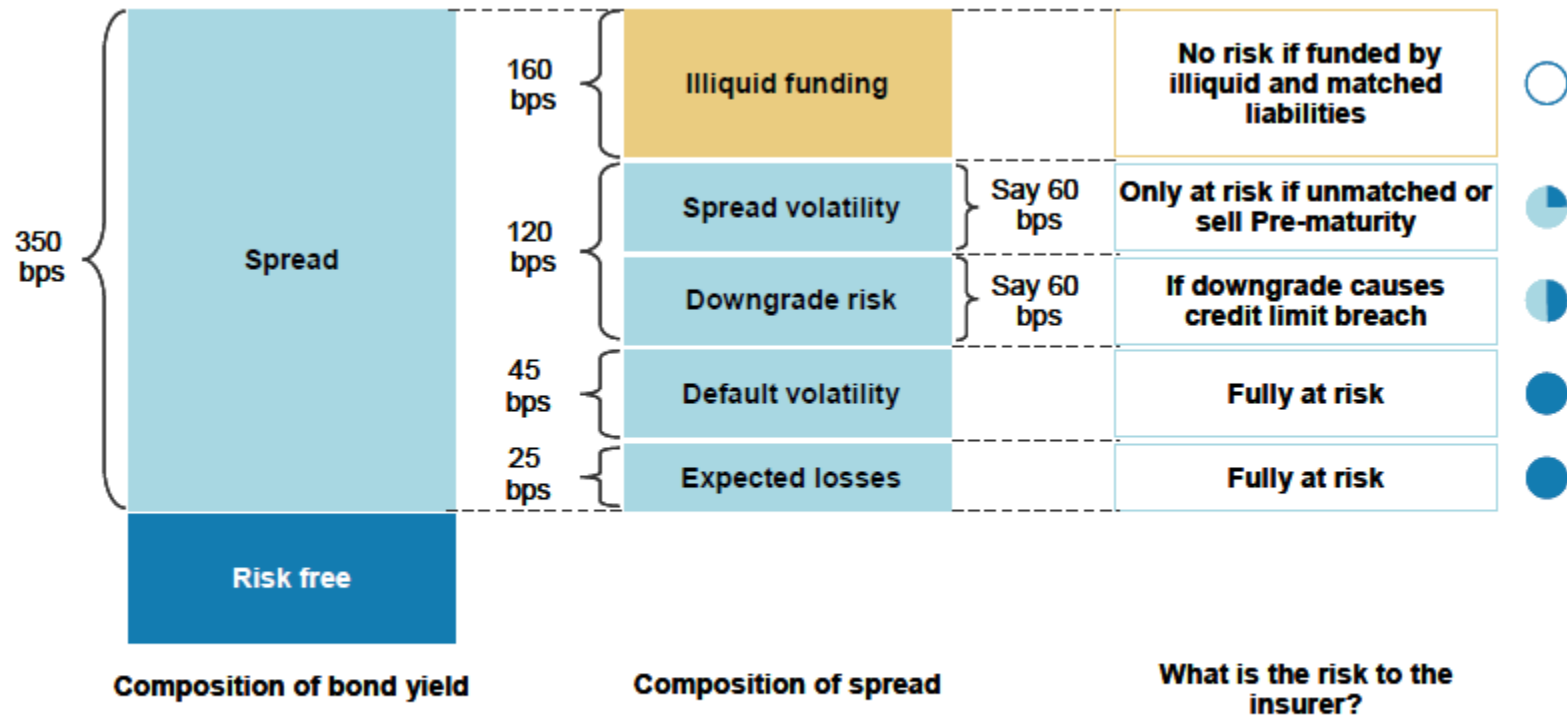


Current context for matching strategies

- Extension of the Yield Curve
 - The Search for Yield
 - The End of 'Safe'
- **Dominant theme currently is how insurers can capture a liquidity premium**



