Exchange Rate Regimes

The Medium Run

Chapter 21: Exchange Rate Regimes

$$\varepsilon = \frac{EP^*}{P}$$

There are two ways in which the real exchange rate can adjust:

- Through a change in the nominal exchange rate E.
- Through a change in the domestic price level P relative to the foreign price level P^*.

Aggregate Demand Under Fixed Exchange Rates

Chapter 21: Exchange Rate Regimes

The aggregate demand relation in an open economy with fixed exchange rate is

$$Y = Y\left(\frac{EP^*}{P}, G, T \right)$$
$$(\ +, \ +, -)$$

Recall that, in a closed economy, the aggregate demand relation took the same form as above, except for the presence of the real money stock M/P instead of the real exchange rate EP/P^*.

Aggregate Demand Under Fixed Exchange Rates

- Under fixed exchange rates, the central bank gives up monetary policy as a policy instrument. This is why the money stock no longer appears in the aggregate demand relation.
- At the same time, the fact that the economy is open implies that we must include a variable that we did not include when looking at the closed economy earlier, namely, the real exchange rate, $\bar{E}P/P^*$.

Aggregate Demand Under Fixed Exchange Rates

$$Y = Y\left(\frac{EP^*}{P}, G, T\right)$$
$$(\ +,\ \ +,-\ )$$

While the sign of the effect of the price level on output remains the same, the channel is very different:

- In the closed economy, the price level affects output through its effect on the real money stock, and in turn, its effect on the interest rate.
- In the open economy under fixed exchange rates, the price level affects output through its effect on the real exchange rate.
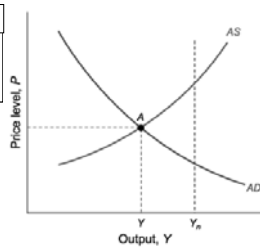
Equilibrium in the Short Run and in the Medium Run

Figure 21 - 1

Aggregate Demand and Aggregate Supply in an Open Economy Under Fixed Exchange Rates

An increase in the price level leads to a real appreciation and a decrease in output: The aggregate demand curve is downward sloping. An increase in output leads to an increase in the price level: The aggregate supply curve is upward sloping.

Equilibrium in the Short Run and in the Medium Run

The aggregate supply relation is:

$$P = P^e(1+\mu)F\left(1-\frac{Y}{L}, z\right)$$

The price level P depends on the expected price level P^e, and on the level of output Y. There are two mechanisms at work:

- The expected price level affects nominal wages which affect price levels.
- Higher output leads to higher employment, which leads to lower unemployment, higher wages, and higher price levels.

Equilibrium in the Short Run and in the Medium Run

Figure 21 - 2

Adjustment Under Fixed Exchange Rates

The aggregate supply shifts down over time, leading to a decrease in the price level, to a real depreciation, and to an increase in output. The process ends when output has returned to the natural level of output.
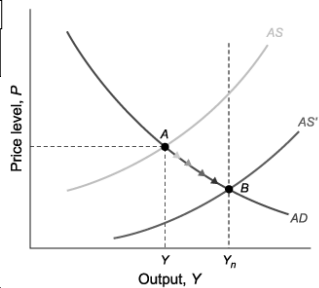
Equilibrium in the Short Run and in the Medium Run

So long as output is below the natural level of output, the price level decreases, leading to a steady real depreciation.

- In the short run, a fixed nominal exchange rate implies a fixed real exchange rate.
- In the medium run, a fixed nominal exchange rate is consistent with an adjustment of the real exchange rate through movements in the price level.

The Case For and Against a Devaluation

The case for devaluation is that, in a fixed exchange rate regime, a devaluation (an increase in the nominal exchange rate) leads to a real depreciation (an increase in the real exchange rate), and thus to an increase in output.
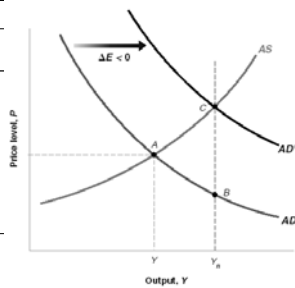
A devaluation of the right size can return an economy in recession back to the natural level of output.

