Chapter 10

Exchange Rates, Business Cycles, and Macroeconomic Policy in the Open Economy

Part 2

Fixing the Exchange Rate

- In a fixed-exchange-rate system, the value of the nominal exchange rate is officially set.
- An overvalued exchange rate is a situation when an exchange rate (e_{nom}) is higher that its fundamental value (e^{1}_{nom} in Figure 10.10, slide 59).

Overvalued Exchange Rate

- In a situation of an overvalued exchange rate a government has a number of options:
  - devalue its nominal fixed exchange rate;
  - restrict international transactions;
  - buy back its currency in foreign exchange market.

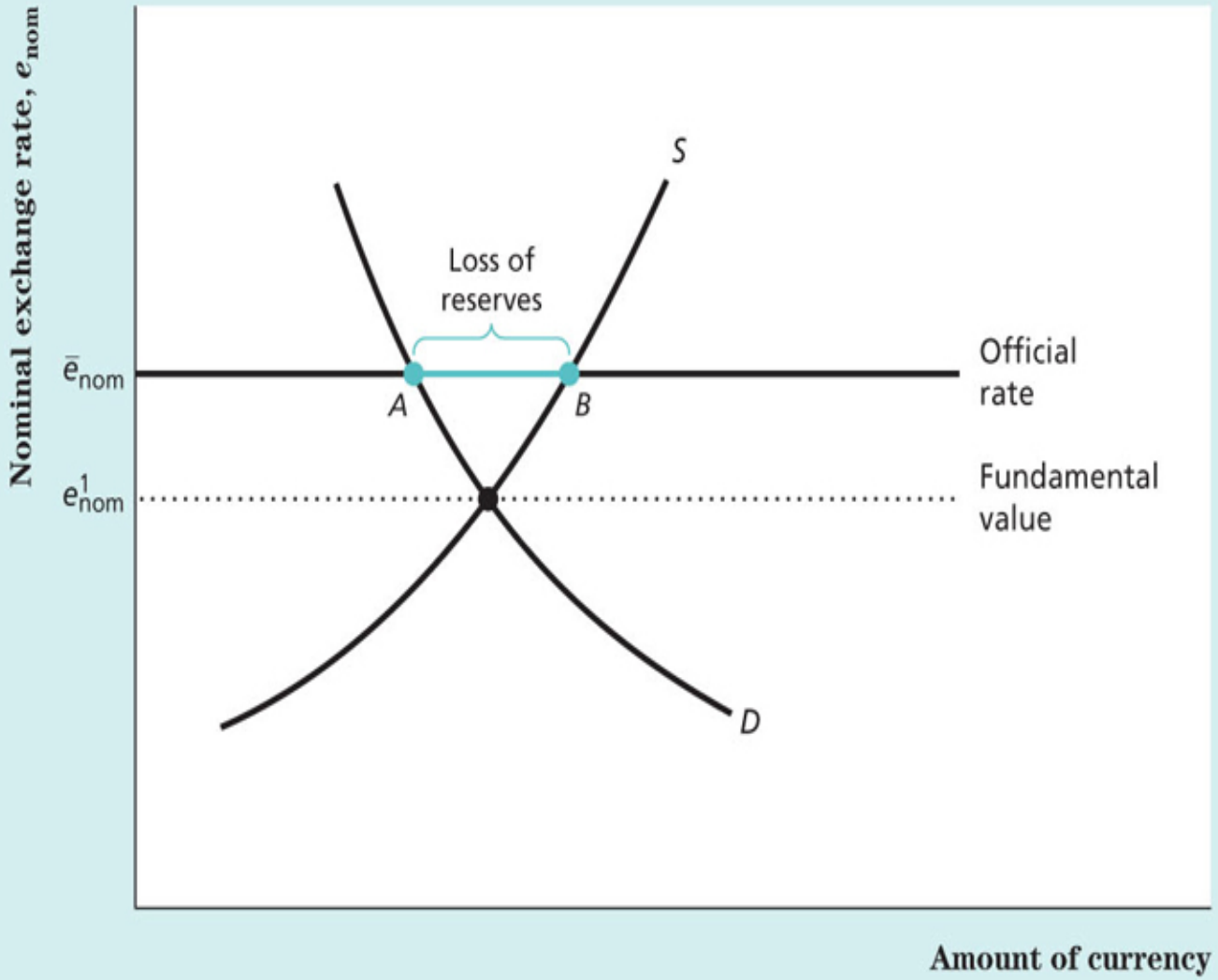
Overvalued Exchange Rate (continued)

- To support the domestic currency the central bank must use reserves equal to the country's balance of payment deficit.
- It cannot do that forever because the amount of reserves is limited.
- In Figure 10.10, they would be losing an amount equal to A-B each year.

