Binomial Option Pricing

DATA 5695: Homework #1

Dr. Tyler J. Brough

2024-02-06

Introduction

This homework assignment is all about the Binomial options pricing model. It is based on Chapters 9, 10, 11 of the McDonald text.

Chapter 9: Parity and Other Option Relationships

9.1 A stock currently sells for $32.00. A 6-month call option with a strike of $35 has a premium of $2.27. Assuming a 4% continuously compounded risk-free rate and a 6% continuous dividend yield, what is the price of the associated put option?

9.2. A stock currently sells for $32.00. A 6-month call option with a strike of $30.00 has a premium of $4.29, and a 6-month put with the same strike has a premium of $2.64. Assume a 4% continuously compounded risk-free rate. What is the present value of the dividends payable over the next 6 months?

9.3 Suppose the S&R index is 800, the continuously compounded risk-free rate is 5%, and the dividend yield is 0%. A 1-year 815-strike European call costs $75 and a 1-year 815-strike European put costs $45. Consider the strategy of buying the stock, selling the 815-strike call, and buying the 815-strike put.

- **a.** What is the rate of return on this position held until the expiration of the options?
- **b.** What is the arbitrage implied by your answer to (a)?
- **c.** What difference between the call and put prices would eliminate arbitrage?
- **d.** What difference between the call and put prices eliminates arbitrage for strike prices of $780, $820, and $840?