Midterm Exam 1 Answers

This exam is 70 minutes long, and is worth 70 points. Part I is multiple choice, Part II is a derivation, and Part III is a short answer w/graph. The points are allocated in proportion to the time you should spend on each problem. Place all your answers in the bluebook.

PART I: Multiple Choice [36 minutes total, 3 points each]. Do NOT explain.

1. The figure below illustrates the effect of an increased rate of money supply growth at time period 0.

From the figure, one can conclude that the

**a) liquidity effect is smaller than the expected inflation effect and interest rates adjust quickly to changes in expected inflation.**

b) liquidity effect is larger than the expected inflation effect and interest rates adjust quickly to changes in expected inflation.

c) liquidity effect is larger than the expected inflation effect and interest rates adjust slowly to changes in expected inflation.

d) liquidity effect is smaller than the expected inflation effect and interest rates adjust slowly to changes in expected inflation.

e) none of the above.

2. Which of the following is included in both M1 and M2?

**a) Currency**

b) Savings deposits
c) Small-denomination time deposits
d) Money market deposit accounts
e) Currency and savings deposits.
3. The graph on the right indicates that

a) there will necessarily be a rapid economic boom in the near future (between 6 months and 3 years).
b) there will necessarily be an increase in inflation in the near future (between 6 months and 3 years).
c) short term interest rates will likely rise in the near future (between 6 months and 3 years).

**d) the economy is likely to go into a recession in the near future (between 6 months and 3 years).**
e) none of the above.

![Yield Curve, October 5, 2006. Source: Bloomberg.com.](image)

4. To say that stock prices follow a "random walk" is to argue that stock prices

a) rise, then fall, then rise again.
b) rise, then fall in a predictable fashion.
c) tend to follow trends.

**d) cannot be predicted based on past trends.**
e) none of the above.

5. In the Keynesian liquidity preference framework, a rise in the price level causes the demand for money to _______ and the demand curve to shift to the ________, everything else held constant.

a) increase; left

**b) increase; right**
c) decrease; left
d) decrease; right
e) cannot be determined with the information given.

6. Which of the following $1,000 face-value securities has the highest yield to maturity?

a) A 5 percent coupon bond selling for $1,000
b) A 10 percent coupon bond selling for $1,000

**c) A 12 percent coupon bond selling for $1,000**
d) A 12 percent coupon bond selling for $1,100
e) cannot be calculated without a financial calculator.

7. The concept of adverse selection helps to explain all of the following except

a) why firms are more likely to obtain funds from banks and other financial intermediaries, rather than from the securities markets.
b) why indirect finance is more important than direct finance as a source of business finance.

**c) why direct finance is more important than indirect finance as a source of business finance.**
d) why the financial system is so heavily regulated.
e) both a and b.
8. An increase in default risk on corporate bonds ________ the demand for these bonds, but ________ the demand for default-free bonds, everything else held constant.
   a) increases; lowers
   b) lowers; increases
   c) does not change; greatly increases
   d) moderately lowers; does not change
   e) none of the above.

9. The principal-agent problem
   a) occurs when managers have more incentive to maximize profits than the stockholders-owners do.
   b) in financial markets helps to explain why equity is a relatively important source of finance for American business.
   c) would not arise if the owners of the firm had complete information about the activities of the managers.
   d) explains why direct finance is more important than indirect finance as a source of business finance.
   e) is not described by any of the above.

10. A discount bond
    a) pays the bondholder a fixed amount every period and the face value at maturity.
    b) pays the bondholder the face value at maturity.
    c) pays all interest and the face value at maturity.
    d) pays the face value at maturity plus any capital gain.
    e) none of the above.

11. What is the return on a 5 percent coupon bond that initially sells for $1,000, has a face value of $1,000, and sells for $900 next year?
    a) 5 percent
    b) 10 percent
    c) -5 percent
    d) -10 percent
    e) none of the above

12. Which of the following types of information most likely allows the exploitation of a profit opportunity?
    a) Financial analysts' published recommendations
    b) Technical analysis
    c) Hot tips from a stockbroker
    d) Insider information
    e) both a and b.

