14.05 Intermediate Applied Macroeconomics

Exam #3

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1. The Mundell-Fleming Model

Assume Japan has a flexible exchange rate and perfect capital mobility (which is an accurate description).

(a) What is the effect of increasing the Japanese money supply in the Mundell-Fleming model with static expectations? What happens to output and the exchange rate? Draw a graph in (ε,Y) space to illustrate your answer.
The increase in money supply shifts the LM curve to the right in the (ε,Y) space. Output increases and the exchange rate depreciates.

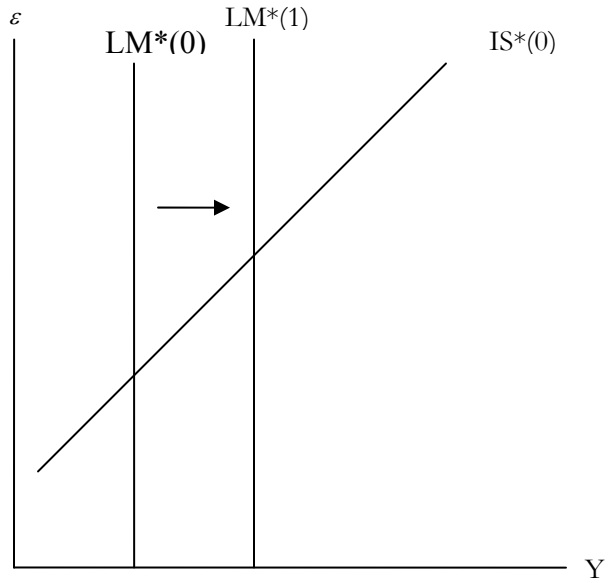

Figure 1

(b) Now assume that the money supply has not changed, but instead there has been a tax cut. Use the Mundell-Fleming model to analyze the effects of the tax cut in Japan on output, the interest rate and the exchange rate. Draw a diagram in (ε,Y) space to illustrate your answer.
In this case, the IS curve shifts to the right in the (ε,Y) space as output is higher for every level of the exchange rate. However, while the exchange rate appreciates, output remains

unchanged. Since we have static expectations and perfect capital mobility, the tax cut will have no effect on the interest rate.

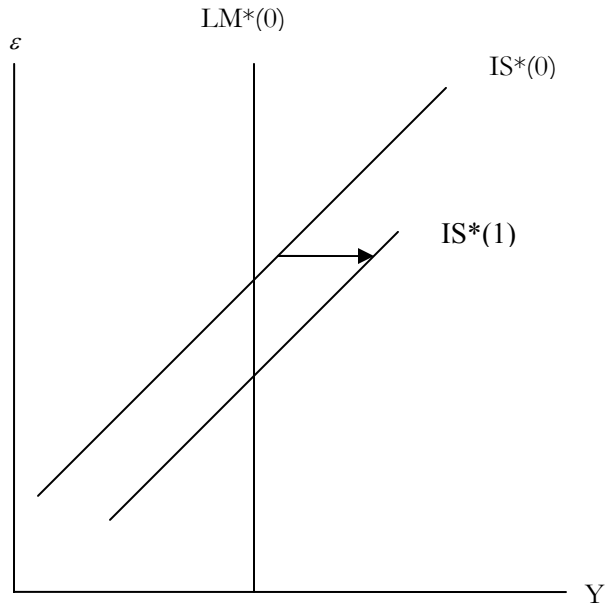

Figure 2

(c) Now suppose that investors have rational expectations. Show that the condition i = i* no longer holds and explain why. What condition now holds? Using this condition, show that there will be overshooting if Japan unexpectedly increases its money supply. Draw graphs in (i,Y) and (ε,Y) spaces to illustrate your answer.

The condition i=i* no longer holds with rational expectations because investors form expectations about the exchange rate. If they expect the domestic currency to depreciate, they will require a higher return on domestic assets and the opposite if they expect an appreciation. Therefore now we have the uncovered interest rate parity condition, $i=i^*+E(\acute{\varepsilon}/\varepsilon)$.

The second term in the right hand side of this condition is the expected rate of depreciation of the domestic currency. If the domestic interest rate is lower than the foreign interest rate ($i<i^*$), the domestic exchange rate must be expected to appreciate for investors to be willing to invest in domestic assets. The opposite occurs when $i>i^*$. So, the UIP simply says that rates of return must be equalized across countries once we take into account expected changes in the exchange rate.

