Open Economy AS/AD Model

Prof. Lutz Hendricks

Econ520

September 12, 2022

Objectives

In this section you will learn:

1. how to analyze an open economy in the medium run (AS/AD model)
2. how the effects of policies and shocks differ from the short run
3. why the medium run outcomes under floating and pegging are similar
   (in contrast to the short run)

Short vs Medium Run

Short run:

- P is fixed.
- Any adjustment of the real exchange rate must work through the nominal exchange rate:

$$\varepsilon = P/(EP^*) \tag{1}$$

Medium run:

- P adjusts
- Any change in E can be mimicked by a change in P
  - same effect on ε
- No other real effects of money in the medium run
  - this is why the exchange rate regime is no longer that important

Fixed Exchange Rates

Fixed Exchange Rate Model

We need to clear these markets:

1. Foreign exchange: UIP with fixed E implies: $i = i^*$
2. **Money**:

$$M/P = YL(i^*) \tag{2}$$

3. **Goods**:
   3.1 demand:

$$Y = C(Y-T) + I(Y, i^* - \pi^e) + G + NX(Y, Y^*, P/(\bar{E}P^*)) \tag{3}$$

   3.2 supply:

$$Y/L = F\left(\frac{P}{P^e}\frac{1}{1+m}, z\right) \tag{4}$$

Endogenous: Y, M, P (really also π^e, but let's set that aside)

Market Clearing

Short run:

- P^e fixed
- AS is upward sloping

Medium run:

- $P^e = P$
- vertical AS curve determines Y_n by itself:

$$Y_n/L = F\left(\frac{1}{1+m}, z\right) \tag{5}$$

Irrelevance of Money

We show:

- The goods market determines Y and P
- The money market determines M
  - so that $i = i^*$ holds at all times
- The Fed has no control over the money supply
- This is true in short run and medium run
- Key assumption: high capital mobility (UIP holds).

Aggregate Demand

Start from IS with $i = i^*$:

$$Y = C(Y - T) + I(Y, i^* - \pi^e) + G + NX(Y, Y^*, P/(\bar{E}P^*)) \quad (6)$$

Simplify:

$$Y = Y\left(P/(\bar{E}P^*), G, T\right) \quad (7)$$

Negative slope: $P \uparrow \Longrightarrow Y \downarrow$

- this works through the real exchange rate and NX

New shifters: Y^*, i^*, P^*, E

Aggregate Demand

M/P no longer shifts AD

Why not?

Analyzing the Model

We can forget about the money market and UIP and just analyze AS:

$$Y/L = F\left(\frac{P}{P^e}\frac{1}{1+m}, z\right) \tag{8}$$

AD:

$$Y = Y\left(P/(\bar{E}P^*), G, T\right) \tag{9}$$

Short run: P^e is given.

Medium run: $P^e = P$.

Transition: $P^e \to P$ shifts AS.