[Exam continues on next page]
1. Suppose one is examining the term structure of a 3 year discount bond.

\[
i_{3t} = \frac{(i_t + i_{t+1}^e + i_{t+2}^e)}{3}
\]  
(1)

Suppose yesterday,

\[
i_{3t} = 0.15
\]
\[
i_t = 0.05
\]

1.1 (4 minutes) Calculate the average value of \(i_{t+1}^e\) and \(i_{t+2}^e\).

Substitute in the numbers.

\[
0.15 \times 3 = (0.05 + i_{t+1}^e + i_{t+2}^e) \Rightarrow 0.45 - 0.05 = i_{t+1}^e + i_{t+2}^e
\]

So the average value is 0.20.

1.2 (5 minutes) Returning to equation (1), suppose today the yield to maturity on the 3 year discount bond has increased by \(\Delta i_t\), while the yield to maturity on a one year bond is unchanged from yesterday. Derive the algebraic expression for the implied change in the expected one year yield, assuming that the short term expected yield on the one year bond in period \(t+2\) is unchanged.

Take the total differential:

\[
\Delta i_{3t} = \frac{(\Delta i_t + \Delta i_{t+1}^e + \Delta i_{t+2}^e)}{3}
\]

Since you are given \(\Delta i_t = \Delta i_{t+2}^e\) then \(\Delta i_{3t} \times 3 = \Delta i_{t+1}^e\)

1.3. (5 minutes) Assume the 3 year bond yield is given by:

\[
i_{3t} = \frac{(i_t + i_{t+1}^e + i_{t+2}^e)}{3} + \ell_{3t}
\]

And the yield on the 3 year discount bond has increased by \(\Delta i_{3t}\). Calculate the implied increase in the liquidity premium for the three year bond, if it is assumed that all the expectations of future one year interest rates are unchanged.

Take the total differential:

\[
\Delta i_{3t} = \frac{(\Delta i_t + \Delta i_{t+1}^e + \Delta i_{t+2}^e)}{3} + \Delta \ell_{3t}
\]

And imposing the restriction that \(\Delta i_t = \Delta i_{t+1}^e = \Delta i_{t+2}^e = 0\) then \(\Delta i_{3t} = \Delta \ell_{3t}\)

2. (5 minutes) Suppose the generalized dividend valuation model is modified thus:

\[
P_t = \frac{D_{t+1}}{1 + k_{e,t+1}} + \frac{E_t D_{t+2}}{(1 + E_t k_{e,t+2})^2} + \ldots + \frac{E_t D_{t+n}}{(1 + E_t k_{e,t+n})^n} + \frac{E_t P_{t+n}}{(1 + E_t k_{e,t+n})^n}
\]

That is, the required rate of return on equities changes over time, and is uncertain. Suppose the economy goes into a recession in, for instance, period \(t+2\). What do you expect to happen to the price of stocks in period \(t^*\)? 

*Explain, using this equation.*
In a recession occurring in time t+2, dividends might be expected to fall, while the interest rate might also be expected to decline, relative to what was expected before. This means both the numerator and denominator decline; it is uncertain which effect dominates, so the current price of the stock might rise or fall.

III. Short Answer [15 minutes]

Suppose the economy in 2006H2, the economy experiences recession, i.e., falling output. Consequently, expected inflation falls and investment opportunities (in plant and equipment) shrink.

1. (5 minutes) Using the bond market diagram (bond price on the vertical axis), show what happens to the quantity and price of bonds. Be sure to label your curves and axes.

In this drawing, the bond price falls, but could rise, depending upon the extent of each shift. The quantity of bonds unambiguously declines.

2. (5 minutes) Explain why the supply curve shifts in the direction it does.

The supply of bonds is driven by the demand for loans. When a recession occurs, firms do not have as much of a need to borrow for investing in new plant and equipment. Hence, the bond supply curve shifts in. Also, if expected inflation is expected to fall, then the real interest rate is expected to rise, also reducing the demand for loans, and hence supply of bonds.

3. (5 minutes) Explain why the demand curve shifts in the direction it does.

When a recession occurs, wealth falls, and so demand for bonds as stores of wealth declines. On the other hand, as expected inflation falls, the expected return on bonds rises, so demand for bonds should increase. Typically, it is assumed that the former effect dominates, and this is what is depicted in this figure.

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