On Gaussian HJM Framework For Eurodollar Futures

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Abstract

One of the standard tools for the theoretical analysis of fixed income securities and their associated derivatives is the term structure model of Heath, Jarrow and Morton. The question which we have attempted to answer is "what specific HJM model is consistent with the observed price of an Eurodollar futures contract"? Eurodollar futures, apart from being the worlds heavily traded futures are connected to LIBOR (London Inter Bank Offered Rate) and to domestic monetary conditions. The answer to the above question will help in pricing any new derivative on Eurodollar futures or price the one which is not heavily traded. We suggest a simple tool to measure the adequacy of different HJM structures that may be used to model Eurodollar futures price process. We also address the question of estimation of parameters of these models by different methods – method of realized volatility, method of maximum likelihood and a two-stage procedure. Although it sounds like a standard statistical procedure one must be careful in applying methods which are not suitable under arbitrage theory for example – Maximum Likelihood. However, under the assumption of real-world and risk neutral measure being same, the maximum likelihood procedure can be used at least for a class (*power*) of HJM models.

(This is based on a joint work with Dr. Vladimir Pozdnyakov, Department of Statistics, University of Connecticut.)