Chapter 3 (QFR)

2. When a firm decides how much of a factor of production to hire, it considers how this decision affects profits. For example, hiring an extra unit of labor increases output and therefore increases revenue; the firm compares this additional revenue to the additional cost from the higher wage bill. The additional revenue the firm receives depends on the marginal product of labor (MPL) and the price of the good produced (P). An additional unit of labor produces MPL units of additional output, which sells for P dollars. Therefore, the additional revenue to the firm is $P \times MPL$. The cost of hiring the additional unit of labor is the wage W. Thus, this hiring decision has the following effect on profits:

$$\begin{aligned} \Delta\text{Profit} &= \Delta\text{Revenue} - \Delta\text{Cost} \\ &= (P \times MPL) - W. \end{aligned}$$

If the additional revenue, $P \times MPL$, exceeds the cost (W) of hiring the additional unit of labor, then profit increases. The firm will hire labor until it is no longer profitable to do so—that is, until the MPL falls to the point where the change in profit is zero. In the equation above, the firm hires labor until $\Delta\text{profit} = 0$, which is when $(P \times MPL) = W$.

This condition can be rewritten as:

$$MPL = W/P.$$

Therefore, a competitive profit-maximizing firm hires labor until the marginal product of labor equals the real wage. The same logic applies to the firm's decision to hire capital: the firm will hire capital until the marginal product of capital equals the real rental price.

Chapter 3 (QFR)

7. When the government increases taxes, disposable income falls, and therefore consumption falls as well. The decrease in consumption equals the amount that taxes increase multiplied by the marginal propensity to consume (*MPC*). The higher the *MPC* is, the greater is the negative effect of the tax increase on consumption. Because output is fixed by the factors of production and the production technology, and government purchases have not changed, the decrease in consumption must be offset by an increase in investment. For investment to rise, the real interest rate must fall. Therefore, a tax increase leads to a decrease in consumption, an increase in investment, and a fall in the real interest rate.

T ↑ :

- Disposable income: Y-T ↓ ➔ C(Y-T) ↓
- Y(const) = C↓ + I↑ + G(const)
- I = I(r), so I↑ if r↓

The interest rate equilibrates the market in closed economy model!

Chapter 4

8. An increase in the rate of money growth leads to an increase in the rate of inflation. Inflation, in turn, causes the nominal interest rate to rise, which means that the opportunity cost of holding money increases. As a result, real money balances fall. Since money is part of wealth, real wealth also falls. A fall in wealth reduces consumption, and, therefore, increases saving. The increase in saving leads to an outward shift of the saving schedule, as in Figure 4–1. This leads to a lower real interest rate.

