Module 45

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Putting It All Together

What you will learn in this Module:

- How to use macroeconomic models to conduct policy analysis
- How to approach free-response macroeconomics questions

Having completed our study of the basic macroeconomic models, we can use them to analyze scenarios and evaluate policy recommendations. In this module we develop a step-by-step approach to macroeconomic analysis. You can adapt this approach to problems involving any macroeconomic model, including models of aggregate demand and supply, production possibilities, money markets, and the Phillips curve. By the end of this module you will be able to combine mastery of the principles of macroeconomics with problem solving skills to analyze a new scenario on your own.

Module 45: Putting It All Together

A Structure for Macroeconomic Analysis

In our study of macroeconomics we have seen questions about the macroeconomy take many different forms. No matter what the specific question, most macroeconomic problems have the following components:

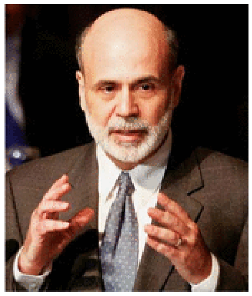
1) A *starting point*. To analyze any situation, you have to know where to start.

2) A *pivotal event*. This might be a change in the economy or a policy response to the initial situation.

3) *Initial effects of the event*. An event will generally have some initial, short-run effects.

4) *Secondary and long-run effects of the event*. After the short-run effects run their course, there are typically secondary effects and the economy will move toward its long-run equilibrium.

For example, you might be asked to consider the following scenario and answer the associated questions.



How will the Fed’s monetary policy change nominal interest rates? AP Photo/Mark Lennihan

Assume the U.S. economy is currently operating at an aggregate output level above potential output. Draw a correctly labeled graph showing aggregate demand, short-run aggregate supply, long-run aggregate supply, equilibrium output, and the aggregate price level. Now assume that the Federal Reserve conducts contractionary monetary policy. Identify the open-market operation the Fed would conduct, and draw a correctly labeled graph of the money market to show the effect of the monetary policy on the nominal interest rate.

Show and explain how the Fed’s actions will affect equilibrium in the aggregate demand and supply graph you drew previously. Indicate the new aggregate price level on your graph.

Assume Canada is the largest trading partner of the United States. Draw a correctly labeled graph of the foreign exchange market for the U.S. dollar showing how the change in the aggregate price levelyou indicate on your graph above will affect the foreign exchange market. What will happen to the value of the U.S. dollar relative to the Canadian dollar?

How will the Federal Reserve’s contractionary monetary policy affect the real interest rate in the United States? Explain.

Taken as a whole, this scenario and the associated questions can seem overwhelming. Let’s start by breaking down our analysis into four components.

1. The starting point

Assume the U.S. economy is currently operating at an aggregate output level above potential output.

2. The pivotal event

Now assume that the Federal Reserve conducts contractionary monetary policy.

3. Initial effects of the event

Show and explain how the Fed’s actions will affect equilibrium.

4. Secondary and long-run effects of the event

Assume Canada is the largest trading partner of the United States. What will happen to the value of the U.S. dollar relative to the Canadian dollar?

How will the Federal Reserve’s contractionary monetary policy affect the real interest rate in the United States? Explain.

Now we are ready to look at each of the steps and untangle this scenario.

