



Monetary Utility Functions and BSDE

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ABSTRACT

Monetary utility functions that are time consistent have a well known expression. Moreover in some cases the dynamic utility processes give rise to a BSDE. We will show that a simple dual argument permits to show that a BSDE with subquadratic convex driver has a (unique) bounded solution for bounded final values. However when the driver is superquadratic, this is no longer true. We will show that for some final values there is no bounded solutions whereas, the existence of a solution implies the existence of infinitely many bounded solutions. Both cases are possible. The set of final values for which there is a solution is not norm dense. In case the final value is only a function of the Brownian motion at the end of the interval, solutions can be found via a quasi-linear PDE. It turns out that for good boundary values, the BSDE method gives the existence of solutions for such PDE. The theorems extend known theorems from PDE and BSDE. The main difficulty with the PDE approach is that we need solutions defined on the whole of the real line and not just on a bounded interval (or domain in more dimensions).