

REAL-TIME MARKET VALUATION OF OPTIONS BASED ON WEB MINING AND NEUROSIMULATION

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Abstract

Today's theoretic, i.e. stochastic, option valuation models, inherently base on unrealistic assumptions. Especially the adequate estimation of a volatility measure is discussed controversially. Several studies show that the issuer's individual volatility measure is used to exploit the consumer surplus. Moreover, not only the well-known inputs but also "hidden" inputs affect option market prices significantly. Therefore alternative options pricing approaches use artificial neural networks to learn market prices models from observed market data. The core question is: Are time-varying artificial neural networks (ANN) based on a high amount of automatically collected market data more accurate and more realistic than classical methods like, e. g., the ones of Black/Scholes or Cox/Ross/Rubinstein? To answer this question the software suite WARRANT-PRO-1 is used which incorporates the web mining agent PISA (Partially Intelligent Software Agent) and the neurosimulator FAUN (Fast Approximation with Universal Neural Networks). In real-time WARRANT-PRO-1 synthesizes ANN market valuation functions of Internet-available data or other (semi-)structured text sources. FAUN trains ANN, e. g., market prices for standard and user defined so called OTC (over the counter) options. Statistical analyses and examples including German DAX warrants and OTC options presented in this article indicate the feasibility of this approach.

Keywords: Options, derivatives, market price models, artificial neural networks, web mining, Black/Scholes model.