A Structure for Macroeconomic Analysis

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The Starting Point

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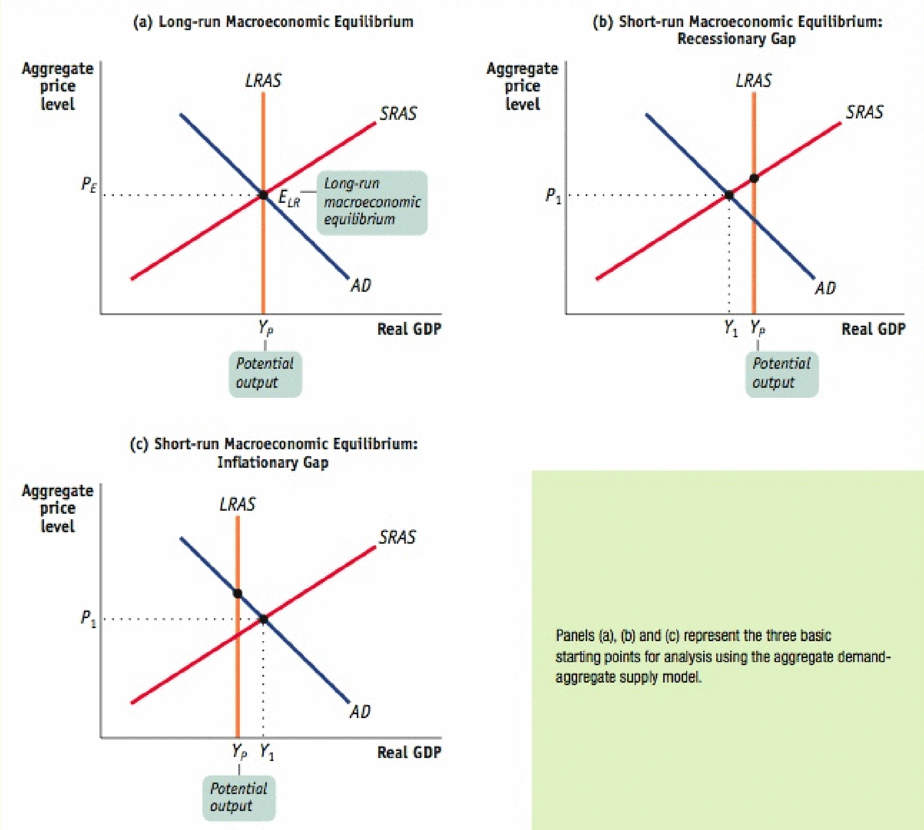
Assume the U.S. economy is currently operating at an aggregate output level above potential output. Draw a correctly labeled graph showing aggregate demand, short-run aggregate supply, long-run aggregate supply, equilibrium output, and the aggregate price level.

To analyze a situation, you have to know where to start. You will most often use the aggregate demand-aggregate supply model to evaluate macroeconomic scenarios. In this model, there are three possible starting points: long-run macroeconomic equilibrium, a recessionary gap, and an inflationary gap. This means that there are three possible "starting-point" graphs, as shown in **Figure 45.1**. The economy can be in long-run macroeconomic equilibrium with production at potential output as in panel (a), it can be in short-run macroeconomic equilibrium at an aggregate output level below potential output (creating a recessionary gap) as in panel (b), or it can be in short-run macroeconomic equilibrium at an aggregate output level above potential output (creating an inflationary gap) as in panel (c) and in our scenario.

figure 45.1 Analysis Starting Points



Panels (a), (b) and (c) represent the three basic starting points for analysis using the aggregate demand-aggregate supply model.

The Starting Point

The Pivotal Event

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Now assume that the Federal Reserve conducts contractionary monetary policy.

It is the events in a scenario that make it interesting. Perhaps a country goes into or recovers from a recession, inflation catches consumers off guard or becomes expected, consumers or businesses become more or less confident, holdings of money or wealth change, trading partners prosper or falter, or oil prices plummet or spike. The event can also be expansionary or contractionary monetary or fiscal policy. With the infinite number of possible changes in policy, politics, the economy, and markets around the world, don't expect to analyze a familiar scenario on the exam.

While it's impossible to foresee all of the scenarios you might encounter, we can group the determinants of change into a reasonably small set of major factors that influence macroeconomic models. **Table 45.1** matches major factors with the curves they affect. With these influences in mind, it is relatively easy to proceed through a problem by identifying how the given events affect these factors. Most hypothetical scenarios involve changes in just one or two major factors. Although the real world is more complex, it is largely the same factors that change—there are just more of them changing at once.

table **45.1**

Major Factors that Shift Curves in Each Model

Aggregate Demand and Aggregate Supply		
Aggregate Demand Curve	**Short-run Aggregate Supply Curve**	**Long-run Aggregate Supply Curve**
Expectations	Commodity prices	Productivity
Wealth	Nominal wages	Physical capital
Size of existing capital stock	Productivity	Human capital
Fiscal and monetary policy	Business taxes	Technology
Net Exports		Quantity of resources
Interest rates		
Investment spending		

