

A Markov chain approach to stock model analysis and inference

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In this presentation, based on Barbu et al., 2017, we are interested in applications of statistical techniques for Markov chains in financial mathematics. We have modelled through a Markov chain the time evolution of the dividend growth factor of a stock. We were interested in estimating the first two moments of the price of the stock and also in forecasting the price of the stock within n time units. This work represents further advancements of the Markov chain stock model proposed in Ghezzi and Piccardi, 2003. We give theoretical results about the consistency and asymptotic normality of the estimated quantities and apply our findings to real dividend data. The statistical techniques for Markov chains are mainly based on Sadek and Linnios, 2002.

These results were integrated into a semi-Markov framework as provided by D'Amico, 2013, where the semi-Markov hypothesis was advanced and validated on real data. A further generalization was given in D'Amico, 2016, where a continuous state space semi-Markov model is considered for the computation of the fundamental price and risk of the stock.

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