Econ 100B
Macroeconomic Analysis
Professor Steven Wood
Fall 2008

Exam #2 ANSWERS

Please sign the following oath:

The answers on this test are entirely my own work. I neither gave nor received any aid while taking this test. I
will not discuss the questions on this test until after 5:00 p.m. on November 6, 2008.

__________________________________
Signature

Any test turned in without a signature indicating that you have taken this oath will be assigned a grade of zero.

Graph Instructions

When drawing diagrams, the following rules apply:

1. Completely, clearly and accurately label all axes, lines, curves, and equilibrium points.

2. The original diagram and any equilibrium points MUST be drawn in black or pencil.

3. The first change in any variable, curve, or line and any new equilibrium points MUST be drawn in red.

4. The second change in any variable, curve, or line and any new equilibrium points MUST be drawn in blue.

5. The third change in any variable, curve, or line and any new equilibrium points MUST be drawn in green.

Do NOT open this test until instructed to do so.

Good Luck!
A. Multiple Choice Questions. Circle the letter corresponding to the best answer. (3 points each; total of 30 points.)

1. Suppose that the government increases its purchases and finances them by printing money. A complete description of this within the IS – LM model framework would be:
   a. A rightward shift of the IS curve.
   b. A rightward shift of the LM curve.
   c. A rightward shift of the IS curve and a rightward shift of the LM curve.
   d. A rightward shift of the IS curve and a leftward shift of the LM curve.

2. The following combination leads to the LOWEST real interest rate:
   a. Expansionary fiscal policy and expansionary monetary policy.
   b. Expansionary fiscal policy and contractionary monetary policy.
   c. Contractionary fiscal policy and expansionary monetary policy.
   d. Contractionary fiscal policy and contractionary monetary policy.

3. Suppose the government enacts a contractionary fiscal policy while the central bank simultaneously undertakes a stabilization policy so as to keep output fixed. After both of these policy changes, all of the following would be true EXCEPT:
   a. Investment is now higher.
   b. The money supply is higher.
   c. Consumption did not change.
   d. Unemployment did not change.

4. Our standard assumption is that desired investment only depends negatively on the real interest rate. Now suppose that desired investment still depends negatively on the real interest rate but now also depends positively on economic output. Then, compared to our standard assumption:
   a. The LM curve is now flatter.
   b. The LM curve is now steeper.
   c. The IS curve is now flatter.
   d. The IS curve is now steeper.

5. According to Tobin’s “Q theory” of investment, a decline in the real interest rate will raise equity (i.e., stock market) prices, causing businesses to issue more stock and increase desired investment. Within the IS – LM model framework, we can analyze this by:
   a. A leftward shift of the LM curve and a rightward shift of the IS curve.
   b. A rightward shift of the LM curve and a rightward shift of the IS curve.
   c. A leftward shift of the LM curve and a leftward shift of the IS curve.
   d. A rightward shift of the LM curve and a leftward shift of the IS curve.
6. Which of the following would ALWAYS cause the IS curve to shift to the left:
   
   a. An increase in the actual budget balance.
   b. A decrease in the actual budget balance.
   c. An increase in the structural budget balance.
   d. A decrease in the structural budget balance.

7. If the economy suddenly went into a recession, the “most effective” fiscal policy for returning the economy to its full-employment level of output would be:
   
   a. Permanent reductions in average tax rates for wealthy people.
   b. Permanent reductions in average tax rates for poor people.
   c. Permanent reductions in marginal tax rates for wealthy people.
   d. **Permanent reductions in marginal tax rates for poor people.**

8. Suppose that the economy is initially at the full-employment level of output and inflation is at its target level. If output now increases while inflation declines, then according to the Taylor rule:
   
   a. The Fed should raise the Fed funds rate.
   b. The Fed should reduce the Fed funds rate.
   c. The Fed should keep the Fed funds rate constant,
   d. **What the Fed should do is ambiguous.**

9. A decrease in the average tax rate with the marginal tax rate held constant will:
   
   a. Increase the amount of labor supplied at any real wage.
   b. Not affect the amount of labor supplied at any real wage.
   c. **Decrease the amount of labor supplied at any real wage.**
   d. Increase the amount of labor supplied at any real wage only if the average tax rate is above the marginal tax rate.

10. Deficits are a burden on future generations:
   
   a. Only if they are cyclical budget deficits.
   b. Only if they are owed to citizens within the country.
   c. Only if they are not used for government investment.
   d. **Only if they cause national saving to fall.**
B. Answer BOTH of the following questions in the space provided. (35 points each, total of 70 points.)