Fundamental considerations in favour of a liquidity premium



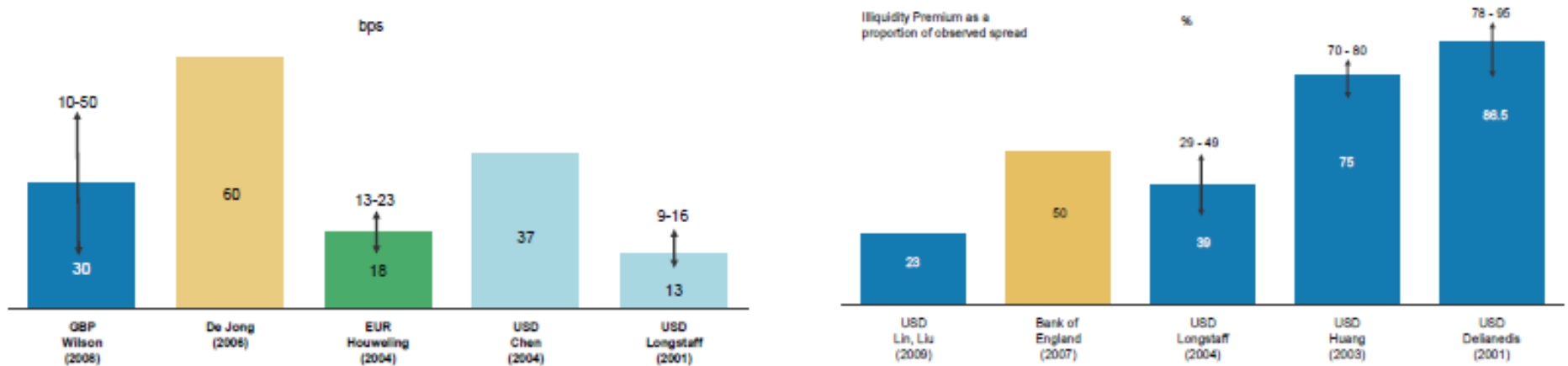
○ Low risk to insurer ● Full risk to insurer

Source: Morgan Stanley / Oliver Wyman (2012)



There is no agreement how big the liquidity premium is

- Empirical research into the liquidity premium (various sources / currencies)



Source: Various authors; Morgan Stanley / Oliver Wyman (2012)



Matching strategies are suitable only in very specific situations

- Highly predictable cash flows from assets and liabilities
 - E.g., no future premiums, no surrender
 - Assigned and ring-fenced 'held to maturity' bond portfolio
 - Minimum credit quality requirements
 - E.g., > BB, with a low maximum allocation \leq BBB
- **Measure and manage credit risk, in particular for low investment grade issues**