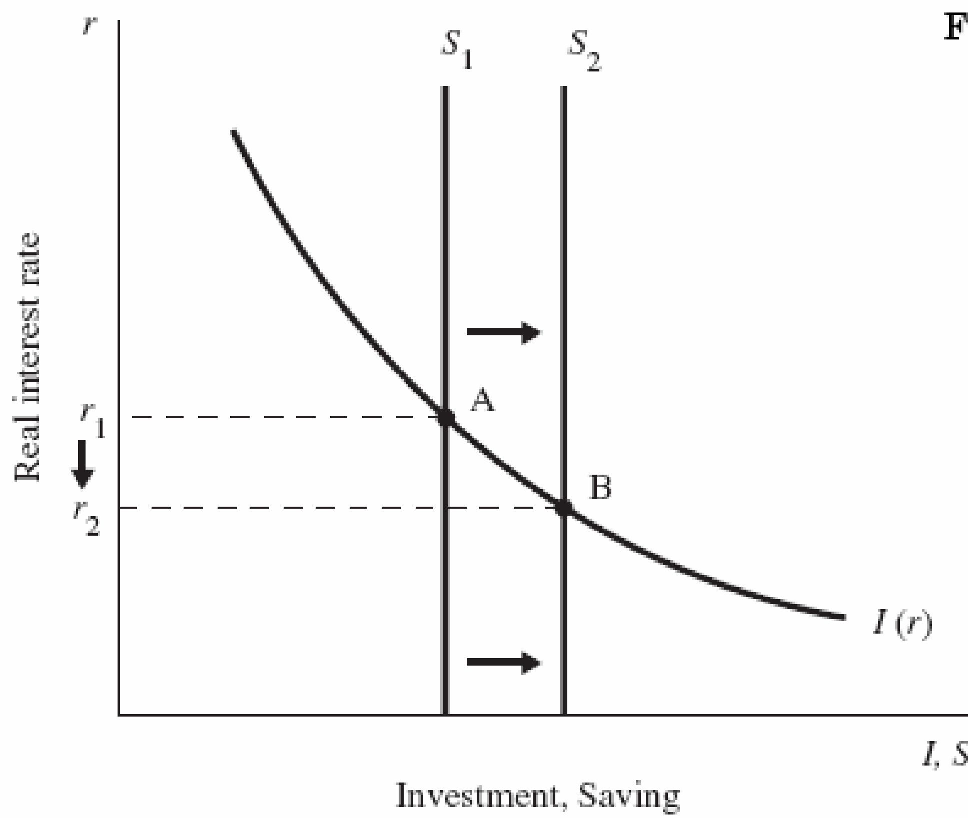

Figure 4–1

The classical dichotomy states that a change in a nominal variable such as inflation does not affect real variables. In this case, the classical dichotomy does not hold; the increase in the rate of inflation leads to a decrease in the real interest rate. The Fisher effect states that $i = r + \pi$. In this case, since the real interest rate r falls, a 1-percent increase in inflation increases the nominal interest rate i by less than 1 percent.

Most economists believe that this Mundell–Tobin effect is not important because real money balances are a small fraction of wealth. Hence, the impact on saving as illustrated in Figure 4–1 is small.

Chapter 4 Appendix

1. With constant money growth at rate μ, the question tells us that the Cagan model implies that $p_t = m_t + \gamma\mu$. This question draws out the implications of this equation.
   a. One way to interpret this result is to rearrange to find:

   $$m_t - p_t = -\gamma\mu .$$

   That is, real balances depend on the money growth rate. As the growth rate of money rises, real balances fall. This makes sense in terms of the model in this chapter, since faster money growth implies faster inflation, which makes it less desirable to hold money balances.

   b. With unchanged growth in the money supply, the increase in the level of the money supply m_t increases the price level p_t one-for-one.
   c. With unchanged current money supply m_t, a change in the growth rate of money μ changes the price level in the same direction.

d. When the central bank reduces the rate of money growth μ, the price level will immediately fall. To offset this decline in the price level, the central bank can increase the current level of the money supply m_t, as we found in part (b). These answers assume that at each point in time, private agents expect the growth rate of money to remain unchanged, so that the change in policy takes them by surprise—but once it happens, it is completely credible. A practical problem is that the private sector might not find it credible that an *increase* in the current money supply signals a *decrease* in future money growth rates.

e. If money demand does not depend on the expected rate of inflation, then the price level changes only when the money supply itself changes. That is, changes in the growth rate of money μ do not affect the price level. In part (d), the central bank can keep the current price level p_t constant simply by keeping the current money supply m_t constant.

Chapter 18

1. The model of the money supply developed in Chapter 18 shows that

$$M = mB.$$

The money supply M depends on the money multiplier m and the monetary base B. The money multiplier can also be expressed in terms of the reserve–deposit ratio rr and the currency–deposit ratio cr. Rewriting the money supply equation:

$$M = \left[\frac{(cr + 1)}{(cr + rr)}\right] B.$$

This equation shows that the money supply depends on the currency–deposit ratio, the reserve–deposit ratio, and the monetary base.

To answer parts (a) through (c), we use the values for the money supply, the monetary base, the money multiplier, the reserve–deposit ratio, and the currency–deposit ratio from Table 18–1:

	August 1929	March 1933
Money supply	26.5	19.0
Monetary base	7.1	8.4
Money multiplier	3.7	2.3
Reserve–deposit ratio	0.14	0.21
Currency–deposit ratio	0.17	0.41

a. To determine what would happen to the money supply if the currency–deposit ratio had risen but the reserve–deposit ratio had remained the same, we need to recalculate the money multiplier and then plug this value into the money supply equation $M = mB$. To recalculate the money multiplier, use the 1933 value of the currency–deposit ratio and the 1929 value of the reserve–deposit ratio:

$$m = (cr_{1933} + 1)/(cr_{1933} + rr_{1929})$$

$$m = (0.41 + 1)/(0.41 + 0.14)$$

$$m = 2.56.$$

To determine the money supply under these conditions in 1933:

$$M_{1933} = mB_{1933}.$$

Plugging in the value for m just calculated and the 1933 value for B:

$$M_{1933} = 2.56 \times 8.4$$

$$M_{1933} = 21.504.$$

Therefore, under these circumstances, the money supply would have fallen from its 1929 level of 26.5 to 21.504 in 1933.

