

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF APPLIED MATHEMATICS

**APPLICATION OF MARKOV SWITCHING VOLATILITY STATES TO THE
BINOMIAL MODEL FOR EUROPEAN CALL OPTIONS**

**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE
BACHELOR OF SCIENCE WITH HONOURS IN APPLIED MATHEMATICS**

SPECIAL COLLECTION

LIBRARY
NATIONAL UNIVERSITY OF SCIENCE
AND TECHNOLOGY
PO BOX 345 BULAWAYO
0900

DATE: CLASS N°

2010 SC
09158



STUDENT NAME:

MUZIWETHU MATHEMA

STUDENT NUMBER:

N0011009B

PROJECT SUPERVISOR:

MR D MAPHOSA



NUST Library

Abstract

The underlying question in this honours project is :Is the CRR model relevant in an economy whose asset returns do not meet that of the Black-Scholes economy .This arises form an increase in the need for derivative instruments in Zimbabwe whilst a fully comprehensive and applicable framework is still lacking.This paper develops a lattice method for pricing call options when volatility switches between two states.This project attempts to price simple European Call options using Markov Switching State variables to accommodate the stochastic volatility experienced in countries with acidic interest rate regimes.The Convergence rate and the computational complexity of our algorithm will be compared to the solutions which we obtain from the CRR model on a stock of the same initial price and strike price