

# Mid Term Exam

Econ. 116b

March 7, 2007

75 MINUTES(one point per minute)

ANSWER EACH PART IN A SEPARATE BLUE BOOK.

(28 minutes- 4 minutes each)

I. Answer True/False/Uncertain. Explain your answers. No credit without explanation.

1. If the Fed announces today that it is going to raise the short term interest rate three months from now (but do nothing until that time) and if this announcement is a surprise, long term interest rates will rise immediately.

**Answer:** True. We know that the long term interest rates must be equal to the composition of the respective short term interest rate. For instance, the two year interest rate  $r_2$  satisfies:

$$(1 + r_2) = (1 + r_1) \cdot (1 + r_1^e)$$

with  $r_1$  the current one year rate and  $r_1^e$  the expected one year interest rate for the next year. Therefore, an increase in  $r_1^e$  leads automatically to a rise in  $r_2$ .

2. The aggregate demand curve is the sum of all market demands curves in the economy.

**Answer:** False. The Aggregate demand curve is obtained through the equilibrium between the IS curve and the real LM curve. The AD falls when the price level increases because the higher price level causes the demand for money ( $M^d$ ) to rise. Therefore, to recover the equilibrium, the interest rate must increase. It is the higher interest rate that cause the output to fall.

3. A low ratio of inventories to sales is generally good for the future course of the economy.

**Answer:** True/Uncertain. If the low ratio of inventories to sales is unexpected, the firms will produce more in order to satisfy the demand and refill part of the inventories. This increment in the production will lead to a higher level of output.

4. In terms of increasing real output, fiscal policy is more effective when the AS curve is fairly flat and monetary policy is more effective when the AS curve is fairly steep.

**Answer:** False. Either monetary policy and fiscal policy produce the same effect when the AS curve is fairly flat or steep. Both policies shift the AD curve, so the equilibrium moves along the AS curve, and in consequence a flat AS implies big changes in output and a steep AS leads to small changes on output.

5. Fixed weight price indices, like the Consumer Price Index, are biased upward.

**Answer:** True. The CPI does not account for consumers' substitution away from high-priced goods.

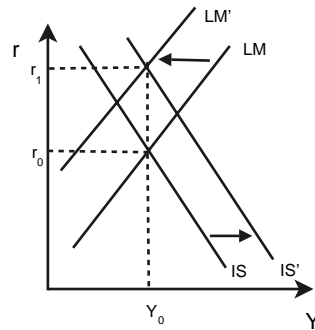
6. A government announcement that the unemployment rate was smaller than the market expected will always lead to an increase in stock prices.

**Answer:** False. In general an unexpected announcement of a lower unemployment rate is interpreted as good news. In that case, consumers and firms adjust their

expectations, and the stock prices rise. However, if the economy is reaching higher levels of inflation, the Fed will try to stop further increases in the level of prices, rising the interest rate, and that policy will lead to a drop in the stock prices. Thus, lower unemployment rate is not **always** good news for the stock market.

7. In principle the effect on real output of a government spending increase can be made zero if the fed increases the interest rate enough, thus making the government spending multiplier zero.

**Answer:** True/Uncertain. The figure shows that in general monetary policy can cancel out the effects of fiscal policy, and make the government spending multiplier equal to zero. However, we know that timing of both policies are different. Monetary policy is quick to implement, but the economy reacts slower to changes in the money supply. Thus, we can still observe some effect of the fiscal policy.



II.

III.

II. Answer each of the following questions in the time allowed.

- 1. Investment of firms fell in 2001 even though the Fed lowered interest rates substantially. How can this happen? Does it mean that interest rates have no effect on investment? The response of investment to output changes varies over business cycle. Why?**

The investment function that we typically use somehow takes into account this characteristic of investment:  $I = I_0 - er$ , has two components,  $er$  which depends on the interest rate, and  $I_0$ , an exogenous component that shifts investment. The question refers to what type of things should occur for  $I_0$  to shift down.

A lower investment level despite low interest rate levels can be explained mainly by the *animal spirits* of investors. When expected output is low, expected returns from investment projects are also low (for example, lower output would imply lower sales for firms), hence making that even at the same interest rate, investment decreases. For the particular case of 2001, an additional reason was that the economy recently had an extended period of expansion, firms had accumulated capital, and this excess capacity made unnecessary for many firms to contract more capital. Another determinant of planned investment is the relative cost of labor and capital, though is hard to use this argument in the context of this question.

