

# How Rates of $L^p$ -Convergence Carry Over to Numerical Approximations of Some Convex, Non-smooth Functionals of SDEs

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**ABSTRACT:** The relation between weak and  $p$ -th mean convergence of numerical methods for integration of some convex, non-smooth and path-dependent functionals of ordinary stochastic differential equations (SDEs) is discussed. In particular, we answer how rates of  $p$ -th mean convergence carry over to rates of weak convergence for such functionals of SDEs in general. Assertions of this type are important for the choice of approximation schemes for discounted price functionals in dynamic asset pricing as met in mathematical finance and other commonly met functionals such as passage times in engineering.