Answer Outline

ECONOMICS 353 (SECTION 2) **L. Tesfatsion/Spring 04**
EXERCISE 5: 6 POINTS TOTAL **DUE: Tuesday, February 17, 2:10pm**

****IMPORTANT REMINDER: LATE ASSIGNMENTS CANNOT BE ACCEPTED – NO EXCEPTIONS****

EXERCISE INSTRUCTIONS:

- (1) Please **fill in your name and student ID number** on Side 1 of your bubble sheet and write **353-2 Exercise 5** in the top margin of Side 1.
- (2) Use a number 2 pencil to **mark your answers** on Side 1 of the bubble sheet to the first five questions Q1 through Q5, below, which are in multiple choice format.
- (3) The sixth question Q6 is a Web Browse Exercise. Please put your **name and student ID number** at the top of your answer sheet for Q6 along with **353-2 Exercise 5** and **separately** hand in your answer sheet for Q6 in addition to your answer bubble sheet for questions Q1 through Q5.
- (4) Each question Q1 through Q6 is worth 1 point.

Q1. Which of the statements A through C below are FALSE for fixed payment loans?

A. Installment loans and mortgages are frequently of the fixed payment type.
B. The borrower repays the loan by making the same fixed payment in every payment period
****C.** The borrower is always required to make all principal plus interest payments in one fixed payment occurring at the maturity date.
D. Both A and B
E. Both A and C

Q2. Which of the statements A through C below are TRUE for coupon bonds?

A. The issuer is required to make a fixed coupon payment in every payment period during the life of the bond, plus a face value payment at maturity.
B. The issuer is required to make a fixed coupon payment in every payment period during the life of the bond, where the present value of these cumulated payments is required to equal the face value of the bond.
C. Corporate bonds often take the form of coupon bonds.
****D.** Both A and C
E. Both B and C

Q3. Letting "×" denote multiplication, if the annual interest rate is 4 percent, then the present value of a 3-year payment stream ($0, $50, $80) with $0 to be received at the end of the FIRST year, $50 at the end of the SECOND year, and $80 at end of the THIRD year is given by

****A.** $\$50/(1+.04)^2 + \$80/(1+.04)^3$

B. $\$50 \times (1+.04)^2 + \$80 \times (1+.04)^3$

C. $\$50/(1+.04) + \$80/(1+.04)^2$

D. $[\$50 + \$80]/3$

E. None of the above

Q4. The (annual) yield to maturity i on a coupon bond with a purchase price $190, a face value $210, a 2-year coupon payment stream ($30, $30), and a 2-year maturity is calculated as follows:

A. i equals the annual rate of interest that, when used to calculate the present value (PV) of the 2-year payment stream ($30, $30), results in a PV value equal to the face value $210.

B. i equals the coupon payment $30 divided by the face value $210

C. i equals the coupon payment $30 divided by the purchase price $190.

****D.** i equals the annual interest rate that, when used to calculate the present value (PV) of the 2-year payment stream ($30, $240), results in a PV value equal to the purchase price $190.

E. None of the above

Q5. Which of the following securities has the LOWEST yield to maturity: NOTE: In all the statements below, an "n percent coupon bond" refers to a coupon bond with an n percent coupon rate.

A. A 7 percent coupon bond with a $2000 face value and a purchase price of $1600

B. A 6 percent coupon bond with a $1200 face value and a purchase price of $1000

****C.** A 5 percent coupon bond with a $900 face value and a purchase price of $1000

D. A 5 percent coupon bond with a $1300 face value and a purchase price of $1200

See Next Page for Web Browse Question Q6.

Q6 (Web Browse Question): The Controversy over Treasury Inflation-Protected Securities

As discussed by Mishkin (Chapter 4, Box 3, p. 82), the U.S. Treasury first issued a special type of coupon bond called Treasury Inflation Protection Securities (TIPS) in 1997. The key feature of these coupon bonds is that they are indexed to inflation. More precisely, their coupon and face payments are adjusted for changes in the CPI inflation rate. These indexed bonds are now also referred to as Treasury Inflation-Indexed Securities (TIIS).

