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^*.

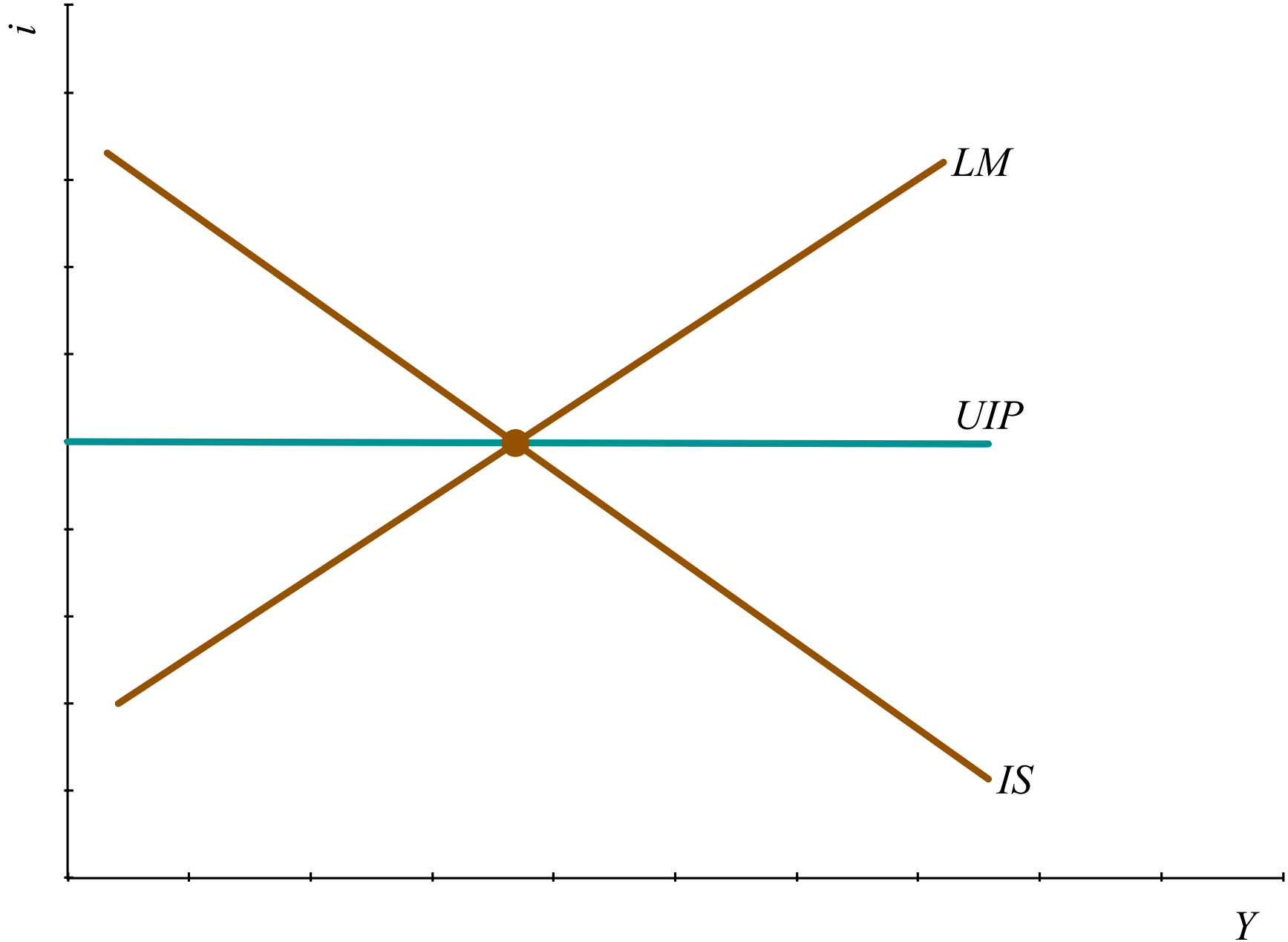
Endogenous: Y, M

The logic:

