ECONOMICS OF DEVELOPMENT

SEVENTH EDITION

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15 Managing Short-Run Crises in an Open Economy

Economic development takes place in the long term. Most of the processes discussed in the previous chapters, whether improving human welfare, increasing saving, or shifting toward manufactured exports, take years and even decades to bear significant results. If policy makers in developing countries gaze only at the far horizon, however, they are unlikely ever to reach it. Much happens in the short term, within a few months or a couple of years, to throw an economy off balance and make pursuing long-term strategies difficult and sometimes impossible. Policy makers need to emulate a ship's captain, who, always steering toward the port of destination, nevertheless must deal decisively with any storms at sea.

Among the most dangerous and likely of these storms are changes in world prices that throw the balance of payments into deficit, excessive spending that fuels inflation or unsustainable debt, and droughts or other natural disasters that disrupt production. Unless a government counteracts these economic shocks, they create greater uncertainty and higher risk for private producers and investors, who take evasive actions that reduce future investment, worsen the crisis, and cause development efforts to flounder.

During the 1970s and 1980s, the late 1990s, and in Europe in 2010–11, as pointed out in Chapters 12 and 13, many economies became unbalanced because of unstable world market conditions and their own macroeconomic mismanagement. In Chapters 5 and 11 through 13, we discussed the consequences of such **macroeconomic instability**. Countries with overvalued exchange rates and rapid inflation were unable to grow rapidly. *Stabilization programs*, many funded by the International Monetary Fund (IMF), were intended to correct these macroeconomic imbalances.

In this chapter, we develop a mechanism for analyzing the macroeconomic policies that a developing country should pursue to stabilize its economy and create a climate for faster economic growth. The model developed here incorporates the two main policy approaches for correcting macroeconomic imbalances: changing the level of domestic expenditures and adjusting relative prices. In many cases, managing economic crises specifically requires expenditure reduction (by lower government budget deficits and slower creation of money) and exchange-rate devaluation.

EQUILIBRIUM IN A SMALL, OPEN ECONOMY

Developing economies[1] have two features central to understanding how macroeconomic imbalances occur and can be corrected. First, they are **open economies**, in that trade and capital flow across their borders in sufficient quantities to influence the domestic economy, particularly prices and the money supply. Most economies are open in this sense, especially because of economic reforms in China beginning in the late 1970s and in Eastern Europe and the states of the former Soviet Union beginning in the early 1990s. Today only a few economies, such as Cuba, North Korea, and Burma, are so heavily protected and regulated (and subject to foreign embargoes) that they might not qualify as open to trade and finance.

Second, these are **small economies**, meaning that neither their supply of exports nor their demand for imports has a noticeable impact on the world prices of these commodities and services. Economists call these countries *price takers* in world markets. A number of developing countries can exert some influence over the price of one or two primary exports in world markets: Brazil in coffee, Saudi Arabia in oil, Zambia in copper, South Africa in diamonds, for example. But they almost never affect the price of goods they import, and for macroeconomic purposes, it usually is adequate to model even these countries as price takers.[2]

These two qualities, smallness and openness, are the basis for the **Australian model** of a developing economy.[3] Countries typically trade both importable and

[1]In developing this and the next two sections, we acknowledge an intellectual debt to Shantayanan Devarajan and Dani Rodrik, who wrote an excellent set of notes for their class on macroeconomics for developing countries at Harvard's John F. Kennedy School of Government in the late 1980s and to Richard E. Caves, Jeffrey A. Frankel, and Ronald W. Jones, who develop the open economy model in Chapter 19 of *World Trade and Payments: An Introduction* (Glenview, IL: Scott, Foresman, Little, Brown, 1990).

[2]Among developing countries, China and India are large enough that they could become exceptions to the small country rule, given continued growth in China and both greater growth and openness in India.

[3]So called because it was developed by Australian economists, including W. E. G. Salter, "Internal Balance and External Balance: The Role of Price and Expenditure Effects," *Economic Record* 35 (1959), 226–38; Trevor W. Swan, "Economic Control in a Dependent Economy," *Economic Record* 36 (March 1960), 51–66; W. Max Corden, *Inflation, Exchange Rates and the World Economy* (Chicago: University of Chicago Press, 1977). Australia also is a small, open economy.

exportable goods and services. The Australian model lumps importables and exportables together as *tradables* and distinguishes these from all other goods and services, called *nontradables.* (We use this specification again in Chapter 18's discussion of Dutch disease.)

Tradable goods and services are those whose prices within the country are determined by supply and demand on world markets. Under the small economy assumption, these world market prices cannot be influenced by anything that happens within the country and so are *exogenous* to the model (determined outside the model). The domestic (local currency) price of a tradable good is given by $P_t = eP_t^*$ where e is the nominal exchange rate in local currency per dollar (pesos per dollar for Mexico or rupees per dollar for Pakistan) and P_t^* is the world price of the tradable in dollars. Even if the supply of and demand for tradables change within an economy, the local price will not change because domestic supply and demand have a negligible influence on the world price. Yet, changes in the nominal exchange rate change the domestic price of tradables commodities. If a country **devalues** its nominal exchange rate, it increases the amount of local currency required to purchase a dollar (e increases); if a country **revalues** its nominal exchange rate it decreases the amount of local currency required to purchase a dollar (e decreases). Devaluations thus increase the local currency price of tradables (all else equal), while revaluations tend to decrease the local currency price of tradables. Because this model simplifies all tradables into one composite good, the price of tradables P_t is best thought of as an index, a weighted average of the prices of all tradables, much like a consumer price index.

Tradables include exportables, such as coffee in Kenya and Colombia, rice in Thailand, beef in Argentina, cattle in West Africa, palm oil in Malaysia and Indonesia, copper in Peru and Zambia, oil in the Middle East, and textiles and electronics in East Asia, and importables, such as rice in West Africa, oil in Brazil or Korea, and intermediate chemicals and machinery in many developing countries.

Nontradables are goods and services, such as transportation, construction, retail trade, and household services that are not easily or conventionally bought or sold outside the country, usually because the costs of transporting them from one country to another are prohibitive or local custom inhibits trade. Prices of nontradables, designated P_n, therefore, are determined by market forces within the economy; any shift in supply or demand changes the price of nontradables. Nontradable prices thus are *endogenous* to the model (determined within the model). The term P_n, like P_t, is a composite or weighted average price incorporating all prices of nontradable goods and services.

INTERNAL AND EXTERNAL BALANCE

Figure 15–1 depicts equilibrium under the Australian model. The vertical axis represents nontradables (N); the horizontal axis takes both exportables and importables and treats them together as tradables (T). The production possibility frontier shows

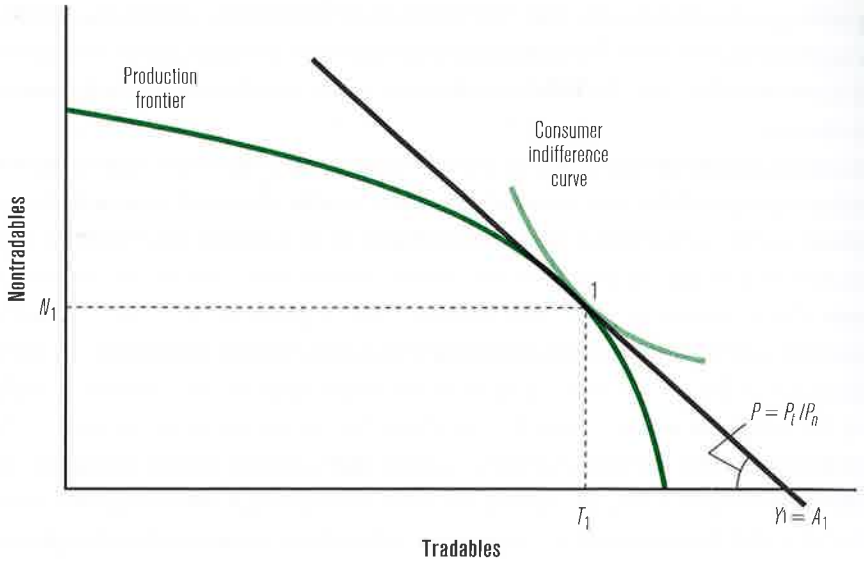


FIGURE 15-1 Equilibrium in the Australian Model

With equilibrium at point 1, the tangency of the production frontier and a community indifference curve, the country produces and consumes T_1 of tradables and N_1 of nontradables. The relative price, P, is a measure of the real exchange rate (see text). Y_1, national income measured in tradable prices.

the menu of possible combinations of outputs of the two kinds of goods, N and T. The community indifference curves show consumer preferences between consumption of tradables and nontradables.

Equilibrium is at point 1, the tangency of a consumer indifference curve and the production possibilities frontier. At this point, the production of tradables, determined by the production frontier at point 1, is T_1, equal to the demand for tradables, determined by the indifference curve at 1, and similarly, for nontradables, supply equals demand at N_1. This is a defining characteristic of equilibrium in the Australian model: At point 1, the markets for both goods are in balance. Put another way, there is **external balance (EB)**, because the supply of tradables equals demand, and **internal balance (IB)**, because the supply of nontradables equals demand.

Point 1 simultaneously indicates the optimal (profit maximizing) combination of tradables and nontradables for producers, the optimal (utility maximizing) combination of tradable and nontradables for consumers. For both producers and consumers, this optimum occurs with respect to relative prices—in this case the relative price of tradables to nontradables. This relative price is indicated by the slope of the price line in Figure 15–1. This joint equilibrium for producers and consumers is indicated by the tangency of the indifference curve and the production possibility frontier. The tangency of the indifference curve and production frontier is jointly determined with the relative price of tradables in terms of nontradables, $P = P_t/P_n$. This relative

price, P, is one way to define the **real exchange rate (RER)**, one of the important innovations of the Australian model.[4] (Box 15–1 provides a more detailed explanation of the real exchange rate.) This formulation separates out prices that are under the influence of monetary and fiscal policy and domestic market forces, P_n, from prices that can be changed only by adjustments of the nominal exchange rate, $P_t = eP_t^*$. Note that the slope of the price line that is tangent to the production possibility curve and the consumer indifference curve is the only real exchange rate consistent with equilibrium in the model.

If P rises (the price line becomes steeper in the diagram), tradables become more expensive relative to nontradables. Producers then attempt to switch along the production frontier away from N goods, toward T goods. Consumers attempt to switch in the opposite direction, up along the indifference curve to consume fewer T goods and more N goods. Therefore, a rise in P should increase the surplus of T-good production over consumption.

If the production of T goods exceeds consumption of T goods, there is an external surplus, which is identical to a surplus in the balance of trade. To see this, start with the definition of the trade balance as

$$B_t = X - M \qquad [15\text{–}1]$$

where X and M are exports and imports. Because exports are the surplus of supply over demand for exportable goods, while imports are the opposite, a surplus of demand over supply, we can write the balance of trade as

B_t = value of X-goods supply − value of X-goods demand − (value of M-goods demand − value of M-goods supply),
= value of X-goods supply + value of M-goods supply − (value of X-goods demand + value of M-goods demand),
= value of tradables supply − value of tradables demand;

or if we let the supply of tradables be S_t and demand be D_t,

$$B_t = P_tS_t - P_tD_t = P_t(S_t - D_t) \qquad [15\text{–}2]$$

In Figure 15–1, with the economy in equilibrium, consumption of tradables is equal to production, so the balance of trade is 0.

