

Economics 302 (Sec. 001)  
Intermediate Macroeconomic  
Theory and Policy (Spring 2011)  
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# 21-1 The Medium Run

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

- There are two ways in which the real exchange rate can adjust:  $E$ , or  $P$  &  $P^*$
- The aggregate demand relation in an open economy with fixed exchange rate is

$$Y = Y\left(\frac{\bar{E}P}{P^*}, G, T\right)$$

( - , + , - )

M/P doesn't appear, but real rate does.

# 21-1 The Medium Run

## Aggregate Demand Under Fixed Exchange Rates

$$Y = Y\left(\frac{\bar{E}P}{P^*}, G, T\right)$$

( - , + , - )

- 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  $\bar{E}P/P^*$ .
- 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,  $\bar{E}P/P^*$ .

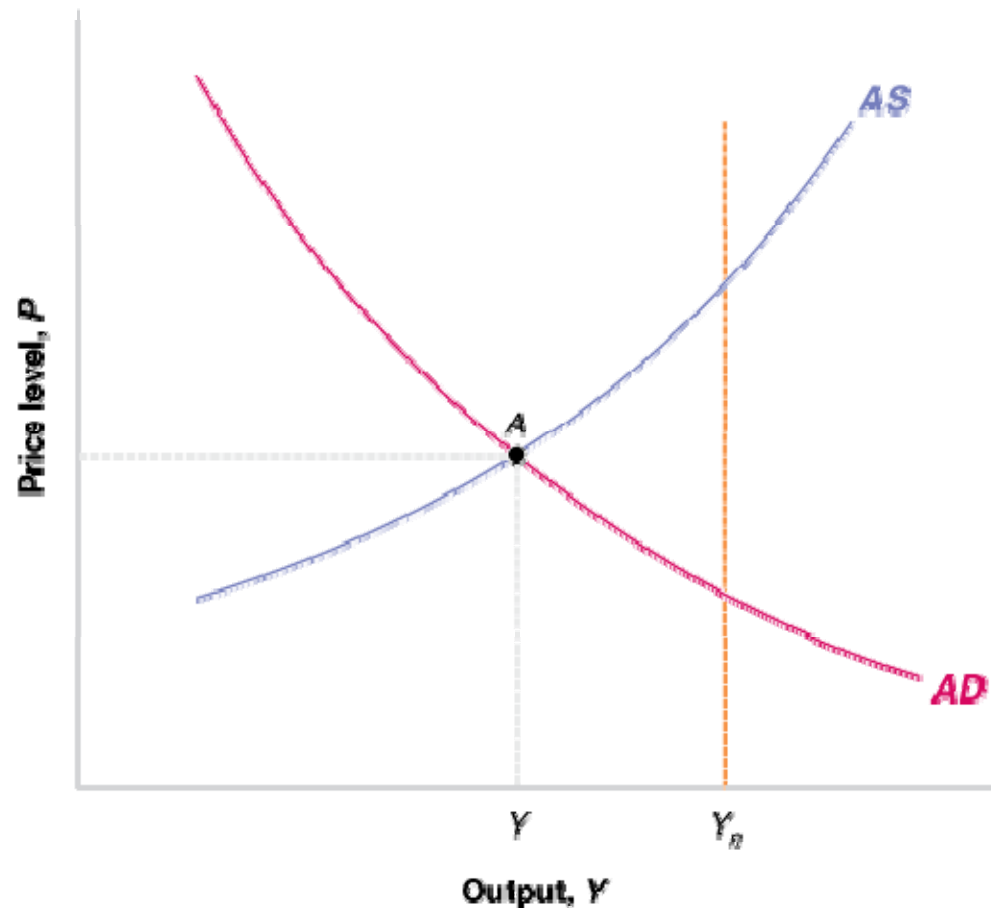
# 21-1 The Medium Run

## 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.



# 21-1 The Medium Run

## 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.

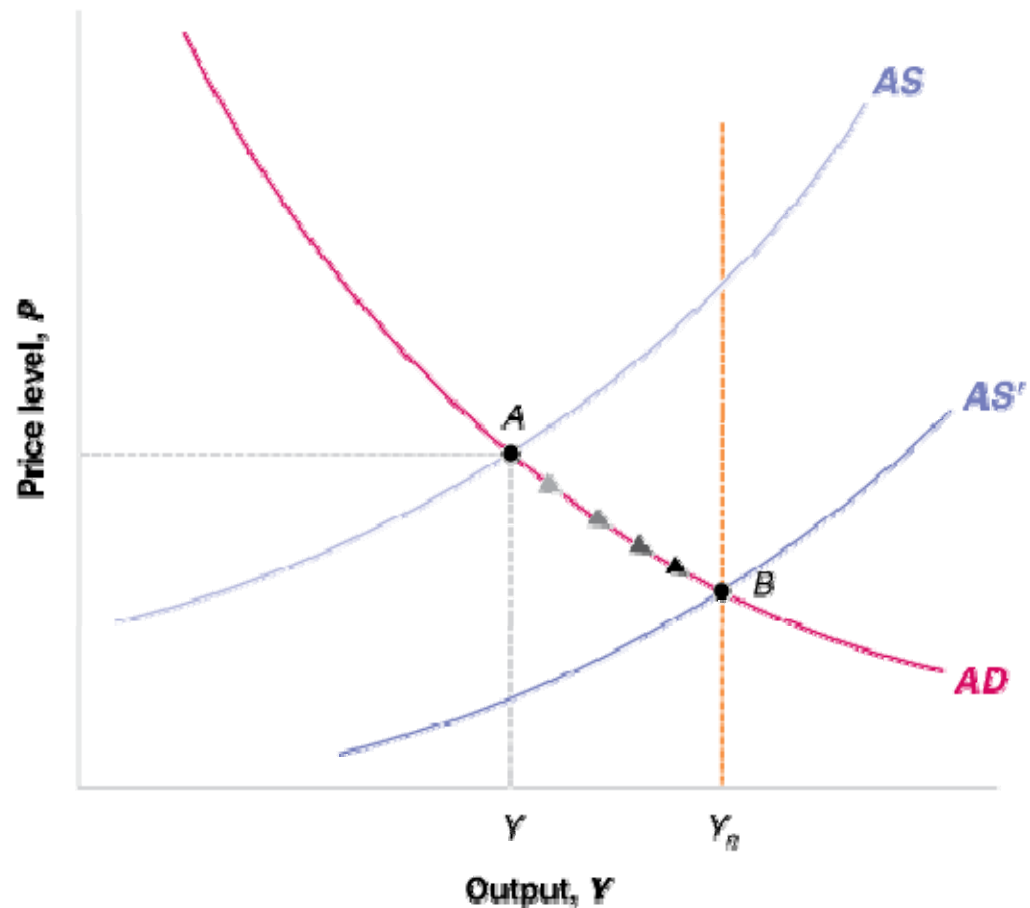
# 21-1 The Medium Run

## Equilibrium in the Short Run and in the Medium Run

■ Figure 21 – 2

### *Adjustment under Fixed Exchange Rates*

The aggregate supply curve 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 its natural level.