The following graphs illustrate an unexpected increase in money supply under rational expectations, where the LM curve shifts to the right in both the (i,Y) and (ε,Y) spaces:

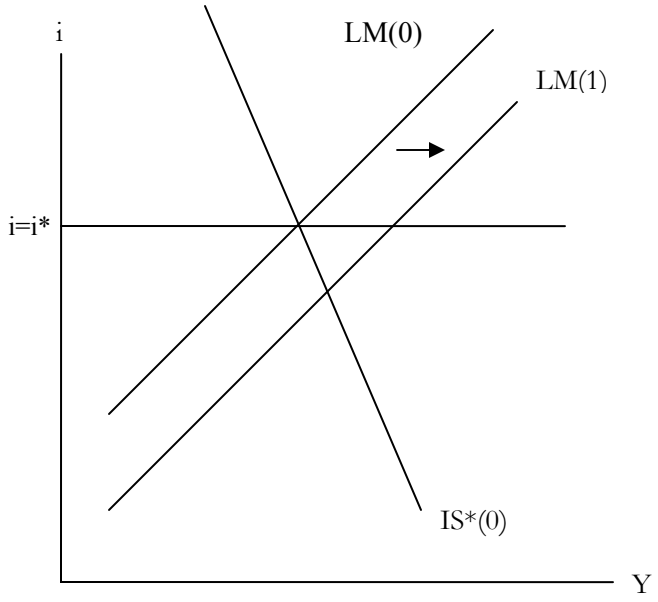

Figure 3

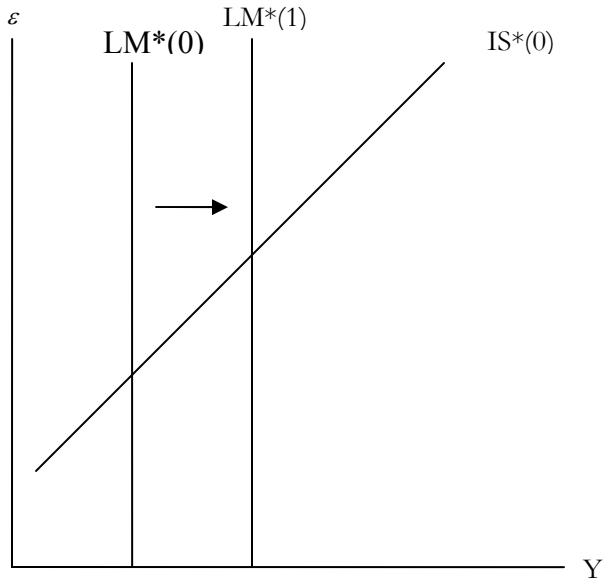

Figure 4

The exchange rate initially depreciates. But the interest rate decreases below i*, therefore from the UIP we have that E(έ/ε) is negative and thus the exchange rate is expected to appreciate. Thus we have overshooting.

(d) Now assume imperfect capital mobility and still assume rational expectations. How does an increase in the foreign interest rate i* affect the Japanese IS curve? Hint: Use the balance of payments equation.

The balance of payments requires that CF(i-i*) + NX(εP*/P) = 0, where both capital flows and net exports are increasing functions of their arguments. Therefore when i* increases, capital flows decrease and net exports increase, shifting the IS curve to the right in both the (ε,Y) and (i,Y) spaces.

(e) What are the effects of this change on output, the exchange rate, and the price level with imperfect capital mobility and rational expectations? Draw graphs in the (ε,Y) and (i,Y) spaces in your answer. How is your answer different from part (b)?
The IS curve shifts to the right, thus increasing output. The exchange rate appreciates. The fact that the IS curve shifts to the right tells us that output is larger for a given price. Thus, the aggregate demand curve is also shifting to the right and in equilibrium we have a higher price level.

2. Unemployment and the Labor Market

Consider the sticky wage model where the nominal wage is fixed at $W = \overline{W}$ as a result of collective wage bargaining by unions, and labor, *L*, is the only factor of production, such that output is given by *Y=F(L)*, where $F'(L) > 0, F''(L) < 0$. Finally, assume firms are competitive and hire labor until the marginal product of labor equals the real wage: $F'(L) = W/P$. Note: For the remainder of this question, whenever you see the word 'unemployment' you should interpret this as 'involuntary unemployment'.

(a) Assuming an upward sloping labor supply curve, use the above setup to draw a labor market equilibrium in *((W/P), L)* space such that there is a positive level of unemployment, and label the equilibrium level of employment as L^*. Label the level of unemployment as *U*. Suppose the government in this economy passes a legislation that seriously weakens the bargaining power of unions, reducing the fixed nominal wage in the economy. How will this affect the unemployment level? Use your graph to explain your answer.