About investment patterns during the business cycle, we already argued what happens during recessions, it's worth mentioning that the opposite effect occurs during economic booms, where higher expected output attracts more investment, and the argument is the mirror of the one explained above. That's the reason of the pattern of investment during the business cycle.

- 2. If the value of stocks in the United States falls permanently by 2 trillion, what roughly are the likely quantitative effects on the US economy in the future? Assume that people have a horizon of 20 years, that the multiplier is 1.4 and that U. S. GDP is 14 trillion. What would this fall likely do to labor supply in the future and why? What would be the likely response of the Fed to this fall?**

A permanent decrease of 2 trillion on a 20 years horizon, imply an average decrease of  $2/20=100$  billion dollars per year. With a multiplier of 1.4, that is 140 billion dollars, or a 1% of GDP.

Stock value falling implies that dividends will be lower, leading to consumers to have lower income. This will create a negative income effect, (unambiguously) increasing the labor supply.

An expansive monetary policy by the Fed decreasing the interest rate, could mitigate this effect.

- 3. Discuss three reasons why unemployment beyond frictional and structural unemployment might exist —i.e., cyclical unemployment. Discuss one argument why cyclical unemployment might not exist even though measured unemployment fluctuates substantially.**

Underlying the following arguments is this: if the labor market behaves as most other markets in the economy, when there is excess supply, prices should adjust to a new (lower) equilibrium price. When there is unemployment, instead of observing this adjustment, the excess supply remains.

The question refers to why this happens. Among the main reasons are the following: sticky wages, due to implicit or explicit contracts, that is, firms can't cut down wages, either because a wage rate has been set in a contract, or for other reasons, it's difficult for firms to lower wages; efficiency wage theory, that is, firms pay wages above the equilibrium level (hence markets won't clear) to create incentives to have more productive workers; imperfect information, that is, firms set wages "too high" not knowing that the equilibrium wage is lower, receiving more job applications and turning down a high number; finally, another reason might be the existence of minimum wage laws, which could explain why there is unemployment when the equilibrium wage rate is below the minimum wage.

One argument why cyclical unemployment might not exist even though measured unemployment fluctuates, has to do with the way unemployment is measured. Unemployment is defined as the proportion of the labor force that can't find a job (even though they are looking for one), but

when this information is gathered, they ask “have you been looking for a job recently”, but they omit the part “at the current wage rate”. It’s likely that a high proportion of people been asked would be able to find a job, but the current wage rate might be too low for them and choose not to work, and that formally would take them out of the labor force during the period, hence not having cyclical unemployment.

4. Each point on the AD curve reflects equilibrium in the IS-LM model for the given value of the price level,  $P$ . Explain carefully why the (equilibrium) interest rate decreases as one moves down the AD curve. How does  $M^d$ , the nominal demand for money, change as one moves down the AD curve and why? How does investment change and why?

For comparison sake, let’s start from an initial equilibrium point, at output  $Y_0$  and price  $p_0$ . As we move down the AD curve to a point  $Y_1$  and  $p_1$ . All this is shown in figure 1.

