

UNIVERSITY OF ROCHESTER

William E. Simon Graduate School of Business Administration

Finance 411
Investments

Professor G. William Schwert
Spring 1997

TRADING CASE B3A: April 28, 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 Monday April 28 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

B3A is trading exercise designed to introduce you to trading bonds, strips, and forwards in a market with a positive spread that can be inefficient.

THE ENVIRONMENT

In this economy, there are four bond markets, two forward markets and a cash market. The first bond type (security 1) is a coupon bond with a face value of \$100, a coupon rate equal to 10%, and a time to maturity of three years. The remaining three types of bond contracts are zero-coupon bonds with a face value of \$100 and respective time to maturities of 1, 2, and 3 years (securities 2, 3, and 4 respectively).

Two types of forward markets are open. Each forward contract obligates its owner to exchange a zero-coupon bond, with one year to maturity from the settlement date, for cash at the pre-specified time of settlement. Forward market one is settled at the beginning of market year 2

(before trading commences), by exchanging the zero-coupon bond (security 3) for cash. This means that no cash is exchanged in the present. Instead the entire contract is executed at the beginning of market year 2. Forward market two is settled 2 years from the present by exchanging one zero-coupon bond (security 4) for cash at the beginning of market year 3 (securities 5 and 6 respectively).

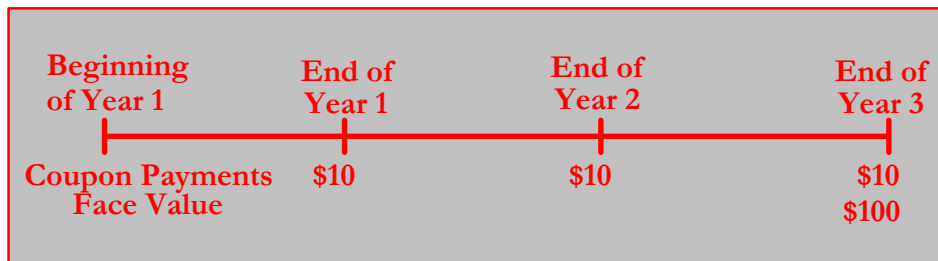
In each bond, strip and forward market you are a market taker only. The activity of a set of exogenous financial intermediaries is continually monitored and your trading screen will display the best available bid and ask in each market every 20 seconds of FTS time.

During each trading year, you can sell bonds that you do not own. This is referred to as shortselling. If you are short a bond then any cash payment made to the owner of the bond must be covered (i.e., paid) by you.

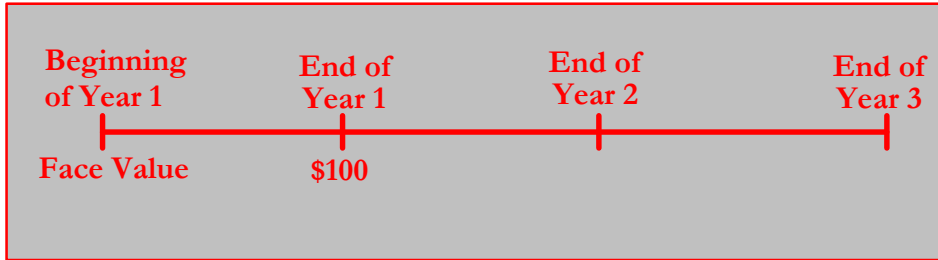
During each trading year, you can borrow cash to purchase additional bonds. At the end of each trading year, but just before any coupon or face value payments from the bonds are made, the closing cash balance of your money market account is increased (if you are long cash) or decreased (if you are short cash) by interest that has accrued. In the cash market the risk-free interest rate for borrowing/lending is 4% in year 1, 10% in year 2 and 16% in year 3. This means that at the beginning of year 1, the spot rate is 4%, and the forward rates for years 2 and 3 are 10% and 16% respectively. In each trading year you can deposit or borrow cash. You will earn/pay interest (i.e., 4% in year 1, 10% in year 2, and 16% in year 3) on your total market cash at the end of each year, but before any coupon or face value payments are made.

A time line of the above events for each of the seven markets (i.e., the coupon bond market, three zero-coupon bond markets, two forward markets and the cash market) is provided below:

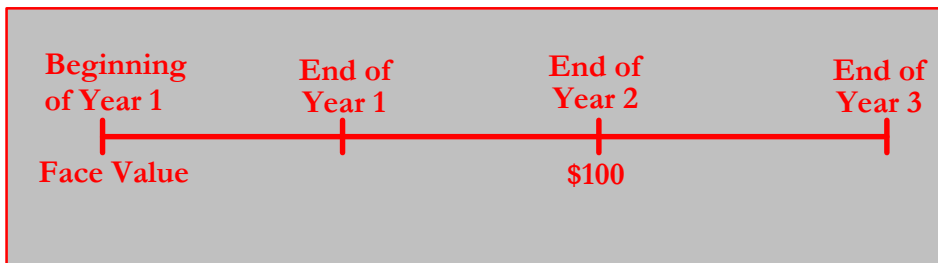
TIME LINE FOR THE COUPON BOND CONTRACT (SECURITY 1)