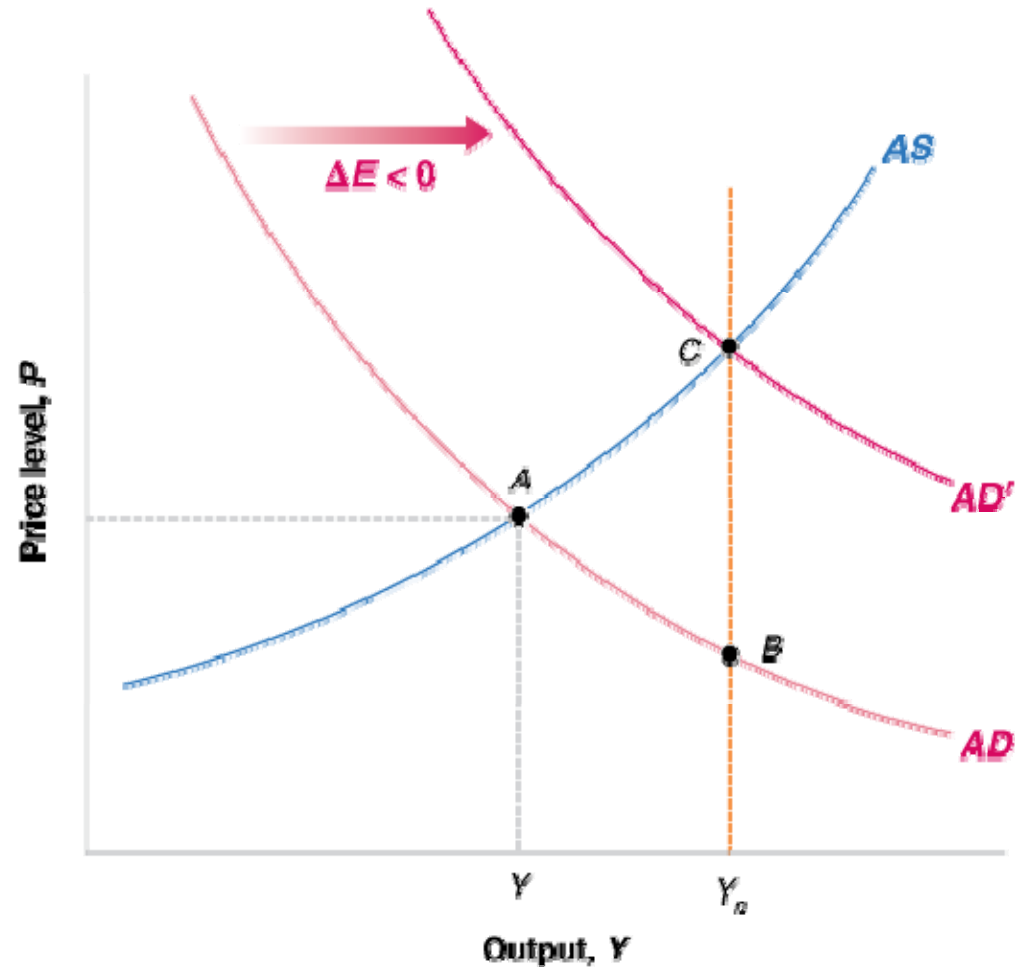
# 21-1 The Medium Run

## The Case for and against a Devaluation

■ Figure 21 – 3

### *Adjustment with a Devaluation*

A devaluation of the right size can shift aggregate demand to the right, moving the economy to point C. At point C, output is back to the natural level of output.



## 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 and stood ready to exchange gold for currency at the stated parity.

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## 21-2 Exchange Rate Crises under Fixed Exchange Rates

- 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.

If credible, then what is true is:

$$\dot{i}_t = i_t^* - \frac{(E_{t+1}^e - E_t)}{E_t}$$

# 21-2 Exchange Rate Crises under Fixed Exchange Rates

- 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.

