

Backward Stochastic Differential Equations with Enlarged Filtration

Option hedging of an insider trader in a financial market with Jumps

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Abstract

Insider trading consists in having an additional information, unknown from the common investor, and using it on the financial market, in order to improve the wealth of a portfolio. Mathematical modeling can study such behaviors, by modeling this additional information within the market, and comparing the investment strategies of an insider trader and a non informed investor. Research on this subject has already been carried out by A. Grorud and M. Pontier since 1996, studying the problem in a wealth optimization point of view. This work focuses more on option hedging problems. We have chosen to study wealth equations as backward stochastic differential equations (BSDE), and we use Jeulin's method of enlargement of filtration to model the information of our insider trader. We will try to compare the strategies of an insider trader and a non insider one. Different models are studied: at first prices are driven only by a Brownian motion, and in a second part, we add jump processes (Poisson point processes) to the model.

Keywords: enlargement of filtration, BSDE, option hedging, insider trading, asymmetric information, martingale representation.