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

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

Fiscal Policy



Fiscal Policy: Process

$G \uparrow \Longrightarrow IS \rightarrow \Longrightarrow Y \uparrow$

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

Fed sells dollars to absorb them

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

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

Closed economy: rising i dampens fiscal expansion

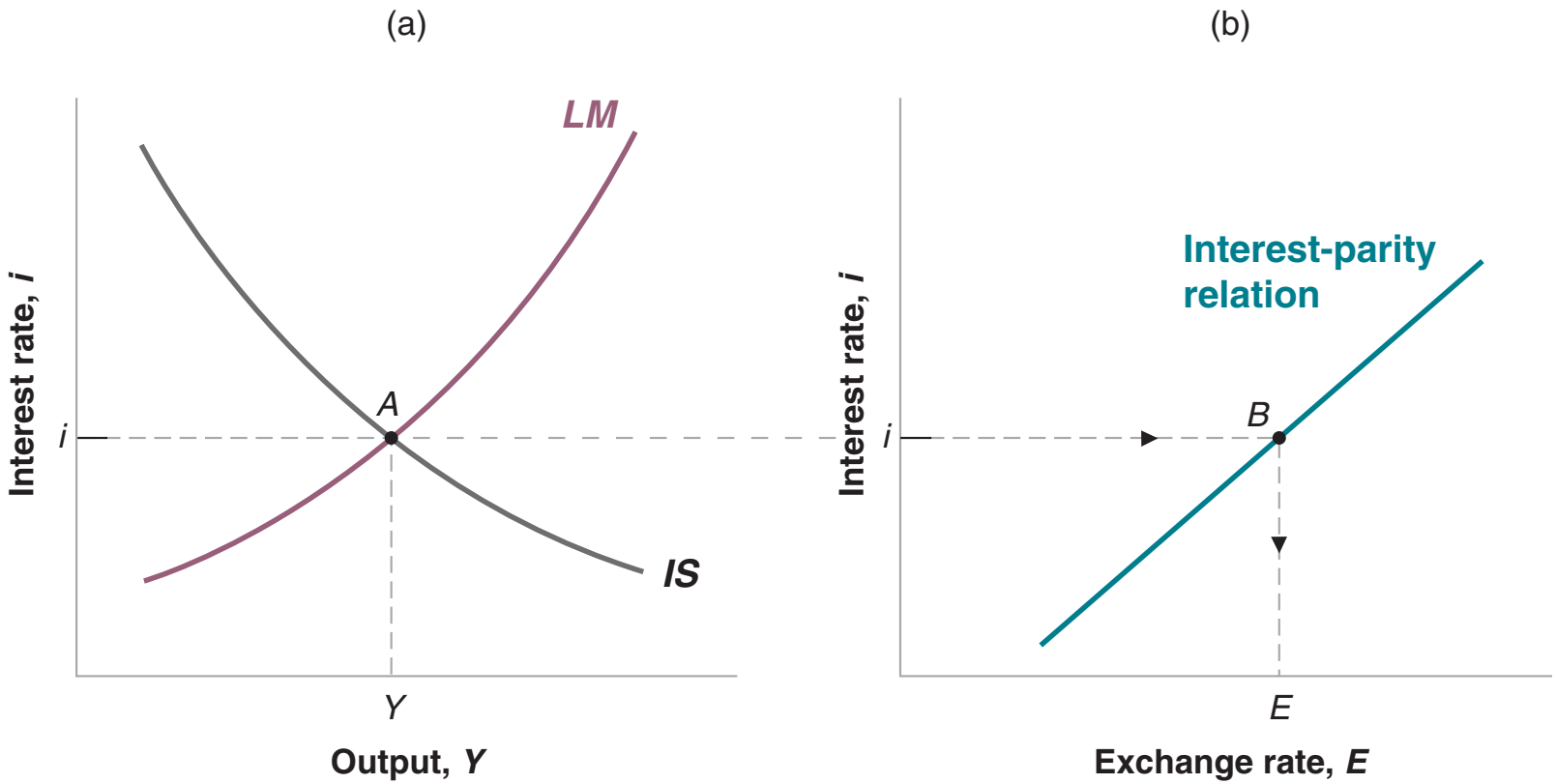
Open economy: fiscal policy is extra powerful