The Case For and Against a Devaluation

Figure 21 - 3

Adjustment with a Devaluation

The right size devaluation can shift aggregate demand to the right, leading the economy to go to point *C*. At point *C*, output is back to the natural level of output.

The Case For and Against a Devaluation

That the "right size" devaluation can return output to the natural level of output right away sounds too good to be true-and, in practice, it is.

- The effects of the depreciation on output do not happen right away.
- There is likely to be a direct effect of the devaluation on the price level.

FOCUS

The Return of Britain to the Gold Standard: Keynes Versus Churchill

The **gold standard** was a system in which each country fixed the price of its currency in terms of gold.

4

Exchange Rate Crises
Under Fixed Exchange Rates

Chapter 21: Exchange Rate Regimes

Suppose a country is operating under a fixed exchange rate, and that financial investors start believing there may soon be an exchange rate adjustment:

- The real exchange rate may be too high, the domestic currency may be overvalued.
- Internal conditions may call for a decrease in the domestic interest rate, a decrease in the domestic interest rate cannot be achieved under fixed exchange rates.

Exchange Rate Crises
Under Fixed Exchange Rates

Chapter 21: Exchange Rate Regimes

Under fixed exchange rates, if markets expect that parity will be maintained, then they believe that the interest parity condition will hold; therefore, the domestic and the foreign interest rates will be equal.

$$i_t = i^*_t + \frac{E^e_{t+1} - E_t}{E_t}$$

Exchange Rate Crises
Under Fixed Exchange Rates

Chapter 21: Exchange Rate Regimes

Expectations that a devaluation may be coming can trigger an exchange rate crisis. The government and central bank have a few options:

- They can try to convince markets they have no intention of devaluing.
- The central bank can increase the interest rate.
- Eventually, the choice for the central bank becomes either to increase the interest rate or to validate the market's expectations and devalue.

Exchange Rate Movements under Flexible Exchange Rates

21-3

The current exchange rate depends on:
- Current and expected domestic and foreign interest rates for each year over a given period.
- The expected exchange rate at the end of the period.

Exchange Rate Movements under Flexible Exchange Rates

Take the interest parity condition we derived in Chapter 18:

$$1+i_t = \left(E_t\right)\left(1+i^*_t\right)\left(\frac{1}{E^e_{t+1}}\right)$$

Multiply both sides by E^e_{t+1}

$$E_t = \frac{1+i_t}{1+i^*_t}E^e_{t+1}$$

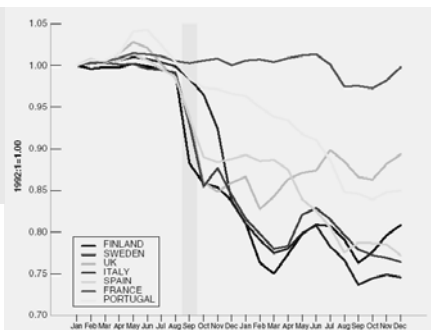Then write the equation for year t+1 rather than for year t:

$$E_{t+1} = \frac{1+i_{t+1}}{1+i^*_{t+1}}E^e_{t+2}$$

FOCUS

The 1992 EMS Crisis

Figure 1

Exchange Rates of Selected European Countries vis-á-vis the Deutschemark (DM), January 1992-December 1993

Exchange Rate Movements Under Flexible Exchange Rates

The expectation of the exchange rate in year t+1, held as of year t, is given by

$$E^e_{t+1} = \frac{1+i^e_{t+1}}{1+i^{*e}_{t+1}} E^e_{t+2}$$

Replacing E^e_{t+1} with the expression above gives

$$E_t = \frac{(1+i_t)(1+i^e_{t+1})}{(1+i^*_t)(1+i^{*e}_{t+1})} E^e_{t+2}$$

Continuing to solve forward in time in the same way we get

$$E_t = \frac{(1+i_t)(1+i^e_{t+1})...(1+i^e_{t+n})}{(1+i^*_t)(1+i^{*e}_{t+1})...(1+i^{*e}_{t+n})} E^e_{t+n}$$

