

Eberlein, E. (Freiburg, Germany) — **Multiple curve interest rate modelling allowing for negative rates.**

The global financial crisis which started in early August 2007 had a lasting effect on financial markets. In particular the fixed income markets changed in a fundamental way. As a consequence of a new perception of risk a number of interest rates, which until then had been roughly equivalent, drifted apart. The basic rates, which are relevant for the interbank market, became tenor-dependent after market participants became aware of credit, liquidity and funding risks in this market segment. These risks had been assumed to be negligible before. In the new reality classical modelling approaches which are based on arbitrage considerations assuming tenor-independence cannot reflect the market behaviour any more. More sophisticated approaches, so-called multiple curve models, are needed to take the increased diversity of risks into account.

We develop a multiple curve forward process as well as a multiple curve forward rate (HJM-type) model. In both approaches time-inhomogeneous Lévy processes are used as drivers. Negative interest rates are taken into account in a natural way. We derive valuation formulas for standard interest rate financial products such as caps, floors, swaptions and digital interest rate options. A number of calibration results is presented where we also consider data in the setting of a two price economy, thus exploiting explicitly bid and ask quotes.

This project is joint work with Christoph Gerhart (Freiburg) and Zorana Grbac (Paris).

REFERENCES

1. *Eberlein E., Gerhart Chr.* A multiple-curve Lévy forward rate model in a two-price economy, *Quantitative Finance*, 2017, DOI: 10.1080/14697688.2017.1384558.
2. *Eberlein E., Gerhart Chr., Grbac Z.* Multiple-curve Lévy forward price model, Preprint University of Freiburg, 2018.