

# **Chapter 18**

## **Open-Economy Macroeconomics: Adjustment Policies**

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*"Since Keynes published The General Theory in 1936, it has been widely accepted that the two fundamental propositions of a full employment policy are a) that incomes and employment depend on the level of spending; and b) that there is no automatic mechanism to keep spending near its full employment level, without conscious action by economic and financial authorities. But the balance of payments equally depends on the level of spending. Must it be only a happy chance if the 'internal balance' and 'external balance' levels of spending coincide?"*

T.W. Swan, "Longer Run Problems of the Balance of Payments",  
AEA Readings in International Economics, Irwin, 1968.

### **I. Chapter Outline**

- 18.1 Introduction
- 18.2 Internal and External Balance with Expenditure-Changing and Expenditure- Switching Policies
- 18.3 Equilibrium in the Goods Market, in the Money Market, and in the Balance of Payments
- 18.4 Fiscal and Monetary Policies for Internal and External Balance with Fixed Exchange Rates
  - 18.4a Fiscal and Monetary Policies from External Balance and Unemployment
  - 18.4b Fiscal and Monetary Policies from External Deficit and Unemployment
  - 18.4c Fiscal and Monetary Policies with Elastic (Financial) Capital Flows
  - 18.4d Fiscal and Monetary Policies with Perfect (Financial) Capital Mobility
- 18.5 The IS-LM-BP Model with Flexible Exchange Rates
  - 18.5a The IS-LM-BP Model with Flexible Exchange Rates and Imperfect (Financial) Capital Mobility
  - 18.5b IS-LM-BP Model with Flexible Exchange Rates and Perfect (Financial) Capital Mobility
- 18.6 Policy Mix and Price Changes
  - 18.6a Policy Mix and Internal and External Balance
  - 18.6b Evaluation of the Policy Mix with Price Changes
  - 18.6c Policy Mix in the Real World

## 18.7 Direct Controls

### 18.7a Trade Controls

### 18.7b Exchange Controls

### 18.7c Other Direct Controls and International Cooperation

## II. Chapter Summary and Review

**Internal balance** is defined as full employment. **External balance** is defined as balance of payments equilibrium, which is defined as equality of autonomous inflows and outflows. (Autonomous transactions will initially include those due to exports and imports; financial capital flows will be subsequently introduced). As the introductory quote explains, internal balance and external balance may exist simultaneously and continuously only by coincidence. In addition, we have seen that some of the automatic adjustments to balance of payments disequilibria may be costly. Consequently, governments may wish to adopt adjustment *policies* to support or offset the *automatic* adjustments discussed in Chapters 16 and 17.

Government can use a number of policies to influence employment and the balance of payments. These policies can be classified as **expenditure-changing policies**, **expenditure-switching policies**, and **direct controls**.

Expenditure-changing policies are those that change the level of economic activity, generally taken to be the price level and/or the level of real GDP (real income), by managing aggregate demand. Expenditure-changing policies include fiscal and monetary policies. Fiscal policy is the use of the spending and taxing functions of government. An expansionary fiscal policy is one that increases aggregate demand by lowering taxes and/or increasing government spending. Similarly, a contractionary fiscal policy is one that reduces aggregate demand by increasing taxes and/or decreasing government spending.

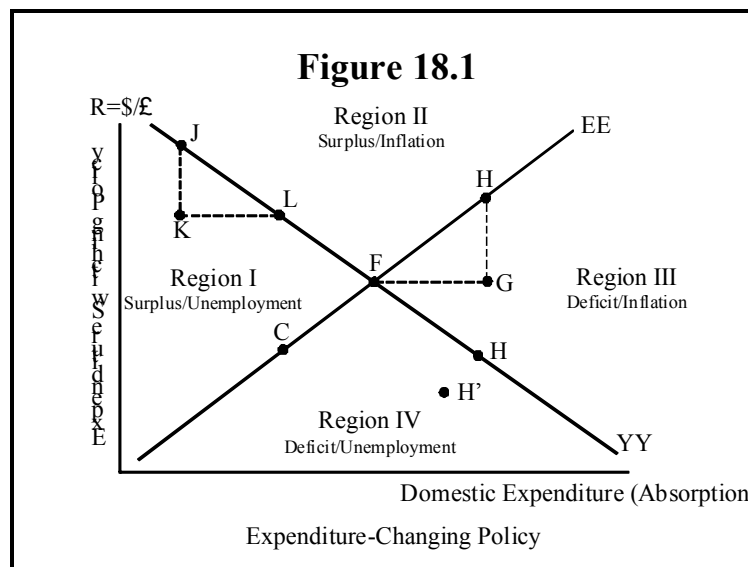
Monetary policy is the management of a nation's money supply by the nation's central bank. An expansionary monetary is one that increases the money supply. An increase in the money supply will lower interest rates, which increases borrowing for spending. The increased spending increases aggregate demand and the equilibrium level of output. Contractionary monetary policy raises the interest through reductions in the money supply. The higher interest rate lowers spending, which lowers equilibrium income.