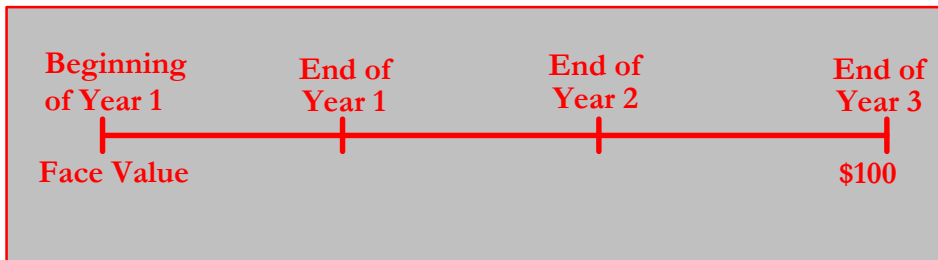
TIME LINE FOR THE ZERO-COUPON BOND CONTRACT (SECURITY 2)



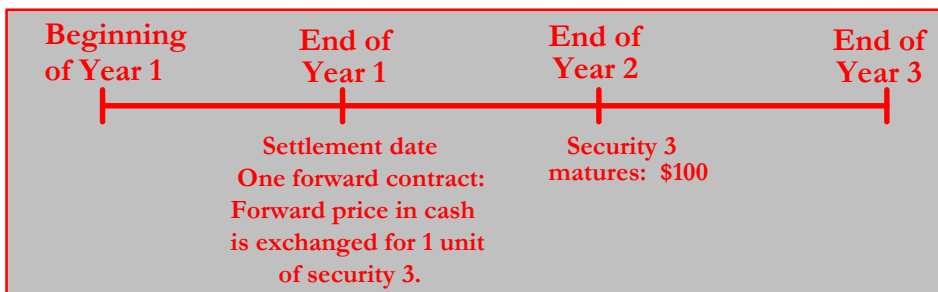
TIME LINE FOR THE ZERO-COUPON BOND CONTRACT (SECURITY 3)



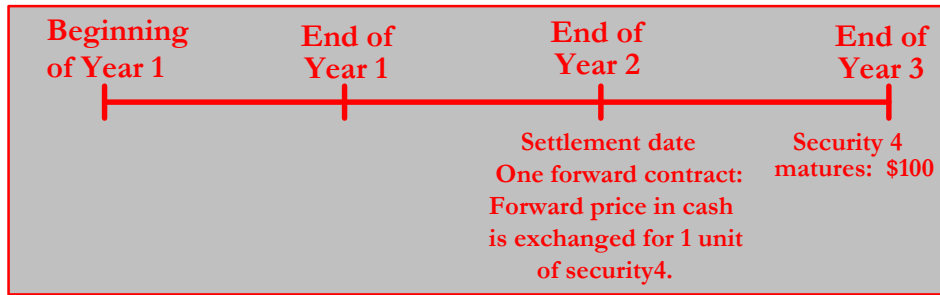
TIME LINE FOR THE ZERO-COUPON BOND CONTRACT (SECURITY 4)



TIME LINE FOR THE FORWARD CONTRACT ON SECURITY 3 (SECURITY 5)



TIME LINE FOR THE FORWARD CONTRACT ON SECURITY 4 (SECURITY 6)



MONEY MARKET TIME LINE

In the money market C_0 is your initial endowment of market cash, and C_1 is your closing balance of market cash after all of the first year's trading activities are accounted for. C_1 can be positive or negative (if you have borrowed market cash). C_{1b} is the total cash received from any bonds you own less (plus) the cost (revenue) from any forward contracts you purchased (sold) during year 1. The one plus risk-free rate of interest (4%) is denoted by (1.04) .

Years 2 and 3 are interpreted in an equivalent manner. In year 2 the one plus risk-free rate is (1.10) and in year 3 this rate is (1.16) .

THE TRADING OBJECTIVE

The object is to accumulate as much grade cash, through trading, as possible.

EARNING GRADE CASH

In each market year, securities are traded using market cash. A set of three market years is referred to as one trial. If at the end of a trial you have a closing balance of \$9999 or higher of market cash, you earn \$10 grade cash. If you have a closing balance of zero or lower market cash, you earn zero grade cash. Any other amount of market cash determines your grade cash for the trial as follows:

$$\text{Grade Cash} = \lfloor (\text{Ending Balance of market cash} / 9,999) \rfloor \times \$10$$

Trading is conducted over a number of independent trials and a record of your cumulative grade cash is maintained.