- 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)

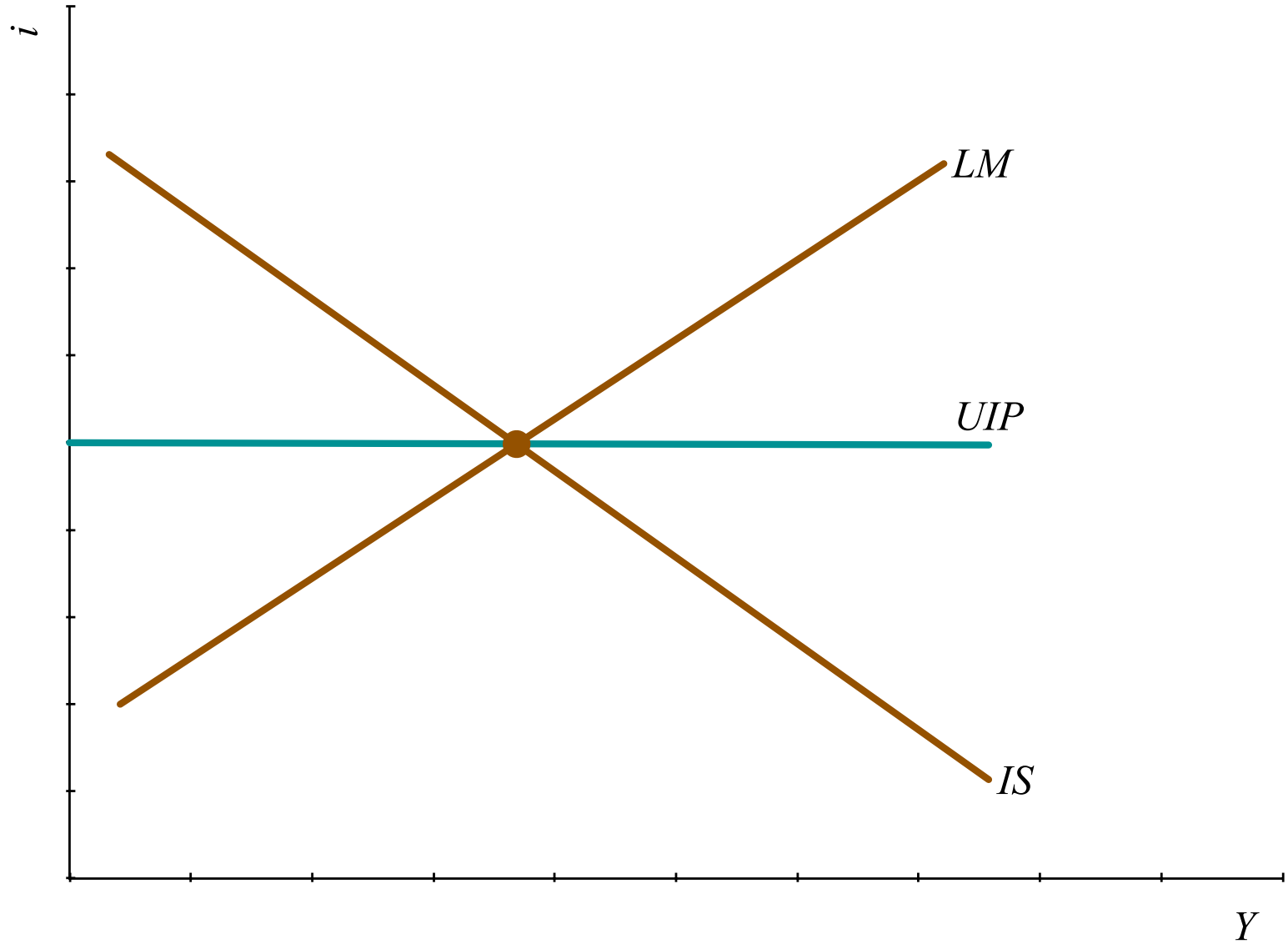
$$IS: Y = C(Y-T) + I(Y, i^*) + G + \underset{-,+,-}{NX}(Y, Y^*, \varepsilon, \tau) \qquad (7)$$