Analysis: Medium Run

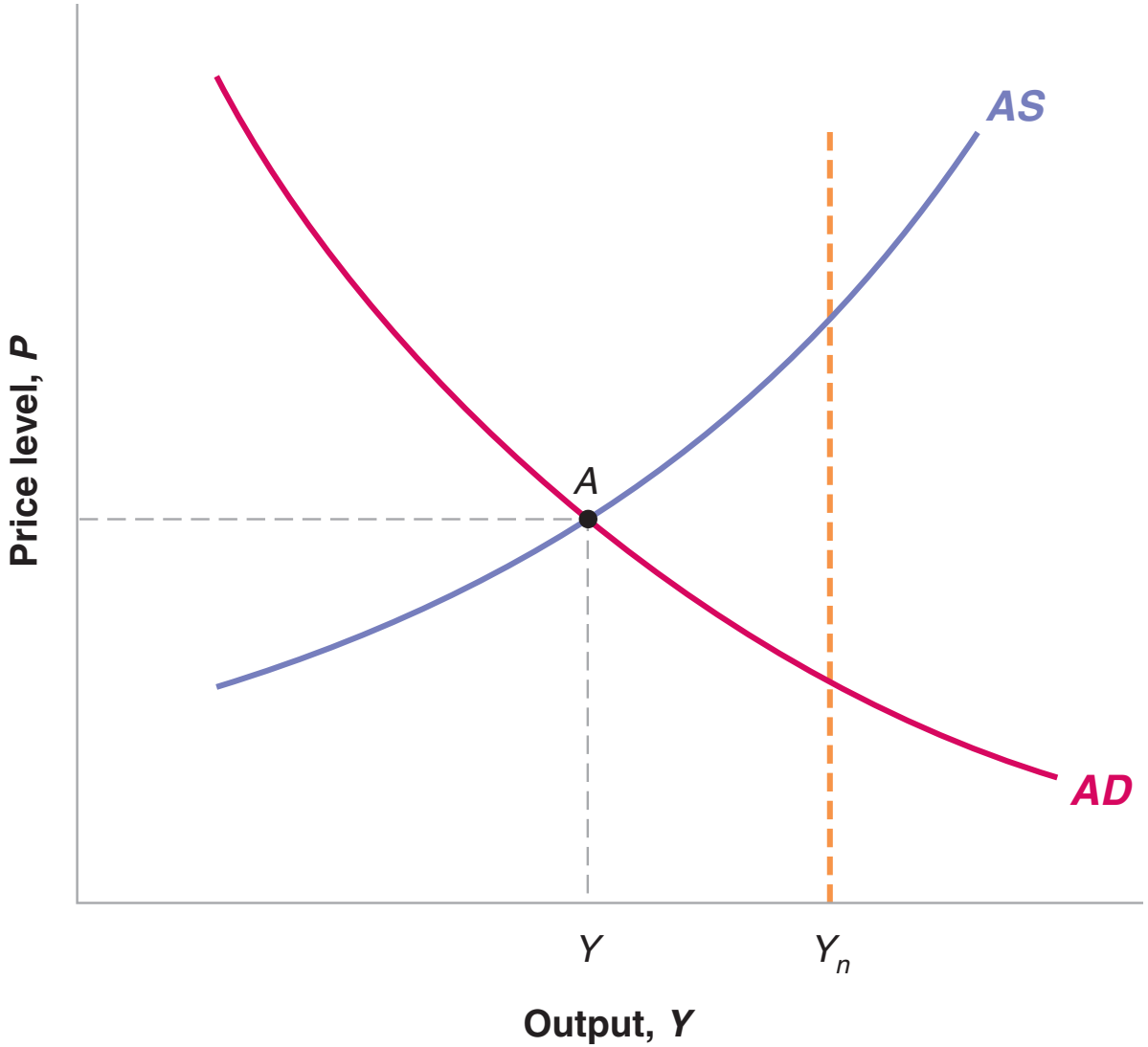
$P = P^e$: AS is vertical and determines Y_n:

$$Y/L = F\left(\frac{1}{1+m}, z\right) \tag{10}$$

P adjusts to get the "right" real exchange rate, such that $AD = Y_n$:

