

## Best-Estimate Yield Curves in Incomplete Bond Markets

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The concept of best-estimate, prescribed by regulators to value insurance liabilities for accounting and solvency purposes, has recently been discussed extensively in the insurance industry and related academic literature. To separate hedgeable and non-hedgeable risks in a general case, Happ, Merz and Wüthrich (2014) define best-estimates using orthogonal projections of a claim on the space of replicable payoffs. In this paper, we apply the concept of best-estimates to long-maturity claims in a market with reinvestment risk, since in this case the total risk cannot be separated using conditional expectations. We assume that a limited number of short-maturity bonds are traded, and derive the best-estimate price of bonds with longer maturities, thus obtaining a best-estimate yield curve. Under the multifactor Vasicek model, we derive expressions for the price of long-term bonds.

### Reference:

Happ, S., Merz, M., & Wüthrich, M. V. (2014). Best-estimate claims reserves in incomplete markets. *European Actuarial Journal*, 1-23.

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