LONGEVITY SWAPS

AN EFFECTIVE, INNOVATIVE WAY TO MANAGE THE LONGEVITY RISK

Impact of Solvency II

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AGENDA

1. Solvency II - Background
2. Impact on Annuities
3. Impact on Longevity Swaps

Solvency II - Background

- to replace Solvency I (1973) to harmonize insurance risk management practices across Europe
- Risk-based required capital
  - "Total Balance Sheet" approach
    - Technical Provision = MV(liabilities) =
      1. Best Estimate [PV(liabilities using expected assumptions)] +
      2. Risk Margin [PV (Cost of Capital)]
    - Minimum Capital Requirement (MCR) – up to 80-90% Value-at-Risk (VaR) over 1 year
    - Solvency Capital Requirement (SCR) – 99.5% VaR over 1 year ≤ MV(assets)
  - robust risk management practices
  - most companies will develop complex models

Solvency II - Background

- 3 Pillars

    1. quantitative calculation of required and available capital

    2. company's risk management systems and controls

    3. disclosure

Solvency II - Background

- Qualitative Impact studies have been submitted by insurers to Committee of European Insurance and Occupational Pension Supervisors (CEIOPS) for determination of the financial impact of the current Solvency II rules
  - QIS5 submitted on October 31, 2010

- Expected effective date of January 1, 2013

Solvency II – Impact on Annuities

- 2 major items

1. Asset Decoupling: Liability value calculated at a risk free rate independent of yield on the supporting assets.

2. Prescribed margin on annuity mortality

Solvency II – Impact on Annuities

- Asset Decoupling
  - liabilities best estimate assumptions discounted at the risk-free rate
  - significant item as the credit spread achieved on assets is a major component in annuity pricing
  - an "Illiquidity Premium" can be added to the "Technical Provision"
    - not credit spread
    - represents the portion of asset yield over the risk-free due to the illiquidity of the assets backing insurance liabilities (eg corporate bonds)
    - level of "Illiquidity Premium" prescribed for QIS5, but has yet to be included in Solvency II
    - a portion of the "Illiquidity Premium" is added back to the SCR

Solvency II – Impact on Annuities

- Prescribed margin on annuity mortality
  - permanent mortality reduction of 20% for all ages and maturity
  - initially 25% based on 2004 insurers' estimate for an average age 60 annuity at a 99.5% VaR level.
  - For insurers with a substantial block of annuities (eg UK companies)
    - significant impact to the SCR;
    - 2nd order increase to the Risk Margin within the Technical Provision
  - stochastic models tend to produce larger SCRs for younger ages and lower SCRs for higher ages
  - some in the EU pushing for a transition to Solvency II for annuities (eg UK) while others not particularly interested (eg France)