FIGURE 10.10

AN OVERVALUED EXCHANGE RATE

The figure shows a situation in which the officially fixed nominal exchange rate, $\bar{e}_{nom}$, is higher than the fundamental value of the exchange rate, e^1_{nom}, as determined by supply and demand in the foreign exchange market. In this situation, the exchange rate is said to be overvalued. The country's central bank can maintain the exchange rate at the official rate by using its reserves to purchase its own currency in the foreign exchange market, in the amount of *AB* in each period. This loss of reserves also is referred to as the country's balance of payments deficit.



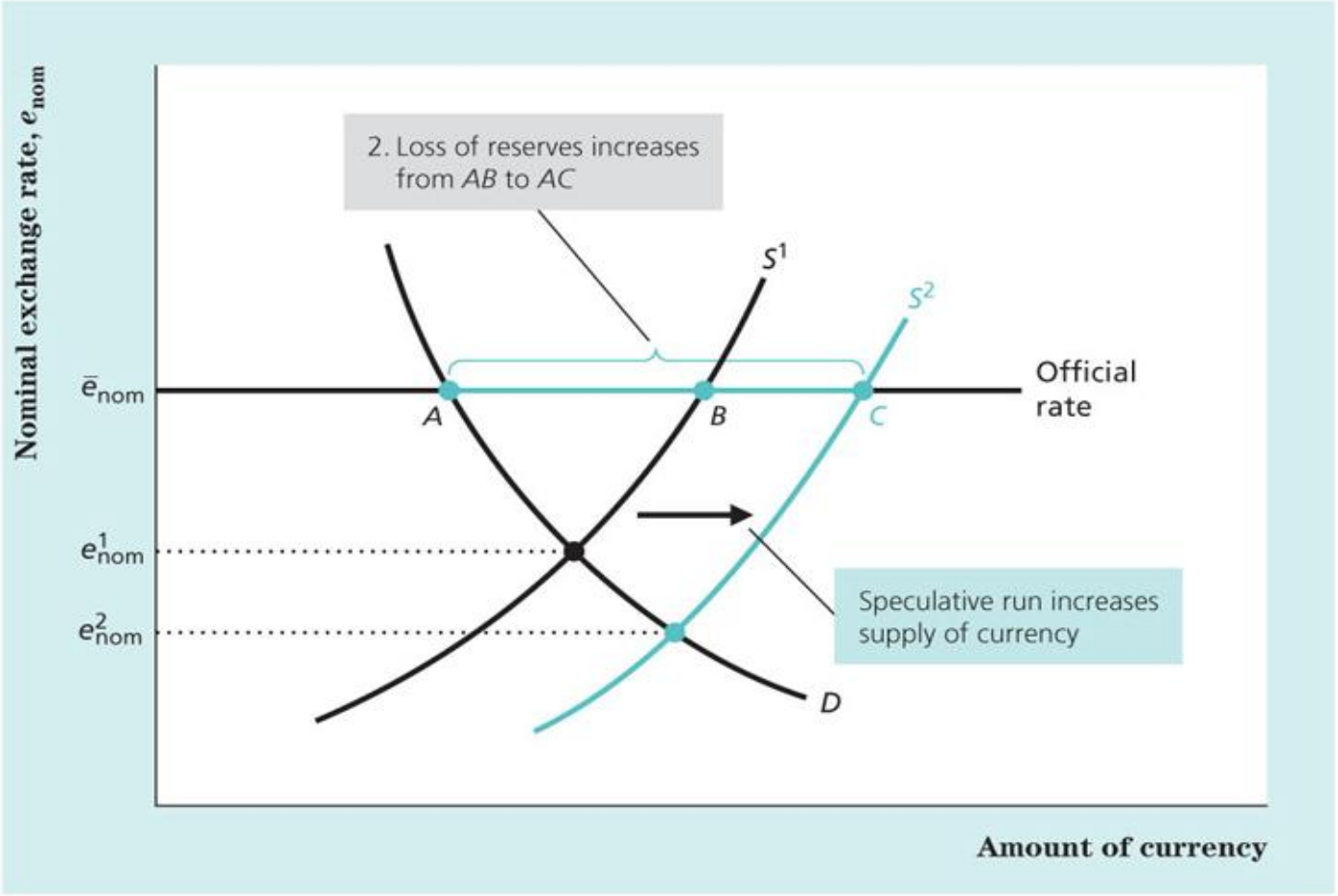
A Speculative Run

- An attempt to support an overvalued currency can be ended by a speculative run – to avoid losses, financial investors frantically sell assets denominated in the overvalued currency.
- The UK in late 1992 and Mexico in 1995 are good examples.