Expenditure-changing policies affect the balance of payments primarily by changing domestic income. An expansionary expenditure-changing policy increases domestic income, and by increasing imports, moves the balance of payments towards a deficit. A contractionary expenditure-changing policy, through the same channels, moves the balance of payments towards surplus.

An expenditure-switching policy is a change in the exchange rate. Currency depreciation switches spending by both domestics and foreigners from foreign goods to domestic goods and so increases net exports,  $X-M$ . By increasing domestic spending, currency depreciation will also offset some of its own effects on net exports because some of the increased spending goes to imports.

Direct controls include tariffs, quotas, and other trade barriers, as well as **exchange controls**, and wage and price controls.

We begin with a very simple model, as demonstrated in the Swan Diagram in Fig. 18.1. The Swan Diagram demonstrates how expenditure-switching and expenditure-changing policies can be used to achieve simultaneous internal and external balance. The Swan Diagram is named after its developer, T.W. Swan, the author of the quote introducing this chapter of the study guide.



The EE line in Fig. 18.1 represents external balance. To see why it is upward sloping, start at point F, which is assumed to be a point of external balance, and imagine an increase in expenditures to point G. An increase in

expenditures will increase income and through the marginal propensity to import, will also increase imports, producing a balance-of-payments deficit at point G. (We are still assuming that the balance of payments is made up of only exports and imports.) In order to eliminate the deficit and restore external balance, R will have to increase from point G to point H (a depreciation of the dollar) in order to increase exports and reduce imports. Thus, for external balance to be maintained, an increase in domestic expenditures must be matched by a devaluation of the dollar. Note that any point to the right of EE indicates an external deficit, and any point to the left indicates an external surplus.

The line YY indicates internal balance, or full employment with no inflation. For simplicity, it is assumed that inflation only occurs if output is above full employment. If point J is a point of full employment, then a decrease in R to point K will, by increasing imports and decreasing exports (switching demand towards foreign goods), cause unemployment. In order to restore full employment, domestic expenditures must be increased from point K to point L. Note that any point to the left of YY indicates unemployment and any point to the right of YY indicates inflation.

Any point in Fig. 18.1 not on the EE and YY lines can be classified as a point that produces inflation or unemployment, and surplus or deficit. The four possible regions in Fig. 18.1 are labeled regions I, II, III and IV. Region I, for example, is above the EE line and below the YY line so all points in Region I will produce unemployment and a surplus.

There is only one point, point F, in Fig.18.1 where there is both internal and external balance. Any other point will require an expenditure-changing and/or an expenditure-switching policy to achieve simultaneous internal and external balance. Consider point C. Point C is on the EE line, but below the YY line, so there is external balance, but unemployment. In order to achieve point F, note that both types of policies are necessary. If just fiscal policy is used to increase expenditure to lower unemployment, then the increased income will cause more imports, producing an external deficit. The expenditure-increasing policy must be accompanied by a devaluation of the domestic currency (an increase in R) in order to achieve internal and external balance.

Similarly, point H produces internal balance, but an external deficit. If the external deficit is addressed by currency devaluation, then the resulting increase in expenditures on domestic goods will produce inflation. The devaluation must be accompanied by a reduction in domestic expenditures; fiscal and or monetary

policy must be contractionary.