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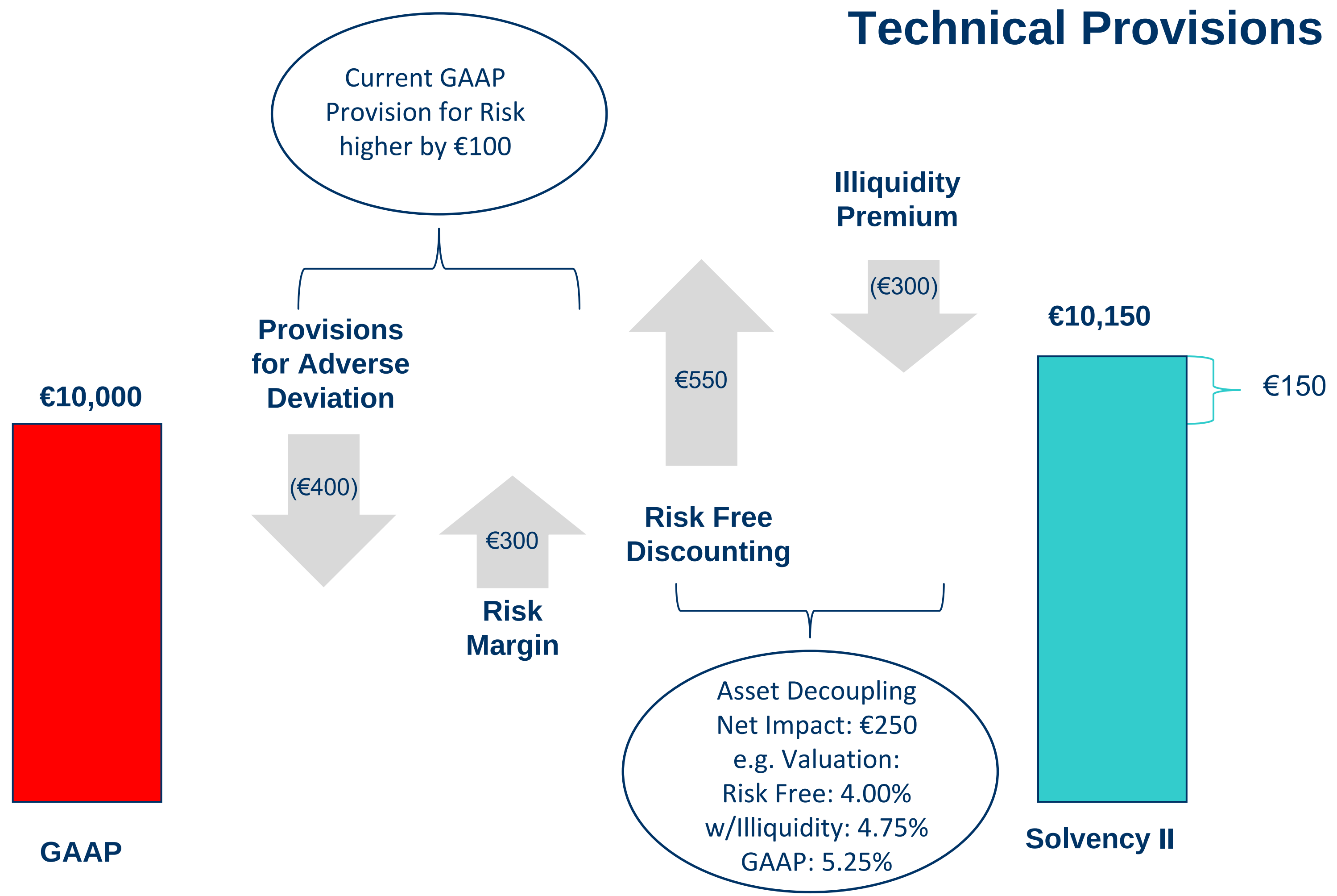