FIGURE 10.11

A SPECULATIVE RUN ON AN OVERVALUED CURRENCY

Initially, the supply curve of the domestic currency is S^1 and, to maintain the fixed exchange rate, the central bank must use amount *AB* of its reserves each period to purchase its own currency in the foreign exchange market. A speculative run occurs when holders of domestic assets begin to fear a devaluation, which would reduce the values of their assets (measured in terms of foreign currency). Panicky sales of domestic-currency assets lead to more domestic currency being supplied to the foreign exchange market, which shifts the supply curve of the domestic currency to the right, from S^1 to S^2. The central bank must now purchase its currency and lose reserves in the amount *AC*. This more rapid loss of reserves may force the central bank to stop supporting the overvalued currency and to devalue it, confirming the market's expectations.



How to Support an Overvalued Currency

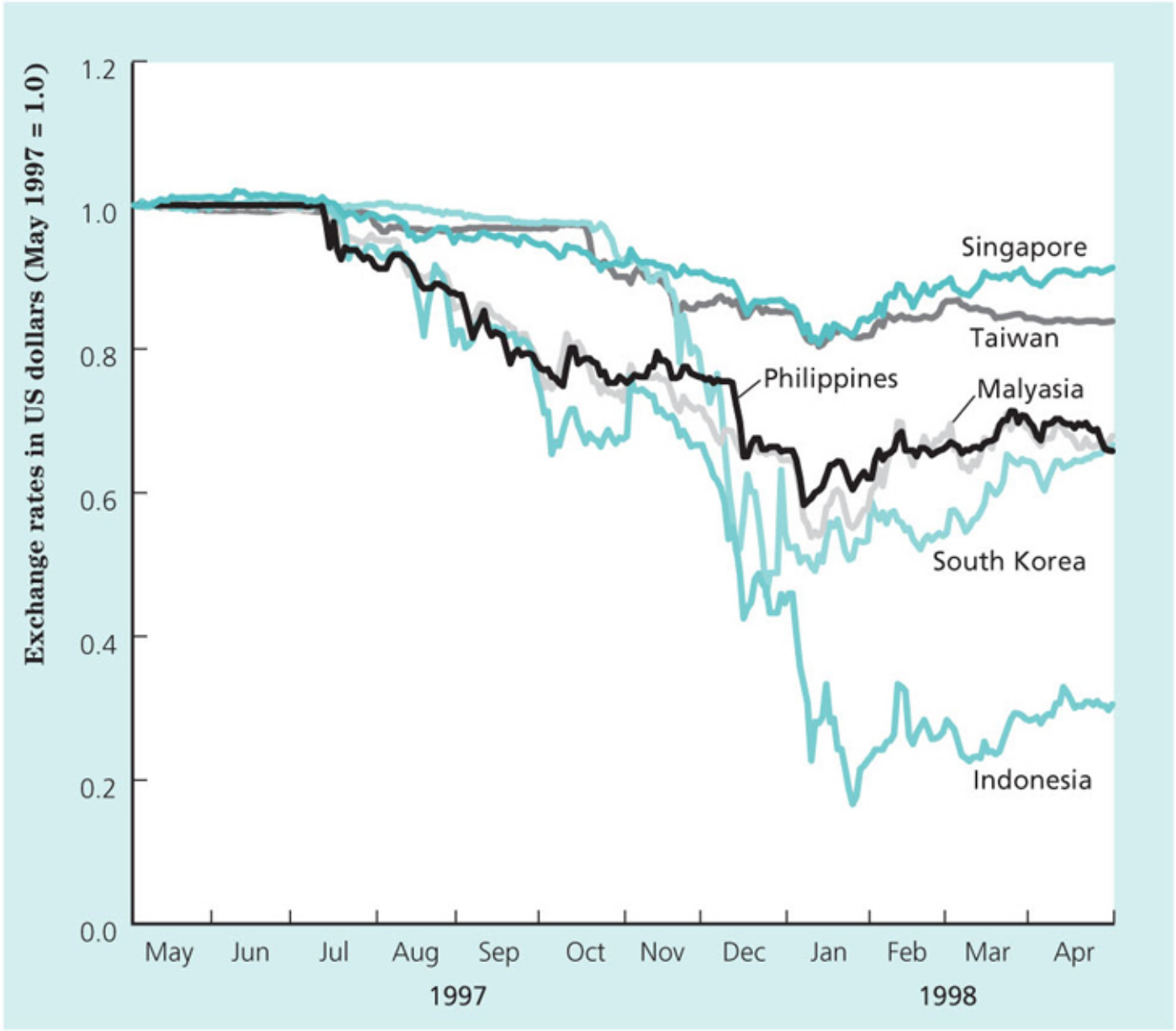
- To support an overvalued currency a country could:
  - impose strong restrictions on international trade and finance;
  - devalue its currency;
  - introduce a policy change to raise the fundamental value of the exchange rate (use monetary policy).

