Title: Pricing of the debt instruments with embedded options

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Abstract: In this thesis we focus on debt instruments with embedded options, which offer the possibility for the creditor or debtor to exercise the option in pre-determined times during its lifetime. With this the Bermudian characteristics it is not possible to price these debt instruments using standard simulation techniques. However, the technique of trinomial trees can be exploited. To preserve consistency with the pricing of fundamental financial instruments, it is suitable to assume that the interest rate follows a stochastic process in the arbitrage free framework. One of the possibilities for modeling the dynamics of interest rates are one-factor models. We have developed a pricing algorithm based on trinomial tree for Hull-White model and Black-Karasinski model which have the desired properties and model parameters are calibrated to the market data.

Keywords: trinomial tree, interest rate derivatives pricing, Hull-White model, Black-Karasinski model, instantaneous interest rate