2. Dynamic hedging of guarantees

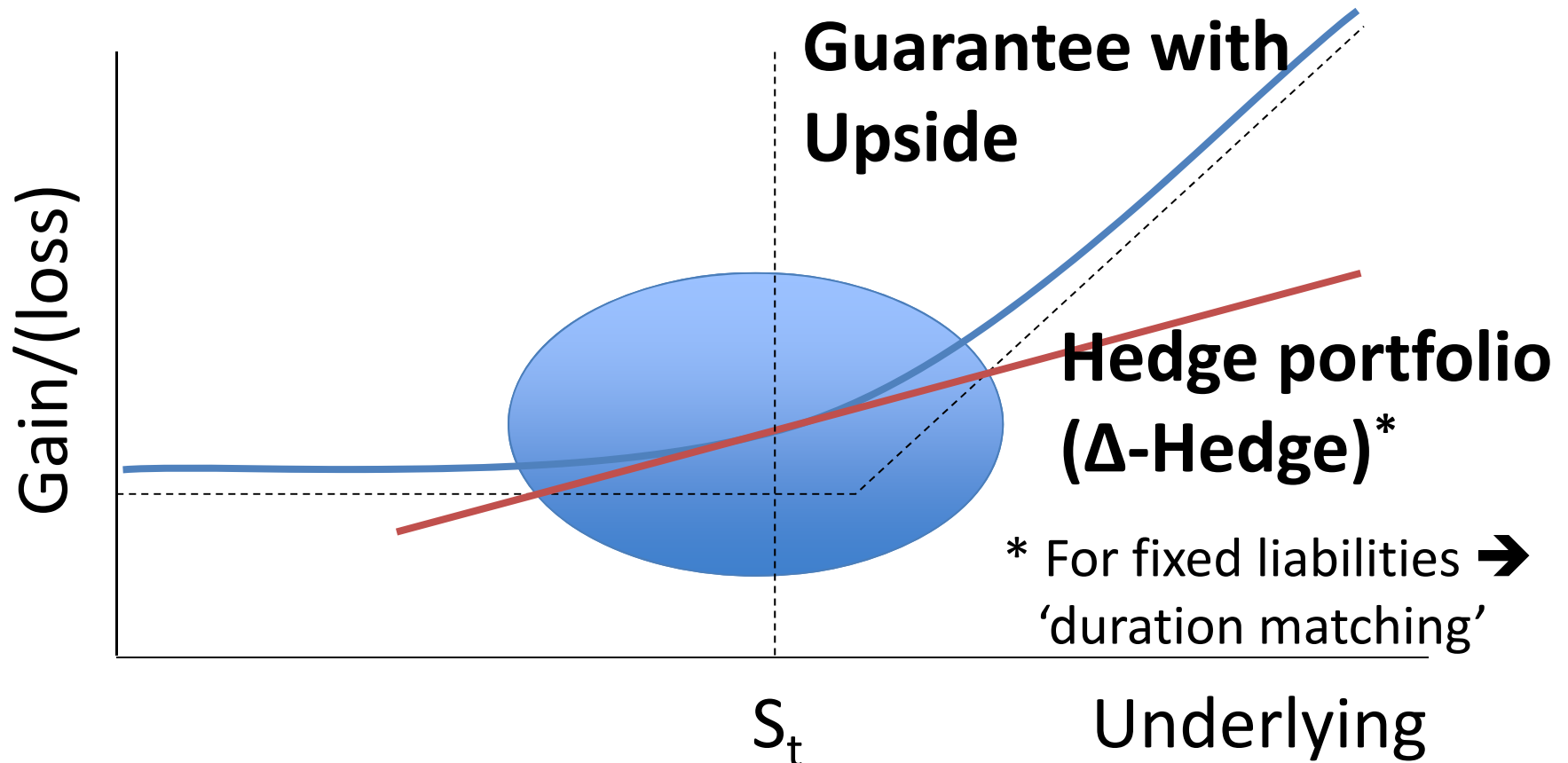


Current context for dynamic-hedging strategies

- Use simple assets ('hedge assets') to off-set value changes of liabilities over time
- Relevant for
 - Financial options ('upside')
 - Long-term guarantees (w/o match)
- **Dominant theme currently is how best to use dynamics in volatile markets**