The value of income (GDP) also can be found in Figure 15–1. It is the sum of the value of output of N goods (N_1) and T goods (T_1). This value is given by Y_1, the

[4]Chapters 18 and 19 will define the real exchange rate index as RER = R_oP_w/P_d. The term R_o is an index of the nominal exchange rate; in this chapter we use e, the nominal exchange rate itself. The term P_w is an index of world prices, often the U.S. consumer or wholesale price index and is similar or identical to P^* as measured in practice. But P_d is a domestic consumer or wholesale price index that includes both tradable and nontradable prices, whereas P_n is an index of nontradable prices only. Thus, the Australian formulation of the real exchange rate is a more-precise definition than those given in the later chapters.

BOX 15-1 REAL VERSUS NOMINAL EXCHANGE RATES

Most anyone who has traveled outside their home country has experience with nominal exchange rates. The nominal exchange rate is simply the number of units of local currency you can buy from the country you visit with one unit of your own currency. For instance, in August 2010, you could buy just over 46 Indian rupees, or 12.6 Mexican pesos, for US$1. (Note, this implies that you could also have bought 3.65 Indian rupees with one Mexican peso.) But when you bring a dollar into India or Mexico what you really care about is not how many rupees or pesos you can buy with that dollar but rather the quantity of actual goods and services that you can buy with that dollar. This depends on the prices of goods and services in the host country in addition to the price of its currency. This distinction is the key idea underlying the concept of the real exchange rate (RER).

In the most general sense, RER is the relative price of foreign goods in terms of domestic goods. In practice, economists have developed a range of approaches to quantifying this idea. Economists working on developed economies typically measure the RER as the relative price of domestic and foreign goods. In contrast, economists working on developing countries typically measure the RER as the relative price of tradables and nontradables. Tradable commodities are goods that are *or could be* traded internationally, in contrast to nontradable goods (such as housing and many services), which are not traded internationally. A key practical distinction between these categories of goods is that there are world market prices for tradable goods, but the prices of nontradables are determined purely by local supply and demand conditions in each country.

The nominal and real exchange rates are linked together by the requirement that the relative prices of tradable and nontradable goods in the RER be expressed in the same currency units. The prices of tradables are typically expressed in U.S. dollars, whereas the prices of nontradables are expressed in units of the local currency. Thus we need to use the nominal exchange rate to convert the dollar-denominated price of tradables into units of the local currency to calculate the RER.

We can construct this RER as follows. Expressing the nominal exchange rate, e, in terms of the number of local currency units per dollar, and expressing the prices of tradables and nontradables as P_t and P_n, respectively, we can construct the RER as

$$\text{RER} = \frac{eP_t^*}{P_n} = \frac{P_t}{P_n}$$

In this equation, the asterisk on P_t in the second term indicates that the price of tradables is expressed in dollars. Multiplying this dollar-denominated price by e, the nominal exchange rate as defined above, converts the price of tradables into the same local currency units as the price of nontradables.

It is important to consider several issues related to this concept of the RER. First, note that the RER is based on price indices rather than actual nominal price levels. The RER is thus expressed relative to a base year, and changes in the relative price of tradables to nontradables, say from 1 to 1.2, would indicate percentage changes (in this case, 20 percent) relative to the base year. We refer to an increase in the RER as a *depreciation* of the local currency, and a decrease in the RER as an *appreciation* of the local currency. While this may sound counterintuitive, the rationale for these terms is that when a currency depreciates in real terms, a given quantity of foreign goods can be exchanged for a greater quantity of that country's domestic goods (and vice versa in the case of an appreciation). It is for this reason that the RER is often thought of an as an indicator of a country's international competitiveness: When a country's currency depreciates in real terms relative to its trading partners' currencies, that country's goods become less expensive to foreigners.

An important practical challenge in constructing an RER lies in the need to choose price indices for tradables and nontradables. P_t and P_n are indices of the prices of entire categories of goods. Thus constructing these price indices first requires deciding which goods (and services) belong in which category. Specific price data may also be lacking. One short cut for addressing these challenges may be to use the U.S. consumer price index in place of P_t and a similar indicator from the home country (with the same base year) in place of P_n.

Although the availability of such price indicators as the consumer price index makes them convenient, their use in constructing RERs is problematic. Theory calls for an index of nontradables prices, but the consumer price index (CPI) is typically constructed to reflect the price of a basket of consumption goods that includes both tradable and nontradable goods. The larger the share of tradable goods in that basket, the greater the divergence between what the RER tells us in theory and what we actually measure if we construct an RER using those broad price indices. In practice, aggregate price indices purely for nontradables rarely exist. Similar problems exist in choosing a price index to represent tradables prices (for use in the numerator of the RER for a given country). In this case, in which the goal is to choose a price index based to the greatest extent possible on tradables, many authors use the wholesale price index (WPI) from the United States or from a given country's trading partners. Yet this approach too is problematic because (as Lawrence Hinkle and Peter Montiel note[a]) for-

[a]Lawrence E. Hinkle and Peter Montiel, *Exchange rate misalignment: concepts and measurement for developing countries.* (Washington, DC: World Bank, 1999).

eign WPIs may not provide a very close indication of the tradables prices actually faced by consumers in the home country. There is no perfect match between the theoretical requirements and practical data availability in constructing empirical RERs. A common compromise is to use the foreign WPI to represent P_t and the domestic CPI to represent P_n.

An additional question is whether the relevant RER is purely between two specific countries (the home country and a single trading partner—that is, the bilateral RER) or between the home country and multiple trading partner countries. In general, policy makers in a given country will be more concerned with how their currency relates in real terms with all of their trading partners. In that case, it is necessary to take a (trade-weighted) average of all the bilateral RERs between the home country and its trading partners. This average is called the **real effective exchange rate (REER)**.

The central challenge for policy makers concerned with their country's international competitiveness is whether the level of the REER at any given time reflects its equilibrium value or whether it is overvalued or undervalued relative to that equilibrium. Equlibrium in this setting generally refers to the level of the REER at which a country's internal market (that is, its supply and demand for nontrable goods and labor) and its external market (that is, its supply and demand for tradable goods) are in balance.

intersection of price line P from point 1 to the T axis.[5] In national income accounting, we distinguish two concepts. Gross domestic *product*, a measure of the value of output, is given by

$$\text{GDP} = C + I + X - M \qquad [15\text{-}3]$$

where C and I are consumption and investment by both the government and the private sector. Gross domestic *expenditure*, often called **absorption**, is

$$A = C + I = \text{GDP} + M - X \qquad [15\text{-}4]$$

When, as in Figure 15-1, the economy is in equilibrium, $X = M$ and income equals absorption. Indeed, this is the other condition for equilibrium in the Australian model. From equation 15-4, we can also see that $A - \text{GDP} = M - X$, indicating

[5]Along the T axis, Y_1 is measured in prices of the T good, so $P_tY_1 = P_tT_1 + P_nN_1$ or $Y_1 = T_1 + (P_n/P_t)N_1$. But $P_n/P_t = \Delta T/\Delta N$, with $\Delta N = N_1$ and $\Delta T = Y_1 - T_1$, the distance along the T axis from T_1 to Y_1. Thus the value of both goods in T prices is $T_1 + Y_1 - T_1 = Y_1$.

that any excess of expenditures over income implies a negative trade balance of equal amount. (The appendix to this chapter provides a more detailed review of balance of payments accounting.)

This exploration of the Australian model yields three results. First, macroeconomic equilibrium is defined as a balance between supply and demand in two markets: nontradable goods (internal balance) and tradable goods (external balance). Second, to achieve equilibrium in both markets, two conditions must be satisfied: Expenditure (absorption) must equal income, and the relative price of tradables (the real exchange rate) must be at a level that equates demand and supply in both markets (the slope of P in Figure 15-1). Third, this also suggests two remedies for an economy that is out of balance: A government can achieve equilibrium (stabilize the economy) by adjusting absorption, the nominal exchange rate, or both. Generally, both instruments must be used to achieve internal and external balance.

THE PHASE DIAGRAM

Using the perspective of trade theory, we tie the small, open economy model of macroeconomic management to the tools of analysis already used in this text. But the principles of stabilization can be explored from a more-useful perspective, the **phase diagram**. To develop this approach, consider the markets for tradables and nontradables from the perspective of conventional supply and demand diagrams, as in Figure 15-2.

In these diagrams, we use the real exchange rate, which is the relative price of T goods in terms of N goods (P_t/P_n), as the price in both markets. For tradable goods, that gives a conventional supply and demand diagram: As the price rises, supply increases and demand decreases. But in the nontradables market, a rise in P means a fall in the relative price of N goods, so supply decreases and demand increases. Note that, in both markets, any increase in expenditure, or absorption, A, causes an outward shift of the demand curve: At any price, consumers buy more of both goods.

To use these diagrams as a basis for macroeconomic analysis, we need to change the interpretation of the supply curve for tradables. Until now, we have assumed that all tradables are produced within the home country. But foreign investment and foreign aid can add to the supply of tradables by financing additional imports. Therefore, the supply curve should not be S_t, but $S_t + F$, where F is the inflow of long-term foreign capital in the form of aid, commercial loans, and investment.

Figure 15-2 constitutes a simple model of the small, open economy that is based on two variables: The real exchange rate, P, on the vertical axis and absorption, A, which determines the position of the demand curves. These, of course, are the conventional variables of microeconomics, price and income. But in this model, they also are the two main macroeconomic policy tools of government: The exchange rate and the level of expenditure. Because these two variables are central to macroeconomic management, it would be helpful to develop a diagram that uses them explicitly on the axes.

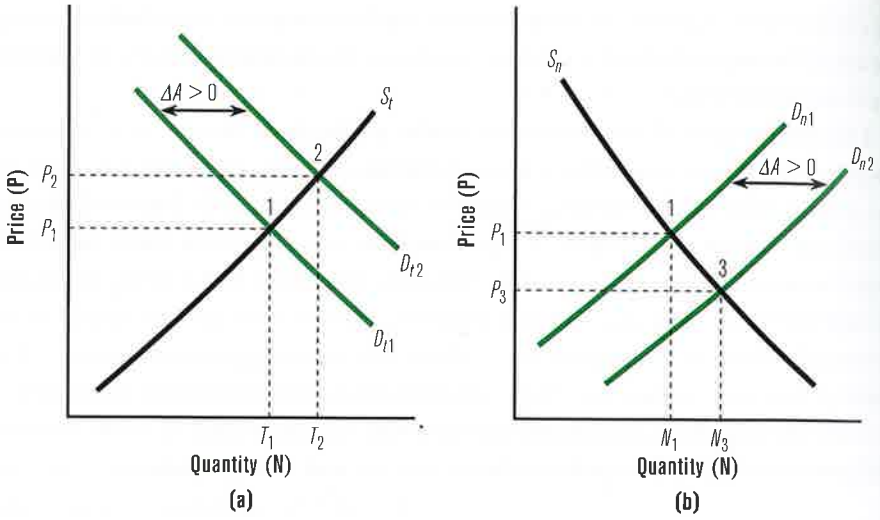


FIGURE 15-2 Tradables and Nontradables Markets

(a) Tradables market: The demand and supply curves for tradables S_t and D_t have the conventional slopes. (b) Nontradables market: The slopes are reversed. S_n falls as P rises (because the relative price of N is falling) and D_n rises as P rises. In both markets, demand increases when absorption (expenditure) increases, shown by and outward shift of D_t and D_n.

