

Mathematical modelling for technical analysis techniques

The aim of this work is to compare financial technical analysis techniques to strategies which depend on a mathematical model. We study the performances of technical analysis designed to detect changes in the volatility term : The Bollinger Bands. First, we study the performances of this indicator in a modified Black-Scholes model such that the rate of volatility changes at an unknown random time , which is independent of the Brownian motion governing the prices. We show that this indicator has the capacity to detect the changes in the volatility. Next, we interest to exhibit a mathematical optimal strategy issued from the stochastic control theory. But, the mathematical difficulties do not allow us to apply directly the usual arguments. The main difficulty comes from the discontinuity of the filtration generated by the prices with the fact that the admissible allocation strategy needs to be adapted to the filtration generated by the prices which is not identical to the Brownian filtration. Finally, we explicit the optimal strategy by modifying the usual techniques in both the dual and the classical EDP approaches.