Utility Optimization on Defaultable Assets with Incomplete Information

Jin Ma

Department of Mathematics,
University of Southern California

Abstract We consider a market where asset prices could be affected by multiple defaults along with possible frailty factors. The aim of an investor is to maximize the expected utility of the terminal wealth, based only on the observed data of the underlying asset(s) and the default history up to the current time. The main purpose is then to determine the conditional intensity of the future defaults, given the observed stock prices and the past defaults, without using the so-called "density hypothesis". The problem is naturally reduced to a filtering problem, for which the so-called H-hypothesis is known to fail as well. We show that the problem can be solved dynamically, via a system of Zakai equations for the conditional densities between and at consecutive defaults. A related BSDE with jumps that has quadratic growth in both continuous and jump martingale integrands will also be studied, as a byproduct of the utility optimization problem.

This is a joint work with Huanhuan Wang.