1. **IS – LM – FE Model.** Suppose that the economy can be described by the Keynesian model, that it is initially in short-term equilibrium, that the unemployment rate is well above the natural rate of unemployment, that Ricardian equivalence does not hold, and that the Federal Reserve targets a fixed monetary base. For simplicity, assume that any individual shift in the LM curve is twice as large as any individual shift in the IS curve.

   a. Based only on this information, use an IS – LM – FE model diagram to clearly and accurately show:

   1. The economy’s initial equilibrium position (in black),
   2. What happens if banks substantially increase their excess reserves and there is a strong demand-side credit channel effect (in red),
   3. What then happens if there is a sharp drop in the liquidity on non-money financial assets (in blue),
   4. What then happens if there is a significant decline in household and businesses expectations about their economic futures (in green), and
   5. The economy’s final equilibrium position.
b. Provide a brief economic explanation of the initial equilibrium, of EACH of the changes that you have made, and of the final equilibrium that you have shown in your diagram above. Be sure to discuss the adjustment process that the economy undergoes with respect to the real interest rate and economic output after EACH of the events described above.

The economy is initially in short-term equilibrium with output at \( Y_0 \) and the real interest rate at \( r_0 \). Because the unemployment rate is above the natural rate of unemployment, the level of output is below its full-employment level, i.e., \( Y_0 < Y^* \).

If banks now substantially increase their excess reserves the money multiplier will decline. Because the Federal Reserve maintains a fixed monetary base, this will cause the money supply to decline and shift the LM curve to the left from \( LM_0 \) to \( LM_1 \). Because the money supply has declined, at the initial real interest rate level, \( r_0 \), the demand for money will now exceed the supply of money, causing the real interest rate to rise. A higher real interest rate reduces desired consumption and investment, causing income to decline. As the real interest rate rises and income declines, the demand for money will increase.

In addition, because there is a strong demand-side credit channel, the higher real interest rate will cause the demand for borrowing to decline. Less demand for borrowing translates into lower desired consumption and investment, shifting the IS curve to the left from \( IS_0 \) to \( IS_1 \). This also causes income to decline, which reduces the demand for money. Because the demand for money is now less than the supply of money, the real interest rate will decline, causing desired consumption and investment to increase and increasing income. As the real interest rate declines and income increases, the demand for money will increase.

This process will continue until the net effect of these two events has increased the real interest from \( r_0 \) to \( r_1 \) and output has declined from \( Y_0 \) to \( Y_1 \). At this income and real interest rate level, i.e., at \( Y_1 \) and \( r_1 \), the demand for money has declined to exactly match the decline in the money supply.

If there is now a sharp drop in the liquidity of non-money financial assets, the demand for money will increase, shifting the LM curve to the left from \( LM_1 \) to \( LM_2 \). At \( r_1 \), the demand for money is now greater than the supply of money, causing the real interest rate to rise. As the real interest rate rises, desired consumption and investment will decline, causing income to fall. As the real interest rate rises and income falls, the demand for money will decline. This process will continue until the real interest rate increases from \( r_1 \) to \( r_2 \) and income has fallen from \( Y_1 \) to \( Y_2 \) at which point the demand for money is back in equilibrium with the supply of money.

If there is now a significant decline in household and business expectations about their economic futures (i.e., expected future income and expected future marginal product of capital), desired consumption and investment will decline, shifting the IS curve to the left from \( IS_1 \) to \( IS_3 \). This will cause income to decline which also reduce the demand for money at \( r_2 \). The demand for money is now less than the supply of money, causing the real interest rate to decline. A lower real interest rate will increase desired consumption and investment and increase income. A lower real interest rate and higher income will increase the demand for money. This process will continue until the real interest rate declines from \( r_2 \) to \( r_3 \) and income has fallen from \( Y_2 \) to \( Y_3 \) at which point the demand for money is back in equilibrium with the supply of money.