S, supply; D, demand; P (price) $= P_t/P_n$.

Figure 15-3 does this. It puts the real exchange rate, $P_t = eP_t^*/P_n$, on the vertical axis and real absorption, A, on the horizontal axis. The diagram also contains two curves, each representing equilibrium in one of the markets. Along the EB, or external balance, curve, the T-goods market is in balance ($S_t = D_t$). Along the IB, or internal balance, curve, the N-goods market is in balance ($S_n = D_n$).

The slopes of the two curves, EB and IB, can be derived from Figure 15-2. In the tradables market, when absorption is A_1, equilibrium is at P_1, where T_1 is produced and consumed. This equilibrium point 1 also is shown in Figure 15-3a. If absorption increases to A_2 in Figure 15-2a, the demand curve moves outward and shifts equilibrium to point 2. Note that with higher absorption, A_2, the real exchange rate, P_2, must be higher to restore equilibrium in the T-goods market. Increased absorption raises the demand for T goods. To meet this demand, it is necessary to raise output, which can be achieved only through a higher relative price of T goods, P_2. This higher price also helps regain balance by reducing the demand for T goods along the new demand curve. Point 2 is transferred to Figure 15-3a at (P_2, A_2).

In the nontradables market, when absorption is A_1, equilibrium is at P_1, where N_1 is produced and consumed. This equilibrium point 1 also is shown in Figure 15-3b. If absorption increases to A_3 in Figure 15-2b, the demand curve moves outward and shifts equilibrium to point 3. In the N-goods market, higher absorption, A_3,

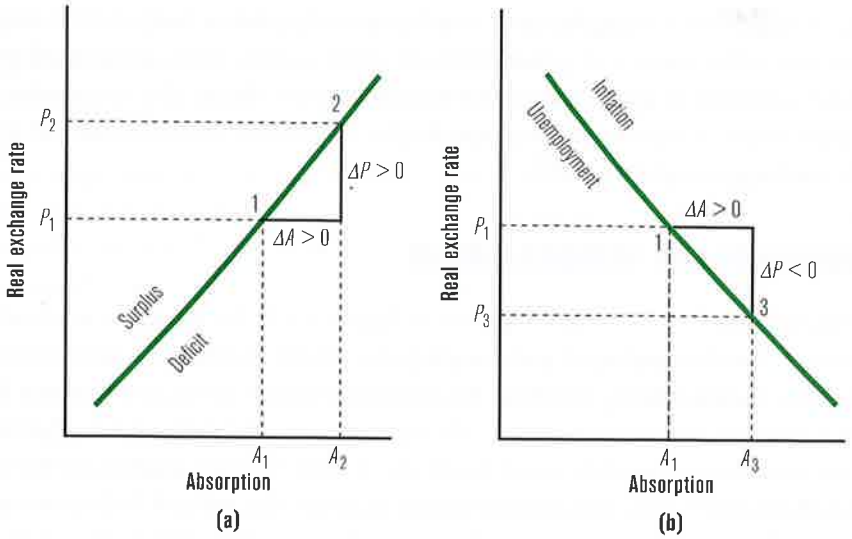


FIGURE 15-3 The Phase Diagram

(a) External balance (EB). (b) Internal balance (IB). The axes are the main policy variables: the real exchange rate, P, and the real absorption, A. The curves show equilibrium in the T-goods market (EB) and N-goods market (IB).

requires a lower, or appreciated, real exchange rate to restore equilibrium. Increased absorption raises demand for N goods, met by raising output, which can be achieved only through a lower relative price of T goods, P_3. This lower real exchange rate, or higher price of N goods, also helps regain balance by reducing the demand for N goods along the new demand curve. Point 3 is transferred to Figure 15-3b at (P_3, A_3).

Figure 15-3 also shows the **zones of imbalance**. In the T-goods market (panel a) for any given level of absorption, say, A_1, any real exchange rate greater than P_1 causes external surplus: The production of tradables exceeds the demand for tradables because the relative price, P, is at a more depreciated level than required for equilibrium. Any real exchange rate below (more appreciated than) P_1 causes an external deficit and the demand exceeds the supply of tradables. Therefore, the zone of surplus is northwest of EB and the zone of deficit is southeast.

In the N-goods market (Figure 15-3b), inflation is to the right of the IB curve, where the demand for N goods exceeds the supply. In that region, for any given real exchange rate, such as P_1, absorption is too high, say, A_3. To the left is the zone of unemployment, where there is an excess supply of N goods. In that region, for any given real exchange rate, say, P_3, absorption is too low, say, A_1.

The meanings of *inflation* and *unemployment* are precise in our model but not in the real world. It is best to think of inflation as being an increase in prices faster than is customary in the country in question. That rate would be quite low in Germany, Japan, or China, probably less than 5 percent a year, but quite high in

Brazil or Argentina. Unemployment implies not only jobless workers but also idle capital and other factors of production. In other words, there is unemployment when an economy is inside the production frontier in Figure 15–1. A country may have high levels of labor unemployment but be unable to increase output because it is fully utilizing its capital or land.

EQUILIBRIUM AND DISEQUILIBRIUM

The two balance curves are put together in Figure 15–4. All along the external balance curve, the demand for T goods equals the supply produced at home plus any net foreign capital inflow. All along the internal balance curve, the demand for N goods equals the supply of N goods. The only point at which there is both internal and external balance (equilibrium in both the T- and N-goods markets) is the intersection of the two curves. This is sometimes called the *bliss point*. It is the same as the tangency of the indifference curve to the production frontier in Figure 15–1 at point 1. The objective of macroeconomic policy is to adjust the exchange rate and absorption to keep an economy stable, in both external and internal balance.

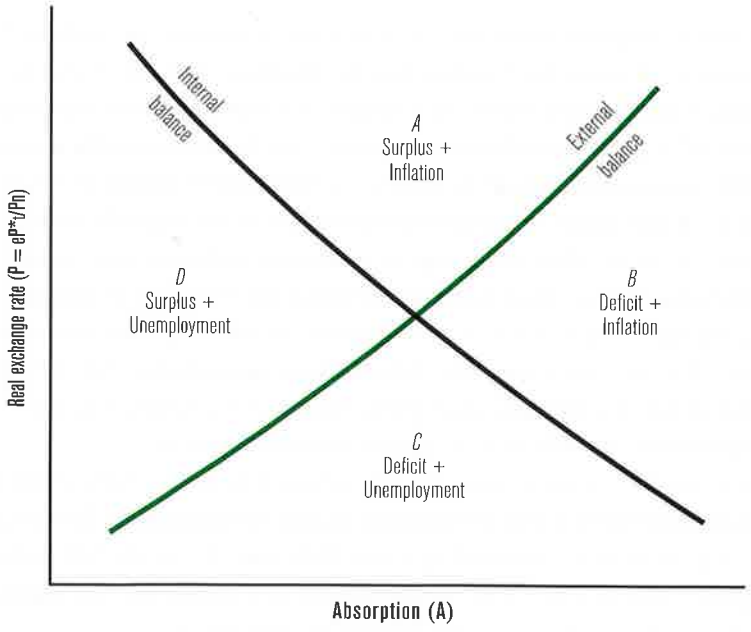


FIGURE 15-4 Zones of Imbalance

The economy is in equilibrium only at the intersection of the external balance (EB) and internal balance (IB) curves. Zones of imbalance are labeled. For example in zone A, the supply of T goods exceeds demand, so there is a surplus, and the demand for N goods exceeds supply, so there is inflation.

Economies spend considerable time in one of the four zones of imbalance shown in Figure 15–4. Zone *A* to the north is a region of external surplus and inflation, where the exchange rate is *undervalued*. In zone *B* to the east of equilibrium, the economy faces inflation and a foreign deficit, due principally to excessive expenditure (absorption is greater than income). To the south is zone *C*, where the exchange rate is *overvalued* (too appreciated) and there is both unemployment and an external deficit. And west of the bliss point the economy is in zone *D*, where, because of insufficient absorption, there is unemployment of all resources but a foreign surplus.

Once in disequilibrium, economies have built-in tendencies to escape back into balance. Figure 15–5 describes them separately for external balance (panel a) and internal balance (panel b). Start with an external surplus, point 1 (Figure 15–5a). The excess supply of tradables generates two self-correcting tendencies. First, the net inflow of foreign exchange adds to international reserves. If the central bank takes no countermeasures, the money supply increases and interest rates fall and induce both consumers and investors to spend more. The increase in absorption moves the economy rightward, back toward external balance. Second, the inflow of foreign exchange creates more demand for the local currency and, if the exchange rate is free to float, forces an appreciation. This is a move downward in the diagram, also toward the EB line. The net result of these two tendencies is the resultant, shown as a solid line in the diagram, heading toward external balance. If, instead, the economy starts in

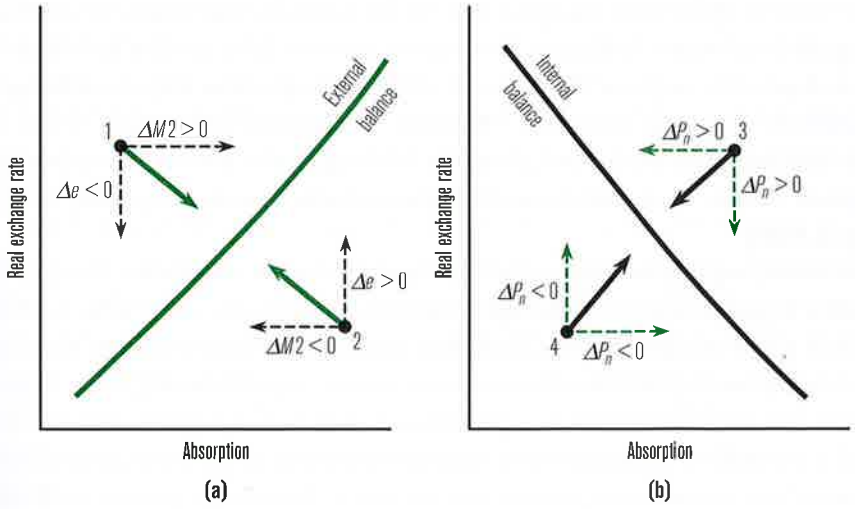


FIGURE 15–5 Tendencies toward Equilibrium

(a) External balance (EB). If the economy faces an external surplus (point 1), reserves and the money supply tend to rise while the exchange rate tends to appreciate; this drives the economy toward EB. (b) Internal balance (IB). For a deficit, if the economy faces inflation (point 3), the rise in prices leads to real appreciation of the exchange rate and a reduction in the real value of absorption; this moves conditions toward IB. Conversely for unemployment at point 4, but only if prices can fall flexibly.

external deficit at point 2, the tendencies are the opposite but the result is the same, a tendency to regain external balance.

