

Definition versus Valuation of Optional Coupon Reinvestment Bonds

Philippe Artzner
and
Patrick Roger

Actuarial Program
University of Strasbourg
France

Abstract

Optional Coupon Reinvestment Bonds (OROC) allow the bearer to choose, at each coupon payment date, between payment of the coupon in cash or "reinvestment" in similar OROC bonds of an amount equal to a predetermined fraction of the OROC currently held.

These choices constitute a complex portfolio of interest rate options and allow the bearer to get a minimum rate of return over the lifetime of the bond. In order to determine this rate, it is necessary to get the correct market value of the OROC when it is issued.

Applying the principle of no arbitrage and using a simple model of interest rate process in a complete market, the paper shows the intricate relationship between the mathematical definition of the cash flow payment process and the bond price process. By means of spreadsheet analysis it provides an example of the dynamic procedure of pricing as well as numerical examples of sensitivity of prices with respect to interest rate volatility.

