Kajian model harga opsi saham Heston dalam menentukan implied volatility = Study of Heston stock option model in determining implied volatility

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Abstrak

[Model Black-Scholes merupakan model pertama penentuan harga opsi. Terdapat asumsi-asumsi yang harus dipenuhi pada model Black-Scholes, salah satunya volatilitas yang konstan. Karena asumsi tersebut, maka nilai implied volatility berdasarkan model Black-Scholes akan sama untuk setiap harga opsi. Implied volatilty dipengaruhi oleh harga strike dan waktu jatuh tempo. Namun, pada skripsi ini, implied volatility dibatasi pada pengaruh harga strike saja dan hubungan antara implied volatility dengan harga strike diinterpretasikan dalam kurva smile. Bentuk kurva smile berbeda-beda tergantung pada data observasi nilai opsi di pasar dan bentuknya seperti senyum (smile), skew, atau smirk. Dengan mempelajari kurva smile, seorang investor dapat mempertimbangkan risiko berinvestasi opsi. Pada skripsi ini dibahas bagaimana cara menentukan implied volatility Heston yang diinterpretasikan dalam kurva smile. Untuk dapat menentukan implied volatility Heston, diperlukan harga opsi Heston yang disubstitusi ke model harga opsi Black-Scholes. Untuk memperoleh harga opsi Heston, dilakukan penurunan harga opsi saham Heston berdasarkan model pergerakan harga saham Heston. Kemudian, dengan menghitung beberapa nilai implied volatility Heston yang diperoleh dengan menggunakan harga strike yang berbeda, dapat dibentuk kurva smile Heston. Hasil analisis kurva smile dari implied volatility Heston menggunakan data Anglo American Shares dengan selang harga strike dan tingkat bunga bebas risiko yang berbeda serta waktu jatuh tempo yang tetap adalah sebuah kurva smile yang berbentuk smirk.

......Black-Scholes model is the first option pricing model. There are some assumptions that need to be satisfied in Black-Scholes model, one of them is the constant volatility. Because of that assumption, implied volatility from Black-Scholes model will be same for all option price. Implied volatility depends on strike price and time to maturity. However, in this skripsi, implied volatility is bounded by strike price only and the relation between implied volatility and strike price is interpreted in smile curve. The shapes of smile curve is vary through observed option price effect and its shape looks like smile, skew, or smirk. With studying smile curve, an investor can consider the risk of investing an option. This skripsi will study how to determine Heston implied volatility which is interpreted in smile curve. Heston option price which is substituted to Black-Schole model is needed to determine Heston implied volatility. For that purpose, deriving Heston option pricing model based on Heston stock price model is needed to be done. Then, by calculating some of implied volatilities that have different strike price, smile curve can be made. The analysis result of Anglo American Shares data with different in Strike Price interval and risk-free rates but same in maturity time (1 year) is a smirk shaped smile curve.;Black-Scholes model is the first option pricing model. There are some assumptions that need to be satisfied in Black-Scholes model, one of them is the constant volatility. Because of that assumption, implied volatility from Black-Scholes model will be same for all option price. Implied volatility depends on strike price and time to maturity. However, in this skripsi, implied volatility is bounded by strike price only and the relation between implied volatility and strike price is interpreted in smile curve. The shapes of smile curve is vary through observed option price effect and its

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