

Name: _____

Quiz 1: Answers
266: Fi. Markets and Institutions
Spring 2014
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DIRECTIONS: We are looking for very concise answers. To the extent possible, write the answers in the space provided. Put your name on the quiz.

NOTE: Each individual question has equal value.

1 Some facts about real data.

- 1.1 Very short-term interest rates on U.S. Treasury bills are currently at approximately what level?

Answer/comment

Currently, short-term interest rates on U.S. Treasury bills are approximately zero.

- 1.2 These short-term interest rates peaked at about what level in the period since the Great Depression?

Answer/comment

Short-term interest rate peaked at the level of 18% around 1980. Anything between 15% and 20% is accepted. Many students wrote “1980s” instead of answering the level of interest rates. Please read the questions carefully for future quiz and exam.

- 1.3 What is the approximate yield-to-maturity on 10-year U.S. Treasury bonds at present?

Answer/comment

Currently, the yield-to-maturity on 10-year U.S. Treasury bonds is approximately 2.6–2.7%. We gave partial credit for answers depending on how far off those answers were.

- 1.4 The spread between Baa bond yields and 10-year U.S. Treasury bond yields rose sharply around the end of what year during the last decade? (note: 'spread between' means the difference between.)

Answer/comment

The spread between Baa bond yields and 10-year U.S. Treasury bond yields rose sharply around the end of 2008, as the financial crisis took off with the failure of Lehman Brothers.

- 1.5 Most of the time, the yield curve representing the yields on U.S. Treasury bonds has been sloped (choose one: upward or downward) implying that longer-term interest rates are (choose one: higher or lower) than shorter-term rates?

Answer/comment

Upward/Higher

- 2 Bond terminology. Define the following terms as they apply to coupon bonds.

- 2.1 Coupon

Answer/comment

Minimal: The periodic payment received by the bond holder.
Larger: Coupon is a periodic payment (interest payment) that the bondholder receives during the time between when the bond is issued and when it matures. The frequency of coupon payments varies with bonds, but typically in annual or semiannual.

- 2.2 Capital gain

Answer/comment

When the price of an asset goes up, the rise in value is called a capital gain for the owner.

- 2.3 Callable bond

Answer/comment

Callable bond is a type of bond that allows the issuer of the bond to redeem the bond (or repay the loan) before the contractual maturity. For full points you needed the idea that the bond can

be repaid early and that the repayment is at the discretion of the bond issuer (the borrower).

- 2.4 In general terms, what is the difference between what is measured by the duration of a bond versus the bond's maturity?

Answer/comment

Bond's maturity is the time when the principal, or face value of the bond, is repaid. On the other hand, the duration of a bond measures "effective maturity" of the bond. Slightly more fully: For purposes of capital gains and losses, the coupon bond behaves approximately like a pure discount bond with the single payment coming at the horizon given by the duration.

- 3 Some additional terms. Briefly define these terms.

- 3.1 Collateral

Answer/comment

Collateral is something of value pledged by a borrower when they take out a loan. If the borrower defaults (doesn't make required payments), the lender gets the collateral.

- 3.2 When we speak of 'indirect vs. direct financing' what do we mean by 'indirect financing'?

Answer/comment

Indirect financing in this sense means that funds flow from lenders to a financial institution, and then from the financial institution to the borrower. This contrasts with the direct case in which the funds flow directly from a lender to a borrower.

- 4 Some computations. You need not show work, but showing work will allow for partial credit in the event of a wrong answer.

- 4.1 Suppose I buy a 6-month Treasury Bill with a face value of \$100 at the price of \$99.04. What is the implied annualized rate of return, in percent, on this investment?

Answer/comment

Implied annualized rate of return can be calculated using the following formula:

$$1 + i = \left(\frac{\text{Future Value}}{\text{Present Value}} \right)^{\frac{1}{\text{Holding Period}}}$$

By plugging in the prices, we have

$$1 + i = \left(\frac{100}{99.04} \right)^{\frac{1}{12}} = (1.009)^2 = 1.019.$$

Thus, $i = 0.019$ the return in percent is $i = 1.9\%$. Please remember to report the **annualized** rate of return, and report it in **percent** as requested in the problem.

- 4.2 If the price of a double-decaf-caramel-pumpkin-no-whip-machiato-with-rainbow-sprinkles goes from \$3.00 in 2012 to \$4.50 2-years later, what has been the annualized rate of inflation of this price, in percent?

Answer/comment

Given the annualized rate of inflation π , the price change over the period of two years is

$$(1 + \pi)^2 = \frac{4.5}{3} = 1.5.$$

or,

$$(1 + \pi) = \sqrt{1.5} = 1.225.$$

As a result, we have the annual inflation rate of 22.5%. Again, the answer needed to be in **percent** as required in the instruction. Some students gave 25% as their answer by dividing the growth rate by 2, but the effect should take account of compounding.

- 4.3 If the interest rate on 2-year loans today (at time t) is 1 percent and the rate on 7 year loans two years from now (at $t + 2$) is expected to be 3 percent, according to the expectations theory of the term structure, the current 9-year interest rate is what?

Answer/comment

According to the expectations theory, both investments:

- the combination of 2-year loan today and 7-year loans two years from now
- 9-year loan today

should have the same return. (Otherwise, there will be an arbi-

trage opportunity.) In other words, we have

$$\begin{aligned}(1 + i_{9,t})^9 &= (1 + i_{2,t})^2(1 + i_{7,t+2})^7 \\ &= 1.01^2 * 1.03^7 = 1.255 \\ 1 + i_{9,t} &= (1.255)^{\frac{1}{9}} \\ &= 1.026\end{aligned}$$

As a result, we obtain that the nine year interest rate is 2.6%.

Some students derived 9-year interest rate by calculating a weighted average of 2-year and 7-year interest rates:

$$1\% \times \frac{2}{9} + 3\% \times \frac{7}{9} = 2.6\%.$$

This is an approximate result using our standard trick ($\ln(1+z) \approx z$). Thus, this answer was accepted. Just remember that this is an approximation that is only accurate for small z (in our case, small interest rates).