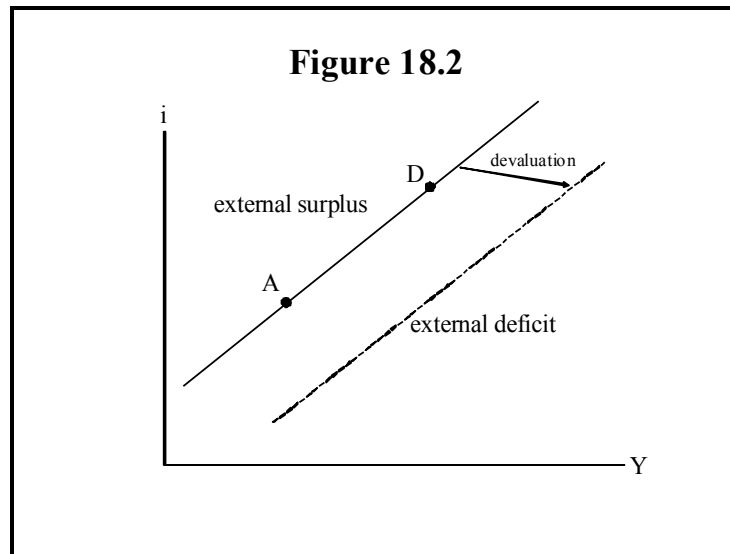
An interesting case is one like point H'. This case is interesting because intuition suggests that unemployment be addressed by domestic expansion, but that's not what the Swan Diagram suggests. At H' there is a deficit and unemployment. Notice that the size of the devaluation necessary to produce external balance increases domestic spending by enough to be inflationary. Domestic expenditures must be lowered in order to achieve internal-external balance.

The Swan Diagram helps us understand how devaluation and expenditure- changing and switching policies can be used to achieve internal-external balance. If policy makers, however, are reluctant to change the exchange rate, either because they have committed to a fixed exchange rate system, or they fear the costs of changing the exchange rate, then the above analysis suggests that both internal and external balance may be impossible to achieve.

The **Mundell-Fleming model**, however, addresses how both internal balance and external balance can be achieved with just expenditure-switching policies. The conclusions of the Mundell-Fleming model can be developed using IS-LM-BP analysis. It will be assumed that the student is reasonably familiar with IS-LM analysis, so only the BP line of the analysis will be summarized. See the *International Economics* text, including the Appendices to Chapter 18, for a review of the **IS curve**, the **LM curve** and the **BP curve**.

In the Mundell-Fleming model, external balance is determined not only by imports and exports, but also by the flow of financial capital. The BP line shows the combinations of income ( $Y$ ) and the interest rate ( $i$ ) for which there is external balance. Suppose an economy is in internal balance at point A in Fig. 18.2. If  $Y$  increases, moving horizontally to the right of point A, then there will be an external deficit due to the increase in imports that will accompany the increase in  $Y$ . In order to restore external balance at this higher level of income, the interest rate will have to increase in order to attract enough financial capital to make up for the increased imports. Thus, although there are indeed more outflows due to the higher imports at point D than at point A, there are more financial inflows. Points below and to the right of the BP line entail higher  $Y$ , and so higher imports, or a lower interest rate, so points below the BP line will produce an external deficit. Points above the line will produce an external surplus.

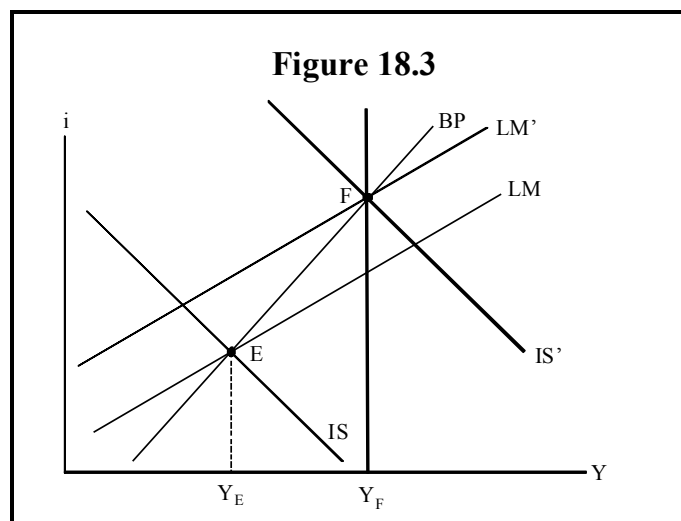
Although the intent of the Mundell-Fleming model is to determine how simultaneous internal and external balance can be achieved with fixed exchange rates, it can incorporate the effects of devaluation (or depreciation). If there is a depreciation of the domestic currency, then what was formerly external balance will now be a surplus. External balance could now be achieved with higher income or lower interest rates. That is, devaluation (or depreciation) will cause the BP line to shift down, as shown in Fig. 18.2.



