Lévy forward price approach for multiple yield curves and low/negative interest rates

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In this talk we present a framework for discretely compounding interest rates which is based on the forward price process approach. This approach has a number of advantages, in particular in the current market environment. Compared to the classical Libor market models, it allows in a natural way for negative interest rates and has superb calibration properties even in the presence of extremely low rates. Moreover, the measure changes along the tenor structure are simplified significantly. These properties make it an excellent base for a post-crisis multiple curve setup. Three variants for multiple curve constructions are discussed. As driving processes we use time-inhomogeneous Lévy processes, which allow to derive semi-explicit formulas for the valuation of various interest rate products using Fourier transform techniques. Based on these formulas we present the calibration results for the three model variants using market data for caplets.

At the end of the talk we shall outline a different class of models in the same forward price framework, namely we shall present examples of local volatility models driven by a Brownian motion, where pricing methods are based on asymptotic expansions (work in progress with D. Krief and P. Tankov).

References

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