The tendency to regain internal balance is shown in Figure 15–5b. When there is inflation (point 3), it affects both the real exchange rate and real absorption. If the nominal exchange rate remains fixed (or is not allowed to depreciate as fast as inflation), the rise in P_n causes a real appreciation. At the same time, the rise in prices can cause a fall in the real value of absorption, assuming that the central bank does not take steps to increase the money supply to compensate for inflation. Under these assumptions, the economy would move from inflation at point 3 back toward internal balance. Unemployment (point 4) would be self-correcting also if prices are able to fall as easily as they rise, but this seldom is the case.

Despite these self-correcting tendencies, in practice, they often fail to work smoothly or quickly enough because of *structural rigidities* in the economy. For instance, exchange-rate changes may take time to affect actual imports and exports, perhaps as long as two years to have a full impact. In economies like Ghana and Zambia, dominated by one or two export products such as cocoa, oil, and copper, with long gestation periods for new investment, supply elasticities for tradables may be especially low, and foreign deficits can persist for a time despite real devaluations.

Nontradables prices probably rise very quickly when demand exceeds supply, as in Figure 15–5b. But in many developing economies, inflation, once started, may resist corrective policies, and prices do not fall so easily when there is unemployment: Unions strike wage bargains that try to maintain real wages by continually raising nominal wages; banks use their market power to keep interest rates high; producers depend on imports, the prices of which are responsive only to exchange rate adjustments; and large firms with monopoly or oligopoly power keep prices up to cover costs that resist downward pressures. Such rigidities have frequently been cited to explain chronic trade deficits and inflation in Latin America, especially in Argentina and Brazil.

However, arguments about structural rigidities can be overstated. There is some flexibility in production for most export industries, even in the short term. And many producer prices are quite flexible, including those of most farm products, those in the large informal sector, and even those of some modern manufacturing firms. Nevertheless, the automatic tendencies toward external and internal balance depicted in Figure 15–5 are likely to be too slow and politically painful to satisfy most governments.

Not all the barriers to adjustment are structural. Sometimes, policies work against adjustment. When foreign reserves fall, for example, the money supply also falls automatically unless the central bank's policy is to *sterilize* these shifts by expanding domestic credit to compensate for the fall in reserves and keep the money supply from falling. Sterilization prevents the move from points 1 or 2 of Figure 15–5a toward external balance. And nominal exchange rates respond to changing market conditions only if the exchange rate is allowed to float or the government makes frequent adjustments in the nominal exchange rate to match changing economic conditions.

However, the opposite policy, a fixed nominal exchange rate, is needed if inflation in nontradables prices is to cause a real exchange-rate appreciation, as depicted at point 3 of Figure 15-5b. This fixed nominal rate is called an exchange rate *anchor* because the fixed rate alone can halt the upward drift of prices as the economy moves due south from point 3. Chile used such an anchor to slow inflation during the late 1970s (Box 15-2). If government devalues the rate to keep up with inflation,

BOX 15-2 PIONEERING STABILIZATION: CHILE, 1973-84

In the last year of the Salvadore Allende regime in Chile, when the public sector deficit soared to 30 percent of the gross domestic product (GDP) and was financed mostly by printing money, inflation exceeded 500 percent a year. In 1973, General Augusto Pinochet overthrew Allende and established an autocratic regime. An early goal of his government was to stabilize the economy. It proved to be a difficult task of many years, with important lessons for later stabilizations in Latin America.

Faced by rapid inflation and unsustainable external deficits, the government imposed a fiscal and monetary shock on the economy. The budget deficit was cut to 10.6 percent of GDP in 1974 and again to 2.7 percent in 1975. Monetary policy was tight: From the second quarter of 1975 through the middle of 1976, it has since been estimated, households and firms were willing to hold more money than was in circulation. But inflation persisted; consumer prices nearly doubled in 1977.

Despite draconian measures, prices continued to rise for two reasons. First, the peso was aggressively devalued to improve the foreign balance, the more so because of the 40 percent fall in copper prices in 1975. In 1977, the peso was worth about one-80th its 1973 value against the dollar. Second, wages in the formal sector were determined by rules that permitted adjustments based on the previous year's rate of inflation, a rule that helped perpetuate the higher rates of earlier years. It also was argued by some that the monetary policy was not stringent enough.

In 1978, the government switched gears and began using the exchange rate as its main anti-inflation weapon. At first a crawling peg was adopted with preannounced rates, the *tablita*, that did not fully adjust to domestic inflation. In 1979, the rate was fixed at 39 pesos to the dollar for three years. The appreciating real exchange rate, or *anchor*, helped control inflation, which was down to 10 percent by 1982. But it also discouraged export growth and contributed to a growing

current-account deficit. At the same time, Chile liberalized its controls over foreign capital flows and attracted large inflows of loans: Net long-term capital rose from negligible amounts before 1978 to average over $2 billion a year in the following five years, equivalent to 8 percent of GDP in 1980. This inflow not only financed the growing current deficit but contributed to the real appreciation of the exchange rate.

Not until after 1984 did Chile finally achieve a semblance of both internal and external balance. It did so through a large real devaluation, approaching 50 percent, supported by tighter fiscal and monetary policies. After a decade and a half of falling income per capita, Chilean incomes grew by 5.8 percent a year from 1985 to 1991.

Source: Based on the account by Vittorio Corbo and Andrés Solimano, "Chile's Experience with Stabilization Revisited," in Michael Bruno et al., eds., *Lessons of Economic Stabilization and Its Aftermath* (Cambridge, MA: MIT Press, 1991).

Brazil's practice for many years, then real appreciation is thwarted and there is no anchor. Similarly, real absorption falls with inflation only if the government fixes its expenditure and its deficit in nominal terms and allows inflation to erode the real value of the expenditure and if the central bank restrains the money supply to grow more slowly than inflation. More typically, the fiscal authorities adjust the expenditure, while the monetary authorities adjust both the money supply and the nominal exchange rate, to fully compensate for inflation. In that case, rising prices have no impact on the real exchange rate or real absorption and an inflationary economy remains at point 3 in Figure 15–5b.

STABILIZATION POLICIES

Whether the barriers to rapid automatic adjustment are inherent in the economic structure or created by policy contradictions, in most cases, governments need to take an active role to stabilize their economies. They have three basic instruments for doing so: exchange-rate management, fiscal policy, and monetary policy.

Alternative **exchange-rate regimes** were introduced in Chapter 12. Governments can vary the exchange rate by having the central bank offer to buy and sell foreign currency at a predetermined or *fixed* official exchange rate (e in our nomenclature) that nevertheless can be changed from time to time or by allowing the rate to *float* in the currency market, although the central bank sometimes may intervene to influence the price. An intermediate case is the *crawling peg*, under which the central

bank determines the rate but changes it frequently, as often as daily, to ensure that the official rate stays in line with domestic and world inflation; this results in a constant or slowly adjusting real exchange rate (P).

Governments have two policies that can influence the level of absorption. Fiscal policy, adjusting levels of government expenditure and taxation, directly affects the government's components of consumption and investment. It also influences private expenditure, especially consumption, which depends on *disposable income*, or income net of taxes. Monetary policy also affects private expenditure. If the central bank acts to increase the money supply, as described in Chapter 12, it increases the liquidity of households and firms, lowers interest rates, and stimulates private consumption and investment.

The power of the phase diagram is that it indicates the necessary directions for these policies, depending on the state of the economy. Figure 15-6 provides such a policy map. It shows the same external and internal balance lines as in the previous diagrams but adds a new element: four policy quadrants, I to IV, within which the policy prescription always is the same.

Take, for example, point 1, which has been placed on the external balance line but in the inflationary zone. For many years, Brazil was in this situation, with buoyant exports and balance in foreign payments but chronic inflation running from 40 to well over 100 percent a year. Because the demand for nontradables exceeds supply, we know that one necessary correction is a reduction in real absorption, monetary and fiscal *austerity*, that would reduce demand and move the economy due west from point 1. But, if that is the only policy taken, the economy would not reach internal balance until point 4, in the zone of external surplus. One imbalance is exchanged for another. To avoid generating a surplus, reduced absorption needs to be accompanied by an appreciation of the exchange rate, a move due south from point 1. The result would be a move approximately toward the equilibrium or bliss point, 0.

Note three things about this result. First, this combination of policies, austerity and appreciation, would work from any point within quadrant I to return the economy to equilibrium. That is, the same combination is needed whether the economy had inflation with a moderate external surplus or inflation with a moderate deficit, either just above or just below the EB line. If the economy starts just below external balance, with a moderate deficit, it may seem strange (*counterintuitive*) to recommend an appreciation that, on its own, would worsen the deficit. But the reduction in absorption, needed to reduce inflation, also reduces the deficit because it also lowers the demand for tradables. Indeed, it reduces the demand for tradables too much and throws the economy into surplus; this is the reason an appreciation is needed. Of course, the relative intensity of each policy is different, depending where in quadrant I the economy starts. But the basic principle holds: Anywhere in quadrant I, the right combination of policies is austerity and appreciation, the combination that moves the economy toward point 0.

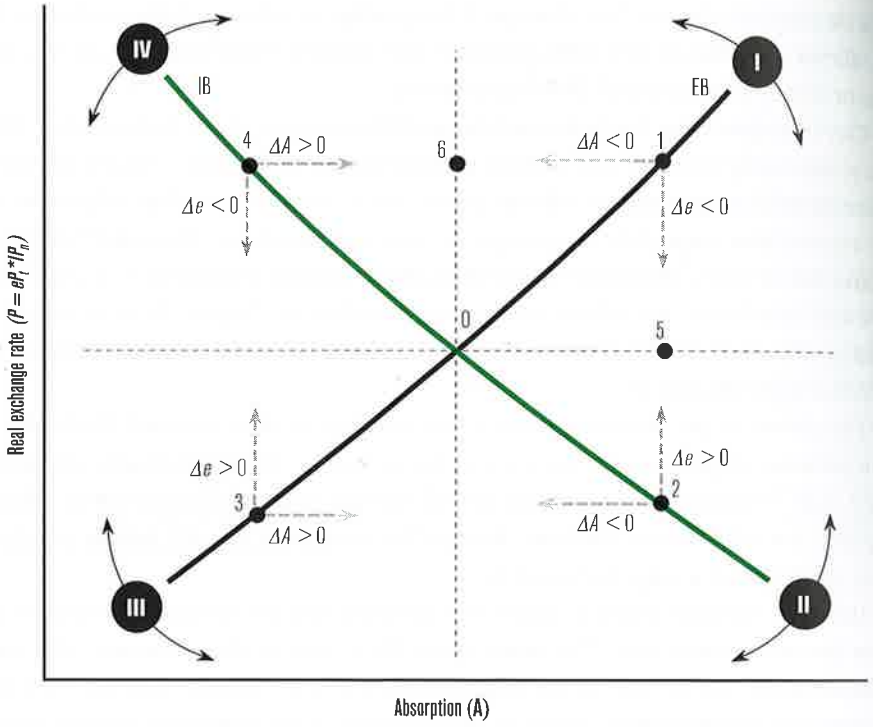


FIGURE 15-6 Policy Zones

From any position of disequilibrium, two policy adjustments generally are needed to restore internal and external balance. In each quadrant (I–IV) a particular combination of exchange rate and absorption policy is prescribed.