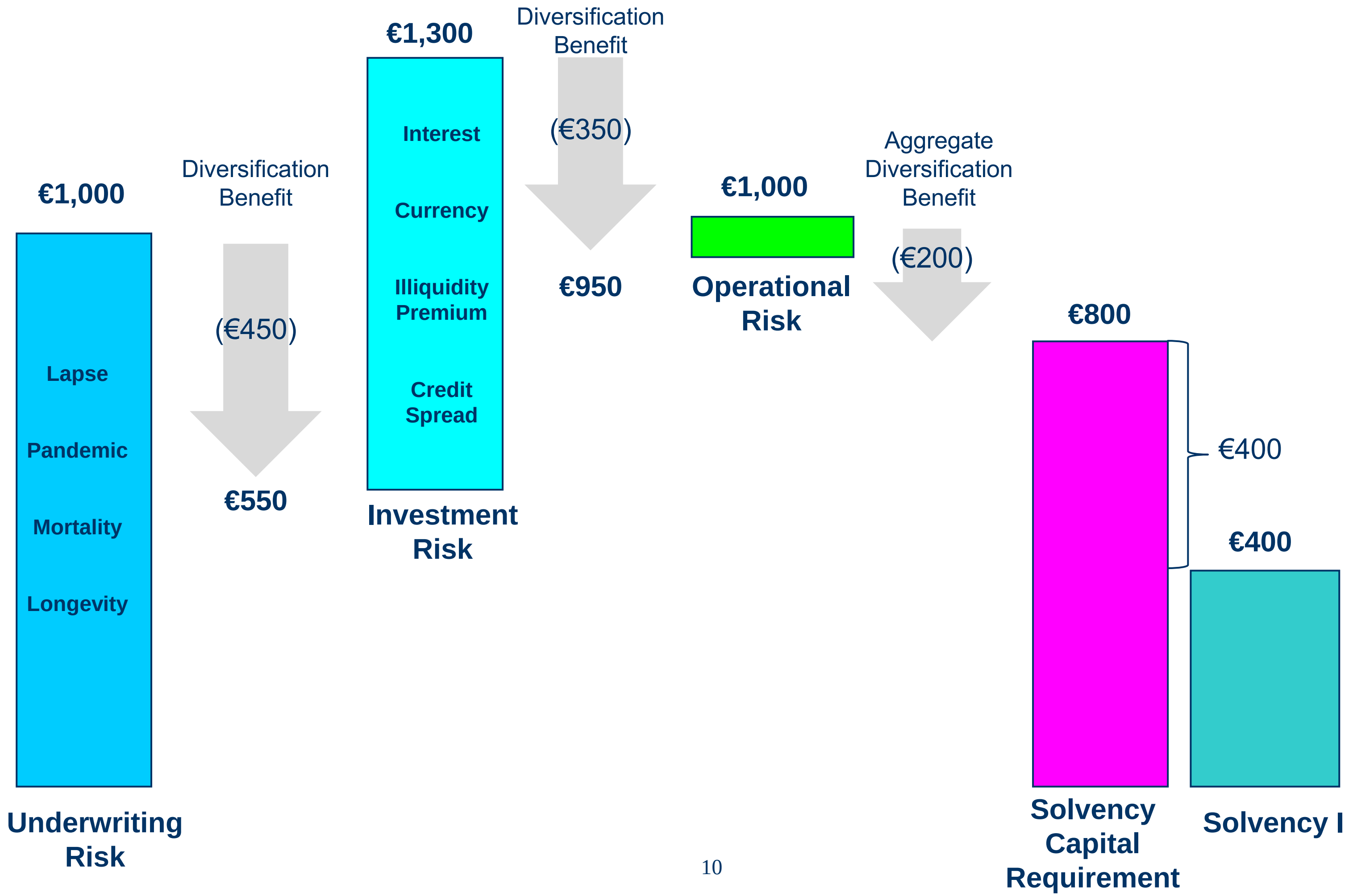
Solvency II – Impact on Annuities