Exchange Rate Movements Under Flexible Exchange Rates

$$E_t = \frac{(1+i_t)(1+i^e_{t+1})...(1+i^e_{t+n})}{(1+i^*_t)(1+i^{*e}_{t+1})...(1+i^{*e}_{t+n})} E^e_{t+n}$$

This relation tells us that the current exchange rate depends on two sets of factors:

- Current and expected domestic and foreign interest rates for each year over the next 10 years.
- The expected exchange rate 10 years from now.

Exchange Rates and the Current Account

Any factor that moves the expected future exchange rate E^e_{t+1} moves the current exchange rate E_t. Indeed, if the domestic interest rate and the foreign interest rate are expected to be the same in both countries from t to $t+n$, the fraction on the right of $E_t = \frac{(1+i_t)(1+i^e_{t+1})...(1+i^e_{t+n})}{(1+i^*_t)(1+i^{*e}_{t+1})...(1+i^{*e}_{t+n})} E^e_{t+n}$

is equal to one, so the relation reduces to $E_t = E^e_{t+1}$.

Exchange Rates, and Current and Future Interest Rates

Any factor that moves the current or expected future domestic or foreign interest rates between year t and $t+n$ moves the current exchange rate.

$$E_t = \frac{(1+i_t)(1+i^e_{t+1})...(1+i^e_{t+n})}{(1+i^*_t)(1+i^{*e}_{t+1})...(1+i^{*e}_{t+n})}E^e_{t+n}$$

Exchange Rate Volatility

The relation between the interest rate i_t and the exchange rate E_t is all but mechanical. A country that decides to operate under flexible exchange rates must accept that it will be exposed to fluctuations over time.

$$E_t = \frac{(1+i_t)(1+i^e_{t+1})...(1+i^e_{t+n})}{(1+i^*_t)(1+i^{*e}_{t+1})...(1+i^{*e}_{t+n})}E^e_{t+n}$$

21-4 Choosing Between Exchange Rate Regimes

- In the short run, under fixed exchange rates, a country gives up its control of the interest rate and the exchange rate.
- Also, anticipation that a country may be about to devalue its currency may lead investors to ask for very high interest rates.
- An argument against flexible exchange rates is that they may move a lot and may be difficult to control them through monetary policy.

Common Currency Areas

For countries to constitute an **optimal currency area**, two conditions must be satisfied:

- The countries experience similar shocks; thus, can choose roughly the same monetary policy.
- Countries have high factor mobility, which allow countries to adjust to shocks.

A common currency, such as the **Euro**, allows countries to lower the transaction costs of trade.

FOCUS — The Euro. A Short History

The European Monetary Union (EMU) was consolidated under the **Maastricht Treaty**.

In January 1999, parities between the currencies of 11 countries and the Euro were "irrevocably" fixed.

The new **European Central Bank (ECB),** based in Frankfurt, became responsible for monetary policy for the Euro area.

Hard Pegs, Currency Boards, and Dollarization

- One way of convincing financial markets that a country is serious about reducing money growth is a pledge to fix its exchange rate, now and in the future.
- A hard peg is the symbolic or technical mechanism by which a country plans to maintain exchange rate parity.

Dollarization is an extreme form of a hard peg. A less extreme way is the use of a **currency board** involving the central bank.

FOCUS — Argentina's Currency Board

Both the creation of a currency board and the choice of a symbolic exchange rate had the same objective: to improve Argentina's currency.

Key Terms

▪ gold standard	▪ European Central Bank (ECB)
▪ optimal currency area	▪ hard peg
▪ Euro	▪ dollarization
▪ Maastricht Treaty	▪ currency board

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