

UNIVERSITY OF ROCHESTER

William E. Simon Graduate School of Business Administration

Finance 411
Investments

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TRADING CASE OP2: April 30, 1997

Part of your grade for this course will depend on trading sessions using the Financial Trading System (FTS). For the purpose of these trading sessions, you should divide your study group into two separate subgroups - append an A or B to your group name for this purpose (e.g., "WildcatA" or "WildcatB"). Each subgroup will be considered a single "trader." Maintain the same subgroups throughout the course. The system will assign each trader a certain amount of "grade cash" based on their trading performance, but the amount assigned is never less than zero. At the end of the course, the grade cash for the two subgroups will be averaged to determine the grade for the study group. This provides diversification (risk reduction) in case one trader makes a big mistake in one of the cases.

The trading session for this case will be conducted after class on Wednesday April 30 from 4-5 PM.

FTS has an online help feature you may want to look at (it's not essential). You get to it by going through the sequence: SIMON_STUDENT, SYS, PUBLIC, . . ., FTS. Once you're in the FTS folder, click on the file FTS with the book icon. Similarly, clicking on Fast! gives a description of all the available trading cases.

Note: don't assume information for trading sessions will be the same as that given in the case descriptions. The information (interest rates, etc.) will be displayed by the system at the beginning of the session.

OVERVIEW

In this case, you will earn grade cash by trading American options. Four markets are open for two trading months. The first market is a stock market. In this market you have no influence over prices (i.e., you are a price taker). The remaining three markets consist of a bond market, a European call option, and a European put option market. Prices in these markets are determined by the traders in the FTS markets.

MARKET ENVIRONMENT

At the end of each month in the stock market either an "uptick" (u) or "downtick" (d) is realized for the stock price with the probability of u equal to p.

Assume the following return distribution properties:

Spot Stock Price (S)	\$20
Risk-free Rate	12% per annum
Unit of Time	1 month
Uptick (u)	2
Downtick (d)	0.5
Probability of uptick	0.50

Over two months the stock price can follow four possible paths, Suu, Sud, Sdu, and Sdd. You can buy or sell stocks in this market at the prevailing beginning period (spot) price only. For trading period 1 this is \$20. For trading period 2 the spot price depends upon whether an up or a down tick was realized after the close of trading period 1, but before the opening of trading period 2. After the close of trading period 2 a second u or d is independently realized and all stocks are marked-to-market at the price associated with the realization from one of the four possible paths.

OTHER FINANCIAL CONTRACTS

The second security market is a risk-free bond that pays \$102 at the end of trading period 2 regardless of which path the stock market takes.

The third and fourth securities are American options (put and call) on the underlying stock. The strike or exercise price for each option is 25 and the duration of each option is 2 months. The terminal payoff for each option depends upon the realized stock price after the FTS markets are closed. That is:

Terminal Value:

Call Option = Max[\$20 x realized (up|down) tick - \$25, 0]

Put Option = Max[\$25 - \$20 x realized (up|down) tick, 0]

These options can be exercised at any time during a trading period. At the end of their life they will automatically be exercised if they are "in the money."

The possible "tick paths" are Suu, Sud, Sdu, and Sdd. At the end of the first trading period the realized up or down tick is disclosed (generically) as "y" if up and "z" if down.

MARKET ACTIONS

You cannot make market in the stock or bond markets. However, you are permitted to buy or sell stock in the stock market in period 1 at the spot price of \$20, and in period 2 at either \$20u or \$20d. That is, in the stock market during the second period you can buy or sell at either \$40, or \$10. Similarly, you are permitted to buy or sell in the bond market at \$100 in period 1 and \$101 in period 2.

In markets 3 and 4 you can both make market and/or take market. In these markets the prevailing spot prices only arise from the market making activities of traders in the FTS markets.

As a trader in this market, you can shortsell securities, borrow cash at the risk-free rate to purchase securities, or hold cash that automatically earns the risk-free rate of interest. The risk-free rate of interest is 12% per annum.

THE TRADING OBJECTIVE

The objective is to accumulate as much grade cash per trial (two trading periods) as possible. Your realized final market cash position determines your grade cash as follows:

EARNING GRADE CASH

In the trading period securities are exchanged using market cash. If at the end of any trial you have a closing balance of \$9999 or higher of market cash, then you will earn \$10 grade cash. If you have a closing balance of zero or lower, market cash then you will earn zero grade cash. Any other amount of market cash will determine your earning grade cash as follows:

$$\text{Grade Cash} = [\text{Ending Balance of market cash} / 9999] \times \$10$$