Economic 100B
Macroeconomic Analysis
Professor Steven Wood
Spring 2008

Exam #3 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 3:30 p.m. on May 22, 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!
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A. **Multiple Choice Questions.** Circle the letter corresponding to the *best* answer. (3 points each; total of 30 points.)

1. If a U.S. company imports 10 Toyotas from Japan at $15,000 each, and the Japanese company buys airline tickets on a U.S. airline with the money, how does this affect the U.S. balance of payments accounts?
   - a. Debit: imports; credit: capital and financial account.
   - b. Debit: capital and financial account; credit: imports.
   - c. **Debit: imports; credit: exports.**
   - d. Debit: exports; credit imports.

2. A large country imposes capital controls that prohibit foreign borrowing and lending by domestic residents. The country is currently running a capital and financial account surplus. This imposition of the capital controls will cause:
   - a. Net exports to decrease.
   - b. **Real domestic interest rates to rise.**
   - c. Real world interest rates to rise.
   - d. Desired national saving to fall.

3. A depreciation of the dollar causes:
   - a. A decrease in U.S. exports.
   - b. An increase in U.S. exports.
   - c. **An increase in the prices of U.S. imports.**
   - d. An increase in the prices of U.S. exports.

4. The U.S. real interest rate rises relative to the British real interest rate. British net exports ______ and the British exchange rate ______.
   - a. Increase; rises.
   - b. **Increase; falls.**
   - c. Decrease; rises.
   - d. Decrease; falls.

5. Suppose Japan is currently running a current account surplus. The most effective way of eliminating this current account surplus would be to ______ government purchases and ______ the domestic money supply.
   - a. Increase; increase.
   - b. Increase; decrease.
   - c. Decrease; increase.
   - d. Decrease; decrease.
6. Suppose that Federal Reserve wanted to reduce the money supply without using open-market operations. It could try to get the public to ______ their currency-deposit ratio and ______ banks’ reserve requirements, which would in turn change the banks’ reserve-deposit ratio.

   a. Decrease; lower.
   b. Decrease; raise.
   c. Increase; lower.
   d. **Increase; raise.**

7. The problem with the strategy of achieving credibility through reputation is that:

   a. Reputations are rarely credible.
   b. Reputations lack any commitment.
   c. **Serious costs may be incurred during the period in which reputation is established.**
   d. Rules always have a lower cost than reputations in maintaining credibility.

8. An increase in the marginal tax rate, with the average 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 if the average tax rate is above the marginal tax rate but decrease the amount of labor supplied at any real wage if the average tax rate is below the marginal tax rate.

9. Government budget deficits are a burden on future generations if they:

   a. Cause higher inflation.
   b. Are not used for government capital formation.
   c. **Cause national saving to fall.**
   d. Are always a primary government deficit.

10. In which case would you be most likely to expect inflation to accelerate?

    a. The government runs a sustained government deficit by lowering tax rates.
    b. The government runs a sustained government deficit by increasing government purchases.
    c. The government runs a sustained government deficit and funds it by borrowing from the public.
    d. **The government runs a sustained government deficit and funds it by increasing the money supply.**
B. Answer BOTH of the following questions in the space provided. (35 points each, total of 70 points.)

1. **Open Economy IS – LM Model.** The U.S. and Argentina are very minor trading partners with extremely small amounts of imports and exports between them. Both the U.S. and Argentine economies were in general equilibrium in 1994 with a flexible exchange rate. Suppose that both economies can be described by the Keynesian model and that Ricardian equivalence does not hold.

   In 1995, the U.S. economy experienced an investment boom. The Federal Reserve reacted immediately by changing monetary policy so that the economy remained at its full-employment level. Also in 1995, the Argentine government reduced government spending.

   a. Based only on this information, use a 2-country, open economy IS – LM diagram with a Foreign Exchange Market diagram (for the Argentina peso) to accurately and clearly show:
      
      i. The initial general equilibrium situation in both countries (in black),
      
      ii. The short-run effects on output and the real interest rates in both the U.S. and Argentina and on the supply and demand for the Argentine peso (in red and blue as needed).
b. Provide a brief economic explanation of the changes you shown in your diagram above. Be sure to compare the level of economic output, the real interest rate, and the exchange rate between the initial general equilibrium and the new short-term equilibrium that exists in each country after these events occur.

The U.S. economy began in general equilibrium with economic output and income at $Y_0$, which was equal to its full-employment level of output, i.e., $Y_0 = Y^*$, and with the real interest rate at $r_0$.

