International Journal of Innovative Computing, Information and Control
Volume **5**, Number **8**, August **2009**
ICIC International ©2009 ISSN 1349-4198
pp. 2169–2188

STUDY ON BLACK-SCHOLES OPTION PRICING MODEL BASED ON GENERAL LINEAR INVESTMENT STRATEGY (PART II: CALL OPTION)

Xuefeng Wang and Lin Wang

School of Management
Harbin Institute of Technology
Harbin 150001, P. R. China
wangxuefeng1125@126.com; wanglinbill@sina.com

Received May 2008; revised September 2008

Abstract. *This paper proposes several general linear investment strategies for call option, which are the linear investment strategy that the initial buying price is higher than the striking price; the linear investment strategy that buy a number of stocks at the striking price and the most general linear investment strategy. The intrinsic value functions have deduced for the cases of call option. Based on the Black-Scholes option pricing theory, new option pricing models are finally obtained respectively by solving complex integral problems. Furthermore, the relationship and the disparity on the option prices between the new options and the classical ones are discussed.*
Keywords: Call option, Put option, Option pricing model, Linear investment strategy

1. Introduction.

In the paper that has published by the author [11], one kind of continuous exchange strategies was build for call option and put option, and the new option pricing models are obtained for the corresponding stock exchange strategies. The characteristic of these continuous exchange strategies is that the price that the investors begin to buy or sell stocks is even the striking price, and the investment percentage changes linearly according to the stock price change. As a linear investment strategy for call option, it is common that the beginning price of buying stock is even the striking price, but investors ought to have more choices. These choices include that the initial buying price is higher than the striking price, or that buying a number of stocks at a certain price, etc.

This paper is the subsequent research on the dynamic investment strategy. The general linear investment strategies are built for call option. The second section of this paper describes these linear investment strategies. These investment strategies includes the investment strategy that the initial buying price is higher than the striking price; the investment strategy that buy a number of stocks at the striking price; and the most general linear investment strategy that considers both factors of the above two investment strategies. The third section gives the detail deduction of the pricing model about the investment strategy that the initial buying price is higher than the striking price. The fourth section and the fifth section give the brief deduction of the pricing models for another two investment strategies. In the sixth section, some comparisons and analysis between these new options and the classical options are given. The final part is the conclusion.

2. The Basic Linear Investment Strategy and Its Extensions for Call Option.