Chapter 3

I. INTEREST BEARING
   - MONEY MARKET
   - BONDS (FIXED INCOME SECURITIES)

II. EQUITIES (Represent Ownership)
   - COMMON STOCK
   - PREFERRED STOCK

III. DERIVATIVES
     (their value is derived from other securities)
     - OPTIONS
     - FUTURES

Money Market Instruments
  - Most common are Treasury Bills
  - Others include Commercial Paper, Bankers’ Acceptances, Negotiable Certificate of Deposit.
  - Are sold at a discount and redeemed at par (so they have implicit interest)
  - Have maturities up to 1 year.
  - Have low default risk, but default is their greatest risk.
Example: You purchase a 90 day TBill with a Face Value = 1000 for 980. What is your hpr, APR, EAY?

\[ EV = 1000 \quad BV = 980 \]

\[ hpr = \frac{EV - BV}{BV} = \frac{1000 - 980}{980} = \frac{20}{980} = 2.0408\% \]

\[ m = \frac{365}{90} = 4.0556 \]

\[ APR = m \times hpr = 4.0556 \times 2.0408 = 8.2766\% \]

\[ EAY = \left(1.020408\right)^{4.0556} - 1 = 8.5384\% \]

Note: EAY > APR as expected

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**Fixed Income (Bonds)**

- have a maturity > 1 year
- have a stated coupon

Examples: Treasury Notes (up to 10yr maturity)  
Treasury Bonds  
Corporate Bonds  
Municipal Bonds  
Mortgage Backed Bonds
DERIVATIVES

Primary Asset - Security originally sold by a business or government to raise money for the issuer.
(i.e. Treasury Bills, Bonds, Stock)

Derivative Assets - Any financial asset which is not a primary asset
(e.g. Options & Futures)
(Are in vector created securities)

FORWARD CONTRACT - An agreement to transact in the future at a price specified today.

Long Position - You are committed to buy in the future.
Short Position - You are committed to sell in the future.

EX. If you contract to sell your textbook at the end of the semester for a price that you set today you have entered the short position in a forward contract.
Futures Contract - is a standardized forward contract.
A margin deposit is required for futures contracts to ensure compliance.

Options Contracts

A CALL [PUT] option gives the buyer the right, but not the obligation to purchase [sell] the underlying asset at the strike (or exercise) price until the maturity date. One contract is for 100 options. (A European Option can only be exercised at maturity)

Options vs. Futures

1. Futures must transact (or offset their position) whereas for options, the buyer has the option to transact.

2. Option buyers pay for the option up front (the option price or premium). For futures, no cash is exchanged until maturity, though a margin deposit is paid to a third party.
Payoffs and Profits to Options

Define: $S_t$ = stock price at expiration
$K$ = strike price

The payoff for a call buyer:
$\text{payoff} = \max [S_t - K, 0]

(The payoff to the call writer (i.e., seller is $-\max [S_t - K, 0]$)

The payoff to a put buyer:
$= \max [K - S_t, 0]

Option Profit to Buyer
$\text{Profit} = \text{Payoff} - \text{Purchase Price}

(Profit to seller i.e., writer is the opposite)