Problems and Applications

1. a. An increase in saving shifts the $(S - I)$ schedule to the right, increasing the supply of dollars available to be invested abroad, as in Figure 5–3. The increased supply of dollars causes the equilibrium real exchange rate to fall from ϵ_1 to ϵ_2. Because the dollar becomes less valuable, domestic goods become less expensive relative to foreign goods, so exports rise and imports fall. This means that the trade balance increases. The nominal exchange rate falls following the movement of the real exchange rate, because prices do not change in response to this shock.

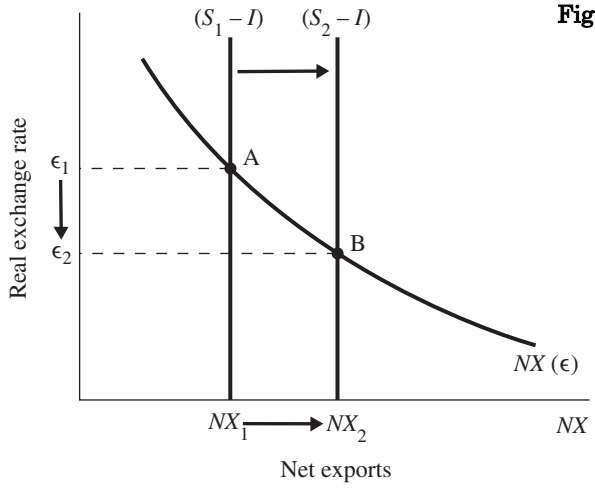


Figure 5–3

b. The introduction of a stylish line of Toyotas that makes some consumers prefer foreign cars over domestic cars has no effect on saving or investment, but it shifts the $NX(\epsilon)$ schedule inward, as in Figure 5–4. The trade balance does not change, but the real exchange rate falls from ϵ_1 to ϵ_2. Because prices are not affected, the nominal exchange rate follows the real exchange rate.

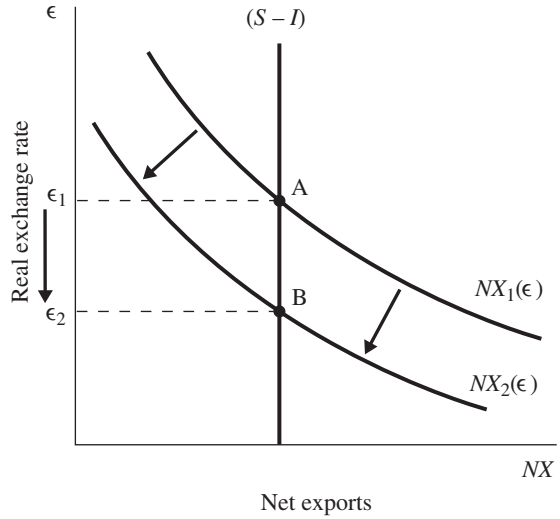
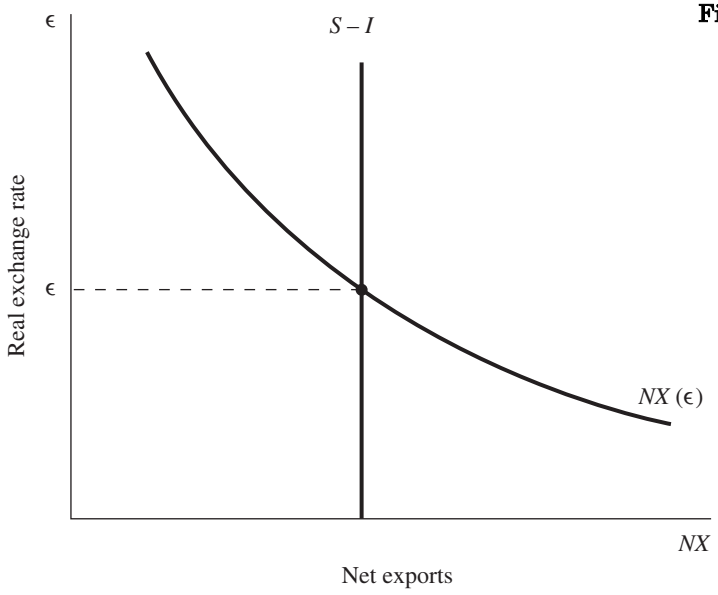


Figure 5–4

c. In the model we considered in this chapter, the introduction of ATMs has no effect on any real variables. The amounts of capital and labor determine output Y. The world interest rate r^* determines investment $I(r^*)$. The difference between domestic saving and domestic investment $(S - I)$ determines net exports. Finally, the intersection of the $NX(\epsilon)$ schedule and the $(S - I)$ schedule determines the real exchange rate, as in Figure 5–5.

Figure 5–5



The introduction of ATMs, by reducing money demand, does affect the nominal exchange rate through its effect on the domestic price level. The price level adjusts to equilibrate the demand and supply of real balances, so that

$$M/P = (M/P)^d.$$

If M is fixed, then a fall in $(M/P)^d$ causes an increase in the price level: this reduces the supply of real balances M/P and restores equilibrium in the money market.