Supply and Demand	
Demand Curve	**Supply Curve**
Income	Input prices
Prices of substitutes and complements	Prices of substitutes and complements in production
Tastes	Technology
Consumer expectations	Producer expectations
Number of consumers	Number of producers
Loanable Funds Market	
Demand Curve	**Supply Curve**
Investment opportunities	Private saving behavior
Government borrowing	Capital inflows
Money Market	
Demand Curve	**Supply Curve**
Aggregate price level	Set by the Federal Reserve
Real GDP	
Technology (related to money market)	
Institutions (related to money market)	
Foreign Exchange Market	
Demand	**Supply**
Foreigners' purchases of domestic	Domestic residents' purchases of foreign
Goods	Goods
Services	Services
Assets	Assets

Note: It is the *real* exchange rate (adjusted for international differences in aggregate price levels) that affects imports and exports.

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As shown in **Table 45.1**, many curves are shifted by changes in only two or three major factors. Even for the aggregate demand curve, which has the largest number of associated factors, you can simplify the task further by asking yourself, “Does the event influence consumer spending, investment spending, government spending, or net exports?” If so, aggregate demand shifts. A shift of the long-run aggregate supply curve is caused only by events that affect labor productivity or the number of workers.

You’ve seen the speech, now, how would you analyze the proposed policy? AP Photo/Gus Ruelas

In the supply and demand model there are five major factors that shift the demand curve and five major factors that shift the supply curve. Most examples using this model will represent a change in one of these ten factors. The loanable funds market, money market, and foreign exchange market have their own clearly identified factors that affect supply or demand. With this information you can link specific events to relevant factors in the models to see what changes will occur. Remember that having correctly labeled axes on your graphs is crucial to a correct analysis.

Often, as in our scenario, the event is a policy response to an undesirable starting point such as a recessionary or inflationary gap. Expansionary policy is used to combat a recession, and contractionary policy is used to combat inflationary pressures. To begin analyzing a policy response, you need to fully understand how the Federal Reserve can implement each type of monetary policy (e.g., increase or decrease the money supply) and how that policy eventually affects the economy. You also need to understand how the government can implement expansionary or contractionary fiscal policy by raising or lowering taxes or government spending.

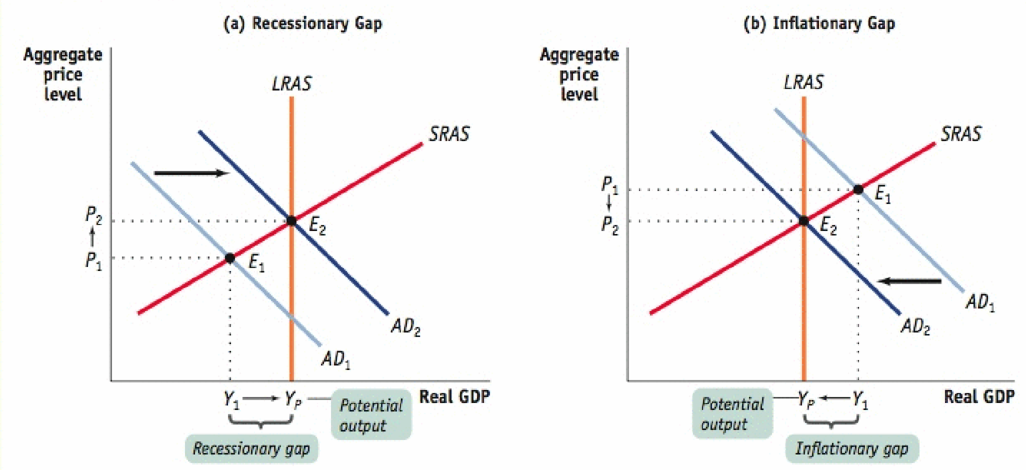
The Pivotal Event

The Initial Effect of the Event

Show and explain how the Fed's actions will affect equilibrium.

We have seen that events will create short-run effects in our models. In the short-run, fiscal and monetary policy both affect the economy by shifting the aggregate demand curve. As shown in panel (a) of **Figure 45.2**, expansionary policy shifts aggregate demand to the right, and as shown in panel (b), contractionary policy shifts aggregate demand to the left. To illustrate the effect of a policy response, shift the aggregate demand curve on your starting point graph and indicate the effects of the shift on the aggregate price level and aggregate output.

figure 45.2 Monetary and Fiscal Policy Close Output Gaps



By shifting the aggregate demand curve, monetary and fiscal policy can close output gaps in the economy as shown in panel (a) for a recessionary gap and panel (b) for an inflationary gap.

