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On dual problem of imperfect hedging with life insurance applications

There is a standard reference for imperfect (quantile and efficient) hedging like Foellmer and Leukert (1999 and 2000). Instead of these references we pay attention to the paper of Novikov (1999) where he developed a dual version of quantile hedging or hedging with given probability. His approach has a clear statistical flavor. It is based on the Neuman-Pearson lemma and leads to a closed form solution in the Black-Scholes case. We extend this approach to a two-dimensional diffusion model as well as to a jump-diffusion model. Our developments include also efficient hedging for the case of a power loss function. We provide applications of our results to equity-linked life insurance with illustrative numerical examples.