## The 1992 EMS Crisis



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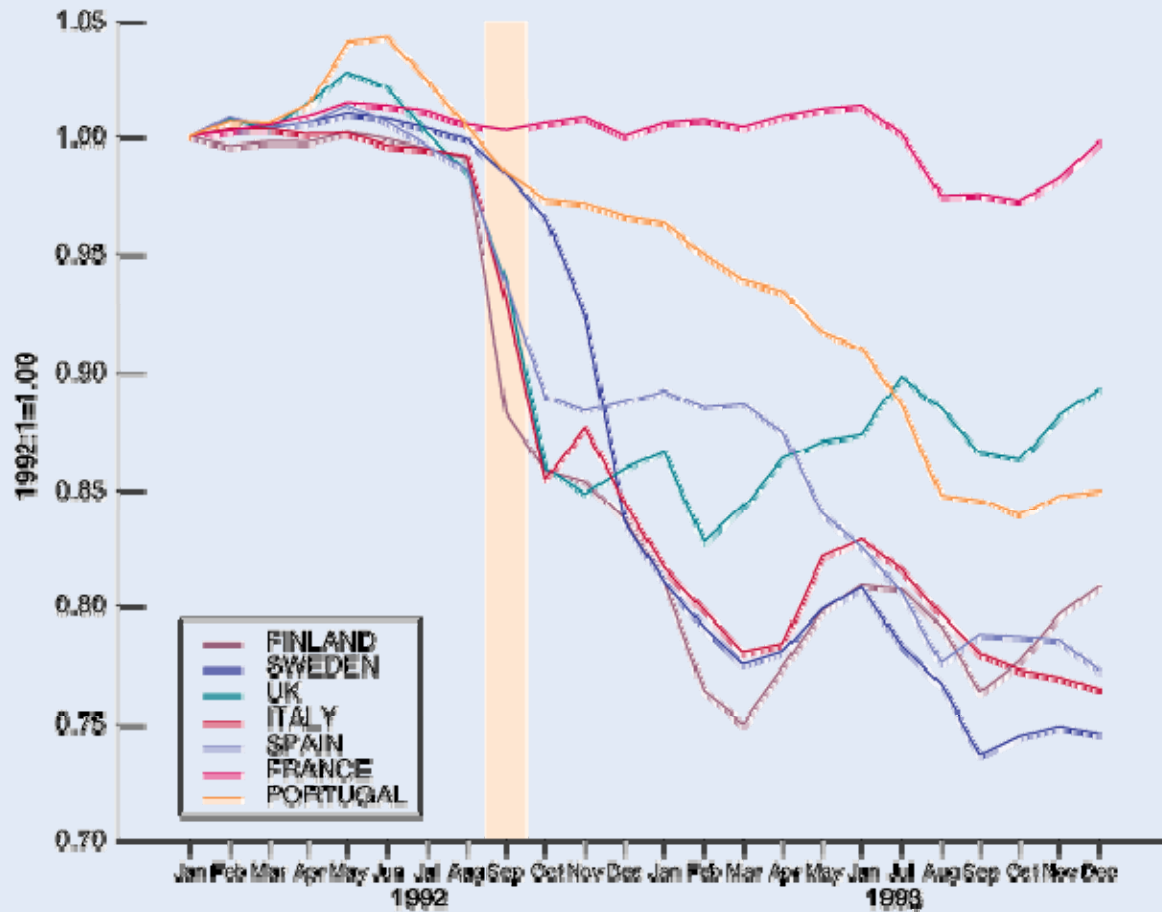


Figure 1 *Exchange Rates of Selected European Countries Relative to the Deutsche Mark, January 1992 to December 1993*

## 21-3 Exchange Rate Movements under Flexible Exchange Rates

- Take the interest parity condition:

$$(1 + i_t) = (1 - i_t^*) \frac{E_t}{E_{t+1}^e}$$

- Multiply both sides by  $E_{t+1}^e$

$$E_t = \frac{1 + i_t}{1 + i_t^*} E_{t+1}^e$$

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

$$E_{t+1} = \frac{1 + i_{t+1}}{1 + i_{t+1}^*} E_{t+2}^e$$

## 21-3 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

$$E_{t+1}^e = \frac{1 + i_{t+1}^e}{1 + i_{t+1}^{*e}} E_{t+2}^e$$

Replacing  $E_{t+1}^e$  with the expression above gives

$$E_t = \frac{(1 + i_t)(1 + i_{t+1}^e)}{(1 + i_t^*)(1 + i_{t+1}^{*e})} E_{t+2}^e$$

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

$$E_t = \frac{(1 + i_t)(1 + i_{t+1}^e) \dots (1 + i_{t+n}^e)}{(1 + i_t^*)(1 + i_{t+1}^{*e}) \dots (1 + i_{t+n}^{*e})} E_{t+n+1}^e$$

# 21-3 Exchange Rate Movements under Flexible Exchange Rates

## 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.

## 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.

## 21-4 Choosing betw. Exchange Rate Regimes

Should countries choose flexible exchange rates or fixed exchange rates?

- 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.

## 21-4 Choosing betw. Exchange Rate Regimes

In general, flexible exchange rates are preferable. There are, however, two exceptions:

First, when a group of countries is already tightly integrated, a common currency may be the right solution.

Second, when the central bank cannot be trusted to follow a responsible monetary policy under flexible exchange rates, a strong form of fixed exchange rates, such as a currency board or dollarization, may provide a solution.

### Optimal Common Currency Areas

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.



## The Euro: A Short History



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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.

# 21-4 Choosing betw. Exchange Rate Regimes

## 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.