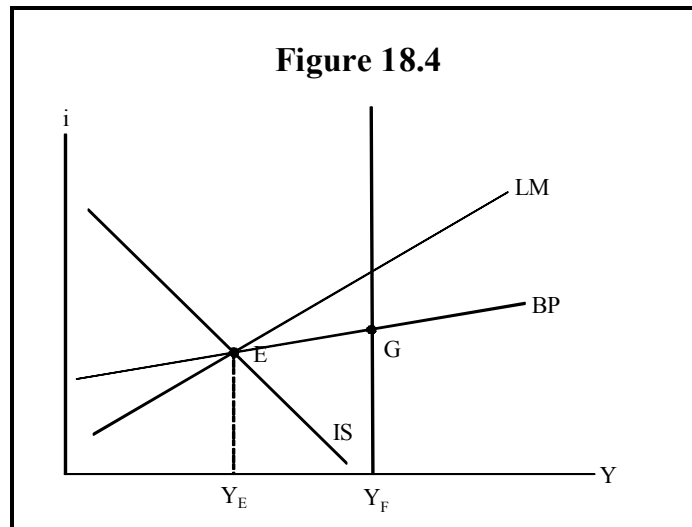
Assume simultaneous equilibrium in all three markets, so that  $i$  and  $Y$  are currently at the intersection of the IS, LM and BP curves. This is shown at point E in Fig. 18.3. At point E there is external balance, but there is unemployment because the equilibrium level of output,  $Y_E$ , is less than the full employment level of output,  $Y_F$ . Notice that full employment and external balance can be produced if LM shifts to LM' and IS shifts to IS'. LM will shift to LM' if the money supply is reduced by the appropriate amount, and IS will shift to IS' if fiscal policy is expansionary by the appropriate amount. Thus, it is possible to achieve internal-external balance through the use of just expenditure-changing policies. Given any initial situation, it is possible to shift the IS and LM curves to produce an intersection with BP at full employment.

In the above situation, where there was initially unemployment and external balance, it was necessary for fiscal policy to be expansionary and monetary policy to be contractionary in order to produce internal-external balance. This assignment of policies may change depending upon the shape of the BP curve. The BP curve is upward sloping because an increase in income increases imports, requiring an increase in interest rates to attract flows of

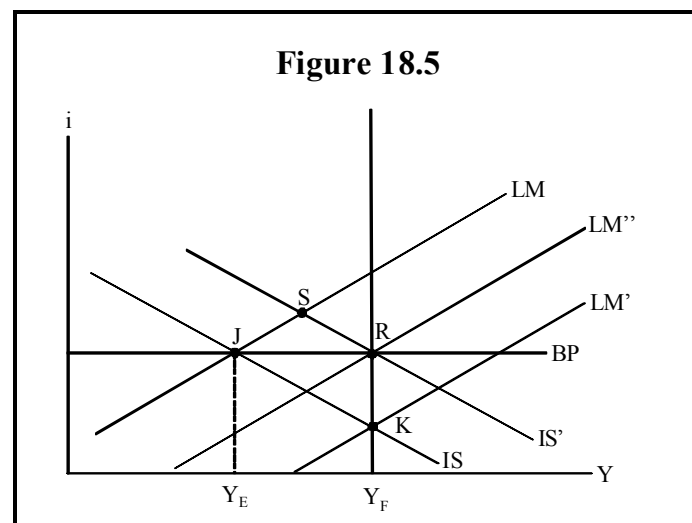
financial capital. If financial capital flows are highly responsive to interest rates—high mobility of financial capital—then only small increases in interest rates are necessary to attract the requisite amount of financial capital, so the BP curve will be flatter. In the extreme case of perfect mobility of financial capital, infinitesimally small increases in the interest rate are all that is necessary to attract the requisite amount of financial capital, and the BP curve will be flat. From another perspective, a flat BP curve means that countries cannot charge an interest rate (assuming equal risks across countries) different than the rest of the world because it will set off financial flows that will equate it to the rest of the world. Equality of interest rates throughout the world is the law of one price applied to interest rates. If interest rates are higher in the United Kingdom than in the United States, then funds will flow to the United Kingdom, lowering the interest rate until it equals the U.S. interest rate.