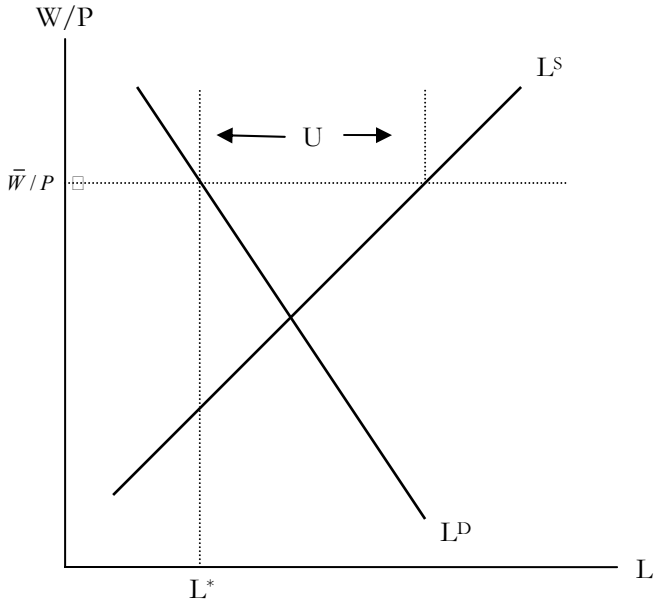

Figure 5

A reduction in the fixed nominal wage will reduce the level of unemployment:

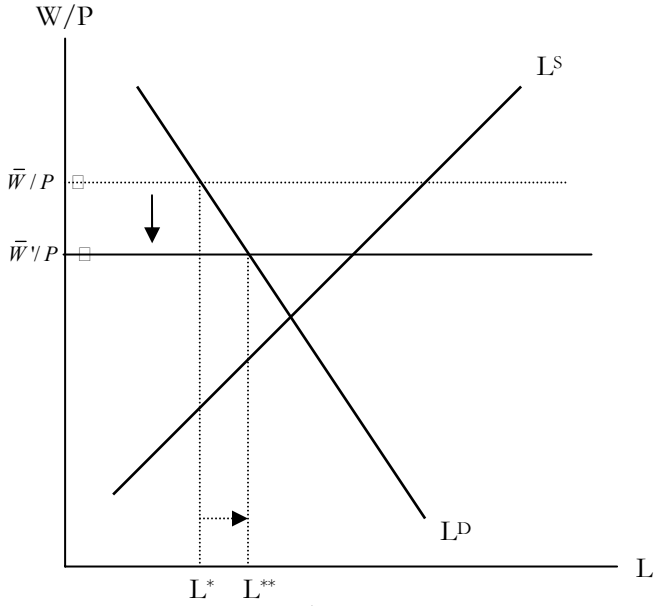

Figure 6

Now consider the second labor market model discussed in class. Assume that wages are flexible, but prices are fixed at $P = \overline{P}$. Again, assume an upward sloping labor supply curve, and assume firms will meet demand at the prevailing price as long as it does not exceed the level where marginal cost equals price; we let Y^{MAX} denote this level of output.

(b) Show the labor market equilibrium of this model in *((W/P), L)* space. [Be sure to label the labor supply, effective labor demand curve, equilibrium labor and wages]. Why didn't we use this model to explain how involuntary unemployment would change in part (a)?

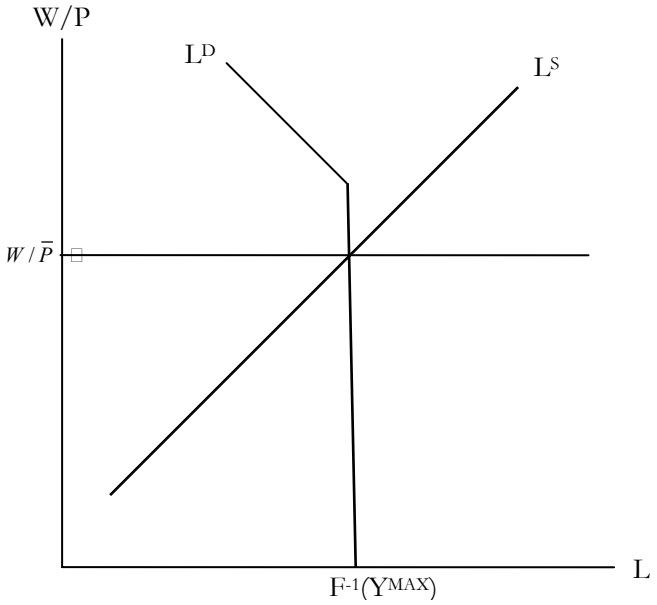

Figure 7

There is no involuntary unemployment in this model, since all the agents willing to work at the equilibrium wage are indeed employed.