As a result of all of these changes, a final short-term equilibrium is established with economic output at \( Y_3 \) which is now even further below the economy's full-employment output level, i.e., \( Y_3 < Y_0 < Y^* \), and with the real interest rate at \( r_3 \) which is higher than its initial level, i.e., \( r_3 > r_0 \).
2. **IS – LM - BB.** Suppose that the economy can be described by the Keynesian model, that it is initially in short-term equilibrium, that there are deficits in both the structural budget and the cyclical budget, and that Ricardian equivalence does not hold. Research has shown that high-income workers have relatively low marginal propensities to consume while low-income workers have relatively high marginal propensities to consume.

   a. Based only on this information, use an IS – LM – BB diagram to clearly and accurately show:

1. The economy’s initial economic position (in black),
2. What happens if President Obama raises average taxes on high-income workers and lowers average taxes by an identical dollar amount on low-income workers, ignoring any effects on labor supply (in red),
3. What then happens if President Obama also decides to increase government purchases (in blue),
4. What then happens if the Fed decides to target interest rates at their initial level, \( r_0 \), (in green), and
5. The economy’s final economic position.
b. Provide a brief economic explanation of the initial equilibrium, of EACH of the changes that you have made, and of the final equilibrium that you have shown in your diagram above. Be sure to discuss what happens to economic output and the real interest rates as well as what happens and why to the actual budget balance and the structural budget balance after EACH of the events described above. Be sure to compare the level of these 4 variables between the initial and final short-term equilibrium situation.

The economy is initially in short-term equilibrium with output at \( Y_0 \) and the real interest rate at \( r_0 \). Because the cyclical budget is in deficit, the initial level of output is below its full-employment level, i.e., \( Y_0 < Y^* \). With income at \( Y_0 \), the actual budget balance will be in deficit at \( ABB_0 \) while the structural budget balance will be in deficit at \( SBB_0 \).

If average taxes are raised on high-income workers (who have relatively low mpc's) while average taxes are lowered by the same dollar amount on low-income workers (who have relatively high mpc's) desired consumption will increase and shift the IS curve to the right from \( IS_0 \) to \( IS_1 \). This will cause income to increase from \( Y_0 \) to \( Y_1 \) and interest rates to increase from \( r_0 \) to \( r_1 \).

Because this is a change in average tax rates not marginal tax rates there is no rotation of the budget balance line. Consequently, the structural budget balance remains at \( SBB_0 \). In addition, because this is a simple redistribution of income, there is no effect on tax revenues at the initial income level of \( Y_0 \). However, because income rises from \( Y_0 \) to \( Y_1 \), tax revenues will also increase, increasing the absolute budget balance from \( ABB_0 \) to \( ABB_1 \).

If government purchases now increases the IS curve will shift to the right from \( IS_1 \) to \( IS_2 \) and the BB line will shift down from \( BB_0 \) to \( BB_2 \). The rightward shift of the IS curve will increase income from \( Y_1 \) to \( Y_2 \) and raise the real interest rate from \( r_1 \) to \( r_2 \).

Because government purchases were increased, the structural budget balance immediately declined by the same magnitude, from \( SBB_0 \) to \( SBB_2 \). In addition, the actually budget balance also declined by the same magnitude when measured at income \( Y_1 \). However, because income rose from \( Y_1 \) to \( Y_2 \), tax revenues also rose so the absolute budget balance fell from \( ABB_1 \) to \( ABB_2 \), which is less than the increase in government purchases. However, the increase in tax revenues from the increase in income is not enough to pay for all of the increase in government spending. Consequently, the absolute budget balance fell, i.e., \( ABB_2 < ABB_1 \).

If the Fed then decides to target the real interest rate at its initial level of \( r_0 \), it will increase the money supply and shift the LM curve to the right from \( LM_0 \) to \( LM_3 \). This will cause the real interest rate to decline from \( r_2 \) to \( r_3 = r_0 \) and cause income to rise from \( Y_2 \) to \( Y_3 \). Higher income will increase tax revenues so the absolute budget balance will increase from \( ABB_2 \) to \( ABB_3 \) (which depending on how much income increased could be greater than, equal to, or less than \( ABB_0 \) or even \( ABB_1 \)). Because this is a change in monetary policy, not discretionary fiscal policy, the structural budget balance does not change from \( SBB_2 \).

As a result of all of these changes, a final short-term equilibrium is established with economic output at \( Y_3 \) (which could be either below, at, or above \( Y^* \)) and with the real interest rate at \( r_3 = r_0 \). In addition, the absolute budget balance is at \( ABB_3 \), which could be either below, at, or above \( ABB_0 \), and a structural budget balance at \( SBB_2 < SBB_0 \). The structural budget balance is clearly in deficit but the actual budget balance might be in surplus if the increase in income was sufficiently large (which is unlikely in the real world).

☺ THE END ☺