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The absence of diffusion in the South African short rate

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ABOUT

Mathematics, stochastic differential equations are used to describe the dynamics of a model for the short rate, which is a mathematically defined rate not directly observable. However, observable rates such as short dated Treasury rates or the Johannesburg Short Rate (JAR) can be used as proxies for the short rate. The short rate dynamics are modeled as factor diffusion processes. These type of models remain popular due to the simplicity of pricing formulae of interest rate derivatives under these models. To capture the short rate returns in the South African market, two types of models can be used: a pure diffusion model. In this paper we investigate whether jumps are present and whether a factor model. Our initial investigation showed that jumps were present in the South African short rate component was evident at low interest rate levels. This result was found using a factor model. We therefore conclude that a pure jump process is an appropriate model for the short rate.

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