

Term structure and credit spread estimation with R

Robert Ferstl

*Department of Operations Research,
Vienna University of Economics and Business Administration*

Zero-coupon yield curves and credit spread curves are important inputs for various financial models, e.g. pricing of securities, risk management, monetary policy issues. Since zero-coupon rates are rarely directly observable, they have to be estimated from market data for existing coupon bonds. The literature broadly distinguishes between parametric and spline-based methods. We implement three widely-used term structure estimation procedures, i.e. the parametric Nelson and Siegel approach, the Svensson approach and the cubic splines method.

The traditional way of credit spread calculation is to subtract individually estimated zero-coupon yield curves from a risk-free reference curve. This approach often leads to twisting credit spread curves. These shapes are unrealistic and problematic if used as inputs for financial models. Therefore, we implement the existing joint estimation procedures, which return smoother credit spread curves. Goodness-of-fit tests are provided to compare the results of the different estimation methods. We illustrate the usage of our functions by practical examples with data from European and CEE government bonds, and European corporate bonds.