Second, in general, two policy adjustments are required to move toward equilibrium. This is a simple example of the general rule enunciated by Dutch economist Jan Tinbergen: To achieve a given number of policy goals, it generally is necessary to employ the same number of policy instruments. Here we have two goals, internal and external balance, and need adjustments in both absorption (austerity) and the real exchange rate (appreciation) to reach them both. It is not always necessary to use two goals, however. If the economy lies just to the east of equilibrium at point 5, then a reduction in absorption achieves internal and external balance simultaneously. And, if the initial situation is point 6, due north of 0, then appreciation alone does the job.

Third, we could view the policy prescription in either of two ways. Austerity is needed to reduce inflation (move west) and appreciation is used to avoid surplus (move south). Or appreciation can be targeted on internal balance (move south toward point 2) but alone would cause a deficit, so that austerity then is required to restore external balance. Therefore, no logic in macroeconomics suggests that one particular policy should be assigned to one particular goal. Economic institutions often do this anyway. In practice, the central bank might use the exchange rate to achieve external

balance while the finance ministry uses the budget for internal balance. But if these two approaches are not coordinated, they may well fail to reach equilibrium.

With these principles established for quadrant I, it is fairly routine to go around the map in Figure 15–6 and see what policy responses are required:

- In quadrant II at a point like 2, with an external deficit but internal balance, exchange-rate devaluation is needed to restore foreign balance but, taken alone, would push the economy into inflation. Fiscal and monetary austerity also are needed to avoid inflation and reach equilibrium. We could reverse this assignment of policies and use austerity to achieve external balance and devaluation to stimulate the economy. Many African countries have been in this situation right up to the present, with low inflation but an insufficiency of export earnings and foreign investment to pay for the imports required for economic development.
- In quadrant III at point 3, an expansionary fiscal or monetary policy eliminates unemployment but at the cost of a foreign deficit, so devaluation is needed to reach equilibrium. Or devaluation stimulates employment and so requires expansion to eliminate the resulting surplus. This is the situation of a mature industrialized economy during a recession, with unemployed labor and capital, but it is not so common in developing countries.
- In quadrant IV at point 4, exchange-rate appreciation can eliminate the external surplus while fiscal expansion prevents unemployment. Or fiscal expansion can end the surplus while appreciation prevents a resulting inflation. A few countries in Asia, such as Taiwan and Malaysia in the 1980s, have been in this situation.

So the principles of macroeconomic stabilization are simple: If policy makers know where to place their economy on this map, they know how to move toward equilibrium. But how do policy makers know where they are? The answer lies partly in measurement, partly in art. Regularly available data on the balance of payments, changes in reserves, and inflation can help locate an economy with respect to the external and internal balance lines. Data on the nominal and real exchange rates, the budget deficit, and the money supply can indicate movements from one policy quadrant to another. Some kinds of data, such as private sector short-term borrowing abroad, however, may not be readily available to policy makers. Such was the case in Korea at the beginning of that country's financial crisis in 1997. In principle, barring such surprises as an unknown large short-term foreign debt that has to be repaid immediately, econometric models can locate the economy and indicate the policies needed to balance it. In practice, especially but not only for developing economies, such models can be too imprecise and too unstable to be wholly dependable. The art of stabilization policy comes in knowing just how hard to push on each component of policy and how long to keep pushing. In this, experience in managing a particular economy is as important a guide as the models estimated by economists.

APPLICATIONS OF THE AUSTRALIAN MODEL

Throughout this book we refer to different kinds of economic problems that are associated with developing countries, including the Dutch disease, debt crises, terms-of-trade shocks, foreign-exchange shortages, destructive inflation, and droughts or other natural catastrophes. The Australian model and its phase diagram can be used to show how these and other shocks affect macroeconomic balance and how they should be handled.

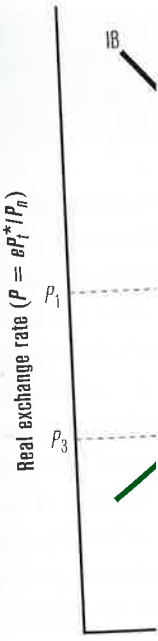
DUTCH DISEASE

In Chapter 18 we will discuss the strange phenomenon of the Dutch disease, in which a country that receives higher export prices or a larger inflow of foreign capital may end up worse off than without the windfall. The Dutch disease was first analyzed by Australian economists Max Corden and Peter Neary, using a version of the open-economy model.[6] Figure 15-7 traces the impact of a windfall gain using the phase diagram. (Box 18-1 provides an alternative exposition of Dutch disease.)

An economy in equilibrium at point 1 suddenly begins to receive higher prices for its major export or is favored by foreign aid donors or foreign investors. All the oil producers, from Saudi Arabia to Indonesia to Mexico, were in this position in the 1970s, as were coffee (and many other commodities) exporters during the boom of the mid-1970s. Egypt and Israel were rewarded with large aid programs by the United States after the Camp David accord of 1978, as was Ghana by the World Bank and others during its stabilization of the 1980s (Box 15-3). Both Chile in the late 1970s and Mexico after its stabilization in the late 1980s received large inflows of private capital, much of it a return of previous flight capital. Foreign exchange windfalls are more frequent than sometimes is supposed. In some cases, these windfalls result from new discoveries of natural resources, such as the major offshore oil reserves discovered by Ghana in 2007.

When the windfall occurs, the supply of tradable goods rises at any given price. This can be shown as a rightward shift in the supply curve in Figure 15-2a. In the phase diagram of Figure 15-7, there is a rightward shift in the EB curve. At point 1, for example, which had been in external equilibrium along EB_1, the economy now is in surplus, so the new EB curve must be to the right—for example, at EB_2. The economy cannot remain at point 1 because the inflow of reserves increases the money supply; this adds to demand and, because the windfall increases private income and government revenue, leads to greater expenditure. So absorption rises, a move

[6]W. Max Corden and J. Peter Neary, "Booming Sector and Deindustrialisation in a Small Open Economy," *Economic Journal* 92 (1982), 825–48.



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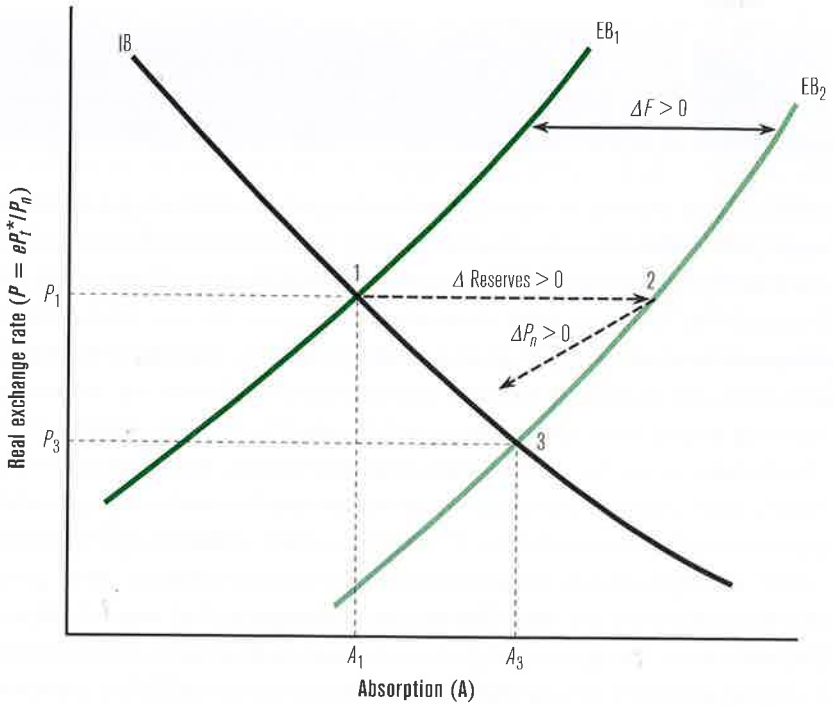


FIGURE 15–7 The Dutch Disease

An export boom or capital inflow shifts the EB curve rightward and leaves the economy at point 1 in surplus. As reserves accumulate and the money supply rises (or as the government and consumers spend the windfall), absorption rises and the economy moves eastward, into inflation. As nontradable prices rise, the real exchange appreciates. At the new equilibrium (point 3), because P is lower, the supply and demand is balanced with less production of T goods and more output of N goods than before. The loss of tradable output is what makes this a disease.

from point 1 toward point 2. This moves the economy off its internal balance, into inflation.[7]

The resulting rise in P_n has two effects: a reduction in real absorption that partially corrects the initial rise in A and, assuming the official rate is fixed, a real appreciation of the exchange rate. (The real rate also appreciates if the nominal rate is floating because the greater supply of foreign currency drives down the price of foreign currency.) Therefore, the economy first moves from point 1 toward point 2 in Figure 15–7, then begins to head in the general direction of the new equilibrium, point 3. In this case, market forces are likely to be sufficient to reach the new equilibrium, unless the

[7]If the windfall is an inflow of capital, this treatment is precise. In the case of a rise in export prices, however, the move from point 1 to point 2 is an approximation. Strictly speaking, a rise in export prices should raise P_t^*, a depreciation of the real exchange rate that moves the economy upward from point 1, after which the economy moves east toward EB_2.

BOX 15-3 RECOVERING FROM MISMANAGEMENT: GHANA, 1983–91

In 1983, after a decade of economic mismanagement, Ghana's gross domestic product (GDP) was 20 percent below its 1974 peak, investment was only 4 percent of GDP, exports had sunk to 6 percent of GDP, and inflation rocketed to 120 percent for the year. After a decade of economic decline, Ghana's military government, headed by Flight Lieutenant Jerry Rawlings, was ready to undertake drastic measures to stabilize the economy and restart economic development.

Working closely with the International Monetary Fund (IMF), Ghana focused on three deep-seated problems: exchange-rate reform, fiscal adjustment, and monetary policy. At first, the government maintained its fixed exchange rate but drastically devalued the cedi from 2.75 to the dollar in 1983 to 90 to the dollar by 1986. In 1986, Ghana adopted a restricted floating currency, using periodic auctions to determine the rate. The official exchange market was broadened in 1988, when many foreign exchange bureaus were authorized to trade currencies and virtually absorbed the parallel market in currency; by 1990, the banks were empowered to trade in an interbank currency market. This completed the move to a floating rate regime. By the end of 1992, the cedi traded at 520 per dollar.

In 1983, with fiscal revenues less than 6 percent of GDP, the urgent need was to restore revenues and control expenditures. The deficit was cut from 6.2 to 2.7 percent of GDP in the first year of austerity, and by 1985, the government had begun a major public investment program to stimulate growth. By 1988, the government had restored total expenditures to 15 percent of GDP, 20 percent of which was investment, and was running a surplus of nearly 4 percent of GDP.

Throughout the period, the money supply was constrained but inflation remained stubbornly above 20 percent a year until 1991, when it was reduced to 16 percent and real interest rates finally became positive. Because food prices play a large role in the consumer price index, investment in food production was seen as an important component of any long-run attack on inflation.

The aid donors responded handsomely to Ghana's stabilization and the accompanying economic reforms: The sum of net official transfers and net long-term capital rose from just over $100 million in 1983 to $585 million in 1991.

Stabilization helped restore economic growth. From the depression of 1983–91, GDP grew by 5.1 percent a year and investment rose to 17 percent of GDP. The improvement, although dramatic in relation to the early 1980s, still left Ghana with a lot to be done: In 1991, income per capita remained 25 percent below its 1973 level.