The Argentine economy also began in general equilibrium with economic output and income at $Y_0$, which was equal to its full-employment level of output, i.e., $Y_0 = Y^*$, and with the real interest rate at $r_0$.

With flexible exchange rates, the equilibrium exchange rate was equal to its fundamental value at $e_{r_0}$.

In 1995, the U.S. experienced an investment boom. This would shift the U.S. IS curve to the right from $IS_0$ to $IS_1$, increasing U.S. economic output and income and also increasing the real interest rate.

However, the Federal Reserve reacted immediately to keep the economy at its full-employment level of output. This required a contractionary monetary policy which shifted the U.S. LM curve to the left from $LM_0$ to $LM_1$, increasing the real interest rate but reducing U.S. economic output and income.

After these events, the U.S. economy would be in short-term equilibrium with the same level of economic output at $Y_0$, which still equaled its full-employment level of output, i.e., $Y_0 = Y^*$, but with a higher real interest rate at $r_1$.

Also in 1995, Argentina experienced reduced government spending. This would shift the Argentine IS curve to the left from $IS_0$ to $IS_1$, reducing Argentine economic output and income and also reducing the real interest rate.

After these events, the Argentine economy would be in short-term equilibrium with a lower level of economic output at $Y_1$, which was less than its full-employment level of output, i.e., $Y_1 < Y^*$ and with a lower real interest rate at $r_1$.

In the foreign exchange market, a higher real interest rate in the U.S. and a lower real interest rate in Argentina make dollar-denominated assets more attractive and peso-denominated assets less attractive. This increases the supply of pesos in the foreign exchange market and shifts the supply curve of pesos to the right from $S_{Peso0}$ to $S_{Peso1}$. In addition, this reduces the demand for pesos in the foreign exchange market and shifts the demand curve for pesos to the left from $D_{Peso0}$ to $D_{Peso1}$. As a result, the foreign exchange value of the peso depreciates from $e_{r_0}$ to $e_{r_1}$. 
c. Now suppose that in 1994 Argentina had fixed its currency, the Argentine Peso, to the U.S. dollar at its fundamental value. The Argentine central bank committed to keeping the exchange rate fixed without sterilizing any foreign exchange intervention.

Describe exactly how Argentina’s central bank must respond to the events in both the U.S. and Argentina in 1995 in order to maintain a fixed exchange rate at its 1994 level.

Also discuss what happens to Argentina’s economic output and real interest rate in the short-run assuming that Argentina is successful in maintaining the fixed exchange rate at its 1994 level.

**In 1994, Argentina fixed the exchange rate of the Argentine peso at its fundamental value at er₀. This became the official rate.**

**In 1995, events in the U.S. and in Argentina would cause the peso to depreciate. This indicates that the supply of the Argentine peso in the foreign exchange market was greater than the demand of Argentine peso in the foreign exchange market. Therefore, in order to fixed the exchange rate at its 1994 level of er₀, the Argentine central bank would have to enter the foreign exchange market and buy up the excess pesos that existed at the official rate of er₀ by selling some of its foreign official reserves. It would have to do this in every time period (until it ran out of foreign official reserves to sell).**

By buying up the excess pesos in the foreign exchange market, the Argentine central bank would be reducing the domestic money supply. Because the central bank was not sterilizing its foreign exchange intervention, this would shift the LM curve to the left, increasing the real interest rates and reducing economic output and income (which was already below its full-employment level).

**Maintaining a fixed exchange rate when an unfavorable demand shock hits the economy (in this case a contractionary fiscal policy) forces a contractionary monetary policy response. This aggravates the downturn in economic output and income.**
2. **IS – LM Model with Monetary and Fiscal Policy.** In 1965, the U.S. economy was in short-run equilibrium with the unemployment rate below the natural rate of unemployment. The government was running both actual and structural budget deficits.

In 1966, the Johnson administration increased spending for the war in Vietnam by $100 billion, financing this increased spending with an increase in tax rates that would generate $100 billion in additional revenues if the economy were at its full-employment level. Assume that the economy can be described by the Keynesian model and that Ricardian equivalence does not hold.

a. Based only on this information, use an IS - LM diagram with a Balanced Budget line to accurately and clearly show:

i. The U.S. economy’s initial short-run equilibrium (in black),

ii. The short-run effect on U.S. economic output, the real interest rate, the actual budget balance, and the structural budget balance from these spending and tax rate changes (in red and blue), and
b. Provide a brief economic explanation of the changes you showed in your diagram above as well as the adjustment process that the economy undergoes with respect to economic output, the real interest rate, the actual budget balance, and the structural budget balance. Be sure to compare the level of these 4 variables between the initial and final short-term equilibrium situations.

