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Journal of Stock & Forex Trading

Perspective

Different ad hoc Black Scholes Model Types and Linear Functions

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DESCRIPTION

There are two ad hoc approaches (absolute smile and relative smile) to the Black Scholes model. We study a number of issues related to the ad hoc Black Scholes model. The Logarithmic transformation is applied to the implied volatility in the linear regression to ensure that the forecast is positive. Simply, retransformations from log to original matric to fitted values that are plugged into Black Scholes yield biased results because the Black Scholes formula is a non-linear function of implied volatility. In order to overcome this bias smearing technique has been applied in this study. The Smearing estimation method also provides a biased yield if there is heteroscedasticity in OLS estimation residuals. We apply the weighted least square regression in order to avoid heteroscedasticity. Mean Bias (MB), Mean Absolute Error (MAE), and Mean Absolute Relative Error (MARE) are performance measures that concluded the smearing method is the finest to correct the bias in ad hoc Black Scholes approaches. Absolute smile is better than a relative smile without smearing technique but with smearing methods results are vice versa.

The option pricing Black Scholes model has been investigated in several empirical studies. A lot of researches reveal some empirical inconsistencies because of a constant volatility and constant risk-free rate in Black-Scholes model. Strike price regulates the implied volatility; this phenomenon suggests by volatility "smile" as an eventual flaw of the BS model. Multiple models such as stochastic volatility models and jump diffusion model it have been developed to resolve this .In the Deficiency of evaluated the effectiveness of different models and recommended ad hoc Black Scholes (AHBS) models are and recommended ad hoc Black Scholes (AHBS) models are volatility in pricing and hedging performance of a number option valuation models and concluded implied volatility with strike price and time to maturity in ad hoc Black Scholes models are superior to deterministic volatility models. Claim ad hoc Black Scholes models are inferior to other refined models.

The variability of implied volatility is dependent on the movement of stock (S) even though the strike price (K) does not shift because implied volatility behaves as a fixed (S/K) function in “relative smile” method. On the contrary, volatility as a fixed (K) function was indicated by the “absolute smile” method. That implied volatility is fixed irrespective of the S level as long as K does not alter. Adopted “absolute smile” method and argue that AHBS models in terms of pricing efficiency are superior to other models. While plugin “relative smile" to ad hoc Black Scholes and concluded stochastic models are superior to AHBS. These diverse results entail that the enactment of ad hoc Black Scholes models be determined by the type of AHBS model. There are several technical problems in the ad hoc Black Scholes model implied volatility (IV) function violates linear regression assumption for real-world data (IV), which is often non-linear and not homoscedastic. A linear function of implied volatility with strike price, time-to-maturity, squares and crossproduct as explanatory variables will not limit the positive IV equation. We resolve these issues by using a log-linear form of regression. Another problem which remarks that plugin the fitted values from this regression into Black-Scholes formula yield biased predictions, transformation being applied because of Black-Scholes is non-linear function of implied volatility. In this study, smearing technique use to correct this bias. The study also reveals concern about homoscedastic or heteroscedasticity residuals because if residuals are heteroscedasticity after adding the smearing factor, the smearing method also gives biased results. The study adopted potential way to overcome this problem Concerning SSE 50 ETF options, this research contrasts the pricing of the “relative method” with that of the “absolute method”. Shanghai stock exchange option market is one of the liquid derivatives markets in world publicized a rare in valuable empirical research. The study to make a comparison between different types of AHBS models in terms of pricing and hedging performance. In the ad hoc Black Scholes model, the researchers also analyze the skewed findings and correct them using the smearing technique. Moreover, the study reports on the smearing process's problems and discusses how to tackle it in order to robust the ad-hoc Black Scholes model.

The bias of the estimations from AHBS with smearing is significantly lower than that of AHBS without smearing. Study empirically convey smearing estimation perform better under both approaches. The results are consistent with the outcomes of prior studies representing that absolute smile superior to relative smile without smearing method in pricing. Comparison of

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Received: 04-Mar-2022, Manuscript No. JSFT-22-18105; **Editor assigned:** 07-Mar-2022, PreQC No. JSFT-22-18105 (PQ); **Reviewed:** 22-Mar-2022, QC No. JSFT-22-18105; **Revised:** 28-Mar-2022, Manuscript No. JSFT-22-18105 (R); **Published:** 05- Apr-2022, DOI: 10.4172/2168-9458.22.9.202

Citation: Sattar A (2022) Different ad hoc Black Scholes Model Types and Linear Functions . J Stock Forex. 9:202

absolute and relative with smearing contribute unanticipated results; relative smile shows the slightly lower pricing error than absolute smile. Several prior studies recommended higher bias in relative approach while, this study reveals there is minor error difference between absolute and relative results due to applied smearing technique. Overall, study concluded that smearing estimation is the better option to get unbiased outcomes in many conditions. Further, researchers can compare results from AHBS smearing method with other stochastic models either its consistent with betterment tag or not in future researches, as well as they check the validity of smearing technique in more sever condition.