Now recall the formula for the nominal exchange rate:

$$e = \epsilon \times (P^*/P).$$

We know that the real exchange rate ϵ remains constant, and we assume that the foreign price level P^* is fixed. When the domestic price level P increases, the nominal exchange rate e depreciates.

2. a. National saving is the amount of output that is not purchased for current consumption by households or the government. We know output and government spending, and the consumption function allows us to solve for consumption. Hence, national saving is given by:

$$\begin{aligned} S &= Y - C - G \\ &= 5{,}000 - (250 + 0.75(5{,}000 - 1{,}000)) - 1{,}000 \\ &= 750. \end{aligned}$$

Investment depends negatively on the interest rate, which equals the world rate r^* of 5. Thus,

$$\begin{aligned} I &= 1{,}000 - 50 \times 5 \\ &= 750. \end{aligned}$$

Net exports equals the difference between saving and investment. Thus,

$$\begin{aligned} NX &= S - I \\ &= 750 - 750 \\ &= 0. \end{aligned}$$

Having solved for net exports, we can now find the exchange rate that clears the foreign-exchange market:

$$\begin{aligned} NX &= 500 - 500 \times \varepsilon \\ 0 &= 500 - 500 \times \varepsilon \\ \varepsilon &= 1. \end{aligned}$$

b. Doing the same analysis with the new value of government spending we find:

$$\begin{aligned} S &= Y - C - G \\ &= 5{,}000 - (250 + 0.75(5{,}000 - 1{,}000)) - 1{,}250 \\ &= 500 \end{aligned}$$

$$\begin{aligned} I &= 1{,}000 - 50 \times 5 \\ &= 750 \end{aligned}$$

$$\begin{aligned} NX &= S - I \\ &= 500 - 750 \\ &= -250 \end{aligned}$$

$$NX = 500 - 500 \times \varepsilon$$

$$-250 = 500 - 500 \times \varepsilon$$

$$\varepsilon = 1.5.$$

The increase in government spending reduces national saving, but with an unchanged world real interest rate, investment remains the same. Therefore, domestic investment now exceeds domestic saving, so some of this investment must be financed by borrowing from abroad. This capital inflow is accomplished by reducing net exports, which requires that the currency appreciate.

c. Repeating the same steps with the new interest rate,

$$\begin{aligned} S &= Y - C - G \\ &= 5{,}000 - (250 + 0.75(5{,}000 - 1{,}000)) - 1{,}000 \\ &= 750 \end{aligned}$$

$$\begin{aligned} I &= 1{,}000 - 50 \times 10 \\ &= 500 \end{aligned}$$

$$\begin{aligned} NX &= S - I \\ &= 750 - 500 \\ &= 250 \end{aligned}$$

$$NX = 500 - 500 \times \varepsilon$$

$$250 = 500 - 500 \times \varepsilon$$

$$\varepsilon = 0.5.$$

Saving is unchanged from part (a), but the higher world interest rate lowers investment. This capital outflow is accomplished by running a trade surplus, which requires that the currency depreciate.

3. a. When Leverett's exports become less popular, its domestic saving $Y - C - G$ does not change. This is because we assume that Y is determined by the amount of capital and labor, consumption depends only on disposable income, and government spending is a fixed exogenous variable. Investment also does not change, since investment depends on the interest rate, and Leverett is a small open economy that takes the world interest rate as given. Because neither saving nor investment changes, net exports, which equal $S - I$, do not change either. This is shown in Figure 5–6 as the unmoving $S - I$ curve.

The decreased popularity of Leverett's exports leads to a shift inward of the net exports curve, as shown in Figure 5–6. At the new equilibrium, net exports are unchanged but the currency has depreciated.

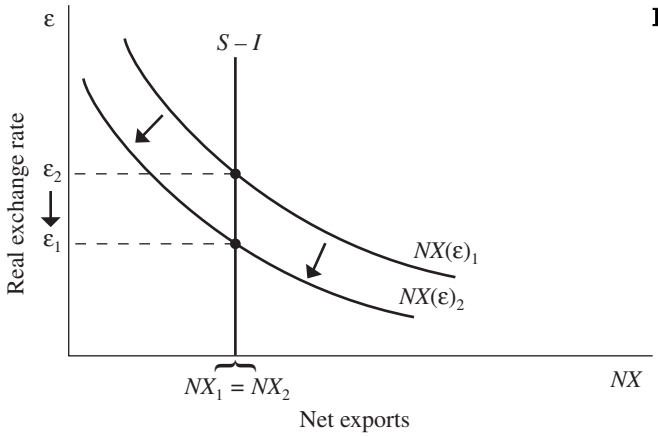


Figure 5–6

Even though Leverett's exports are less popular, its trade balance has remained the same. The reason for this is that the depreciated currency provides a stimulus to net exports, which overcomes the unpopularity of its exports by making them cheaper.