

## EE431: Economics of financial market and institutions

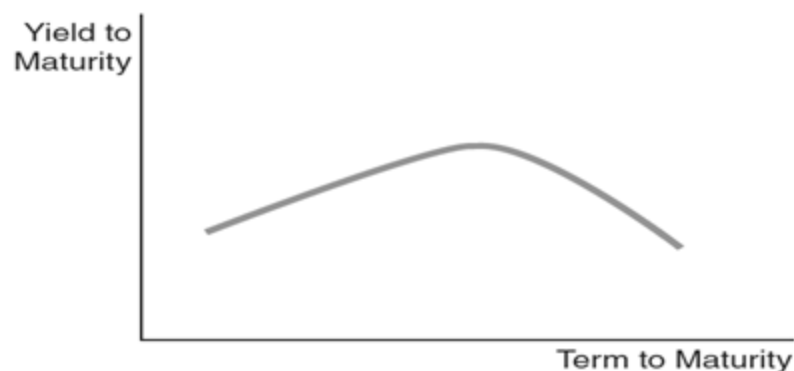
Semester 2/2017

### Assignment 4: Risk and Term structure of interest rate (Due on March 1<sup>st</sup>)

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**Instruction:** Attempt all the odd-numbered questions. (All the even-numbered questions are given as your own practice problem set. No need to turn them in.)

1. Assuming the pure expectations theory is correct, an upward-sloping yield curve implies: (why?)
  - a. Interest rates are expected to increase in the future.
  - b. Longer-term bonds are riskier than short-term bonds.
  - c. Interest rates are expected to decline in the future.
2. Following the Liquidity premium theory, if yield curve has become flat, what do you think it could be inferred from the movement the yield curve?
3. If a yield curve looks like the one shown in the figure below (humped shape), what is the market predicting about the movement of future short-term interest rates? What might the yield curve indicate about the market's predictions for the inflation rate in the future?



4. (Moderate) The following is a list of prices for zero-coupon bonds of various maturities. Calculate the yields to maturity of each bond and the implied sequence of forward rates using the expectation hypothesis theory.

Maturity (Years)	Price of Bond
1	\$943.40
2	898.47
3	847.62
4	792.16

5. (Moderate) Consider the following \$1,000 par value zero-coupon bonds:

Bond	Years to Maturity	YTM(%)
A	1	5%
B	2	6%
C	3	6.5%
D	4	7%

According to the expectations hypothesis, what is the expected 1-year interest rate 3 years from now?

6. During the US subprime crisis, credit spread had been rising rapidly, and term spread had become so high. The US Federal Reserve has then responded to the situation by adopting many unconventional monetary policies. Under the policy, Federal Reserve expands the type of fixed instrument asset that it purchases under the open market operation program. That is, not only does the FED conventionally purchase short-term government bond, it has also purchased other forms of fixed instrument assets including long-term government bond and private credit bond during the crisis period. Use the analytical framework discussed in class to explain the plausible impact of the unconventional monetary policies on the movement of US yield curve and credit spread.

7. During 2008, the difference in yield (the yield spread) between three-month AA-rated financial commercial paper and three-month AA-rated nonfinancial commercial paper steadily increased from its usual level of close to zero, spiking to over a full percentage point at its peak in October 2008. What explains this sudden increase?

8. (Hard) The yield to maturity on 1-year zero-coupon bonds is currently 7%; the YTM on 2-year zeros is 8%. The Treasury plans to issue a 2-year maturity coupon bond, paying coupons once per year with a coupon rate of 9%. The face value of the bond is \$100.

- a. At what price will the bond sell?
- b. What will the yield to maturity on the bond be?
- c. If the expectations theory of the yield curve is correct, what is the market expectation of the price that the bond will sell for next year?
- d. Recalculate your answer to (c) if you believe in the liquidity preference theory and you believe that the liquidity premium is 1%.

9. In the fall of 2008, AIG, the largest insurance company in the world at the time, was at risk of defaulting due to the severity of the global financial crisis. As a result, the U.S. government stepped in to support AIG with large capital injections and an ownership stake. How would this affect, if at all, the yield and risk premium on AIG corporate debt? (Hint: to ease your analysis, you're supposed to have two figures. One figure is for the US bond and the other is for the private bond. Then do the analysis step-by-step by explaining what had happened before and after the US government stepped in.)

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