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2017 SOA Annual Meeting—Session 58—Validation of Asset Cash Flows

By **Scott Houghton**

Moderator: Rebecca Margaret Emily Kovach, FSA
Presenters: Daniel B. Finn, FCAS
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For applications such as PBR, cash flow testing, and economic capital, actuaries often validate and review models that contain projections of both the asset and liability sides of the balance sheet. Actuaries have tried-and-true methods for validating liabilities, but techniques for assets are less developed. In this session, an insurance asset manager (Finn), a consultant (Houghton) and a company investment actuary (Reedy) demonstrated effective and efficient asset model validation techniques.

Finn decomposed a corporate bond model into the components and assumptions needed to replicate cash flow and market value calculations, and provided techniques for duplication and validation of key calculations. He presented a key validation technique of selecting single bonds and projecting yields under a large number of stochastic scenarios. If a model is set up correctly, graphing the yield vs. a scenario-specific representative

level of the stochastic interest rate for the term of a Treasury bond should produce a negatively sloped and nearly linear relationship. As the credit risk of a bond increases, the negatively sloped linear relationship decreases, and the plots on the graph move from linear to elliptical shaped.

Reedy covered application of common assumptions for different asset types, and common modeling issues and their prevention. One issue discussed was asset portfolios becoming unrepresentative over time, due to initial scaling or a fixed purchase allocation of short- and long-term bonds. Reedy discussed how implementing a more sophisticated investment strategy like duration matching can correct this issue, and how more sophisticated investment and disinvestment strategies can also prevent distortion of results related to borrowing and arbitrage.

Houghton discussed ways to ensure assets and liabilities interact properly in a model, and expanded on issue prevention and validation techniques. As a complementary validation technique to Finn's method of projecting yields of a single bond under a large number of scenarios, Houghton presented a case study and validation technique where an entire portfolio of bonds were projected under a single scenario. The ratings of the bonds in the portfolio are identified with different colors on a graph of yield vs. maturity date, which makes any assets with data or modeling issues easy to spot as outliers on the graph.

Session slides are available at:
<https://www.soa.org/pd/events/2017/annual-meeting/pd-2017-10-annual-session-058.pdf> ■



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Coming Soon! Asset Allocation Contest

More information will be posted on the Investment Section's page at: www.soa.org/sections/investment/investment-landing/