Source: This account is based on Ishan Kapur et al., *Ghana: Adjustment and Growth, 1983–91* (Washington, DC: International Monetary Fund, 1991).

authorities prevent appreciation and maintain real absorption and so keep the economy in an inflationary posture like point 2.

What, then, is the problem? The economy is at a new equilibrium, its terms of trade improved, its currency appreciated and so citizens have more command over foreign resources, people spending and consuming more without having to work any harder. There are two flaws in this otherwise idyllic picture. First, such windfalls generally are temporary. When export prices fall or the capital inflow dries up, the EB curve shifts back and a costly adjustment is necessary. We analyze that process in the next section.

The second problem is that, in shifting from the old to the new equilibrium, adjustments in the economy must be made. The real exchange rate P is lower, so S_t has fallen, while S_n has risen. Because the booming export sector does not retrench, nonboom tradables bear the brunt of the adjustment. Frictions in the labor market are likely to mean at least temporary unemployment as workers switch from tradable to nontradable production. If the tradable sector includes modern manufacturing, then long-term development may be set back because manufacturing is the sector likely to yield the most rapid productivity growth in the future. And if tradable industries close, it is more difficult to make the inevitable adjustment back toward point 1 when the windfall is over. This decline in nonboom-tradable production turns a foreign exchange windfall into a "disease."

What can be done to cure the disease? The government could try to move the economy back toward the old (and probably future) equilibrium at point 1. Its tools are the official exchange rate, which would have to be devalued against the tendencies of market forces, and expenditure, which would have to be reduced through restrictive fiscal and monetary policies that also reduce inflation (lower P_n or at least its growth). The resulting buildup of reserves and bank balances have to be sterilized through monetary policy so they are held as assets and not spent. It is a neat political trick to manage an austere macroeconomic policy in the face of a boom because all the popular pressures are for more spending. Not too many countries have managed it. Indonesia is among the few that have.

DEBT REPAYMENT CRISIS

When Mexico announced in 1982 that it no longer could service the debt it acquired during the oil boom of the 1970s, many other developing countries followed Mexico's lead, and the financial world entered a decade of debt crisis (Chapter 13). Most Latin American countries largely have overcome their debt problems, but many African countries continue to struggle to repay the money they borrowed, mostly from aid agencies. Although debt service insolvency encroaches gradually on an economy and can be foreseen, it often appears as a national crisis because economic management has been inept.

The formal analysis of a debt crisis is similar to that of another common phenomenon, a **decline in the terms of trade** that leads to a foreign exchange shortage, which in turn is simply the reverse of the Dutch disease. Therefore, the oil exporters, such

as Indonesia, Nigeria, and Venezuela, faced a similar kind of crisis once oil prices began falling in the 1980s. We can understand the similarity between a debt crisis and a decline in the terms of trade more clearly by seeing them in their common context in the balance of payments. A decline in the terms of trade implies deterioration in the balance of trade (in which the excess of imports over exports increases). All else equal, a declining trade balance adds directly to the current account deficit. As detailed in the appendix to this chapter, one of the few ways in which countries can finance current account deficits is by borrowing abroad.[8] Indeed, many developing countries financed chronic current account deficits by borrowing abroad, in the process accumulating enormous stocks of debt (often to levels greater than their GDP). Debt crises ensue (as discussed in Chapter 13) when current account deficits become unsustainable and lenders want to be repaid.

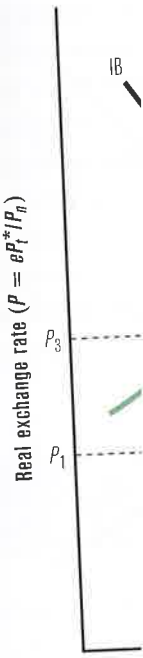
Figure 15-8 captures this process. An economy in balance at point 1 needs to find additional resources to repay its foreign debt or needs to adjust to falling terms of trade. The supply of tradables therefore shifts to the left in Figure 15-2a; in the phase diagram, the EB curve also shifts leftward to EB_2.[9] If the crisis leads to debt relief or additional foreign aid, the curve moves less far and might settle at EB_3.

Now in foreign deficit, the economy begins losing reserves. If the government has to repay some of the debt or falling export prices cut into its revenues, the government needs to reduce its expenditures as well. Both cause a reduction in absorption. These actions move the economy toward external balance but also into unemployment. To gain the new equilibrium at point 3, it is also necessary to devalue the currency. This could be done by the central bank under a fixed rate or by the foreign exchange market under a floating rate. At the new equilibrium, the country produces more and consumes fewer tradables because P has risen. This, of course, is a loss of welfare for the populace. The surplus of S_t over D_t is used to repay the debt or simply compensates for reduced export prices.

Debt crises and the hardships they cause are not an inevitable consequence of borrowing to finance development, as was discussed in Chapter 13. If the borrowed resources are invested productively, they increase the potential output of both tradables and nontradables. Added production increases income and generates the capacity to repay the debt out of additional income, without a crisis and an austerity program. Countries such as Korea and Indonesia have been large international borrowers, but before the financial crisis of 1997–99, they escaped debt crises.

[8]The only other ways (beyond foreign borrowing) to finance a current account deficit are to attract foreign investment and/or to run down the central bank's stock of foreign reserves. See the appendix to this chapter for a concise summary of balance of payments accounting.

[9]Strictly speaking, we cannot analyze the fall in export prices this way, but it is a reasonable approximation for many situations. See note 7.



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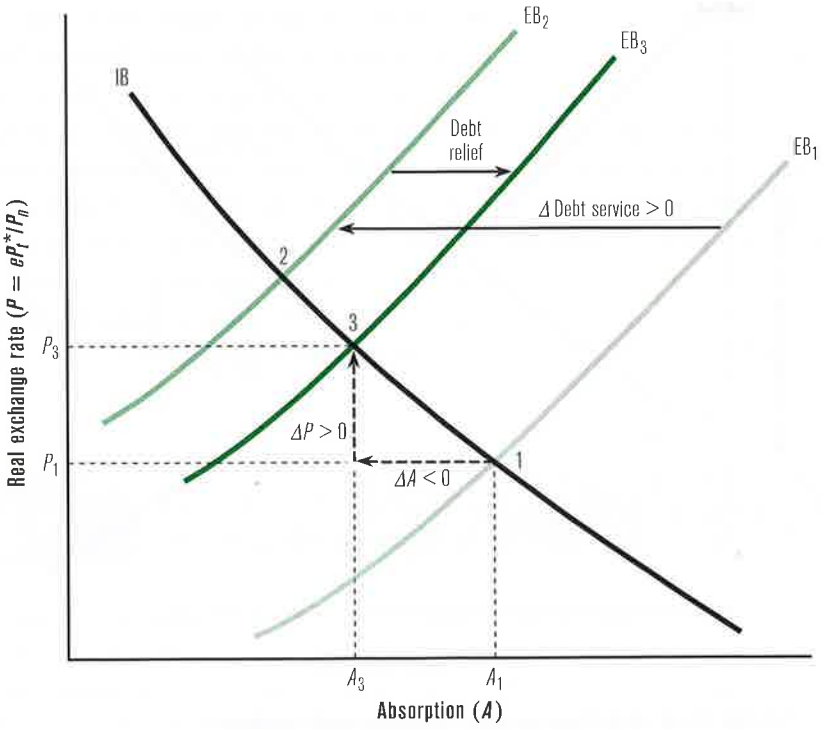

FIGURE 15-8 Debt Crisis or Declining Terms of Trade

An economy in equilibrium at point 1 suddenly needs to repay its debt (or faces falling export prices). External balance shifts from EB_1 to EB_2, although debt relief or increased foreign assistance might reshift the balance line back to EB_3. If policies accommodate the fall in reserves and income, absorption declines. A devaluing exchange rate, via central bank action or market forces, helps the economy move to its new equilibrium at point 3. With more tradables produced and less consumed, the surpluses can be used to repay the debt.

STABILIZATION PACKAGE: INFLATION AND A DEFICIT

External shock is not the only way an economy gets into trouble. Reckless or misguided government policies often are to blame. Impatient with sluggish development or intent on benefiting its constituencies, a government expands its spending and incurs a budget deficit. Unable to finance the deficit by borrowing from the public, the ministry of finance sells short-term bills to the central bank; this adds to the money supply. The economy drifts into inflation and a foreign deficit, at a point like point 1 in Figure 15-9, far from equilibrium at point 2 on the economy's original external balance curve EB_1. When economies become unstable in this way, private investors get skittish and try to invest in nonproductive assets like land or, more often, invest abroad; this deepens the external deficit. The government, recognizing the error of its ways or just hoping for some outside help to avoid painful adjustment, calls in the IMF.

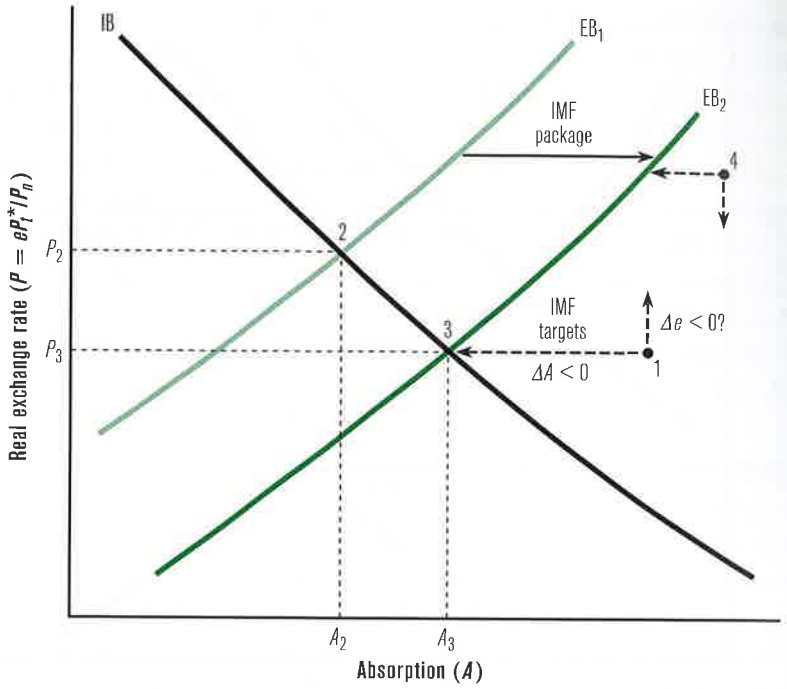

FIGURE 15-9 Stabilization from Inflation and a Deficit

An economy at point 1, far from equilibrium at point 2, above all needs to reduce absorption through austerity: reduced budgetary deficits and slower growth of the money supply. An International Money Fund (IMF) and donor package of aid might bring equilibrium closer by shifting the external balance to EB_2, but the aid package is conditional on the austerity program. Whether any exchange rate action is required depends on the precise initial position, point 1.

The core IMF stabilization program consists of a reduction in the government's budget deficit and programmed targets for domestic credit that, in effect, cap the growth of the money supply. Together, these measures reduce absorption in the economy and move it westward from point 1, closer to external and internal balance. IMF packages frequently include an exchange-rate devaluation as well. Whether this is needed or not depends on the precise location of the economy (point 1) relative to equilibrium (point 2). In some cases, the reduction in absorption is sufficient to reach both internal and external balance. As pictured in Figure 15-9, a small devaluation is needed to reach point 2 and avoid unemployment.

