Open Economy IS/LM Model: Fixed Exchange Rate

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Exchange Rate Interventions

- Almost all central banks intervene in FX markets
- The mechanics: buy dollars and sell Euros (or vice versa)
- Each intervention changes the money supply.
- This produces a conflict: the CB has one instrument (M) but 3 targets
  - stable inflation
  - stable output
  - stable exchange rate

Exchange Rate Regimes

- Two extremes:
  - **floating**: the CB does not buy or sell FX
  - **peg**: the CB stands ready to buy/sell any amount of FX at a fixed E
- Reality is somewhere in between

Pegging and Monetary Control

How can the exchange rate be fixed when capital is mobile?

UIP

$$1 + i = (1 + i^*)E/E^e \tag{1}$$

Fixing the exchange rate $(E = E^e)$ implies

$$i = i^* \tag{2}$$

The CB has no control over the interest rate

What happens if the Fed tries to change the interest rate?

- short answer: capital flows overwhelm the Fed
- long answer: below

Monetary control

Money market clearing

$$M/P = YL(i^*) \tag{3}$$

The CB has no control over the money supply either.

Why?

- short answer: the Fed needs to set M/P to keep $i = i^*$
  - otherwise: capital flows overwhelm the Fed
- long answer: below

Equilibrium: Fixed Exchange Rate

$$IS: Y = C(Y-T) + I(Y, i^*) + G + NX(\underset{-,+,-}{Y, Y^*, \varepsilon}) \tag{4}$$

$$LM: M/P = YL(i^*) \tag{5}$$

$$UIP: i = i^* \tag{6}$$

Exogenous: $E = E^e$, $i = i^*$, P, P^*, $\varepsilon = EP/P^*$, Y^*.

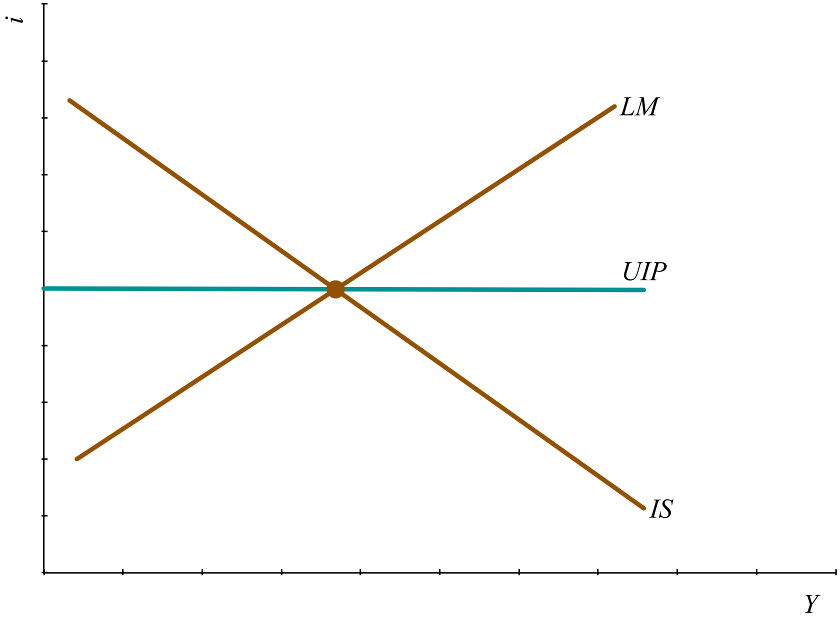
Endogenous: Y, M

The logic:

- UIP $\implies i$, IS $\implies Y$, LM $\implies M$.

Caveat: We have assumed that the peg is credible $(E = E^e)$.

Fiscal Policy



Fiscal Policy: Process

$G \uparrow \implies IS \rightarrow \implies Y \uparrow$

$i \uparrow > i^* \implies$ capital inflows

Fed sells dollars to absorb them

$M \uparrow \implies LM \rightarrow \implies Y \uparrow$ and $i \downarrow$

This continues until $i = i^*$ again.

Closed economy: rising i dampens fiscal expansion

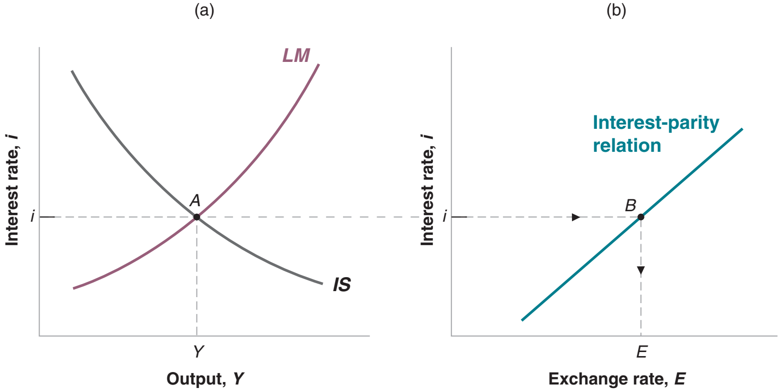
Open economy: fiscal policy is extra powerful

- this is exactly what happens in a closed economy when $G \uparrow$ **and** $M \uparrow$

Open Market Operations

- What happens if the CB tries to increase the money supply?
- Open market operation: buy bonds in exchange for money.
- We know the eventual outcome:
- What is the process?