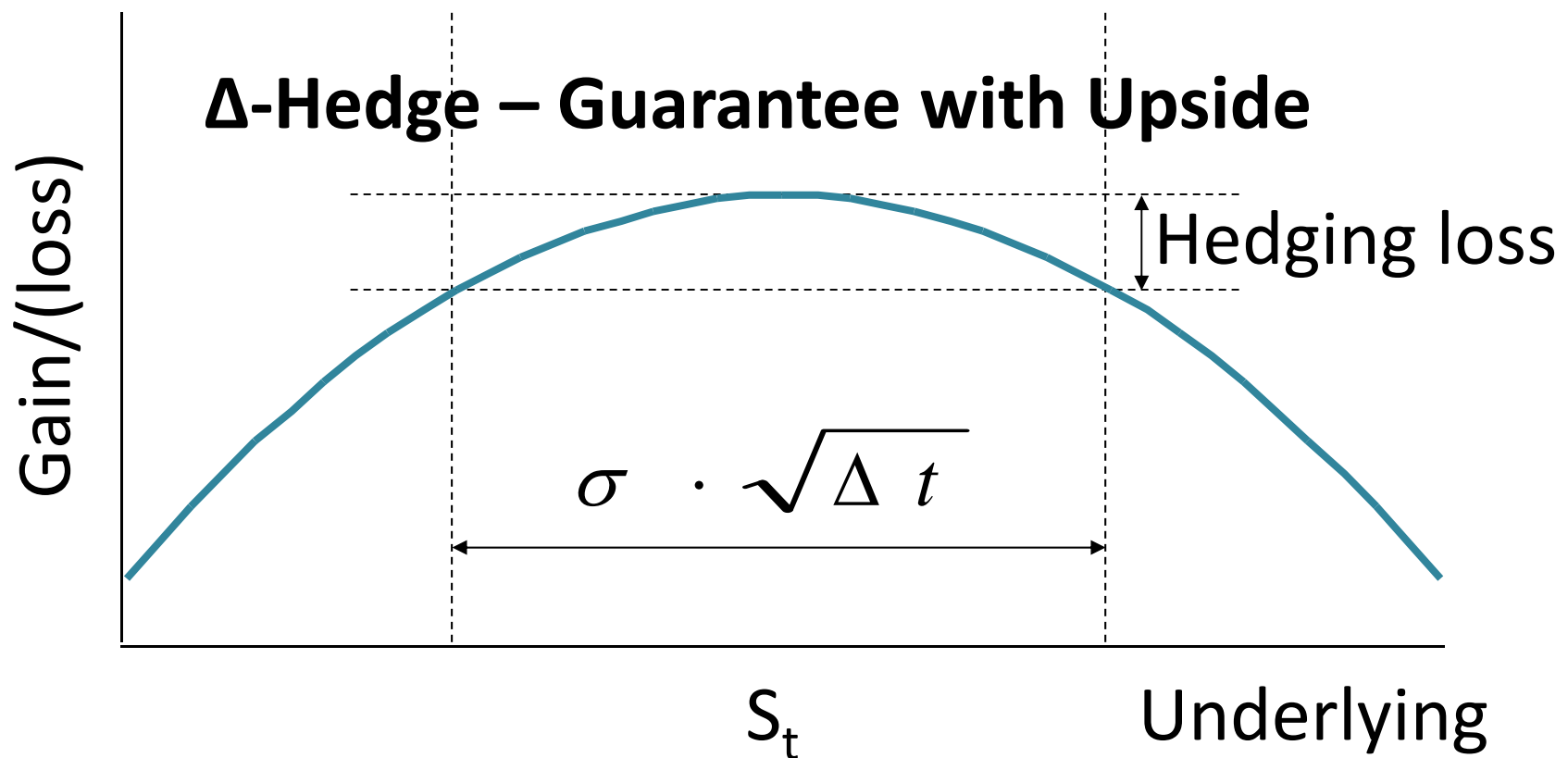


The basic hedge is structured to immunize small movements





Basic hedges produce losses in volatile markets





Dynamic hedging strategies introduce their own risks

- Basis risk: Hedge instruments do not track perfectly the underlying
 - Spread risk for fixed liabilities
- Market volatility; market “gapping”
- Model risk, model mis-specification
- Liquidity risk of placing M2M collateral
- Operational risk: Hedge implementation



2. (Semi-)Static replication strategies



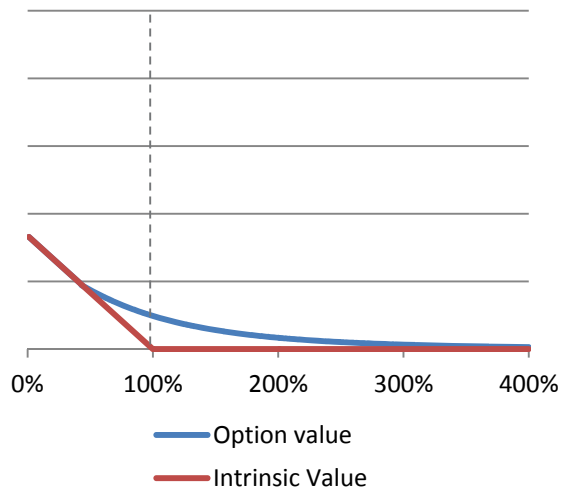
Current context for static replication strategies

- Innovation in capital markets create opportunities for risk management
- Markets for standardised options have grown significantly (OTC and XT)
- **Dominant theme currently is managing the cost of an options programme**

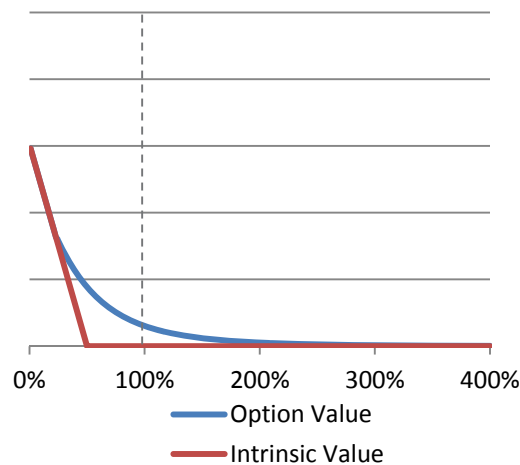


Several suitable combinations of options are typically possible

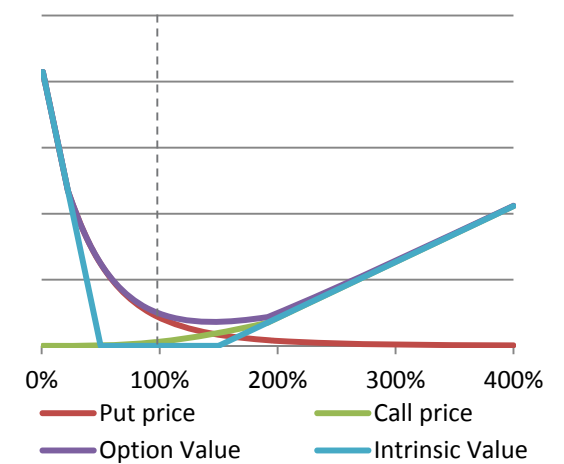
Option 1 - 8Y ATM Put hedging 50% of Vega



Option 2 - 8Y OTM Put hedging 100% Vega



Option 3 - 8Y OTM/P + OTM/C hedging 100% Γ





Experience shows that the benefits of options is limited

- Standard options can typically **replicate the immediate impact** of market shocks
- However, the replication **dissipates quickly** due to the option's time decay
- A potential strategy is to **roll over the options** but cost needs to be budgeted
- Options introduce **Vega risk** into B/S