However, IMF programs usually come with substantial aid attached, not only from the fund, but from the World Bank and bilateral donors. The aid package, by adding to the economy's capacity to buy tradables, shifts the EB curve to the right, to EB_2 in the diagram, and moves equilibrium to point 3. Note two things about this aid package. First, it reduces the need for austerity to some extent, as A_3 is greater than A_2. Second, it reduces the need for devaluation of the exchange rate. Indeed, as shown,

there is little or no need to devalue to move from 1 to 3. Donors and the IMF nevertheless frequently insist on devaluation. Sometimes, that may be a requirement just to reach a point like 3. In other cases, donors and the IMF may have in mind a self-sustaining stabilization that will be valid even after aid is reduced and the external balance curve moves back toward EB_1. Whatever the motive, it is important to realize that aid itself is a partial substitute for both devaluation and austerity. In essence, the aid does what higher production of tradables otherwise must do and it finances expenditures that otherwise must be cut. Ghana's experience, which fits this description, is discussed in Box 15-3. More recently, Greece has suffered a major debt crisis, the analysis of which draws on elements of both Figures 15-8 and 15-9 (Box 15-4).

BOX 15-4 THE GREEK DEBT CRISIS OF 2010-12

Problems of unsustainable debt are not limited to the poorest countries. Starting in 2010, Greece faced a debt crisis so severe as to threaten the stability of the European Union (EU). As of September 2011, it remained uncertain whether Greece would be forced to default on its foreign debts or whether other members of the EU would provide its second bailout package for Greece in two years. In May 2010, the EU and the International Monetary Fund (IMF) provided a package of loans and balance of payments support worth €750 billion (approximately $938 billion). In return, the government of Greece committed itself to an austerity program that included severe reductions in expenditures and wages, termination of tens of thousands of government jobs, and extensive tax increases. This agreement sparked widespread civil unrest in Greece, which contributed to a lack of confidence in the country's ability to implement the promised reforms and service its foreign debts.

Greece's debt problem accumulated over many years of current account deficits, the magnitude of which ballooned during the late 2000s. Greece's current account deficits as a share of GDP began mounting in the mid-1990s. Deficits on the order of 3 percent of GDP in the late 1990s more than doubled relative to GDP during 2000–05. By 2005, Greece's current account deficit was equivalent to 7.5 percent of GDP, a proportion that doubled again to nearly 15 percent by 2008. Between 2008 and 2010, Greece succeeded in reducing its current account deficit to 10.5 percent of GDP, mainly by reducing imports. Borrowing by the Greek government to finance its deficits had also grown rapidly, as the government budget deficit as a share of GDP increased from 5.7 percent in 2006 to 15.4 percent in 2009. The government's total debt shot up from €183.2 billion in 2004 (equivalent to 99 percent of GDP, or approximately $228 billion)

to €330.4 billion in 2010 (equivalent to 144 percent of GDP, or approximately $438 billion). The country's general economic stagnation was further reflected in its unemployment rate, which after fluctuating around 10 percent for a decade, fell to 7.5 percent in May 2008, only to double by March 2011. Greece's GDP shrank by 6.6 percent in 2010.

By the fall of 2011, the government of Greece found itself between a rock and a hard place, as the EU debt relief package was imperiled by a threatened cutoff in response to Greece's apparent inability to meet its austerity commitments. Yet daily strikes and mounting political pressure within Greece were preventing the government (led by a socialist party, with a slim parliamentary majority) from fully implementing the promised cuts. A disorderly default was a distinct possibility, along with an exit by Greece from the euro zone.

The Australian model lends itself well to a depiction of the Greek debt crisis. The analysis shown in the figure combines elements of Figures 15–8 and 15–9. By 2005, Greece was suffering from both a balance of payments deficit and unemployment, conditions indicated by point 1. By 2010, both unemployment and the balance of payments deficit had substantially worsened, moving Greece toward point 2 (farther from both internal and external balance and far from equilibrium at point 3). It seems straightforward, based on the phase diagram, that Greece needed to reduce absorption and depreciate its real exchange rate, but there's a catch. As a member of the EU, Greece was a member of the euro zone and was thus unable to devalue its currency as a means of reducing its balance of payments deficit. The only way for Greece to induce the necessary real depreciation was to reduce P_n sufficiently. In short, austerity presented itself as virtually the only tool available to the Greek government. Pushing down wages—a central element of the Government's austerity program—would reduce P_n (because labor can be counted as a key nontradable) and help depreciate the real exchange rate. Austerity was also critical to restoring external balance because borrowing to finance the current account deficit was no longer an option for Greece.

The bailout package offered by EU member states in concert with the IMF would effectively shift the EB curve out to *EB'*, thus reducing the amount of both real depreciation and spending cuts required to reach the new equilibrium at point 4. Herein lay the impasse encountered in the fall of 2011. Greece was widely seen as incapable of making the cuts necessary to reach equilibrium at point 3. Without the bailout package, default seemed unavoidable. Yet even the degree of austerity required to reach the postbailout equilibrium at point 4 was becoming politically impossible for the Greek government. Absent a credible commitment by the Greek government to impose the necessary spending and public employment cuts (along with substantial tax increases), the EU was

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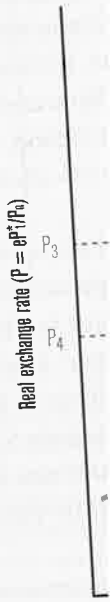

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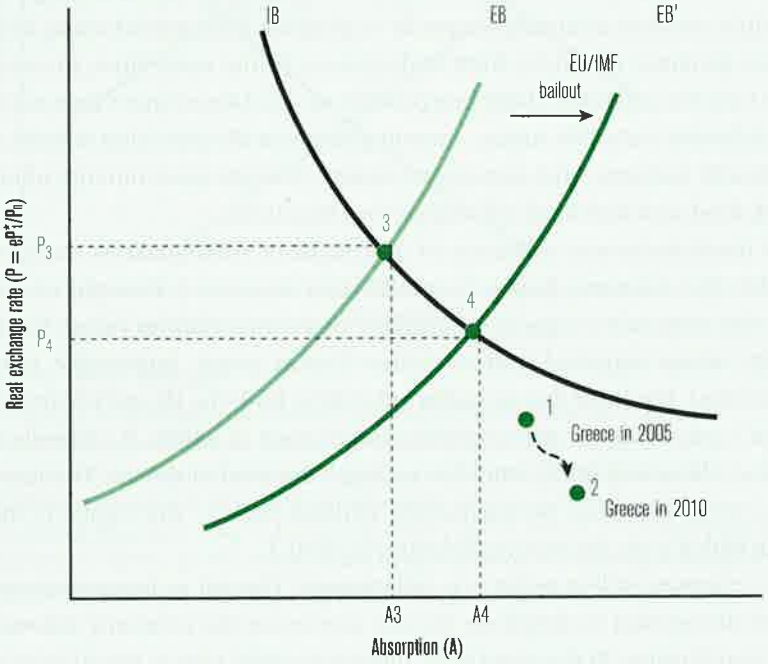
unwilling to provide the bailout. The brinksmanship between Greece's government and its debtors continued into early 2012. Greece's next round of debt repayments were due in on March 20, 2012, and, absent a new bailout agreement, default was inevitable. In late February, just weeks before the prospective default, EU and Greek negotiators agreed on a second bailout program worth €130 billion ($169 billion) in return for renewed promises of severe austerity and greater EU influence over Greek budgets. The deal was intended to keep the Greek government solvent until 2014. Yet, Greece's continuing deep recession and political uncertainty suggested that the crisis was far from over.



Another kind of stabilization also can be illustrated with Figure 15–9, **rapid inflation** (or hyperinflation). In Bolivia's hyperinflation of the mid-1980s or the chronic inflations in the past in Brazil and Argentina, external balance is a secondary consideration or not a major problem. Point 4 in the diagram depicts this situation. Austerity still is required to move toward equilibrium at point 2 or 3 (if there is an aid package), but devaluation only intensifies inflation. Instead, the currency must be appreciated, which also dampens inflation. One way to achieve this would be to fix the nominal rate and let the continuing (if decreasing) inflation in nontradable prices (P_n) appreciate the real rate P. This is the *exchange-rate anchor*, a device used often in Latin America, especially in Chile during the late 1970s, in Bolivia during the

mid-1980s, and in Argentina during the 1990s. It has the disadvantage that a lower real rate discourages export growth. Yet investment in new exports may be part of a strategy to open the economy, diversify exports, and move the external balance curve to the right.

DROUGHT, HURRICANES, AND EARTHQUAKES

The human tragedy of drought, earthquakes, and other natural disasters in places such as Ethiopia, the West African Sahel, and Haiti in 2010 dwarfs issues of macroeconomic management. But the adept management of an economy racked by natural disaster is essential to reduce the misery of starving or displaced people. Drought, for example, reduces a country's capacity to produce food, export crops, and in some countries, generate electricity from hydropower. At the same time, income is lower because farmers and others have less product to sell. Government then needs to provide social safety nets; this means spending more on the provision of food, transportation, health services, and sometimes shelter. Foreign governments often provide financial, food, and technical aid under these situations.

The macroeconomic reflection of a drought or earthquake is depicted in Figure 15–10. The economy begins in equilibrium at point 1. Drought or earthquake reduces the economy's capacity to produce both nontradables (some foods, hydroelectricity, water supplies) and tradables (export crops, importable foods, some manufactures). We show this as a leftward shift in both the IB and EB lines: Reduced output of S_n at any given price means a larger zone in which D_n exceeds S_n; this is inflationary. Similarly for S_t, and this enlarges the area of deficit. The new external balance curve, EB_2, may be augmented (shifted back to the right) by foreign aid to EB_3, in which case, the new equilibrium is point 3.

The economy, still at point 1, is inflationary. The fall in incomes creates a tendency for absorption to shrink on its own and move the economy leftward toward the new equilibrium. At the same time, the government tries to spend more to relieve hunger, disease, and other problems. The outcome depends on the relative force of these tendencies. The impact of most natural disasters is temporary, typically lasting a year, although some African droughts have been much longer, and the Haiti earthquake of 2010 is likely to last for several years or more. It is appropriate to try to ride out such shocks with minimal adjustment, especially if foreign aid can bear much of the burden. Therefore, for example, even if an exchange-rate adjustment is called for to reach equilibrium, it is unlikely to work very well during the natural disaster and probably should be resisted. This could be said for fiscal austerity too, except that the rise in prices can deepen the suffering of those already hurt by the disaster. If the government is able to shift its expenditures so that a greater portion goes into alleviating the impact of the disaster, it may be able to relieve the worst suffering while restricting the rise of total expenditures and containing inflation.