(c) How will real wages, employment, and output respond to a negative aggregate demand shock in this model? Please show this graphically. Given your results, describe the effect of a contractionary monetary policy on income, the real wage, and unemployment in this economy.

A negative shock to aggregate demand will reduce demand for output, and the monopolistic firms will meet this reduced demand by decreasing their output. [This is seen explicitly in the model as a flat aggregate supply curve at $P = \bar{P}$]. We can then immediately see in figure 8 that the decrease in the output will reduce real wages and the equilibrium level of employment. All of these results are what we would typically expect from an aggregate demand shock, except that we don't see any movements in involuntary unemployment, as noted in part (b).

A contractionary monetary policy will provide us with a negative shock to aggregate demand. Thus, we know that it will decrease income, decrease the real wage, but not affect unemployment (since there is none in this model).

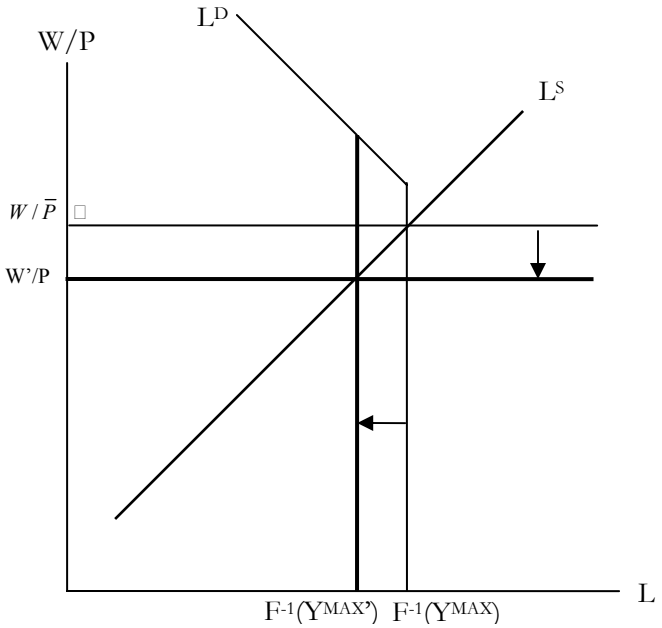

Figure 8

(d) The New Deal in 1933 allowed formation of labor unions. Which model accounts for the fact that these unions negotiated more in the interests of the current workers and their members rather than in the interests of the entire labor force? Use this model to explain the more persistent unemployment experienced in the later 1930s.

In the latter half of the 1930s, following the passing of laws that gave workers the right to organize (including the Wagner Act), unions gained some strength in the US. Wages could still adjust, but they were not totally flexible as in the model in part (b). Now we can use the insider-outsider model to think about how unemployment might have continued in the late 1930s. In this situation, only those who are employed in this period have a say in what the wage will be in the next period, so the unemployed workers are not able to bid the wage down (so as to increase the number of people employed in the next period). This gives us the persistent unemployment that we saw in the late 1930s. Figure 9 presents this case.

