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*A unified approach to explicit bond price solutions under a time-dependent affine term structure modelling framework*

We consider affine term structure models with time-varying parameters. Under this framework, we use an ansatz approach and a solution property of Riccati equations to provide exact and approximate explicit representations of the price of a zero-coupon bond. We demonstrate that our proposed methodology readily recovers certain well-known bond valuation formulae. For the short-rate process, we also put forward a stochastic differential equation capable of incorporating desired characteristics for an interest rate model. We address the feasibility of a practical implementation of our proposed methodology within the context of model calibration. Finally, we present an analytical solution, via a series expansion, to the Riccati equation involved under this extended setting. An approximation to this analytical solution, valid up to any desired degree of accuracy, is also given.

This is a joint work with Rogemar Mamon (Western).