Now take the same initial situation as in Fig. 18.3, but assume a very flat BP curve. This is shown in Fig. 18.4. In order to reach full employment and external balance, the IS, LM, and BP curves have to intersect at point G, which requires both expansionary fiscal policy (shifting the IS curve to the right) and expansionary monetary policy (shifting the LM curve to the right.)



If there is perfect mobility of financial capital, then we get the interesting result that *in a fixed exchange rate system, monetary policy, by itself, becomes completely ineffective*. The case of perfect mobility of financial capital is shown in Fig. 18.5. Equilibrium is assumed to be initially at point J, at which there is external balance but unemployment.



If monetary authorities attempt to promote full employment by increasing the money supply, say through open market operations, then the LM curve will shift to LM'. The IS and LM curves now intersect at point K, which is below the BP line. The low interest rate produces financial outflows and downward pressure on the domestic currency's exchange rate. To maintain a fixed exchange rate, the monetary authorities must buy their own currency, which reduces the money supply, shifting the LM curve back to its original position. Monetary policy becomes completely ineffective because the money supply



cannot be controlled. (Recall that the same conclusion about monetary control with fixed exchange rates was reached in Chapter 15, although the analysis was the monetary approach to exchange rates.)

*Fiscal policy, however, does become effective in a fixed exchange rate system.* If the IS curve is shifted to IS' (less than what is necessary to reach full employment), then IS and LM intersect at point S, at an interest rate above the BP line. The higher interest rate will attract financial flows, putting upward pressure on the country's exchange rate. In order to maintain a fixed exchange rate, the monetary authorities must sell their own currency, which increases the money supply, shifting the LM curve to the right to LM". This will occur until interest rates reach the BP line, which occurs at point R.

With floating exchange rates and perfect mobility of financial capital, the role of fiscal and monetary policy reverses. *In a floating exchange rate system, fiscal policy becomes ineffective and monetary policy becomes effective.* If we start, as above, with external balance and unemployment, then expansionary fiscal policy will shift the IS curve to the right so that the IS and LM curves intersect above the flat BP line. (Draw this.) The equilibrium interest rate is now above the flat BP line, causing financial inflows, which will cause an appreciation of the exchange rate. An appreciated exchange rate will cause exports to decrease and imports to increase, which are reductions in spending on domestic goods. This decreased spending shifts the IS curve back until the interest rate reaches the flat BP line, which is at the original equilibrium. Essentially, increased government spending (or lower taxes) causes decreased exports and increased imports by the same total amount, leaving total spending unchanged.

Monetary policy, though, is effective with floating exchange rates. An increase in the money supply shifts the LM curve to the right, producing an intersection with the IS curve at an interest rate below the flat BP line. The low interest rate produces financial capital outflows and a depreciation of the domestic currency. The currency depreciation increases exports and decreases imports, shifting the IS curve to the right until it intersects the LM curve on the flat BP line, which is at a higher level of output. An increased money supply works not by the usual mechanism of lowering interest rates, but by changing the currency value, which stimulates exports and discourages imports.

There is an interesting analysis that suggests that monetary policy should be directed towards external balance problems and that fiscal policy should be directed towards internal balance problems. This is Mundell's **principle of**

**effective market classification**, in which a policy should be directed at that target on which it has the most effect. The key to understanding why monetary policy should be used for external balance problems is recognizing that monetary policy will have a greater effect on the external balance than will fiscal policy.

The *International Economics* text presents Mundell's principle of effective market classification graphically; it will be summarized here intuitively. If fiscal policy is expansionary, then it will increase domestic income and imports, causing an external deficit. If, on the other hand, monetary policy is expansionary, increasing domestic income by the same amount as in the expansionary fiscal case, then imports will also increase. But expansionary monetary policy works by reducing interest rates, so in addition to increasing imports, there will be an outflow of financial. Thus, expansionary monetary policy will cause a greater external deficit than an equivalent fiscal policy, as measured by the effect on income. Similarly, contractionary monetary policy will cause a greater external surplus than will fiscal policy. If policy is directed towards that goal (internal balance versus external balance) on which it has the larger effect, then monetary policy should be used for external balance problems, leaving fiscal policy to be used for internal balance problems.