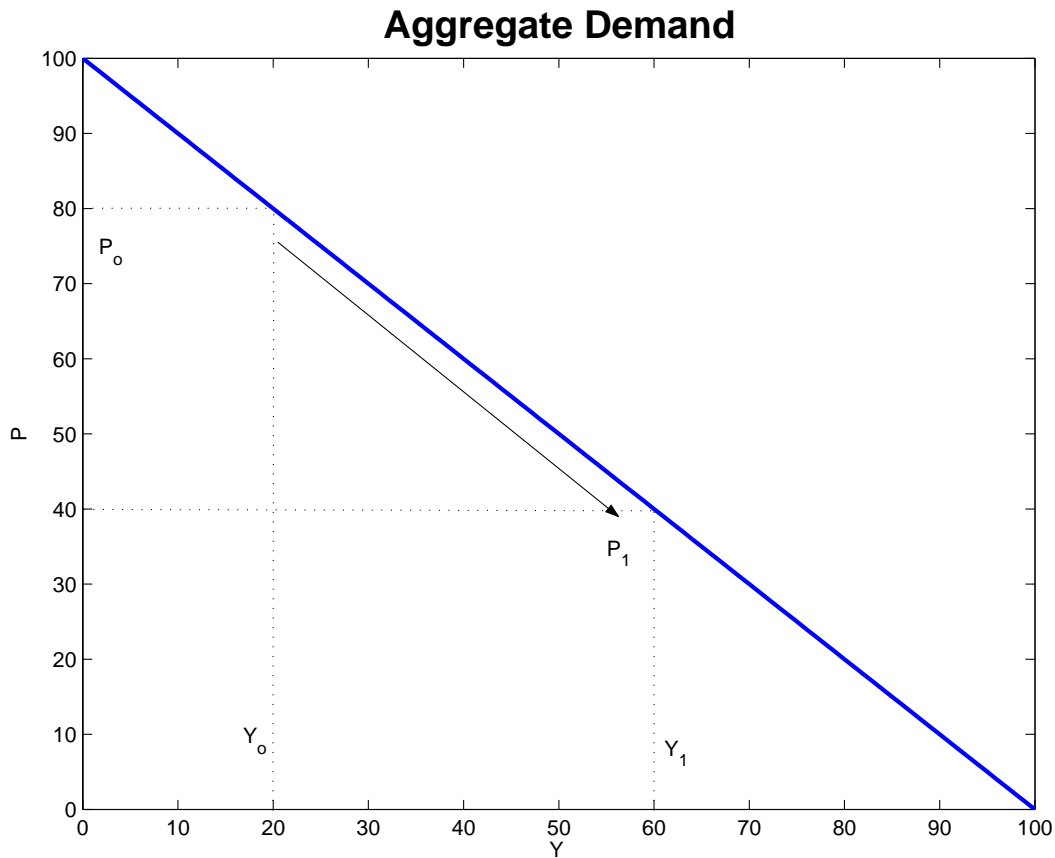


Figure 1: Aggregate demand as we move down the curve.

The first effect, as the price level decreases, the money demand shifts down (while keeping the money supply constant) leading to a new, lower equilibrium interest rate while keeping the same equilibrium amount of money. The effect of this change is a shift in the LM curve, shown in figure 2.

The complete story is the following: when prices are lower, the demand for money shifts down; as the money supply remains fixed, the quantity of money demanded stays the same, but the interest rate decreases. As a consequence, investment increases leading to higher output. The IS-LM curves, figure 2 show the “summarized” version.