Figure 10.12

Currency values in the East Asian crisis

The figure shows daily values for six East Asian exchange rates, from May 1, 1997, to April 30, 1998. Rates are in US dollars and apply to the Indonesian rupiah, Malaysian ringgit, Philippine peso, Singapore dollar, Taiwanese dollar, and South Korean won. The exchange rates are scaled so that they are equal to 1.0 in May 1997. These sharp depreciations reflect speculative runs or attacks.

Source: Based on statistics accessed from Pacific Exchange Rate Service, *http://fx.sauder.ubc.ca/*.



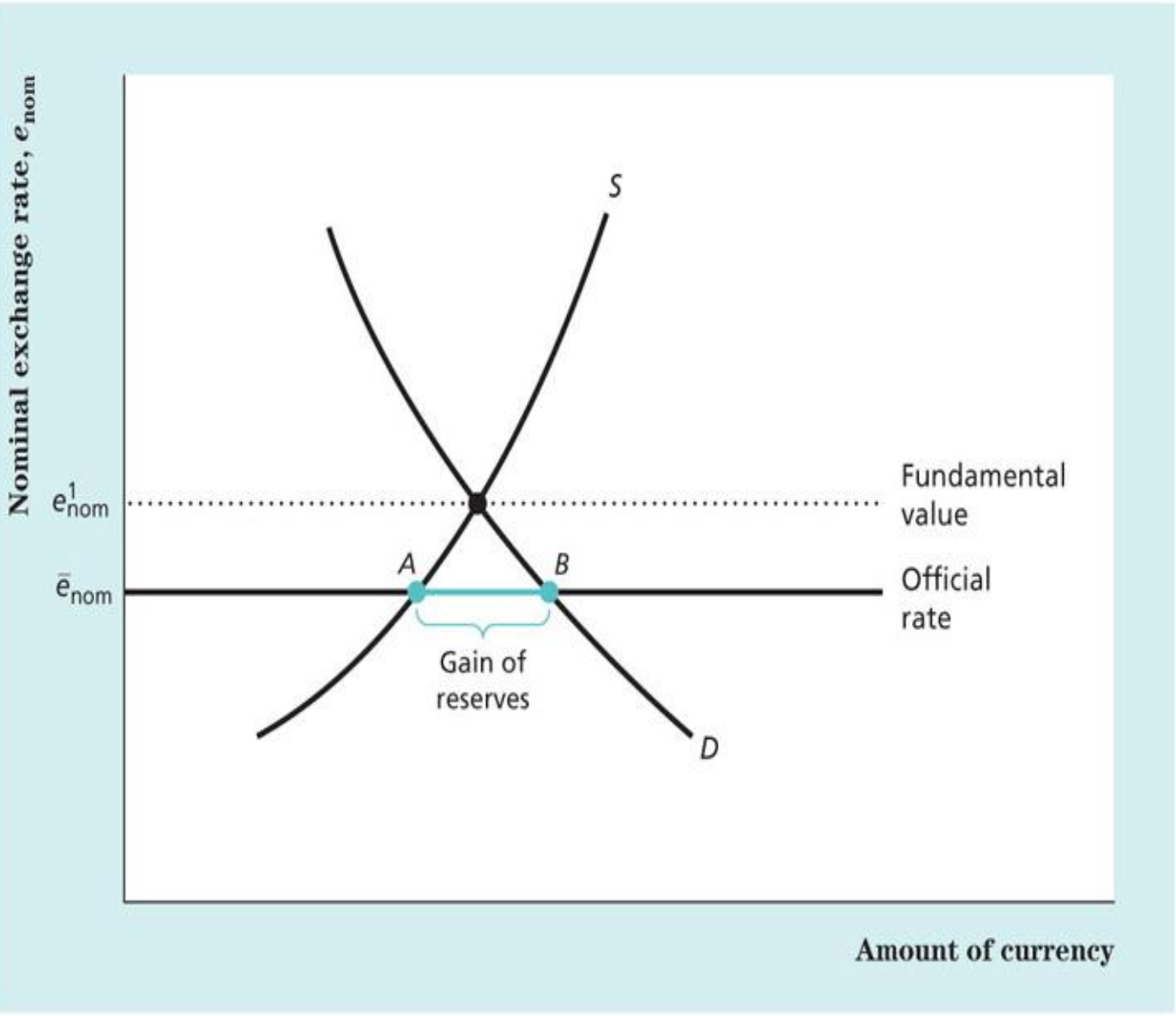
Undervalued Exchange Rate

- An undervalued exchange rate exists if the officially fixed value is lower than the fundamental value of the exchange rate.
- An undervalued exchange rate could be maintained indefinitely if a country trading partners do not mind losing their reserves.