The Initial Effect of the Event

Secondary and Long-Run Effects of the Event

Assume Canada is the largest trading partner of the United States. What will happen to the value of the U.S. dollar relative to the Canadian dollar?

How will the Federal Reserve's contractionary monetary policy affect the real interest rate in the United States? Explain.

Secondary Effects In addition to the initial, short-run effects of any event, there will be secondary effects and the economy will move to its long-run equilibrium after the short-run effects run their course.

We have seen that negative or positive demand shocks (including those created by inappropriate monetary or fiscal policy) move the economy away from long-run macroeconomic equilibrium. As explained in **Module 18**, in the absence of policy responses, such events will eventually be offset through changes in short-run aggregate supply resulting from changes in nominal wage rates. This will move the economy back to long-run macroeconomic equilibrium.

If the short-run effects of an action result in changes in the aggregate price level or real interest rate, there will also be secondary effects throughout the open economy. International capital flows and international trade will be affected as a result of the initial effects experienced in the economy. A price level decrease, as in our scenario, will encourage exports and discourage imports, causing an appreciation in the domestic currency on the foreign exchange market. A change in the interest rate affects aggregate demand through changes in investment spending and consumer spending. Interest rate changes also affect aggregate demand through changes in imports or exports caused by currency appreciation and depreciation. These secondary effects act to reinforce the effects of monetary policy.

Long-run Effects While deviations from potential output are ironed out in the long run, other effects remain. For example, in the long run the use of fiscal policy affects the federal budget. Changes in taxes or government spending that lead to budget deficits (and increased federal debt) can "crowd out" private investment spending in the long run. The government's increased demand for loanable funds drives up the interest rate, decreases investment spending, and partially offsets the initial increase in aggregate demand. Of course, the deficit could be addressed by printing money, but that would lead to problems with inflation in the long run.

We know that in the long run, monetary policy affects only the aggregate price level, not real GDP. Because money is neutral, changes in the money supply have no effect on the real economy. The aggregate price level and nominal values will be affected by the same proportion, leaving real values (including the real interest rate as mentioned in our scenario) unchanged.

Secondary and Long-Run Effects of the Ev...

Analyzing Our Scenario

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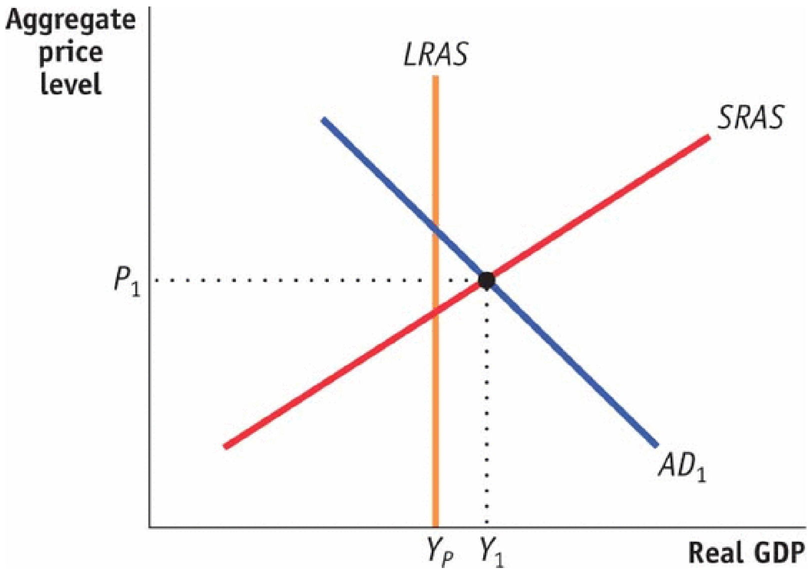
Now let's address the specific demands of our problem.

