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

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

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

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

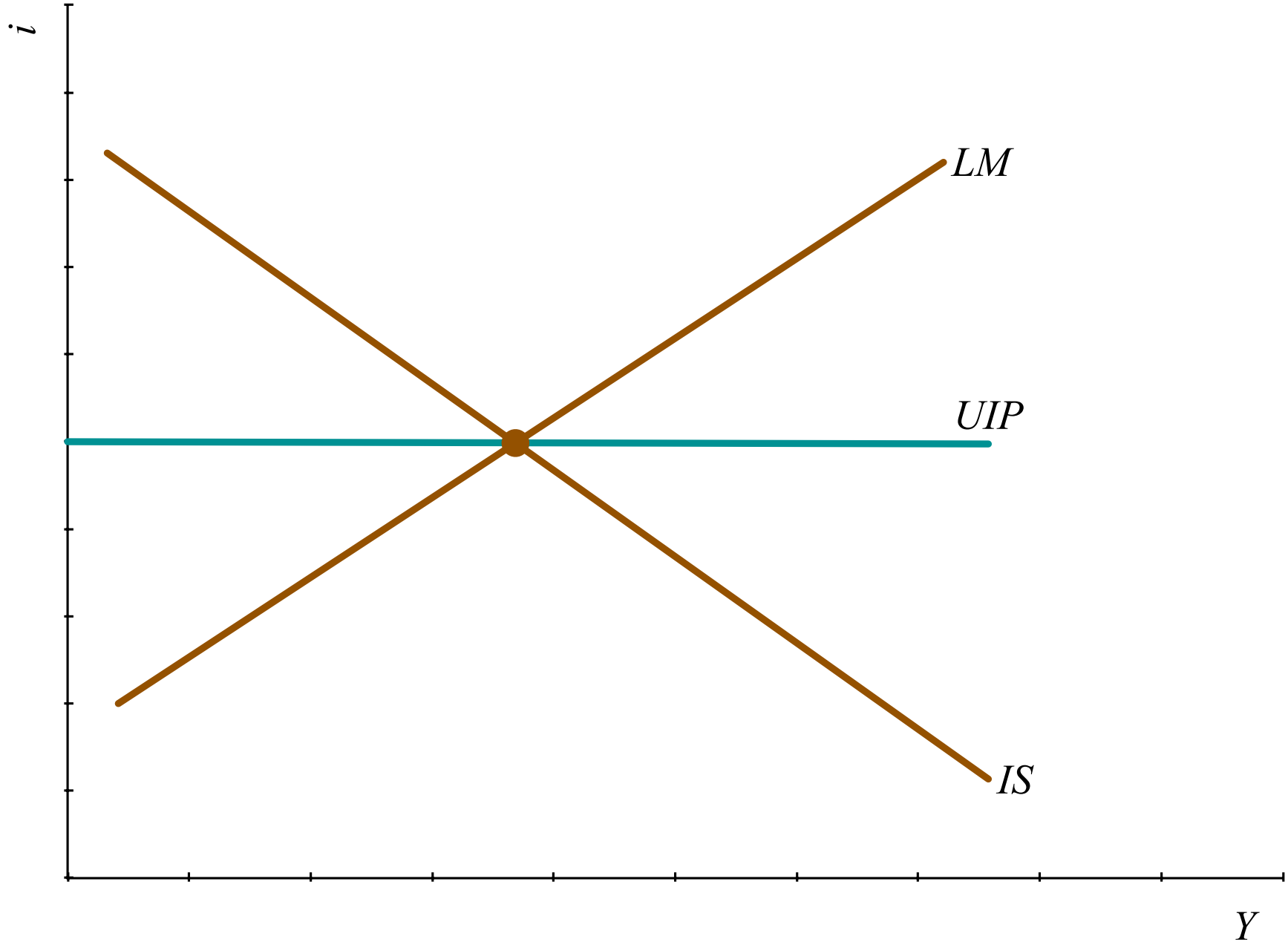
Exogenous: $E = E^e$, $i = i^*$, P, P^*, $\varepsilon = EP/P^*$, Y^*.