FIGURE 10.13

AN UNDERVALUED EXCHANGE RATE

The exchange rate is undervalued when the officially determined nominal exchange rate, $\bar{e}_{nom}$, is less than the fundamental value of the exchange rate as determined by supply and demand in the foreign exchange market, e^1_{nom}. To maintain the exchange rate at its official level, the central bank must supply its own currency to the foreign exchange market in the amount *AB* each period, thereby accumulating foreign reserves.

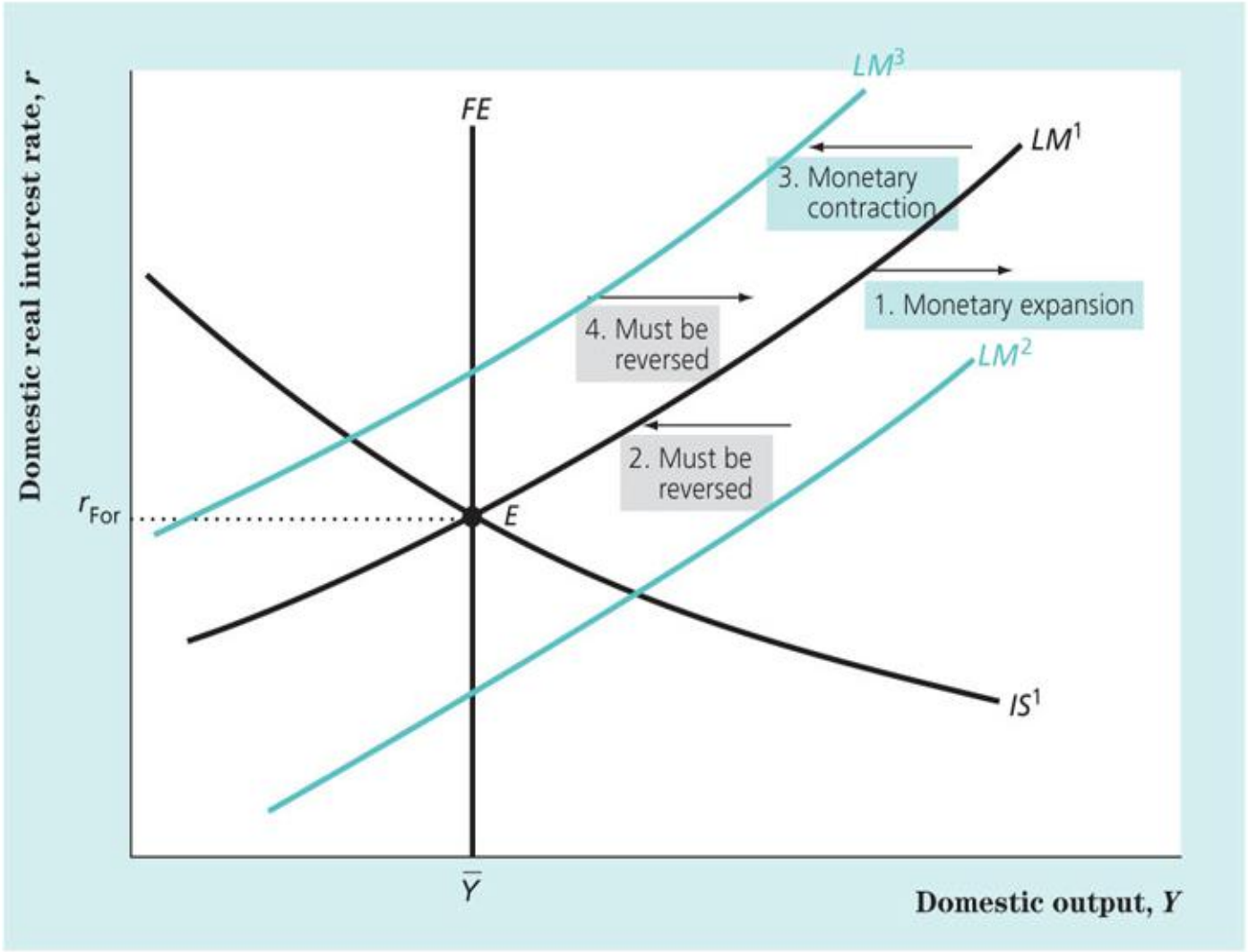


Monetary Policy when the Exchange Rate is Fixed

- An increase in *M*:
  - shifts the *LM* curve to the right, *r* is below r_{For};
  - the exchange rate is overvalued;
  - the money supply has to contract.
- A decrease in *M*:
  - shifts the *LM* curve to the left, *r* is above r_{For};
  - the exchange rate is undervalued;
  - the money supply has to be increased.
- Under a fixed exchange rate the central bank cannot use monetary policy to pursue macroeconomic stabilization goals.