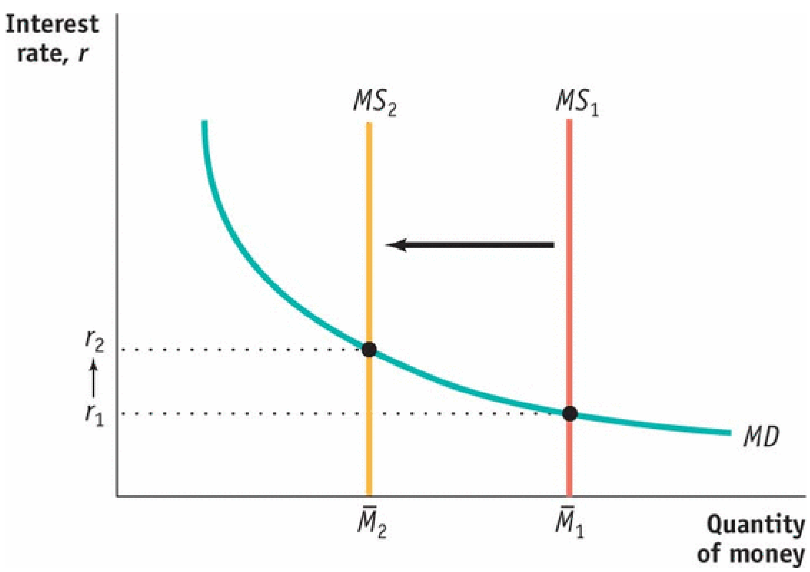
✔ *Draw a correctly labeled graph showing aggregate demand, short-run aggregate supply, long-run aggregate supply, equilibrium output, and the aggregate price level.*



✔ *Identify the open-market operation the Fed would conduct.*

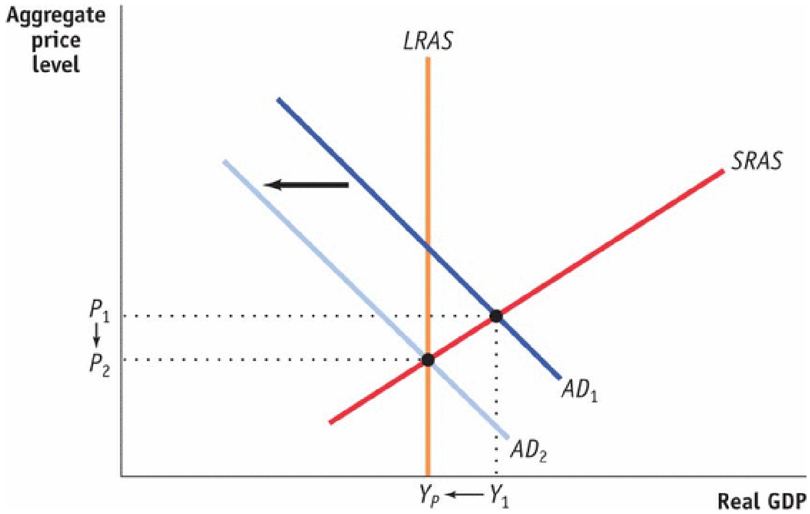
The Fed would sell U.S. Treasury securities (bonds, bills, or notes).

✔ *Draw a correctly labeled graph of the money market to show the effect of the monetary policy on the nominal interest rate.*



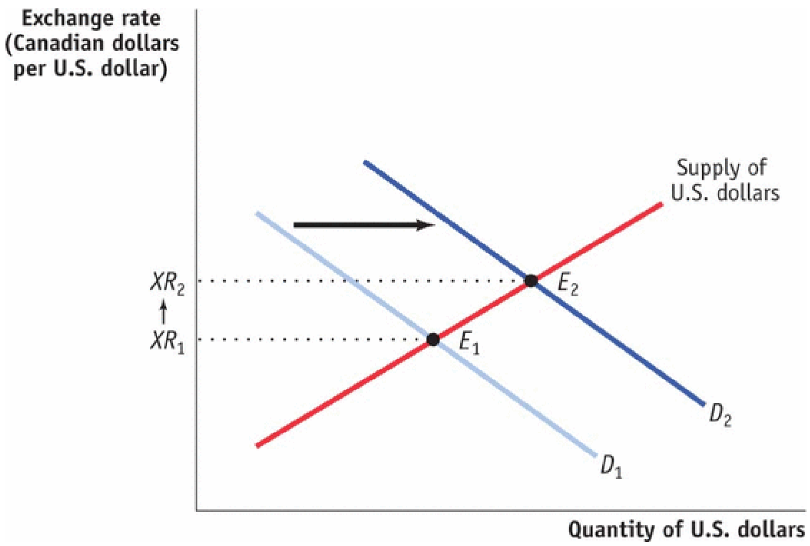
✔ *Show and explain how the Fed's actions will affect equilibrium in the aggregate demand and supply graph you drew previously. Indicate the new aggregate price level on your graph.*

A higher interest rate will lead to decreased investment and consumer spending, decreasing aggregate demand. The equilibrium price level and real GDP will fall.



