# Calibration of Chaotic Models for Interest Rates

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In this paper we calibrate chaotic models for interest rates to market data using a polynomial-exponential parametrization for the chaos coefficients. We identify a subclass of one-variable models that allow us to introduce complexity from higher order chaos in a controlled way while retaining considerable analytic tractability. In particular we derive explicit expressions for bond and option prices in a one-variable third chaos model in terms of elementary combinations of normal density and cumulative distribution functions. We then compare the calibration performance of chaos models with that of well-known benchmark models. For term structure calibration we find that chaos models are comparable to the Svensson model, with the advantage of guaranteed positivity and consistency with a dynamic stochastic evolution of interest rates. For calibration to option data, chaos models outperform the Hull and White and rational lognormal models and are comparable to LIBOR market models.

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