Endogenous: Y, M

The logic:

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

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

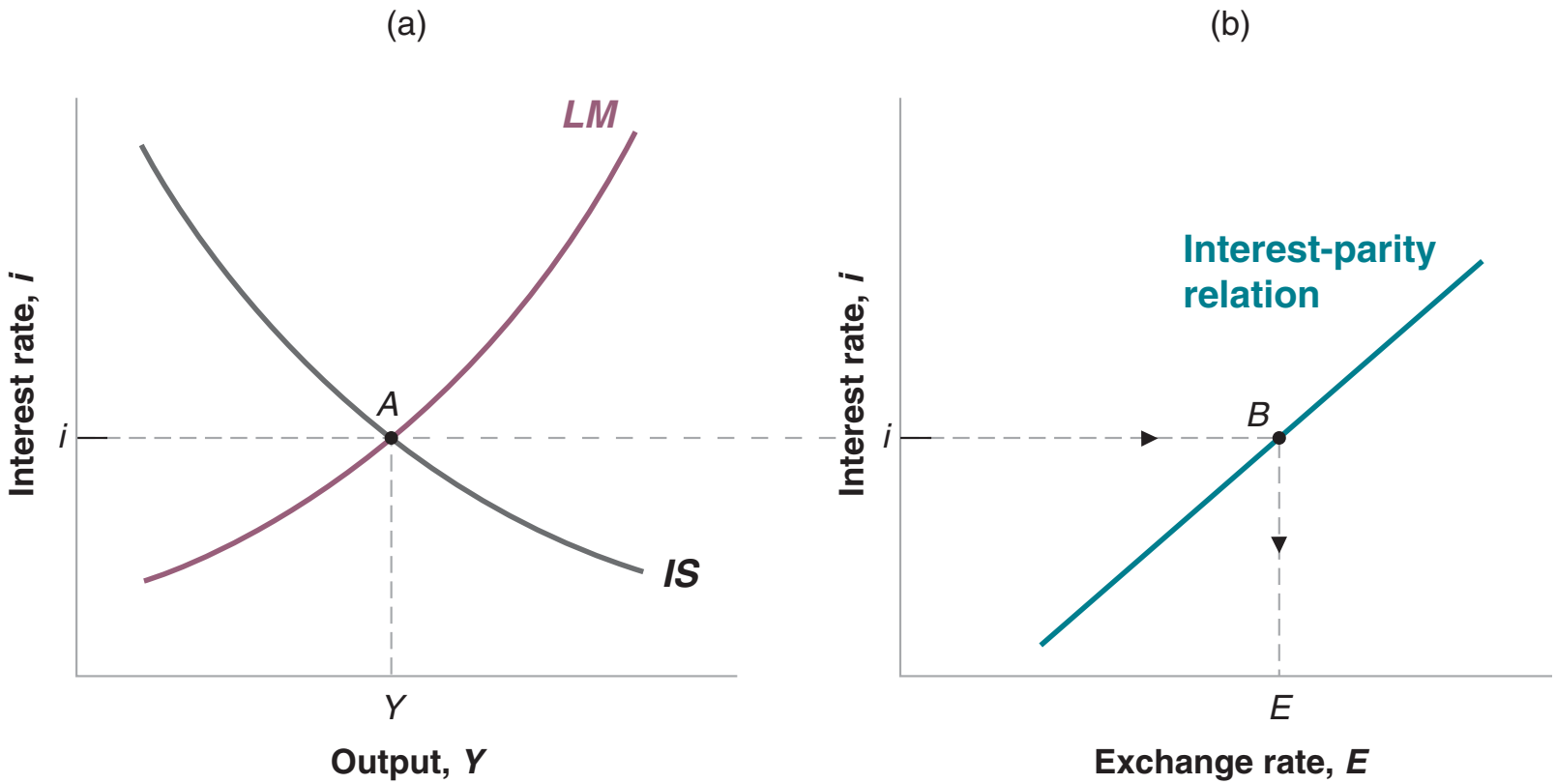
Open economy: fiscal policy is extra powerful

- 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

Then it buys the high powered money back in the FX market

The Central Bank balance sheet:

Assets		Liabilities	
Bonds:	ΔB	**Monetary base**	$\Delta B - \Delta B$
Reserves:	$-\Delta B$		$= 0$

