

Exponential Semi-Martingale Models Depending on a Parameter and its Applications in Mathematical Finance

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Abstract

We consider utility maximization problem for semi-martingale models depending on a random factor ξ . We reduce initial maximization problem to the conditional one, given $\xi = u$, which we solve using dual approach. For HARA utilities we consider information quantities like Kullback-Leibler information and Hellinger integrals, and corresponding information processes. As a particular case we study exponential Levy models depending on random factor. In that case the information processes are deterministic and this fact simplify very much indifference price calculus. Then we give the equations for indifference prices. We show that indifference price for seller and minus indifference price for buyer are risk measures. Finally, we apply the results to Geometric Brownian motion case. Using identity in law technique we give the explicit expression for information quantities. Then, the previous formulas for indifference price can be applied.