

Pricing of Contingent Interest Rate Claims, Foundations and Application of the Hull-White Extended Vasicek Term Structure Model.

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Title: **Pricing of Contingent Interest Rate Claims, Foundations and Application of the Hull -White Extended Vasicek Term Structure Model**

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Abstract: This thesis is concerned with the modeling of stochastic rate term structure models. Particularly, we consider descendants; the Hull -White and the Hull -White Extended Vasicek model. We derive the expressions behind the Vasicek model and compare them to the more elaborate versions of Vasicek's model. The distributional assumptions of the short rate, forward rates and the volatility structure implied by the given models are investigated. The Hull -White Extended Vasicek model has been chosen as platform for the stochastic rate term structure model. The improved flexibility offered by this model. A piecewise linear approximation is used for the volatility structure. To enable pricing of complex and exotic derivatives, a numerical solution is needed, whenever an analytical solution is absent. We implement the stochastic differential equation, describing the Hull -White Extended Vasicek model. The model has been calibrated to the Black76 volatility surface of European Cap (Floor) options. The model has been tested by comparing to market prices. The implications of the model for pricing of different complex derivatives are investigated. To justify the Monte Carlo setup, a pseudo path-dependent model is used. To justify the Monte Carlo setup, a pseudo path-dependent full-grid calibrated model, we find that the Hull -White Extended Vasicek model prices of options not too far away from ATM. Consequently, the model is exposed to broader areas of the volatility surface, as the model becomes expensive in time and generality.

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