Final Exam: Model Answers & Comments

July 25, 2010

- Basic statistics: average 44.72, standard deviation 20.62, best score 90.
- You can receive your graded answer sheets from 13:00 on July 27, Tuesday, until 17:00 on July 30, Friday, at the Faculty of Int'l Studies Office (2nd floor, the Faculty building). Please tell them that you took this course and want to receive your sheets.
- If you want to have an interview with me, send an e-mail to: iwamura@k.meijigakuin.ac.jp

Part 1

1. **False**   Money has only a temporary impact on employment.
2. **False**   The expected yields of the two investments are the same, 10%, and a risk-neutral person is defined to be interested only in the expected yield.
3. **True**
4. **True**   By the Warlus' Law.
5. **False**   In Keyens' model, rises in prices shifts money demand curve to the right, thus raising the equilibrium interest rate.

Part 2

1.
$$98,000 = \frac{7,000}{1+i} + \frac{7,000}{(1+i)^2} + \frac{7,000}{(1+i)^3} + \frac{7,000 + 100,000}{(1+i)^4}$$

2.
   a) MGU asks First Bank to transfer 3 million yen from its account to AM's account.
   b) Any one of the followings could be an answer.
      (1) First Bank transfers 3 million from MGU's account to Second Bank's account, and asks Second Bank to add 3 million to AM's account.
      (2) First Bank transfers 3 million from MGU's account to Second Bank's account, and asks Second Bank to pay 3 million to AM.
      (3) First Bank decreases MGU's account by 3 million, and asks Second Bank to transfer 3 million from its account to AM's account.
      (4) First Bank decreases MGU's account by 3 million, and asks Second Bank to pay 3 million to AM.

   Comment
   Very few students could understand the question (b). In this example, MGU owes one million yen to AM. Therefore, the result should be a million-yen decrease in MGU's assets and an increase in AM's assets. There's finally no change in First Bank's and Second Bank's "net" assets. The followings are the instructive examples by students.

   Example 1: First Bank asks Second Bank to take 3 million yen out of its account at Second Bank, and deposit it into AM's account at Second Bank.

   In this case, First Bank just decreases its assets by 3 million yen. First of all, First Bank has to decrease MGU's deposit by 3 million yen.

Example 2: First Bank can remove 3 million yen from MGU's acccount and add it to Second Bank's account at First Bank. Then Second Bank can remove the 3 million yen from its account at First Bank and add it to AM's account at Second Bank.

In this case, when Second Bank transfers money from its account at First Bank to AM's account at Second Bank, cash money has to be physically carried between the banks. But remember that the point in bank transfer is no need for physical transfer of cash money.

3. Financial markets enable us to allocate our income over time and expand our choice of spending. For example, when young, we want to spend more than we earn, and when old, we spend less than we earn. Financial markets allow us to borrow when we are young and repay when we are old. On the other hand, without financial markets, when young we could only spend what we earn, and when old we have to spend more than we need.

4. According to the expectations theory, the current 2% yield on two-year bonds implies that people expect one-year rate next year to be 4%, because $3 = (2 + i^e)/2$, where i^e represents the one-year rate that people today expect to prevail next year. Therefore, the fact does not necessarily suggest that two-year bonds will yield more than one-year bonds.

5.

For two-year rate; $\dfrac{3+5}{2} = 4\%$

For three-year rate; $\dfrac{3+5+7}{3} = 5\%$

For four-year rate; $\dfrac{3+5+7+3}{4} = 4.5\%$

For five-year rate; $\dfrac{3+5+7+3+2}{5} = 4\%$

Comments
Then, we observe a "kinked" or "inverted U-shaped" yield curve, which gives us a hint for the question 1 in Part 3.   2.5 point for each maturity.

Part 3

1.
(a) Because people expect short-term rates to keep falling in the future, the theory predicts the yield curve to slope downward.
(b) Because people expect short-term rates to fall and rise afterward, the theory predicts the yield curve to slope downward and upward.
(c)Because people expect short-term rates to keep rising in the future, the theory predicts the yield curve to slope upward.
(d) Because people expect short-term rates to rise and fall afterward, the theory predicts the yield curve to slope upward and downward.

Comments
- You should state how yield curves look like *and* why they do so, to get full points.
- When the economy is midway between a peak(trough) and a trough(peak), we can expect to go up to a peak and then go down. Therefore, we expect the short-term interest rates to rise for some period of time, and after a peak, to fall. This expectation causes the yield curve to be inverted U-shaped, as the question 5 in Part 2 implies.

2. The equation for the interest rate is;

$$P = \frac{100,000}{1+i} + \frac{100,000}{(1+i)^2} + \frac{100,000}{(1+i)^3} + \frac{100,000}{(1+i)^4} + \cdots$$

$$= \frac{100,000}{1+i} \times \left[1 + \frac{1}{1+i} + \frac{1}{(1+i)^2} + \frac{1}{(1+i)^3} + \cdots \right]$$

Noting that the bracket is the sum of an infinite geometric series, we can simplify the RHS.

$$P = \frac{100,000}{1+i} \times \frac{1}{1 - \frac{1}{1+i}}$$

$$= \frac{100,000}{1+i} \times \frac{1+i}{i}$$

$$= \frac{100,000}{i}$$

Last line tells that, for the interest rate to be 0.08, the price must be 1,250,000. Therefore, if the price of land is equal to or smaller than 1,250,000, you are willing to buy this land.

Comment

The equation which tells us the interest rate of a financial instrument can be used to derive the price (or initial payment) which ensures a certain interest rate.

3.
   a) When the central bank sells one million yens of bonds to First Bank, it decreases the First Bank's account by the same amount. First Bank, in order to compensate for the decrease in reserves, collects one million yens of loans which it has made to Alpha Motors. Alpha Motors repays by withdrawing from Second Bank, where AM has deposited.
   Second Bank repays AM a million, which <u>decreases AM's deposit</u> by a million and, at the same time, decreases Second Bank's reserve by the same amount. Now Second Bank finds itself in lack of reserves, and collects loans from Beta Steel, which repays by withdrawing its deposits at Third Bank.
   Third Bank repays Beta Steel, <u>decreasing its reserves and Beta Steel's deposits</u>. Then, to compensate for the decrease in reserves, Third Bank collects loans from some of its borrowers, which decreases deposits at some other banks. The process goes on, and deposits decrease at one bank after another.
   b) The central bank's sale of bonds to a commercial bank causes money stock to shrink by much larger amount. Now people hold less money than they desire at the ongoing interest rate, and try to sell bonds they hold in exchange for money. Then the price of bonds start to fall and the interest rate starts to rise. As the cost of holding money rises, people are less willing to hold money. Finally, when demand for money equals supply, people no more sell or buy bonds and the markets are again in equilibrium at a higher interest rate.