

## ABSTRACT

This project designs and formulates prices and the inherent factors used in contingent securities. Participating contingent contracts are most popular in most financial jurisdictions. They present many different covenants and depend on sector regulations. This work tries to design the new participatory contract although structurally unchanged from the traditional contracts, the stochastic nature of the interest rates are taken into consideration in the design of this new contract this research envisages. After an in-depth analysis of the factors stochastic or otherwise but with a guaranteed rate matching the rate of interest in Kenyan government bonds, we prove that this new type of contract can be valued in closed form when interest rates are stochastic and the company can default.

The stochastic interest rate model used here borrows heavily from Schwartz and Gibson's work (1989) as it is used to capture the empirical properties of the financial time series. Most of these applications are made on the assumptions that the conditional distribution of interest rates given that the log distribution of volatilities is normal. This research project aims to analyze the other side of the standard Black-Scholes and GARCH-Models and re-evaluate the parameters as used in BSM Model using Stochastic Volatility models (SV) and applying the estimated rate of the interest in a two factor stochastic model to price a contingent security. The traditional BSM pricing assumption of interest rate is looked upon as continuous time processes and the re-evaluation is done using the continuous time model of SV. These models are derived and applied on the two factor security pricing formulae. The standard SV Model is examined and applied in statistical sense- linear model. The revised stochastic interest rate model is then applied to the pricing of contingent claims using the Nairobi stock exchange prices as the underlying security. Emphasis is laid on the estimation of the parameter interest rates that is looked upon as a stochastic random variable depending on time and other factors the motivation thus is the inherent failures of the traditional option pricing Models as BSM Model. This is due to the realization that most of parameters used in the standard Black-Scholes and assumed constant and are in real sense are time dependent variables and should be looked upon as such given the complex business environment that requires effective pricing that reflect this modern challenges and factors. The study therefore aims to go beyond the norm by doing in depth analysis into the Black-Scholes pricing formulae and the time proven time series model- GARCH Model and concentrating on the synergy between the two and proposing a more robust model for security pricing