b. To determine what would have happened to the money supply if the reserve–deposit ratio had risen but the currency–deposit ratio had remained the same, we need to recalculate the money multiplier and then plug this value into the money supply equation $M = mB$. To recalculate the money multiplier, use the 1933 value of the reserve–deposit ratio and the 1929 value of the currency–deposit ratio:

$$m = (cr_{1929} + 1)/(cr_{1929} + rr_{1933})$$
$$m = (0.17 + 1)/(0.17 + 0.21)$$
$$m = 3.09.$$

To determine the money supply under these conditions in 1933:

$$M_{1933} = mB_{1933}.$$

Plugging in the value for m just calculated and the 1933 value for B:

$$M_{1933} = 3.09 \times 8.4$$
$$M_{1933} = 25.96.$$

Therefore, under these circumstances, the money supply would have fallen from its 1929 level of 26.5 to 25.96 in 1933.

c. From the calculations in parts (a) and (b), it is clear that the decline in the currency–deposit ratio was most responsible for the drop in the money multiplier and, therefore, the money supply.

Chapter 18 (QFR)

6. "Near money" refers to nonmonetary assets that have acquired some of the liquidity of money. For example, it used to be that assets held primarily as a store of value, such as mutual funds, were inconvenient to buy and sell. Today, mutual funds allow depositors to hold stocks and bonds and make withdrawals simply by writing checks from their accounts. The existence of near money complicates monetary policy by making the demand for money unstable. As a result, velocity of money becomes unstable, and the quantity of money gives faulty signals about aggregate demand.

Chapter 5

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.

Chapter 5 (QFR)

3. A cut in defense spending increases government saving and, hence, increases national saving. Investment depends on the world rate and is unaffected. Hence, the increase in saving causes the $(S - I)$ schedule to shift to the right, as in Figure 5–1. The trade balance rises, and the real exchange rate falls.

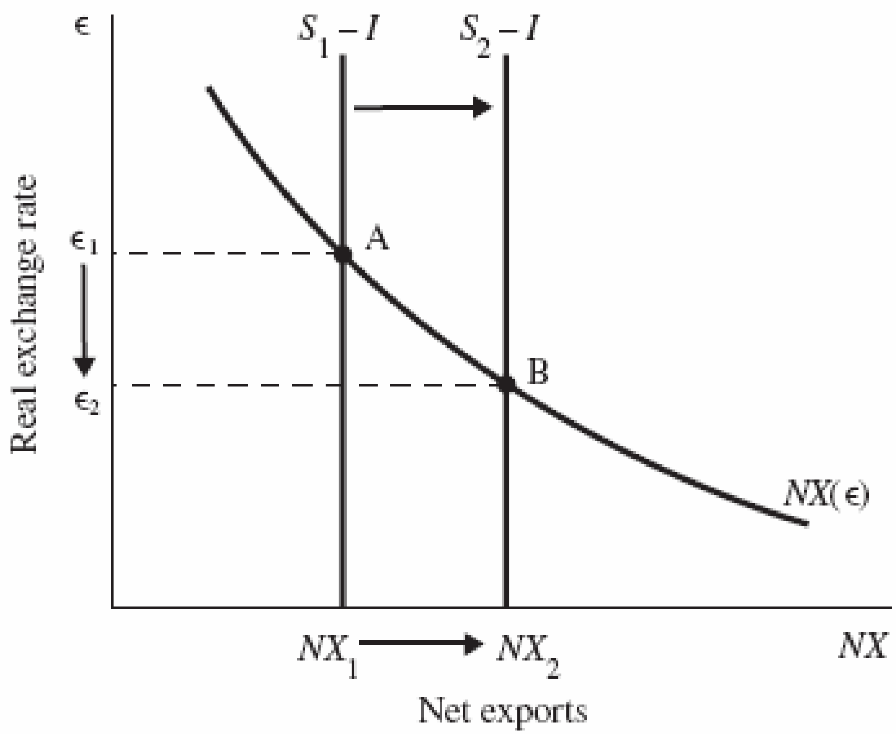

Figure 5–1