Open Market Operations



Open Market Operations

The CB buys bonds with high powered money

- $M \uparrow$
- downward pressure on the dollar

In the FX market: CB must buy dollars to keep the peg

- $M \downarrow$
- FX reserves $\downarrow$

Net result: the CB has effectively paid for the bonds with FX reserves.

- M stays unchanged (as required by UIP)

Reality Check

- We have assumed perfect capital mobility (UIP)
- In reality, Central Banks have some control over the domestic interest rate
- Outcomes are somewhere in between closed economy and perfect capital mobility.

Trade restrictions

What is the effect of a tariff on imports?

Think of a tariff as improving NX for given (Y, Y^*, ε)

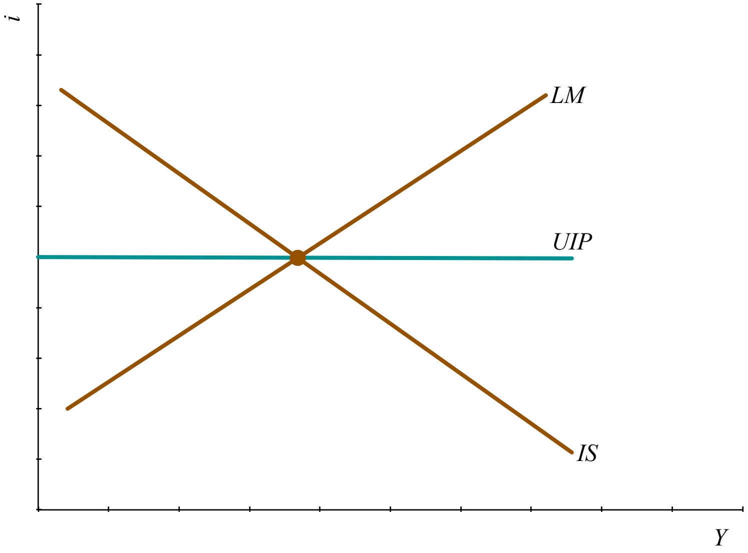
$$IS: Y = C(Y-T) + I(Y, i^*) + G + NX(\underset{-,+,-}{Y, Y^*, \varepsilon}, \tau) \tag{7}$$

Recall the floating outcome:

- the foreign currency depreciates
- this mostly undoes the effect of the tariff on NX

Do fixed exchange rates change this result?

Trade restrictions



Trade restrictions

Result: tariffs work!

How does is square with

$$NX = (Y - T - C) + (T - G) - I \tag{8}$$

We have $i = i^*$ unchanged and $Y \uparrow$.

Assumption (always): $b + c < 1$

- only part of the additional income is spent

$NX \uparrow$

But only in the short run...

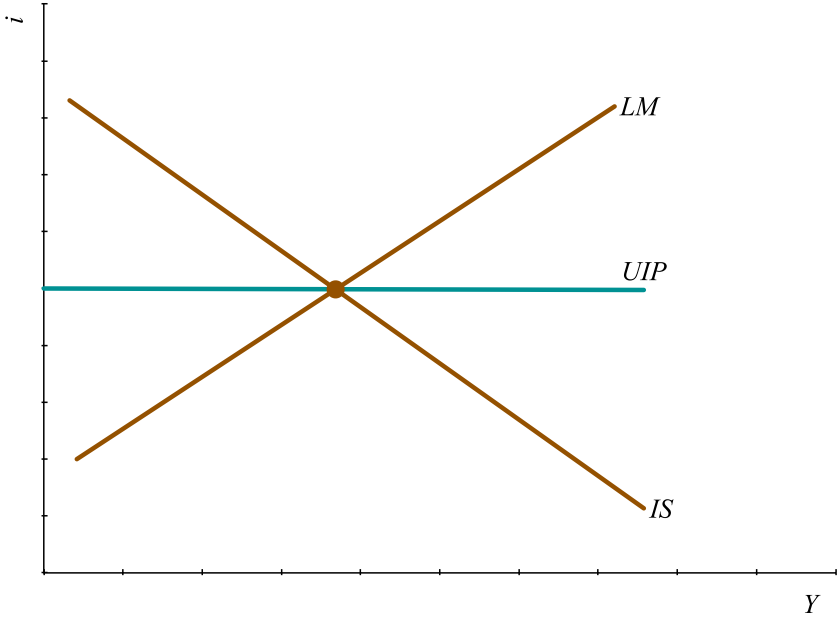
Trade restrictions

Eventually, the expanding money supply causes higher prices

- we will see this in the medium run analysis

Result: Even with fixed exchange rates, tariffs don't improve the trade balance.

Devaluation



Policy coordination

Countries can achieve domestic expansion in different ways:

1. $G\uparrow$: positive spillover on other countries ($NX\downarrow$)
2. Devaluation, tariffs: negative spillover

Need for policy coordination

Risk of competitive devaluations

Review Questions

1. Real demand shocks are extra powerful under fixed exchange rates. Why?
2. Monetary policy does not work. Why?
3. What would happen if the dollar risk premium rose?

Reading

- Blanchard / Johnson, Macroeconomics, 6th ed., ch. 19, 20