Solvency II – Impact on Annuities

Solvency Capital Requirement

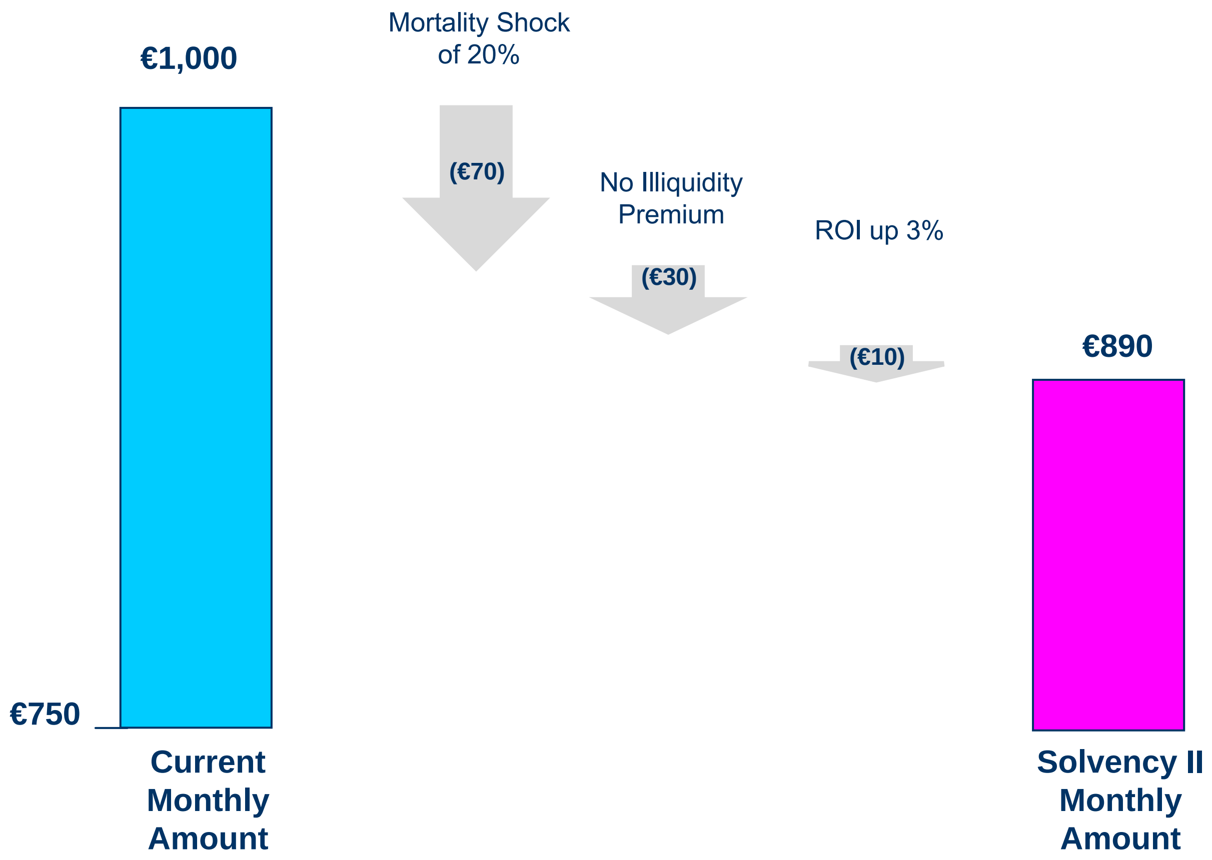


Solvency II – Impact on Annuities

- Result of an Increased Total Balance Sheet Requirement
  - increased security for annuity policyholders
  - comes at a cost with lower monthly benefit payments to policyholders
    - insurers still need to achieve their target return on capital for their shareholders
    - less competition as annuity only insurers will be at a disadvantage due to the “diversification benefit”
    - additional expense of Solvency II administration has to be eventually borne by either the shareholders or policyholders.

Solvency II – Impact on Annuities

Policyholders' Monthly Benefit reduction for Solvency II



Solvency II – Impact on Longevity Swaps

- Longevity Swaps with Solvency II
  - as Solvency II is model based, the reinsured longevity risk would be eliminated from the cedant
  - possibly partially offset by Solvency II's Counterparty Risk requirement
  - evaluation of reinsurance must take into account potential loss of Diversification Benefit
  - The cedant continues to have the Investment Risk

Solvency II – Impact on Longevity Swaps

- Counterparty Risk – Reinsurance Recoverables
  - risk of default by Reinsurer determined by
    - reinsurer rating
    - variability of the reinsurance panel
    - QIS5 correlation between reinsurers added to SCR

Solvency II – Impact on Annuities

- Solvency II has a significant impact on annuity pricing, reserves, capital and reinsurance
  - Mortality shock of 20% is punitive
  - Risk Free discount rate can increase the Technical Provision over the current reserve
  - Counterparty risk requirement for recoverables will need to be reflected in reinsurance decisions