

Consistent price systems and face-lifting pricing under transaction costs

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ABSTRACT

In markets with transaction costs, consistent price systems play the same role as martingale measures in frictionless markets. We prove that if a continuous price process has conditional full support, then it admits consistent price systems for arbitrarily small transaction costs. This result applies to a large class of Markovian and non-Markovian models, including geometric fractional Brownian motion.

Using the constructed price systems we show under very general assumptions the following “face-lifting” result: the asymptotic superreplication price of a European contingent claim $g(S_T)$ equals $\hat{g}(S_0)$, where \hat{g} is the concave envelope of g and S_t is the price of the asset at time t . This theorem generalizes similar results obtained for diffusion processes to processes with conditional full support.