Stochastic Market Volatility Models

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In this paper, we offer a new market-based approach to evaluating options on an asset. Our model corresponds to the real situations encountered in the market: option prices are not uniquely determined by their underlying asset but mainly by another factor, namely stochastic market volatility (or simply SMV). To begin constructing SMV, we assume that there exists a hedging portfolio which replicates perfectly the value of the underlying option. By 'perfectly', we mean that the value of the hedging portfolio will always equal exactly to the option. The hedging portfolio takes asset price and SMV as its input, therefore, for a given asset price the correct value of SMV gives the correct value for the option. SMV presents the dynamics of options market. We provide the proof of existence and uniqueness of solutions for SMV.

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