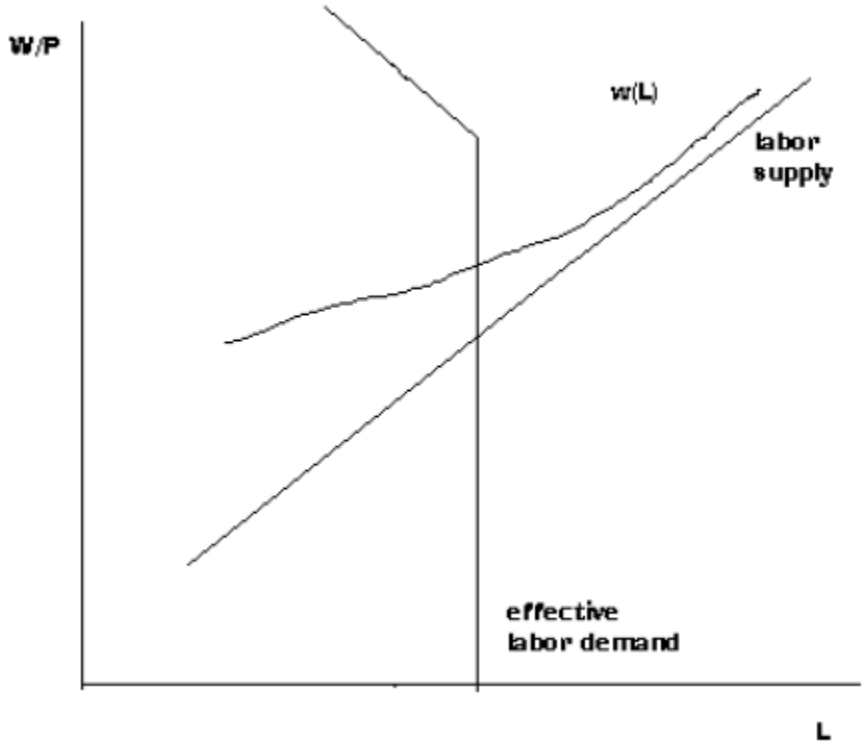

Figure 9

(e) Which of these models of the labor market is consistent with Nickell's analysis? According to his empirical results, what are the various policies and rules that affect unemployment in European countries and how do their affect differentially short-term and long-term unemployment?
The insider-outsider model is consistent with Nickell's analysis, since it explains how policies that affect the efficiency of the labor market in turn affect the level of unemployment.
Long-term unemployment is affected mainly by unemployment benefit duration, active labor market policies, union coverage and coordination with employers and by the total tax rate. Short-term unemployment is affected by employment protection, union/employer coordination and the total tax rate.

3. The Great Depression

(a) Using the Mundell-Fleming model with fixed exchange rates, describe the position and actions of the UK within the gold standard in 1931. What determined expectations of the exchange rate in the summer of 1931? Draw a graph in (ε,Y) space to illustrate your answer. Make sure you work with rational expectations, making use of the uncovered interest parity condition.
In the UK there were expectations of a devaluation because the recession shifted the IS curve to the left. From the UIP, the interest rate had to rise to equilibrate the markets. The

Bank of England was unwilling to increase the interest rate and therefore it devalued in September 1931, allowing the exchange rate to rise, but it didn't expand money supply immediately. While there was overshooting, the equilibrium is shown in figure 10.

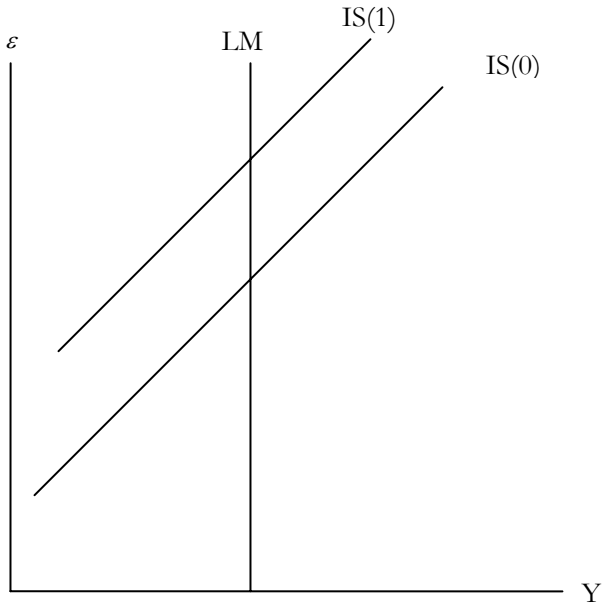

Figure 10

(b) Analyze similarly the position and actions of the US.
The US responded to expectations of devaluation by increasing the interest rate, which in turn led to a contraction of the money supply. It was able to satisfy the UIP condition and to keep a fixed exchange rate. However, this contractionary monetary policy made the recession even worse. The US situation can be described by figure 11.

