Session 22: Capital Framework on Life/Pension

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Capital

- What is capital?
- Characteristics of good capital frameworks
- Consequences of inappropriate capital frameworks
  - Magnitude
  - Structure

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Overview of Longevity Risk

- Longevity Risk the risk that mortality in the future deviates adversely from what is expected for products that are negatively impacted by policyholders living longer than expected

- Longevity Risk can manifest as:
  - Base Risk: The risk that the base mortality assumptions at time 0 differ from the true underlying mortality rates.
  - Trend Risk: The risk that mortality improvement in the future deviates adversely from what is expected.
  - Trend Risk is the primary longevity risk for large insurers with credible data.

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Longevity Base and Trend Risk

- Potential sources of base risk include a lack of credible data and past random fluctuations.
  - Widely accepted statistical techniques such as use Longley-Cook demonstrate that base risk is minimal when appropriate significant and credible claims experience exists.
- Trend risk can be quantified using two principle approaches:
  - a data-driven approach in which a statistical model is fit to historical mortality data and used to project future mortality, and
  - a driver-based approach in which the major drivers of mortality change (such as lifestyle, medical advances etc.) are modeled.
- Base and trend risk are broadly independent

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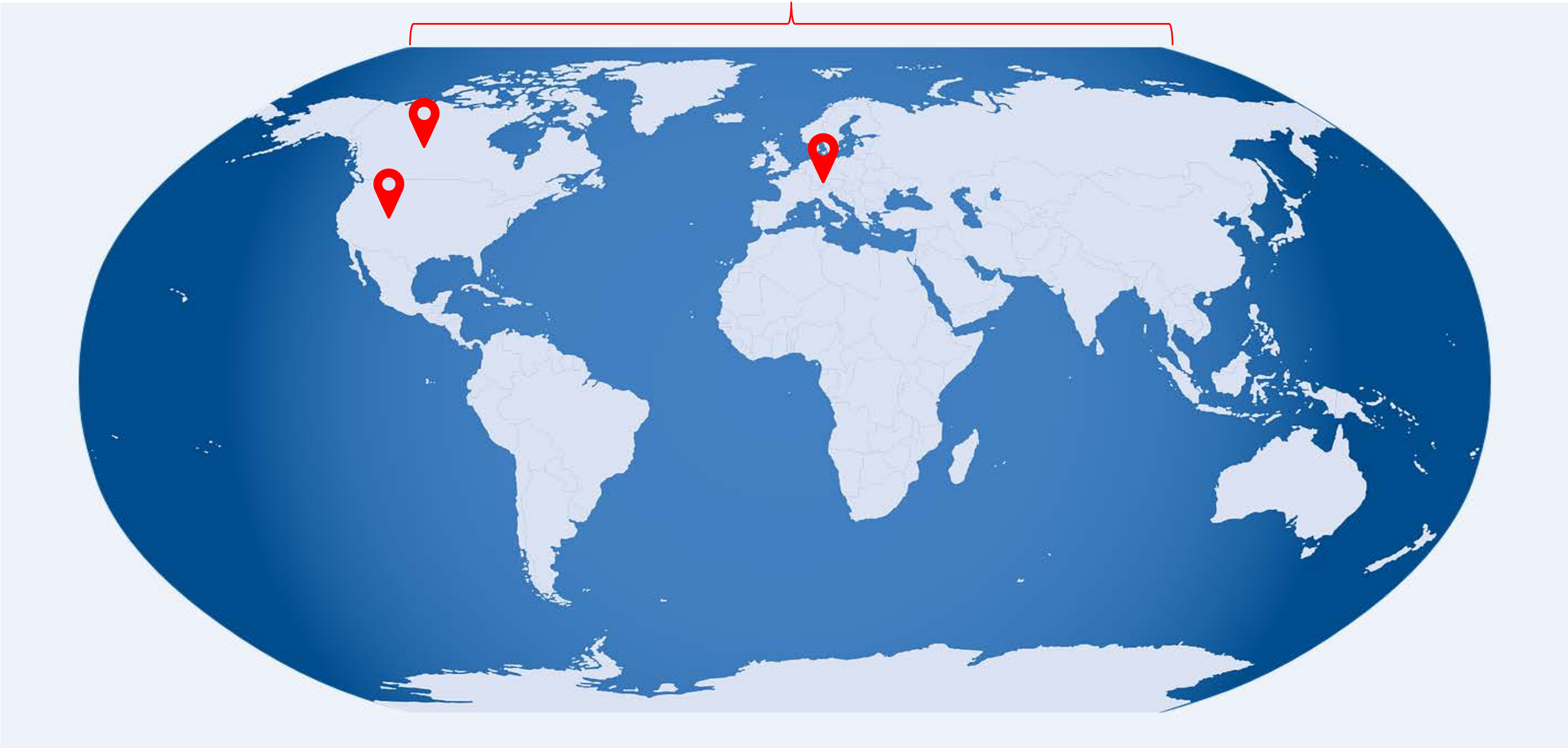
Mortality and Longevity Netting

- If annuitants are living longer, for example, from a medical breakthrough, then life insurance policyholders will also be living longer.
  - The gains from life insurance policies will partially offset the losses on the annuity contracts.
    - The offset varies by the mix of business, and the demographics of the book
    - Estimate offset based on history or modeling
    - Consider offset in tail vs. in the belly of the distribution

Existing Major Capital Frameworks



Implications of inappropriate frameworks?

- May not protect policyholders
- Can be penal to certain customers
- Incents bad risk management behaviors
- May result in transfers of Risk
- Insurance Companies may become unattractive to shareholders

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Conclusion

- Longevity Risk is primarily a trend risk for those with credible data

- A risk offset exists

- Inappropriate Capital constructs have far reaching implications

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