ALPHA-CIR MODEL WITH BRANCHING PROCESSES IN SOVEREIGN INTEREST RATE MODELLING

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Abstract: We introduce a class of interest rate model, called the α-CIR model, which is a natural extension of the standard CIR model by adding a jump part driven by α-stable Lévy processes with index $\alpha \in (1, 2]$. We deduce an explicit expression of the bond price by using the fact that the model belongs to the family of CBI and affine processes, and analyze the bond price and bond yield behaviors. The α-CIR model allows to describe in a unified and parsimonious way several recent observations on the sovereign bond market such as the persistency of low interest rates together with the presence of large jumps. Finally we provide a thorough analysis of the jumps and in particular the large jumps. This is a joint work with Chunhua Ma (Nankai University) and Simone Scotti (Université Paris Diderot - Paris 7)

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