✔ *Draw a correctly labeled graph of the foreign exchange market for the U.S. dollar showing how the change in the aggregate price level you indicate on your graph above will affect the foreign exchange market.*

The decrease in the U.S. price level will make U.S. exports relatively inexpensive for Canadians to purchase and lead to an increase in demand for U.S. dollars with which to purchase those exports.



✔ *What will happen to the U.S. dollar relative to the Canadian dollar?*

The U.S. dollar will appreciate.

✔ *How will the Federal Reserve's contractionary monetary policy affect the real interest rate in the United States? Explain.*

There will be no effect on the real interest rate in the long run because, due to the neutrality of money, changes in the money supply do not affect real values in the long run.

⬅ Analyzing Our Scenario ➡

Summary

1. A country's **balance of payments accounts** summarize its transactions with the rest of the world. The **balance of payments on the current account**, or the **current account**, includes the **balance of payments on goods and services** together with balances on factor income and transfers. The **merchandise trade balance**, or **trade balance**, is a frequently cited component of the balance of payments on goods and services. The **balance of payments on the financial account**, or **the financial account**, measures capital flows. By definition, the balance of payments on the current account plus the balance of payments on the financial account is zero.

2. Capital flows respond to international differences in interest rates and other rates of return; they can be usefully analyzed using an international version of the loanable funds model, which shows how a country where the interest rate would be low in the absence of capital flows sends funds to a country where the interest rate would be high in the absence of capital flows. The underlying determinants of capital flows are international differences in savings and opportunities for investment spending.

3. Currencies are traded in the **foreign exchange market;** the prices at which they are traded are **exchange rates**. When a currency rises against another currency, it **appreciates;** when it falls, it **depreciates**. The **equilibrium exchange rate** matches the quantity of that currency supplied to the foreign exchange market to the quantity demanded.

4. To correct for international differences in inflation rates, economists calculate **real exchange rates**, which multiply the exchange rate between two countries' respective currencies by the ratio of the countries' price levels. The current account responds only to changes in the real exchange rate, not the nominal exchange rate. **Purchasing power parity** is the exchange rate that makes the cost of a basket of goods and services equal in two countries. While purchasing power parity and the nominal exchange rate almost always differ, purchasing power parity is a good predictor of actual changes in the nominal exchange rate.

5. Countries adopt different **exchange rate regimes**, rules governing exchange rate policy. The main types are **fixed exchange rates**, where the government takes action to keep the exchange rate at a target level, and **floating exchange rates**, where the exchange rate is free to fluctuate. Countries can fix exchange rates using **exchange market intervention**, which requires them to hold **foreign exchange reserves** that they use to buy any surplus of their currency. Alternatively, they can change domestic policies, especially monetary policy, to shift the demand and supply curves in the foreign exchange market. Finally, they can use **foreign exchange controls**.

6. Exchange rate policy poses a dilemma: there are economic payoffs to stable exchange rates, but the policies used to fix the exchange rate have costs. Exchange market intervention requires large reserves, and exchange controls distort incentives. If monetary policy is used to help fix the exchange rate, it isn't available to use for domestic policy.

7. Fixed exchange rates aren't always permanent commitments: countries with a fixed exchange rate sometimes engage in **devaluations** or **revaluations**. In addition to helping eliminate a surplus of domestic currency on the foreign exchange market, a devaluation increases aggregate demand. Similarly, a revaluation reduces shortages of domestic currency and reduces aggregate demand.

8. Under floating exchange rates, expansionary monetary policy works in part through the exchange rate: cutting domestic interest rates leads to a depreciation, and through that to higher exports and lower imports, which increases aggregate demand. Contractionary monetary policy has the reverse effect.

9. The fact that one country's imports are another country's exports creates a link between the business cycles in different countries. Floating exchange rates, however, may reduce the strength of that link.

Summary