FIGURE 10.14

MONETARY POLICY IN A SMALL OPEN ECONOMY WITH FIXED EXCHANGE RATES

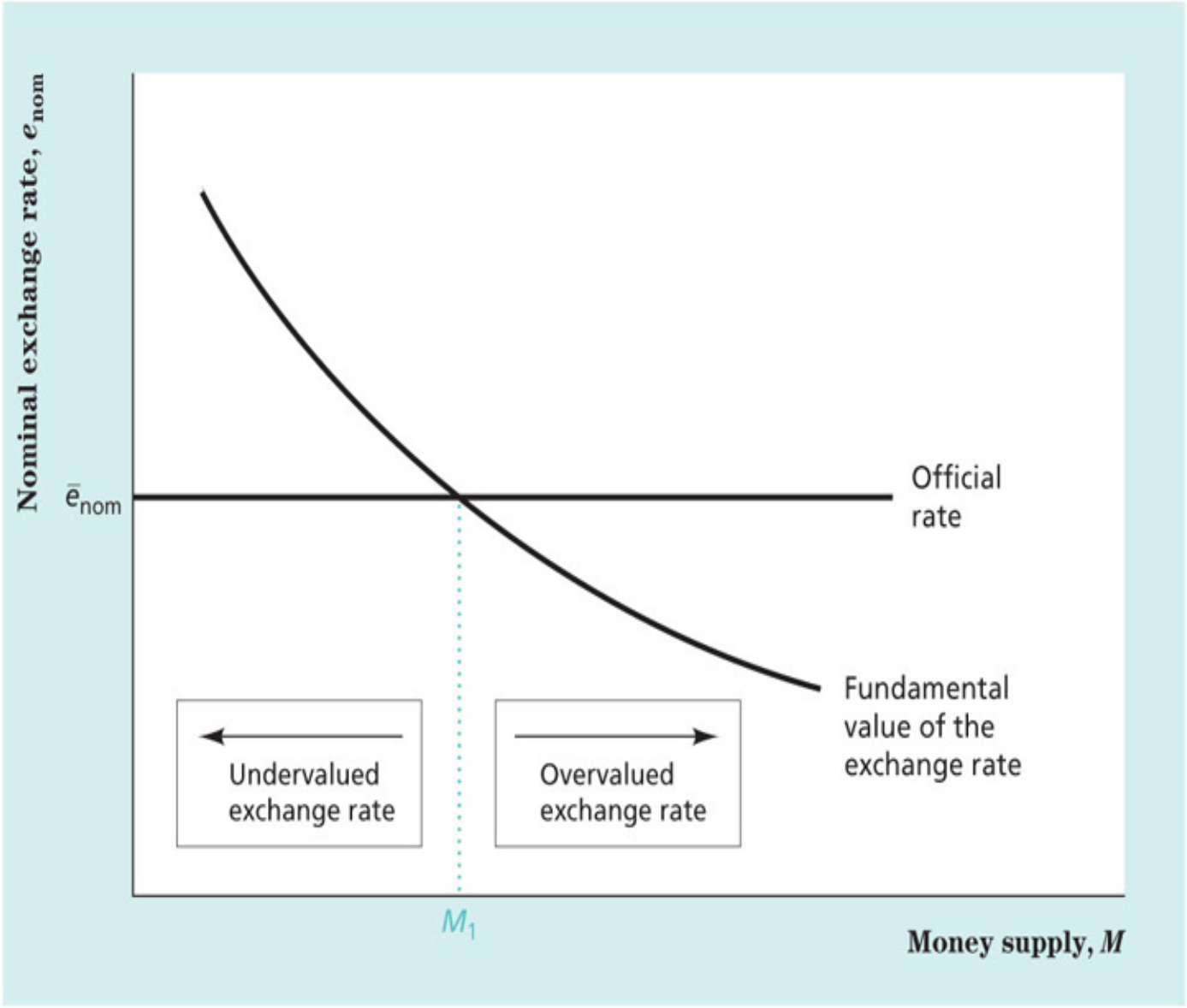


The economy is in general equilibrium at point *E*. The exchange rate is at its fundamental value. A monetary expansion shifts the *LM* curve down and to the right from LM^1 to LM^2. Such a policy results in an overvalued currency. To fix the value of the currency, the monetary expansion must be reversed. A monetary contraction shifts the *LM* curve up and to the left from LM^1 to LM^3. Such a policy results in an undervalued currency. To fix the value of the currency, the monetary contraction must again be reversed. Under fixed exchange rates a central bank cannot use monetary policy to pursue macroeconomic stabilization goals.