The economy was initially in short-term equilibrium with economic output at $Y_0$, which is greater than its full-employment level because it is given that the unemployment rate is below the natural rate of unemployment. The real interest rate is at $r_0$, the actual budget balance is at $ABB_0$, which is given to be in deficit, and the structural budget balance is at $SBB_0$, which is also given to be in deficit.

The increase in government spending shifts the IS curve to the right from $IS_0$ to $IS_1$ and increases economic output and income. As economic output and income increase, the demand for money increases. Because the nominal supply of money is fixed, the real interest rate rises from $r_0$ to $r_1$. A higher real interest rate reduces interest-sensitive spending and limits the increase in economic output and income to $Y_1$.

The increase in government spending also shifts the budget balance line down from $BB_0$ to $BB_1$, the amount of the increase in government spending. Although economic output and income has increased, the actual budget balance fell from $ABB_0$ to $ABB_1$ because higher tax revenues (at the initial tax rates) due to increased economic output and income was insufficient to pay for the increased government spending. In addition, the increase in government spending caused the structural budget balance to fall from $SBB_0$ to $SBB_1$.

The increase in tax rates shifts the IS curve to the left from $IS_1$ to $IS_2$ and decreases economic output and income. Although the increase in tax rates will fully finance the increase in government spending, the leftward shift in the IS curve due to the increase in tax rates is smaller than the rightward shift of the IS curve due to the increase in government spending. This is because a change in government spending affects economic output and income directly while a change in tax rates affects economic output and income indirectly by affecting desired consumption. As economic output and income decline, the demand for money also declines. Because the nominal supply of money is fixed, the real interest rate falls from $r_1$ to $r_2$. A lower real interest rate reduces interest-sensitive spending and limits the decline in economic output and income to $Y_2$.

The increase in tax rates also rotates the budget balance line up from $BB_1$ to $BB_2$. High tax rates generate higher tax revenues despite the decline in economic output and income. Consequently, the actual budget balance increases from $ABB_1$ to $ABB_2$ (which I have drawn as a surplus but doesn’t need to be). Because the tax rate increase was sufficient to fully finance the increase in government spending, a change that is measured at the full-employment level of output, the structural budget balance will increase from $SBB_1$ to $SBB_2$ which is identical to $SBB_0$. That is, after both of these fiscal policy changes there has been no change in the structural budget balance.

After these fiscal policy changes have been implemented, economic output and income has increased from $Y_0$ to $Y_2$, the real interest rate has increased from $r_0$ to $r_2$, the actual budget balance has improved from $ABB_0$ to $ABB_2$, and the structural budget balance has not changed.
c. After these fiscal policy changes were implemented, the Federal Reserve acted to move the economy to its full-employment level. On your diagram above, accurately and clearly show:

i. The short-run effect on economic output, the real interest rate, the actual budget balance, and the structural budget balance after this monetary policy action has occurred (in green).

ii. The economy’s final short-run equilibrium after all of these effects have occurred.

d. Provide a brief economic explanation of the changes you showed in your diagram above as well as the adjustment process that the economy undergoes with respect to economic output, the real interest rate, the actual budget balance, and the structural budget balance. Be sure to compare the level of these 4 variables between the initial and final short-term equilibrium situations.

Because economic output and income is still above its full-employment level, i.e., \( Y_2 > Y^* \), the Federal Reserve needs to conduct a contractionary monetary policy by reducing the nominal money supply. This will shift the LM curve to the left from \( LM_0 \) to \( LM_3 \).

The money supply is now less than the demand for money (at \( Y_2 \) and \( r_2 \)) causing the real interest rate to rise from \( r_2 \) to \( r_3 \). A higher real interest rate will reduce interest-sensitive spending and economic output and income will fall from \( Y_2 \) to \( Y_3 = Y^* \).

As a result of the decline in economic output and income, the actual budget balance falls from \( ABB_2 \) to \( ABB_3 \). However, because monetary policy does not affect the structural budget balance, the structural budget balance remains at \( SBB_2 = SBB_0 \).

After both the fiscal and monetary policies are implemented, economic output and income has fallen from \( Y_0 \) to the economy’s full-employment level of output, \( Y_3 = Y^* \), the real interest rate has increased from \( r_0 \) to \( r_3 \), the actual budget balance has fallen from \( ABB_0 \) to \( ABB_3 \), and the structural budget balance has not changed.