

## Nonparametric Specification Testing for the Drift of the Short Rate Diffusion Process Using a Panel of Yields

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**Abstract :** Based on a new method of the nonparametric estimator of the drift function, we propose a consistent test for the parametric specification of the drift function in the short rate diffusion process using observations from a panel of yields. The test statistic is shown to follow an asymptotic normal distribution under the null hypothesis that the parametric drift function is correctly specified, and converges to infinity under the alternative. Taking the daily 7-day European rates as a proxy of the short rate, we use our test to examine whether the drift of the short rate diffusion process is linear or nonlinear, which is an unresolved important issue in the short rate modeling literature. The testing results indicate that none of the drift functions in this literature adequately captures the dynamics of the drift, but nonlinear specification performs better than the linear specification.

**Keywords :** diffusion process, nonparametric estimation, derivative security price, drift function and volatility function

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