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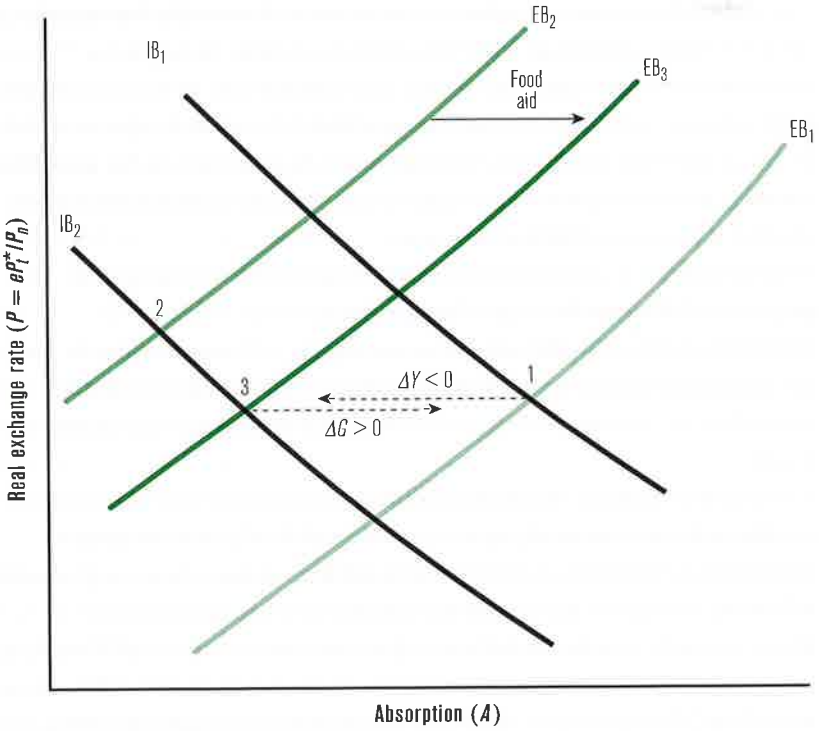

FIGURE 15-10 Drought

Drought or another natural disaster reduces the capacity to produce both nontradables and tradables, so the curves shift to the west. Disaster relief from abroad augments the external balance curve and shifts it to EB_3, with equilibrium at point 3. Remaining temporarily at point 1, the economy becomes inflationary. The reduction in output and therefore in income reduces absorption, but the government's need to spend more on relief tends to offset this move toward equilibrium. The outcome could be continued inflation.

SUMMARY

- Open economies may be exposed to a variety of shocks, both positive and negative, either of which may require policy responses to balance potential negative effects. In many cases, we have seen that a country's vulnerability to external shocks may be increased by its own history of poor policy choices.
- One common problem among developing countries arises from extended periods of spending more than they earn and financing the resulting current account deficits with foreign borrowing. For many developing countries, these persistent current account deficits become unsustainable, typically requiring both spending reductions and currency devaluation.

- The Australian model provides a convenient and versatile framework within which to diagnose common macroeconomic imbalances. Equilibrium in the Australian model requires balance in the markets for both tradable and nontradable commodities (the relative price of which is one expression of the real exchange rate). Equilibrium in the tradables markets is known as external balance; equilibrium in the nontradables market is known as internal balance.
- Disequilibrium in the tradables market implies either a balance of payments deficit (in the case of excess demand) or a balance of payments surplus (in the case of excess supply). Disequilibrium in the nontradables market implies either a higher rate of inflation (in the case of excess demand) or higher unemployment (in the case of excess supply).
- Considered together, these disequilibrium conditions may arise in four combinations: balance of payments deficit with inflation, balance of payments deficit with unemployment, balance of payments surplus with inflation, and balance of payments surplus with unemployment.
- The main policy tools available to regain macroeconomic equilibrium are fiscal and monetary policy interventions to change the level of domestic spending (absorption) and changes in nominal exchange rate policy aimed at altering the real exchange rate.
- Recommendations to use some combination of these policy tools to regain equilibrium must take account of the economy's natural tendencies toward equilibrium. The functionality of these natural tendencies will vary with each country's economic and policy circumstances.

APPENDIX TO CHAPTER 15: NATIONAL INCOME AND THE BALANCE OF PAYMENTS

Many macroeconomic problems and crises in developing countries have their roots in the balance of payments. Chapter 10 opens the discussion of balance of payments by describing the role of foreign savings in financing investment. Chapter 13 discusses debt crises in developing countries, and Chapter 15 provides a model for diagnosing and responding to macroeconomic crises—including debt crises. Balance of payments accounting provides a framework within which to understand many of the opportunities and risks created by opening economies to trade and financial flows.

This appendix provides a brief overview of some key aspects of balance of payments accounting.[10]

We begin by placing the balance of payments in the broader context of national income accounting. The value added from all goods and services produced domestically sums to Gross Domestic Product (GDP). In a closed economy, this exactly equals gross national expenditure, which consists of private consumption on final goods and services (C), government consumption and investment in final goods and services (G), and private investments to expand the country's capital stock (I). That is, GDP = C + I + G in a closed economy. In Chapter 15, we refer to gross national expenditure as **absorption** (A), or A = C + I + G. Adopting this notation, we can say that in a closed economy, GDP = A. In addition, in a closed economy all of gross national expenditures (or absorption) is paid to domestic entities, so GDP also equals gross national income (GNI).

When we allow for trade with other countries, it is no longer required that gross domestic product exactly equals absorption or gross national income. This is where the balance of payments comes in. Balance of payments accounting records all of the (home) country's transactions with the rest of the world, including both trade and financial flows. The main components of the balance of payments are the **current account**, the **financial account**, and the **capital account**.

We begin by incorporating the current account into national income. The current account records all foreign trade in goods (the trade balance) and services (net factor income from abroad), along with net unilateral transfers (such as foreign aid or remittances from residents working abroad). The current account also includes interest payments on foreign debts (debt service payments, but not repayment of principal on the debt). In an open economy, part of absorption may be spent on imports (M), and must be subtracted from A; conversely, some domestic production may be exported abroad (X), and the resulting payments to domestic firms are added to A. In this case, we can write the national income accounting identity as

$$GDP = C + I + G + X - M \qquad \text{[A15-1]}$$

Substituting absorption (A) in for gross national expenditure, we can re-write equation A15-1 as

$$GDP = A + X - M \qquad \text{[A15-2]}$$

[10]This discussion draws on Robert C. Feenstra and Alan M. Taylor, *International Macroeconomics*, 2nd edition (New York: Worth Publishers, 2012), Chapter 5 (to which the reader is referred for a more detailed treatment), as well as the IMF's *Balance of Payments and International Investment Position Manual*, 6th edition (Washington, DC: International Monetary Fund, 2011).

That is, gross domestic product equals domestic expenditure plus net exports. Rearranging the terms of equation A15-2, we can see that A − GDP = M − X. In other words, if domestic spending exceeds GDP, then our imports exceed our exports and we run a negative trade balance. The trade balance is typically the major component of the current account. As noted above, net factor income from abroad (NFIA), or income from the net export of services (e.g., wages paid to a home country resident working abroad for a foreign firm), is also part of the current account and is included in gross national income (GNI). Thus, GNI = GDP + NFIA. The difference between gross national income (GNI) and gross national disposable income (Y) is that the latter also includes the final component of the current account, net unilateral transfers (NUT). Putting these steps together, we can write

$$Y = A + (X - M) + NFIA + NUT = A + CA \qquad \text{[A15-3]}$$

where CA is the current account, which equals the sum of net exports, net factor income from abroad, and net unilateral transfers. Equation A15-3 is important. It implies that if the home country's total expenditures exceed its total receipts, the difference must be provided by running a deficit on the current account. From equation A15-3, we can see that $A - Y = -CA$. The current account balance thus serves as an indicator of whether a country's spending exceeds its income.

As discussed in Chapter 10, we can also approach the current account from the perspective of national savings. National savings is what is left over from total receipts net of private and government consumption, or $S = Y - C - G$. If we expand A in equation A15-3 to write $Y = C + I + G + CA$ and subtract $C + G$ from both sides, we arrive at the **current account identity**,

$$S = I + CA \qquad \text{[A15-4]}$$

which says that we can only save more than we invest if there is a CA surplus, and we can only invest more than we save if there is a CA deficit.

Domestic savings has two components—private savings (S_p) and government savings (S_g). Income in the private sector must be consumed, saved, or paid to the government as taxes. Thus,

$$S_p = Y - C - T \qquad \text{[A15-5]}$$

Similarly, government savings is the difference between the tax revenue collected by the government (T) and its expenditures (G), or

$$S_g = T - G \qquad \text{[A15-6]}$$

which is the government's fiscal surplus (or deficit, if $G > T$). The sum of these two equations equals our previous observation that $S = Y - C - G = S_p + S_g$, or total national savings is the sum of private savings and government savings. Substituting this idea into equation A15-4 and rearranging, we can see that

$$CA = S_p + S_g - I \qquad \text{[A15-7]}$$

Stated slightly differently, if investment is to exceed national savings, the difference must be financed from abroad, and that difference equals the current account deficit. In this sense, we can think of the current account as foreign savings. In addition, if we substitute equation A15–6 into equation A15–7, we see that

$$CA = (S_p - I) + (T - G) \qquad \text{[A15–8]}$$

which tells us that if investment exceeds private savings and/or the government runs a fiscal deficit, the current account must be in deficit by an equivalent amount.

The rest of the balance of payments story is about how the current account is financed. As noted above, in addition to the current account, the balance of payments includes the financial account (FA) and the capital account (KA). The financial account records foreign transactions involving financial assets such as stocks, bonds, and real estate ownership. The major components of the financial account (using the IMF definition) are foreign direct investment, portfolio investment, and (importantly) reserve assets (which is the stock of foreign currency—usually U.S. dollars, euros, or yen) held by the central bank. The capital account refers to the transfer of assets such as gifts to and from abroad.[11]

A fundamental principle of balance of payments accounting is that bills must be paid. This implies that the balance of payments must sum to zero, or

$$CA + FA + KA = 0 \qquad \text{[A15–9]}$$

This is the **balance of payments identity**. It implies that there are only three ways in which a country can finance a current account deficit: 1) it can borrow from abroad (from foreign governments, banks, or international lending bodies), 2) it can attract capital inflows (in the form of direct or portfolio investment), or 3) it can run down its stock of foreign reserves. If the current account is in deficit, then it must be balanced by a surplus in the financial and capital accounts (which potentially includes running down the country's stock of foreign reserves). If the balance of payments must also equal zero, what is meant when we hear about a "balance of payments deficit?" In common use, a balance of payments deficit refers to a situation in which a CA deficit is not fully balanced by a surplus in FA + KA *where FA is defined narrowly to exclude the foreign reserve assets of the central bank.* In such a case, the total balance of payments must be brought to zero by a change in foreign reserves (running them down, in this instance, to finance the remaining CA deficit).

Running a surplus in the (non-reserve) financial and capital accounts means that the home country is either borrowing from abroad or selling domestic assets to foreigners. In either case, the home country is increasing the claims by foreigners

[11]This narrow definition of the capital account (and broad definition of the financial account) is in accordance with the approach now taken by the IMF, along with OECD and the UN System of National Accounts. Previously, the accepted tradition was to define the capital account broadly enough to include everything that the IMF now assigns to the financial account, with the exception of the reserve assets of the central bank.

on domestic residents. Conversely, if the home country is running a current account surplus, it must also be running a deficit on the financial and capital accounts, thus increasing the claims by residents on foreigners. Since the home country's stock of net foreign assets equals the difference between claims by residents of the home country on foreigners and claims by foreigners on home country residents, the current account equals the change in net foreign assets.