Student ID.....

EE431 Economics of Financial Markets and Institutions
Problem Set 2 : Debt Market and Structure of Interest Rate

Please submit at the BE office, 5th floor department of Economics building.

Deadline of submission :February 23, 2017, before 15.00 hrs.

Late submission will not be accepted.

1. Write the Fisher Equation, relating the nominal interest rate i, the real interest rate r, and expected (or anticipated) inflation π^e :

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2. A = the last digit of your student ID. **If the last digit of your student ID = 0, use A = 5.**

   Fill in the table below.

A	=.....

   Example.

   A student with ID 5404640319, A = 9.

   A student with ID 5504640243, A = 3

   A student with ID 5504640110, A = 5.

   Suppose you earn A% nominal interest from your deposit account. If inflation rate is 2%, what is the real rate of return?

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3. Use the following information. Answer all parts of this question.

   Government Bond Yield

TTM (Time To Maturity)	January 2017	February 2017
1	2.1%	2.15%
2	2.2%	2.24%
3	2.3%	2.35%

   (a) Sketch the yield curves in January 2017 and February 2017 in the same graph.

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(b) Use the government bond yield data in **January 2017**. Suppose the expectation theory of the yield curve holds, what is the expected one-year government bond rate for 2018 and 2019? Would you be able answer this question without assuming that the expectations hypothesis is true?

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(c) Use the government bond yield in **January 2017**. Suppose liquidity premium for 1 year and 2 year bonds are 0% and 0.5% respectively. According to the liquidity premium theory of the yield curve, what is your prediction for the interest rate on one-year bonds in 2018?

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4. Suppose one is examining the term structure of a 3 year discount bond, and the expectations hypothesis of the term structure holds.

$$i_{3,t} = \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2}}{3}$$

Suppose yesterday, $i_{1,t}$= 0.03 and $i_{3,t}$ = 0.06

(a) Calculate the average value of $i^e_{1,t+1}$ and $i^e_{1,t+2}$.

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(b) Suppose today the yield to maturity on the 3 year discount bond has increased by $\Delta i_{3,t}$,

- while the yield to maturity on a one year bond is unchanged from yesterday [$\Delta i_{1,t} = 0$] and
- the short term expected yield on the one year bond in period t+2 is unchanged [$\Delta i^e_{1,t+2} = 0$].
- Derive the **algebraic expression** for the implied change in the expected one year bond in period t+1[Find $\Delta i^e_{1,t+1}$].

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(c) Assume the 3 year bond yield is given by:

$$i_{3,t} = \frac{i_{1,t} + i^e_{1,t+1} + i^e_{1,t+2}}{3} + \eta_{3,t}$$

And going from one day to the next day the yield on the 3 year discount bond has increased by $\Delta i_{3,t}$. Can one say for certain whether the increase is due to change in expected future rates, or due to a change in the risk premium? Why or why not?

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5. Consider a group of investors who want to lend money out in financial markets for a two-year period and who must therefore choose between one of the following two strategies.

   Strategy 1: Buy a one-year bond today and when it matures, buy another one-year bond.
   Strategy 2: Buy a two-year bond today and hold it to maturity.
   Suppose, too, that the expected return on strategy 1 is higher than the expected return on strategy 2.

   (a) If these investors behave according to the assumptions of the expectations hypothesis, which strategy all investors will follow? Why?

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   (b) Suppose investors behave according to the assumptions of the expectation hypothesis and where the expected return on strategy 1 is higher than the expected return on strategy 2. Investors follow strategy in question (a). What are the effect of investors' action on interest rate on one-year bond and interest rate on two-year bond?

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   (c) Suppose investors behave according to the assumptions of the expectations hypothesis, how do expected return on the two strategy compare in equilibrium?

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(d) Suppose instead that investors behave according to the assumptions of segmented markets theory. In this case, does investors' action will necessarily cause interest rates on one-year bonds to fall and interest rates on two-year bonds to rise until the expected returns on the two strategies are equal?

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6. A lender forecasts inflation to be 4% over the upcoming year, 2% in following year, and 5% in the year after that. If she wants a real return (real interest rate) of 3% every year, determine the term structure of bonds with maturities of 1, 2, and 3 years implied by the expectations hypothesis and the Fisher relation.

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