When first issued, TIPS were advertised as a win-win instrument for the U.S. Treasury (the borrower), for the purchasers (the lenders), and for U.S. goverment policy makers. However, researchers who have studied the performance of the TIPS/TIIS program disagree on the success of the program to date and on its future prospects. For example, in a June 2002 study (No. 2002-32, Finance and Economics Discussion Series, Board of Governors of the Federal Reserve System), authors Robert Elsasser and Brian Sack report that, on the whole, the TIPS/TIIS program has proven to be a disappointment. In contrast, various other authors, e.g., P. Brest Hammond in a September 2002 TIAA-CREF *Research Dialogue* publication, provide much more up-beat assessments of the potential benefits of "inflation bonds" such as TIPS/TIIS. This question asks you to focus on this controversy.

HINT: For answering parts A through C below, you might find it useful to refer to the "Websites Related to Mishkin Chapter 4" linked at the Econ 353 Syllabus.

Part A: Explain BRIEFLY (150 words or less) in what ways the original TIPS program was thought by its developers to be a beneficial program for: (1) the U.S. Treasury; (2) the purchasers of the securities; and (3) U.S. government policy makers.

Answer Outline for Part A:

(1) TIPS/TIIS were expected to reduce the U.S. Treasury's borrowing (interest) costs by attracting a wider investor base, and by saving the "inflation-risk" premium embedded in nominal bonds – i.e., the extra interest typically demanded by lenders (security purchasers) as insurance against uncertain movements in the price level and hence in the real purchasing power of their payment streams.

(2) The lenders (security purchasers) were expected to benefit from having a new type of security with which to diversify their portfolios that could provide a hedge against inflation, i.e., a way to protect savings from being eroded by inflation. This benefit was thought to be particularly imortant for older lenders interested in secure retirement incomes.

(3) Because their payments are adjusted for changes in the price level, TIPS/TIIS provide a direct measure of a real interest rate, a valuable piece of information for government monetary policymakers interested in trying to control the economy through open market operations and real interest rate targeting. Some researchers have also pointed out that issuance of inflation-indexed government bonds helps governments credibly signal they are inflation fighters uninterested in confiscating wealth though inflation.

Part B: Explain BRIEFLY (300 words or less) the arguments that have been made: (1) to support the position that the TIPS/TIIS program has been a disappointment; and (2) to support the opposing view that inflation bonds such as TIPS/TIIS have great potential benefits that are beginning to be realized in the U.S.

Answer Outline for Part B:

(1) Elsasser and Sack (2002) argue that TIPS/TIIS have not been highly valued by investors, as evidence by the fact that the spread between yields on nominal and inflation-indexed securities has been much smaller than most measures of long-run inflation expectations. As a result, the securities have not reduced financing costs to the Treasury as much as anticipated. The authors suggest that the narrow spread might reflect in part a "liquidity premium" on the inflation-indexed bonds reflecting the thinness of the market for these securities and hence the uncertainty with regard to their liquidity (resale value) in secondary markets.

(2) Elsasser and Sack (2002, p. 3-4) acknowledge that there is evidence the investor base for TIPS/TIIS has broadened and that liquidity has improved in recent years but are pessimistic TIPS/TIIS will ever achieve the same liquidity as nominal bonds. The U.S. Treasury (and a number of other researchers) are much more upbeat about the increasing liquidity of the market for these securities. For example, TIAA-CREF analyst P. Brett Hammond (2002, p. 16) argues that "investors and issuers are gaining greater confidence and understanding of this new instrument, (and) the market should witness continued growth... ."

Part C: Briefly identify (150 words or less) the principal types of empirical evidence that detractors and supporters of the TIPS/TIIS Program have used to support their assertions. If possible, display some of this empirical evidence.

Answer Outline for Part C: Elsasser and Sack (2002, Figure 1) display the narrow spread between Treasury and TIPS/TIIS yields over 1997 through May 2002 and argue that the inflation compensation is well below the actual inflation rate over these years. Hammond (2002) asserts that trading volume in these securities has been steadily increasing since the first quarter of 2002. This is supported by average daily trading volume data reported and graphically depicted for 2002:Q1 through 2003:Q3 in *Research Quarterly* (November 2003, p. 3) put out by the Bond Market Association.