FIGURE 10.15

DETERMINATION OF THE MONEY SUPPLY UNDER FIXED EXCHANGE RATES

The downward-sloping fundamental value curve shows that a higher domestic money supply causes a lower fundamental value of the exchange rate. The horizontal line shows the officially fixed nominal exchange rate. Only when the country's money supply equals M_1 does the fundamental value of the exchange rate equal the official rate. If the central bank increased the money supply above M_1, the exchange rate would become overvalued. A money supply below M_1 would result in an undervalued currency.



Fiscal Policy and Fixed Exchange Rates

- An increase in *G*:
  - shifts the *IS* curve to the right, *r* is above r_{For};
  - the exchange rate is undervalued and wants to rise;
  - monetary expansion is now required to maintain the exchange rate fixed and this accommodates the fiscal expansion;
  - means *LM* shifts to the right until increase in *G* is accommodated – i.e., where $r=r_{For}$;
  - can use the new *IS* and $r=r_{For}$ to solve for short-run output.

Fiscal Policy (continued)

- Since e_{nom}, P and P_{For} are fixed in the short run then under the fixed exchange rate, e is also fixed over this period.
- But now output is above its equilibrium level and P starts to increase which shifts back the LM curve.
- As a result, e increases and NX fall.
- Note that P has to rise by enough to crowd out NX, which could be a lot given the response of NX to e.
- Eventually NX gets crowded out by the fiscal expansion.

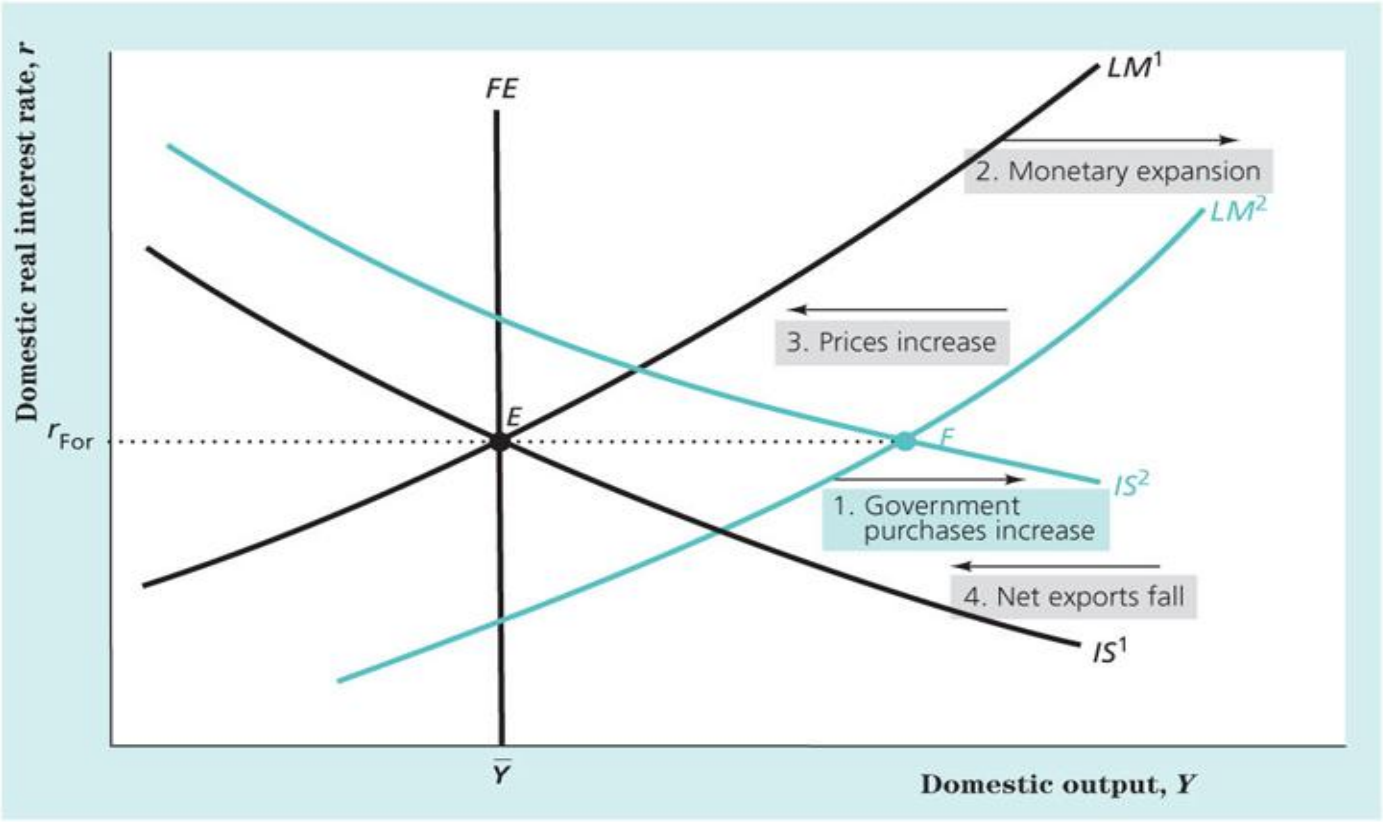
Fiscal Policy (continued)