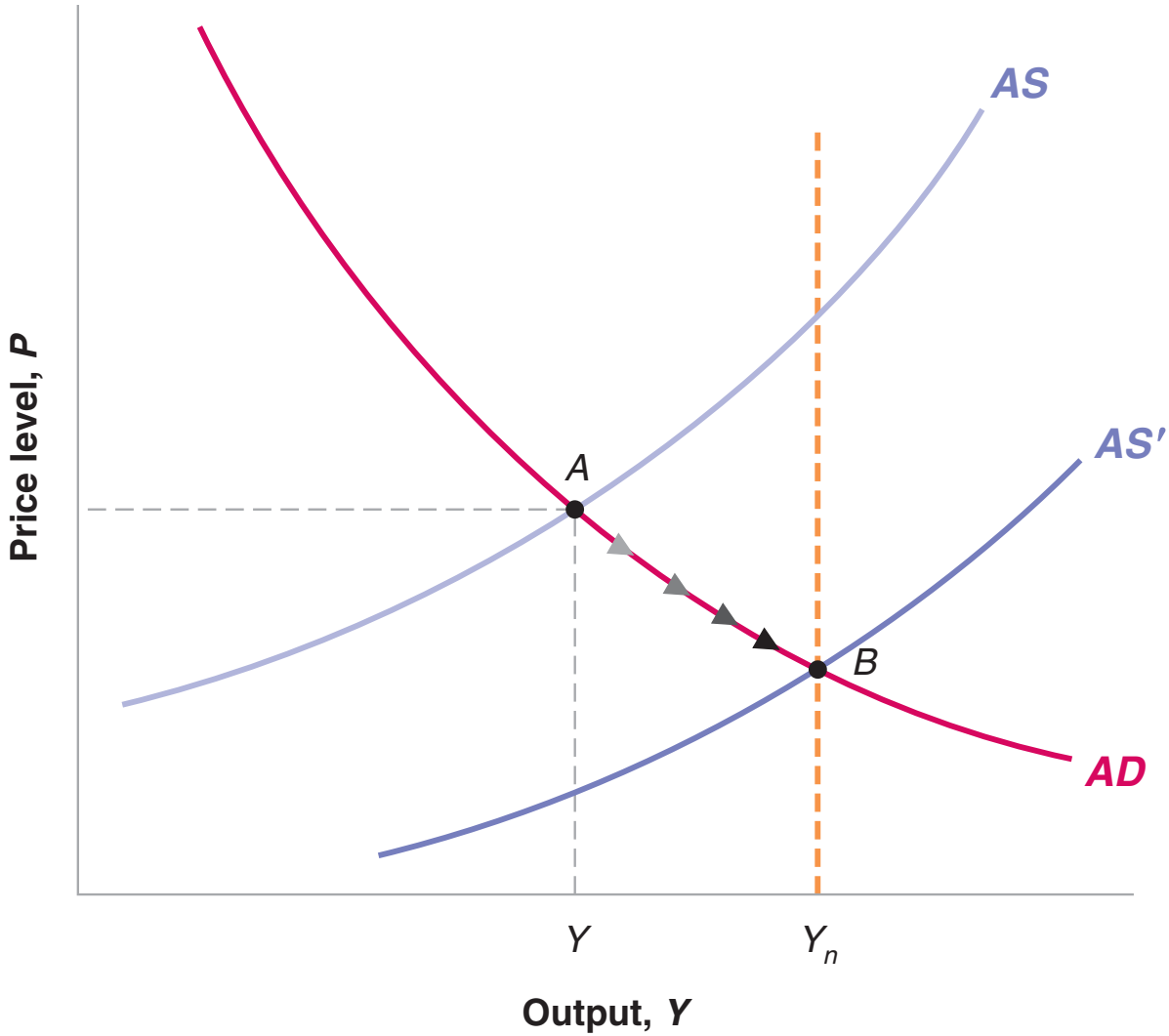
$$Y_n = Y\left(P/(\bar{E}P^*), G, T\right) \rightarrow P$$

AS/AD Graph



Short run: P^e is fixed.
Output is not at the natural rate.

Adjustment Over Time



Initially: $P^e > P$.
W/P too high.
P^e falls over time.
AS shifts down

What Differs From Closed Economy?

Closed economy:

- $P \downarrow \Longrightarrow M/P \uparrow \Longrightarrow i \downarrow \Longrightarrow I \uparrow$

Open economy:

- $P \downarrow \Longrightarrow NX \uparrow$

Understand the Transition

Start from $P > P^e$.

AS implies: $Y < Y_n$.

Prices fall. NX improves. AD rises.

Money market: $M/P = YL(i^*)$

- Households need more money.
- Try to sell bonds.
- i rises $\Longrightarrow$ capital inflows
- Fed must sell dollars $\Longrightarrow$ $M \uparrow$

Key Points

With fixed exchange rates, the money market becomes irrelevant

- the Fed is busy fixing $i = i^*$
- that breaks any transmission to the real sector

The economy "works" much like a closed economy

- but foreign shocks now transmit into the home economy (in the short run)
- and monetary policy is gone

Reading

- Blanchard / Johson, Macroeconomics, 6th ed., ch. 21

Additional reading:

- Jones, Macroeconomics, ch. 15.