

## DOCTORAL THESIS

### A study of forecasting performance of alternative option pricing models on option return and market volatility

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# Abstract

In this thesis, we investigate the forecasting problem for option return and future volatility in financial market.

The first part of this thesis is to study the option return skewness effect and the negative correlation between asset return and volatility. We propose a measure of ex-ante measure of option return skewness which accommodates the negative return-volatility relationship in asset returns. We investigate how time-to-expiration and moneyness affect the skewness and return of an option. Furthermore, we show that our proposed measure has extra benefits in forecasting option returns.

In the second part, we test the information contents of implied volatility derived from stochastic volatility option pricing model and also examine the potential benefit of including the model's implied volatility of volatility in forecasting future volatility and volatility risk premium. Our study finds that the inclusion of volatility of volatility factor has significantly reduced the downward bias of the slope coefficients. Most importantly, the ex-ante volatility of volatility has significant predictive power on the ex-post volatility premium.

In the third part, we study the incremental benefit of adding skewness in predicting future realized volatility. The study finds that consistent with the empirical findings in the first part, realized volatility is negatively related to their skewness measure which provides a downward adjustment of the implied volatility forecast.

**Keywords:** Option returns; Implied volatility; Stochastic volatility model; Skewness; Volatility risk premium.

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