

Necessary and Sufficient Conditions for the Uniform Integrability of the Stochastic Exponential

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Abstract Given a continuous local martingale M , the associated stochastic exponential $\mathcal{E}(M) = \exp\{M - \frac{1}{2}\langle M \rangle\}$ is a local martingale, but not necessarily a true martingale. To know whether $\mathcal{E}(M)$ is a true martingale is important for many applications, e.g., if Girsanov's theorem is applied to perform a change of measure. We establish necessary and sufficient conditions for the uniform integrability of the stochastic exponential $\mathcal{E}(M)$.