There are a number of problems with this analysis, including the assumption that fiscal policy has little effect on interest rates (or that monetary policy is always used to offset the effect of fiscal policy on interest rates), as well as the fact that nations often have more than two objectives. Additional objectives include price stability and adequate long-run growth, so fiscal and monetary policy would have to be supplemented by other policies such as exchange rate changes and direct controls, the latter being summarized in the *International Economics* text.

### III. Questions

1. a) Suppose that a nation has an external surplus and inflation. Is it necessarily the case that expenditures should be reduced, along with the appropriate expenditure-switching policy, in order to reach internal and external balance? Along with your explanation, demonstrate your answer with the Swan Diagram. (Assume throughout this question that the Marshall-Lerner condition is met.)

b) Suppose a nation has a deficit and inflation. Is it necessarily the case that expenditures should be reduced, along with the appropriate expenditure-

switching policy, in order to reach internal and external balance? Along with your explanation, demonstrate your answer with the Swan Diagram.

c) Is it possible to for a nation to eliminate a deficit and inflation with just an expenditure-switching policy? Along with your explanation, demonstrate your answer with the Swan Diagram.

**2.** Suppose that the Marshall-Lerner condition is not met, i.e., a depreciation (or devaluation) of a currency actually causes a larger deficit. Draw the EE and YY schedules of the Swan Diagram.

**3.** Assuming perfect mobility of financial capital and fixed exchange rates, use IS-LM-BP analysis to determine the effect of the following changes on a nation's

- i) interest rate
- ii) domestic income
- iii) trade balance (the trade balance is only part of external balance when there are financial capital flows)

a) An increase in foreign incomes, leading to greater imports by foreigners

b) An increase in a nation's budget deficit

c) The central bank conducts open market purchases designed to increase the money supply

**4.** Assuming perfect mobility of financial capital and a floating exchange rate, use IS-LM-BP analysis to determine the effect of each of the following (a-c) on a nation's

- i) Interest rate
- ii) Domestic income
- iii) Trade balance
- iv) Exchange rate

a) An increase in foreign incomes, leading to greater imports by foreigners

b) An increase in a nation's budget deficit

c) The central bank conducts open market purchases designed to increase the money supply

**5.** Suppose events lead international investors to become concerned about the safety of their investments in a nation with perfect financial capital mobility. A small nation will tend to have a flat BP line because they can have little influence on world interest rates. If international investors perceive greater risk, they will require higher interest rates. This has the effect of shifting the BP line up. Assume the small nation pursues a fixed exchange rate and was originally at full employment.

a) Will this fear by international investors cause domestic incomes to fall or increase? Use IS-LM-BP analysis.

b) What policy should the small nation pursue to restore full employment?

**6.** a) What important component of the balance of payments is assumed away by the Swan Diagram, but is an important part of the IS-LM-BP analysis?

b) Why could the Swan Diagram be considered appropriate for very long-run analysis?

**7.** Using IS-LM-BP analysis, determine the direction (expansionary or contractionary) of fiscal policy and monetary policy necessary to correct the following situations. Assume that financial capital is not perfectly mobile, but the BP line is flatter than the LM curve. Assume that exchange rates are fixed.

a) Full employment and external surplus

b) Full employment and external deficit

c) Inflation (production above full employment) and external deficit

b) Unemployment and external deficit

**8.** According to the principle of effective market classification, determine the

direction of fiscal policy and monetary policy necessary to correct the following situations:

- a) External deficit and inflation
- b) External deficit and unemployment
- c) External surplus and inflation
- d) External surplus and unemployment

**9.** a) Using the IB-EB lines developed in the Salvatore text (but not in the above Summary and Review), explain why the IB line is steeper than the EB line. Here's a way to proceed: Begin at the intersection of IB and EB and then increase government spending. Now, will interest rates have to be increased more or less to reach internal balance versus external balance? Whichever balance requires the greater increase in interest rates has the steeper line.

b) What do the IB-EB lines look like if international flows of financial capital are not responsive to interest rate changes?

c) Assume external surplus and inflation. Using the IB-EB model, show and explain what would happen if policy makers begin by decreasing the money supply, followed by increasing government spending.

**10.** Explain how IS-LM-BP analysis differs from that used in effective market classification? (Hint: Consider how fiscal policy is treated in the two models.)