Empirical Performance of Alternative Option Pricing Models

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Summary by Dan Wouden

Big Picture:

Chen look at how the generalizations we make in option pricing models affect the predictability of option pricing and hedging. The authors derive a model that allows volatility, interest rates, and jumps to be stochastic. The look at several different alternative models. First internal consistency of implied volatility. Second, out of sample pricing. Finally, hedging. Their main thesis is that incorporating stochastic volatility and jumps are important for internal consistency but with regards to hedging, stochastic volatility is the most important factor to realize the best performance.

For the empirical work, Chen uses S&P 500 call option prices since they are the most actively traded. The authors had access to the daily dividend distributions. They also used this data since many others had used the same data before. They use puts to estimate pricing and hedging errors.

The authors derived an option pricing model that allows for stochastic volatility, stochastic interest rates and random jumps. The hedge ratios produced by their pricing model are especially relative. Stochastic volatility is very important to include since it improves the Black Scholes by a large magnitude. The authors proceed to talk about how the different stochastic variables affect each model. A model with stochastic volatility and random jumps is the better alternative to Black Scholes.

Everyone knows the Black Scholes option pricing model is not the most efficient. Why do scholars like to prove that their model is superior to Black Scholes? This does not indicate to me that their model is that much better. It's almost as if these scholars are competing for who is the least wrong, or as Ben Blau would say who sucks the least. If Black Scholes is that bad why does everyone still use it? Is it just a good base line?