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RISK NEUTRAL OPTION PRICING VIA ESSCHER TRANSFORM USING CHARACTERISTIC FUNCTION

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Abstract

We present a characteristic time changed Esscher transformation for normally distributed random variables. The price representation derived involves probability Esscher measure and Esscher Martingale measure. The general Fourier transform of $Y_t \equiv X_t$ under measure P can be represented as the Laplace transform of T_t under a new complex valued measure $\phi(u)$ evaluated at the characteristic exponents $\varphi_x(u)$ of X_t. In a financial market in which the asset price represented by a stochastic differential equation with respect to Brownian -Motion, the price mechanism based on characteristics Esscher measure can generate approximate arbitrage free financial derivatives prices.

Key Words : *Derivative pricing, Esscher transform, Esscher martingale measure, Equivalent martingale measure and Characteristic function.*

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