"We are not a speculator but investor"

Eco352 Finance
10/30-11/1/2018 in-class activity

Name_____

The Starbucks has two bond issues outstanding. Both bonds pay $100 annual interest plus $1,000 at maturity. Bond L has a maturity of 15 years and Bond S has a maturity of one year.

a) What will be the values o these bonds when the going rate of interest is (1) 5 percent, (2) 7 percent, (3) 11 percent? Assume that there is only one more interest payment to be made on Bond S.

(1) 5%: Bond L: Vd = $100(10.37966) + $1,000(0.48102) = $1,518.99
Bond S: Vd = ($100 + $1,000)(0.95238) = $1,047.62

(2) 7%: Bond L: Vd = $100(9.107914) + $1,000(0.362446) = $1,273.24
Bond S: Vd = ($100 + $1,000)(0.934579) = $1,028.04

(3) 11%: Bond L: Vd = $100(7.19087) + $1,000(0.209004) = $928.09
Bond S: Vd = ($100 + $1,000)(0.900901) = $990.99

Calculator solutions:

(1) 5%: Bond L: Input N = 15, I/Y= 5, PMT = 100, and FV = 1000; compute PV = -1,518.98
Bond S: Change N = 1; compute PV = -1,047.62

(2) 7%: Bond L: Input N = 15, I/Y= 7, PMT = 100, and FV = 1000; compute PV = -1,273.24
Bond S: Change N = 1; compute PV = -1,028.04

(3) 11%: Bond L: Input N = 15, I/Y= 11, PMT = 100, and FV = 1000; compute PV = -928.09
Bond S: Change N = 1; compute PV = -990.99

b) Why does the longer term (15-year) Bond fluctuate more when interest rates change than does the shorter-term bond (one-year)?

Think about a bond that matures in one month. Its present value is influenced primarily by the maturity value, which will be received in only one month. Even if interest rates double, the price of the bond still will be close to $1,000. The value of a one-year bond would fluctuate more than the

value of a one-month bond’s value because of the difference in the timing of receipts. However, its value would still be fairly close to $1,000 even if interest rates doubled. A long-term bond paying semiannual coupons, on the other hand, will be dominated by distant receipts, receipts that are multiplied by $1/(1 + r_d)^N$, and if r_d increases, these multipliers will decrease significantly. Another way to view this problem is from an opportunity point of view. A one-month bond can be reinvested at the new rate very quickly, and hence the opportunity to invest at this new rate is not lost; however, the long-term bond locks in returns, which could be subnormal, for a long period of time.