A Radial Basis Function Method For Solving Bond Pricing Model

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A bond is a financial contract under which the issuer promises to pay the bondholder a stream of coupon payments (usually periodic) on specified coupon dates and principal on the maturity date. If there is no coupon payment, the bond is said to be a discount bond or zero coupon bond. The popular meshless technique which is used for reconstructing an unknown from scattered data is RBF interpolation scheme with many applications in various fields. In this article, a Radial Based Function (RBF) method is presented to solve the problem arising in zero-coupon bond pricing. First, the zero-coupon bonds (ZCB) is modeled by using partial differential equations which leads to a boundary and initial value problem. Then standard techniques based on Ito formulas prove that the function satisfies the bond partial differential equation. The common idea of the proposed numerical scheme is to interpolate the unknown function by employing the radial basis functions. Thus the linear system Ordinary Differential Equation (ODE) is obtained and this ODE system should be solved by Runge-Kutta method.

References

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