- Under a fixed exchange rate regime, fiscal policy is an effective tool for adjusting domestic output in the Keynesian short run.
- In the classical model *P* and *e* increase immediately in response to the fiscal expansion and *NX* is immediately crowded out.

FIGURE 10.16

A FISCAL EXPANSION IN A SMALL OPEN ECONOMY WITH FIXED EXCHANGE RATES

An increase in government purchases shifts the *IS* curve up and to the right, from IS^1 to IS^2. In the Keynesian short run, the result is an undervalued currency. To fix the value of the currency, the central bank must expand the money supply and thus shift the *LM* curve from LM^1 to LM^2. Intersection of IS^2 and LM^2 must occur at point *F* where the domestic and foreign interest rates are equal. In the Keynesian long run, the price level increases, causing LM^2 to shift up and to the left. The increase in the price level causes an increase in the real exchange rate and a fall in net exports. This causes IS^2 to shift down and to the left. The *IS* and *LM* curves must return to intersect at point *E*. In the classical model, the rapid adjustment of the price level causes the real exchange rate to increase immediately following the increase in government purchases, leaving the positions of *IS* and *LM* unaffected.



Fixed Exchange Rates: A Summary

- Monetary policy
  - Completely ineffective given that the authorities must maintain the nominal exchange rate fixed.
- Fiscal policy
  - Effective in short run at raising output.
  - Essentially causes the central bank to accommodate the increase in *G* because of the pressure put on the exchange rate.

Fixed Exchange Rates: A Summary (continued)

- Since economy is above full employment the short-run position is unsustainable.
- *P* starts to rise, pushing *LM* curve back.
- This puts upward pressure on *e*, lowering *NX.*
- The process continues until both curves have shifted back to their original position.
- Fiscal policy will crowd out completely net exports through a rise in the real exchange rate.
- The only way *e* can rise is through a rise in *P*.

Fixed versus Flexible Exchange Rates

- Benefits of fixed-exchange-rate systems:
  - less costly trade in goods between countries, i.e. lower transaction cost;
  - promotes monetary policy discipline.
- The downside is inability of a country to use its monetary policy to deal with recessions.

Open-Economy Trilemma

- In selecting an exchange rate system a country can choose only two of the three features:
  - a fixed exchange rate to promote trade;
  - free international movement of capital;
  - autonomy for domestic monetary policy.

Fixed Exchange Rate System

- Fixed exchange rates can be useful when used in a group of countries:
  - large benefits can be gained from increased trade and integration;
  - monetary policies can be coordinated closely.

Flexible Exchange Rates System

- A flexible exchange rate system is useful if a country has specific macroeconomic shocks.
- Then they can be reduced with help of monetary policy.

Currency Unions

- A currency union is sharing of a common currency by a group of countries.
- A currency union reduces the cost of trading and prevents speculative attacks on currencies.
- However, monetary policies cannot be independent.

The Self-Correcting Small Economy

- A small open economy has more sources of unexpected shocks.
- However, if the exchange rate is flexible there also exists a correcting mechanism in addition to the price level – an exchange rate adjustment.

The Self-Correcting Small Economy (continued)

- A fixed-exchange-rate system:
  - neutralizes the effects of both fiscal policy and shocks to the *IS* curve;
  - monetary policy and shocks to the *LM* curve have a magnified impact.
- A flexible exchange rate system neutralizes monetary shocks and magnifies effects of the fiscal policy.