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

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

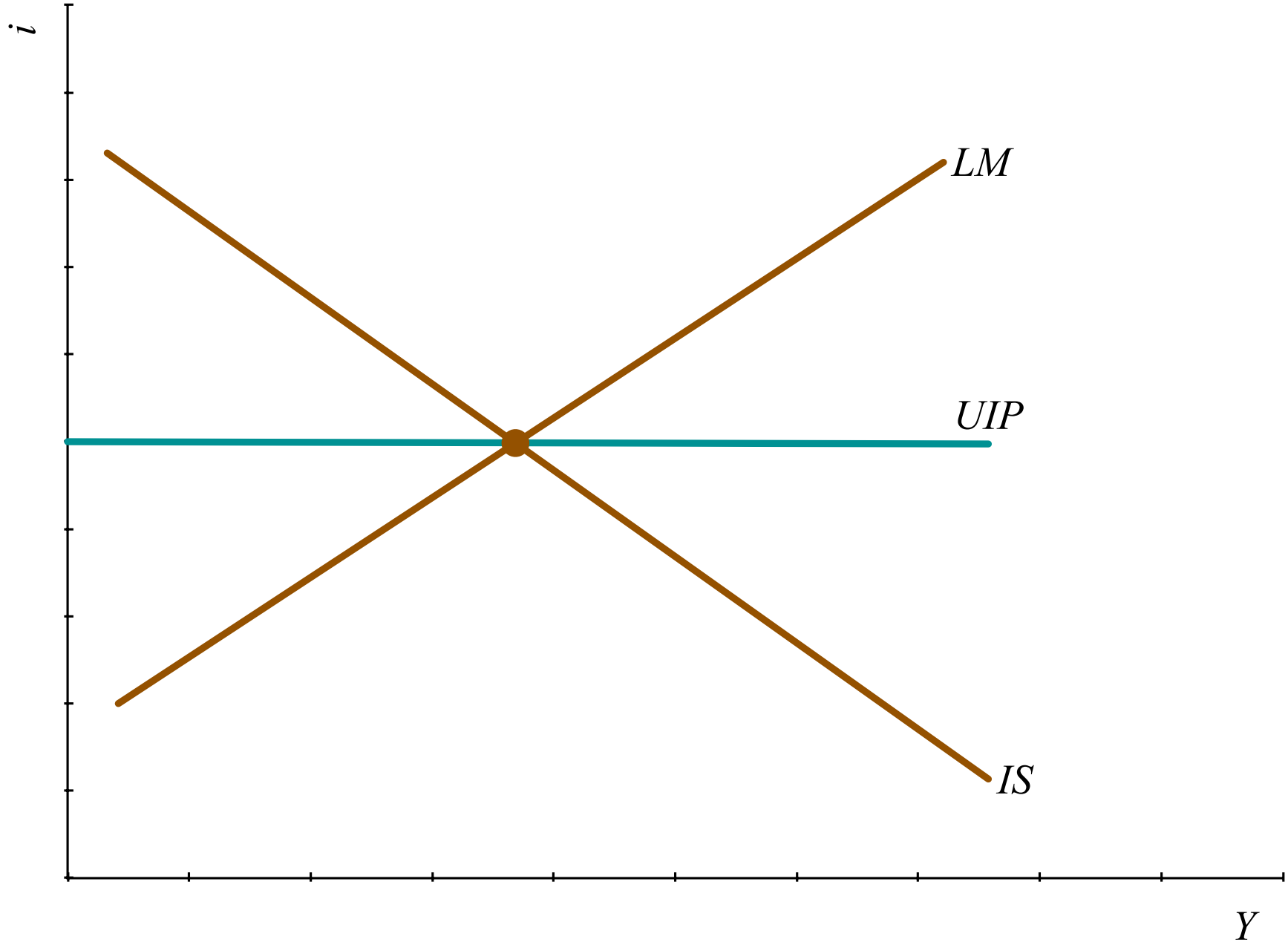
- $I \uparrow$ worsens the trade balance
- $S^p \uparrow$ pays for all of this

But: 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

Reading

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