

**MIDTERM #2 SOLUTIONS**  
**14.02**

**I. TRUE, FALSE OR UNCERTAIN**

**1. FALSE.** A future tax cut will shift the IS out to the right, raising interest rates and output. The expectation is thus that short term interest rates will rise, implying a steeper yield curve.

**2. FALSE.** While nominal interest rates are the relevant interest rate in the financial market, it is because it represents the opportunity cost of holding money versus bonds. The trade-off in returns between these assets is not affected by changes in inflationary expectations, either immediately or in the longer run.

**3. TRUE.** People will react to the announcement and not wait until the actual policy is implemented, provided the announcement is credible. An expected increase in the money supply will increase output and decrease interest rates. Higher expected output implies higher expected dividends, and lower expected interest rates means that the discount factor will be larger. Both effects work to increase the price of stocks now (the price of a stock is the PDV of expected dividends).

**4. TRUE.** If firms cannot borrow from banks, they must finance their investments out of current cash flows or profits. These are the highest in times of expansion. Unconstrained firms may also increase their investment in boom times, but they are able to borrow and smooth out their desired investments, or to invest in anticipation of a coming boom.

**5. FALSE.** The PDV of the stream of expected dividends is an acceptable way to price a stock. However, it is not the only rational way. If you believe that you will be able to sell the stock for a higher price to someone else in the future, it is rational to buy the stock even if the price is above the PDV of the expected dividends. Examples in the book were the 'the totally worthless stock' that paid no dividends, the tulip craze in Holland, etc. The caveat to keep in mind is that these bubbles, while rational, can become unsustainable, and at some point the price of the stock will fall dramatically.

**Answers to Question 2**

a.) Real i.r. are expected to be constant. The remaining answers to this question will come later.

b.) The news that firms will increase their hiring leads to higher expected inflation. Higher expected inflation will cause the IS curve to shift up by the change in expected inflation. This is because the IS-LM diagram uses nominal interest rates on the vertical axis, yet the equilibrium in the goods market is determined by real interest rates. To graph the same combinations of income and real interest rates for which the goods market is in equilibrium, the IS curve must be redrawn, shifted by the amount inflationary expectations changed. Initially, the financial markets will not respond, as expected inflation does not affect the trade-off between money and bonds. If nominal i.r. is unchanged and inflation is expected to rise, real i.r. fall by the same amount expectations rose. The lower real i.r. rates stimulate investment, increasing output. As output and income rise, money demand rises, pushing up interest rates. At the new equilibrium, nominal ir. is higher, but by less than the amount that inflationary expectations rose. Real i.r. will be lower. Output will be higher.

c.) Higher output will raise dividends, increasing financial wealth. Higher income will raise human wealth. Lower real i.r. will increase the PDV of payments received in the future. The result is ambiguous. Wealth will increase and so will consumption.

d.) If the Fed keeps output constant and the IS curve is shifting out, it will contract the MS. If  $Y$  is left unchanged, nominal i.r. will have risen by the full amount that inflationary expectations rose so that real i.r., wealth,  $C$  and  $I$  are also unchanged.

e.) One cannot conclude that 'good news' will always translate into higher wealth and thus more  $C$  for households that take current and future variables into account. The Fed's reactions are crucial. In part d.), the Fed's actions meant that the possible increase in output stemming from the news hiring would not occur.

### Answers to Question 3. Stocks.

a.) Since there are 100 shares, you must divide the dividend amount by 100 in order to get the per share dividend. The stock price is the present discounted value of the dividend stream.

$$Q_t = \frac{.55}{(1.10)} + \frac{1.1}{(1.10)^2} + \frac{1.1}{(1.10)^3} = \$2.236$$

b.) We know that the return from buying and selling the stock and getting the dividend should be the same as the return from owning a stock that matures in one year. We know already that the return on the bond is 10% or .10. Thus, we can just plug in the dividend from the first period and the price initially paid for the stock.

$$\frac{Q_{t+1} + D_{t+1} - Q_t}{Q_t} = .10$$

$$\frac{Q_{t+1} + .55 - 2.236}{2.236} = .10$$

$$Q_{t+1} = \$1.91$$

c.) Seeing as though future profits will decline, the stock price should decline.

#### Answers to Question 4. Bonds.

$$a.) 100 = \frac{FV}{(1.03)(1.04)(1.05)}$$

$$FV = \$112.476$$

$$b.) P_{2t+1} = \frac{FV}{(1.04)(1.05)}$$

$$P_{2t+1} = \$103$$

This can also be done by arbitrage where the return from holding a one-year bond is the same as the return from holding a three year bond and selling it after the first year as a two year bond.

c.) You would expect the friend's bond to give a higher return because of the risk involved in owning his/her bond versus a virtually risk-free t-bill.

d.) The yield curve will be flat (slopeless). The annual return will be constant at  $i$ .

e.) ii. An upward sloping yield curve means that the return on long-term bonds is greater than the return on short-term bonds. If the long-term rate is an average of current and expected future short-term rates, then short-term rates are expected to rise.