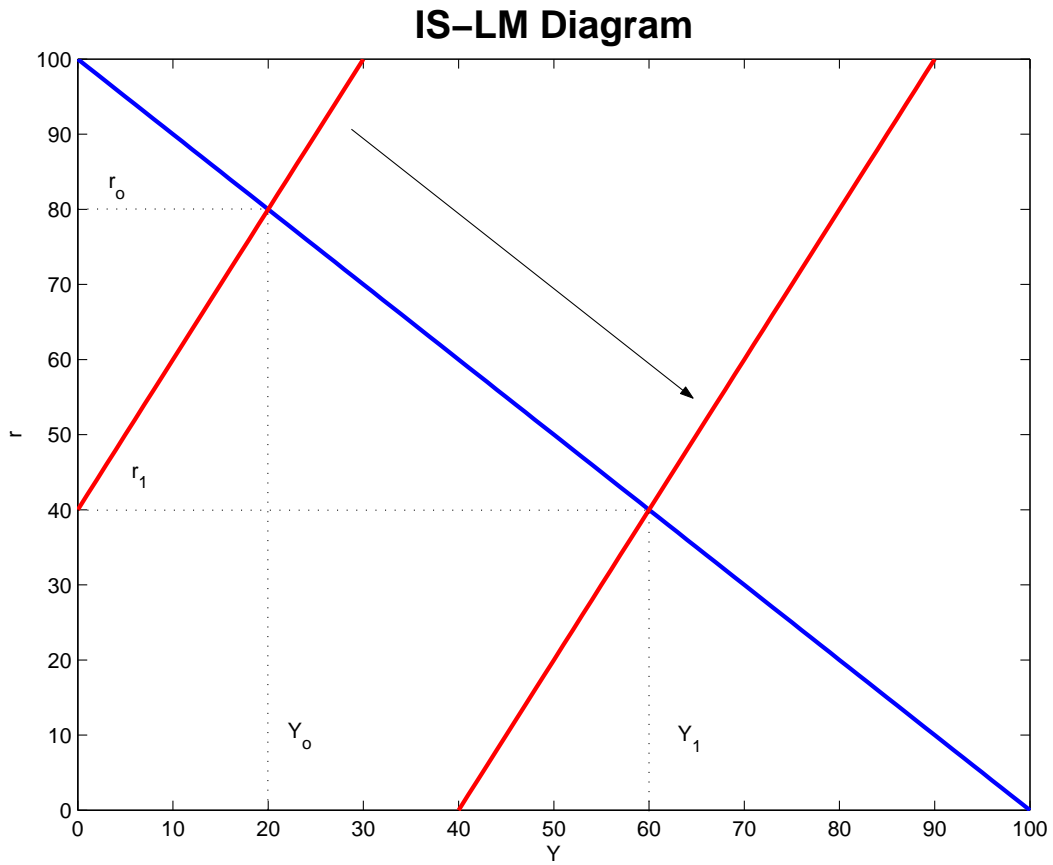


Figure 2: IS-LM diagram: LM curve shifts, leading to a new equilibrium output.

Regarding the effects on money demand and investment, as stated above, the money demand function shifts, but the quantity demanded remains constant; investment increases as the interest rate decreases.

## 2 Question 2 (10 minutes)

ASIMO is a small, closed economy defined by the following equations:

$$\begin{aligned}C &= 300 + 0.8(Y - T) - 500r \\I &= 400 \\T &= 100 \\G &= 80 \\\frac{M^d}{P} &= 0.5Y - 250r \\M^S &= 10000\end{aligned}$$

Throughout the question, we will limit ourselves to short-run analysis and set  $P = 10$ .

A. Find equilibrium  $Y$  and  $r$ .

The IS curve is:

$$\begin{aligned}Y &= C + I + G \\Y &= 300 + 0.8(Y - 100) - 500r + 400 + 80 \\0.2Y &= 700 - 500r \\Y &= 3500 - 2500r\end{aligned}$$

Set  $M^S = M^D$  implies the LM curve is  $\frac{M^d}{P} = \frac{10000}{10} = 0.5Y - 250r$ . It can be rewritten as  $Y = 2000 + 500r$ .

Combining to get:

$$\begin{aligned}2000 + 500r &= 3500 - 2500r \\1500 &= 3000r\end{aligned}$$

$$r = 0.5$$

$$Y = 2000 + 500r = 2250$$

B. Suppose the central bank of ASIMO decides to perform an open market purchase of \$250 securities. If the reserve-deposit ratio is 10%, what is the new equilibrium  $Y$  and  $r$ ? What happens to the AD curve in this economy?

An open market purchase of \$250 at reserve ratio of 10% would increase the money supply by  $\frac{250}{0.1} = 2500$ . It would change the LM curve but not the IS curve. Thus the LM curve becomes  $Y = 2500 + 500r$ . Solving yields  $r = \frac{1}{3}$  and  $Y = 2667$ .

The above implies an increase in  $Y$  while holding the price level constant. Thus the AD curve shifts to the right.

C. Going back to the original set of equations in part (A). Suppose the government of ASIMO increases its spending by 100, find the new  $Y$  and  $r$ . This is related to the "crowding-out effect". Explain the "crowding-out effect". Make sure your explaining is specific to this problem.

The multiplier of government expenditure is  $\frac{1}{0.2}$ , so the GDP will increase by  $100/0.2 = 500$ , and the IS curve becomes  $Y = 4000 - 2500r$ . Solving yields  $r = \frac{2}{3}$ , and  $Y = 2333$ .

When government increases spending, it would increase GDP through the multiplier effect. However, the increase in final GDP ( $2333 - 2250 = \$83$ ) is smaller than the increase in GDP due to the multiplier effect alone (\$500). The reason is that an increase in GDP leads to an increase in money demand, which drives the interest rate up. In turn, the increased interest rate leads to a decrease in consumption (not investment in this particular question), which lowers the GDP and offsets the effect of the increase in government expenditure. In other words, the government spending crowds out consumption.