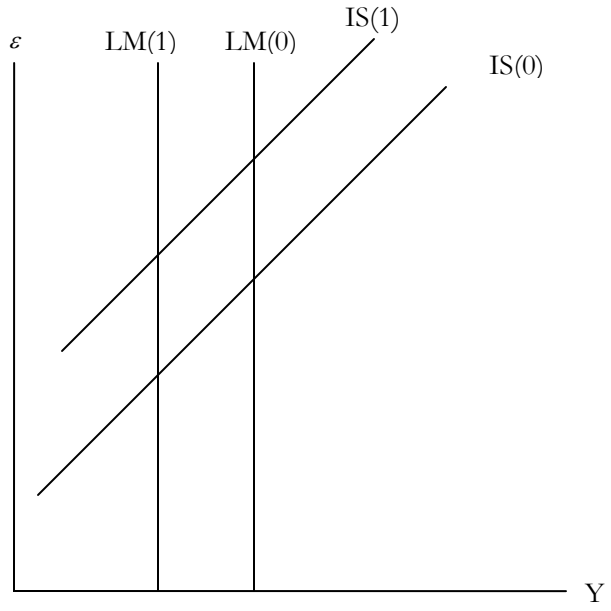

Figure 11

(c) How and why would current exchange rate regimes make the adjustment of global imbalances during Great Depression easier?
After the First World War there was a fixed exchange rate regime. This regime is sustainable only while the Central Banks have enough reserves to keep the exchange rate fixed. If there are expectations of a depreciation, the interest rate must go up. This decreases domestic activity and may lead to a currency crisis. Today there is a flexible exchange rate. If the dollar depreciates slowly, there will be no currency crisis.

(d) How do financial crises in recent decades compare with those of the 1930s? What kinds of policies have been proposed to avoid crises today? In general, what are the costs and benefits these policies have?
Present financial crises occur in emerging markets – e.g. in East Asia, Russia or Mexico. Proposed policies to avoid crises include re-regulation of financial institutions, re-imposition of capital controls, adoption of a common currency or creation of a new currency. The cost of these policies is a reduction of the rate of economic growth. According to Eichengreen, the cost for the first two policies exceeds the benefit, which is a reduction in the risk of currency crises.

(e) Consider the current example of global imbalances with US negative net exports and positive capital inflows. If foreign agents expect a depreciation of the US dollar and therefore no longer want to hold dollars. Explain how this will lead to an adjustment of the imbalance. Assume rational expectations and illustrate your answer in (ε,Y) space.
If foreign countries do not wish to hold dollars, net exports must rise for the balance of payments condition to hold. So, there must be a depreciation of the dollar. Consumption must fall for the exchange rate to depreciate, as in figure 12. If foreigners expect ε to rise

more, the interest rate will need to rise. We can see it from the uncovered interest rate parity condition: $i=i^*+E(\acute{\varepsilon}/\varepsilon)$.
Because the interest rate rises, investment falls and the IS shifts to the left even further in the (ε, Y) space, leading to an even larger depreciation.

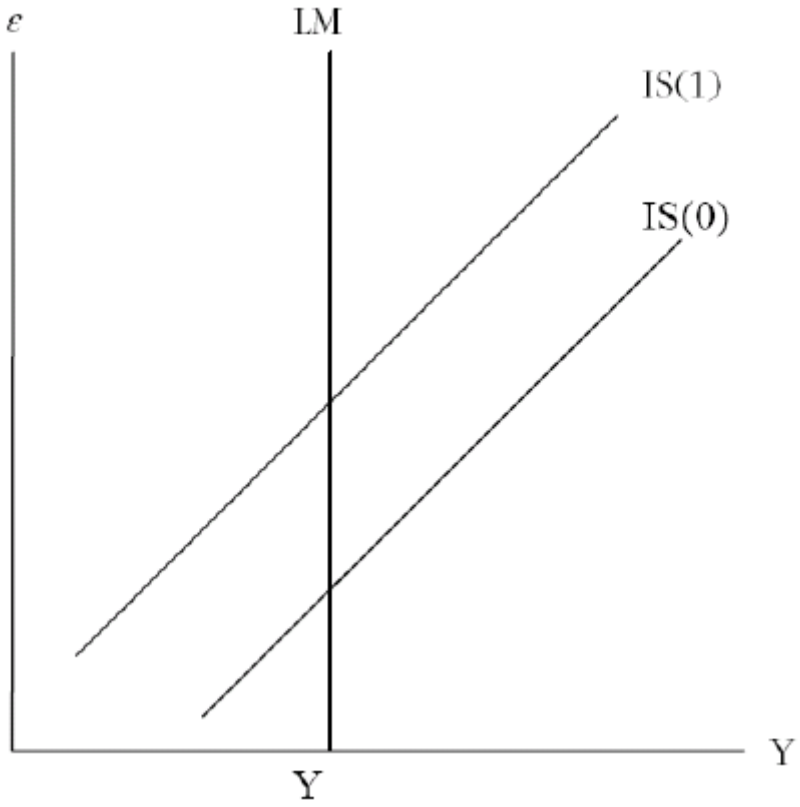

Figure 12