

## Optimal liquidation in limit orders books under general uncertainties

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In this talk we consider the optimal trading strategy of a passive trader who is trading in the limit order book. A limit order book is a record of unexecuted trades. In passive trading, orders are placed into the limit order book and are only filled when met by an aggressive trader's order. The further into the limit order book the trades are placed, the higher the payoff for the trader but with a lower probability of the order being filled. Our objective is to maximise the expected utility of the trader. We introduce a Geometric Brownian Motion as the driving process for the asset price, a novel characteristic for this problem. We reduce the resulting four-dimensional Hamilton-Jacobi-Bellman partial differential equation (PDE) to a classical three-dimensional non-linear PDE, as well as rescaling the variables to reduce the number of input parameters by two. We use numerical methods to solve the PDE before asymptotically examining it in several variables, with each approach informing and confirming the other. Finally we emphasize the adaptability of our proposed methodologies by implementing the same methods on a mean-reverting process for the asset price. The trading strategies we develop are asset price dependent, which to our knowledge is a unique concept in the literature.