- Open Market Operations simply exchange currency reserves for bonds.
- No effect on money supply

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)

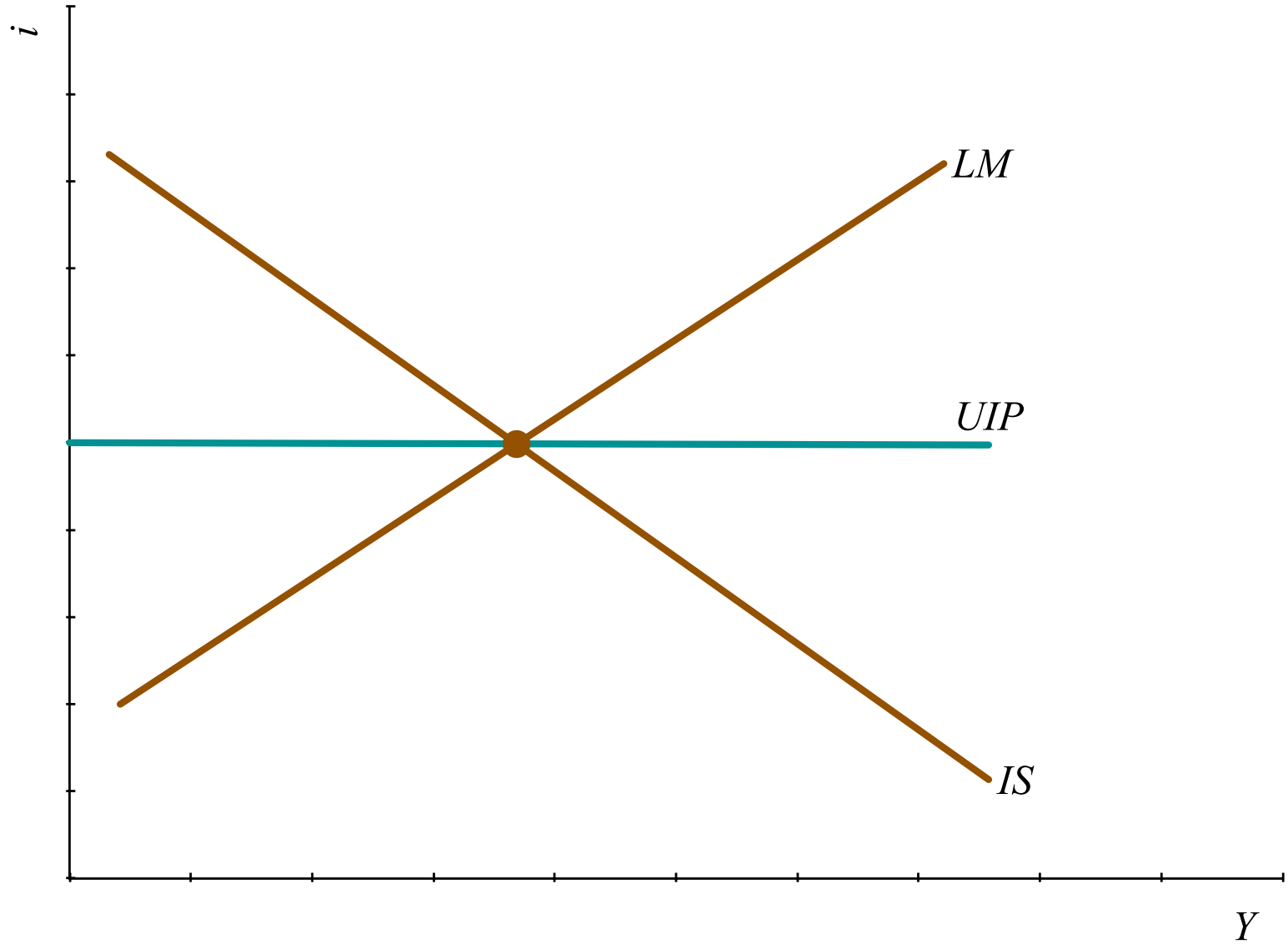
$$IS: Y = C(Y-T) + I(Y, i^*) + G + \underset{-,+,-}{NX}(Y, Y^*, \varepsilon, \tau) \qquad (7)$$

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

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

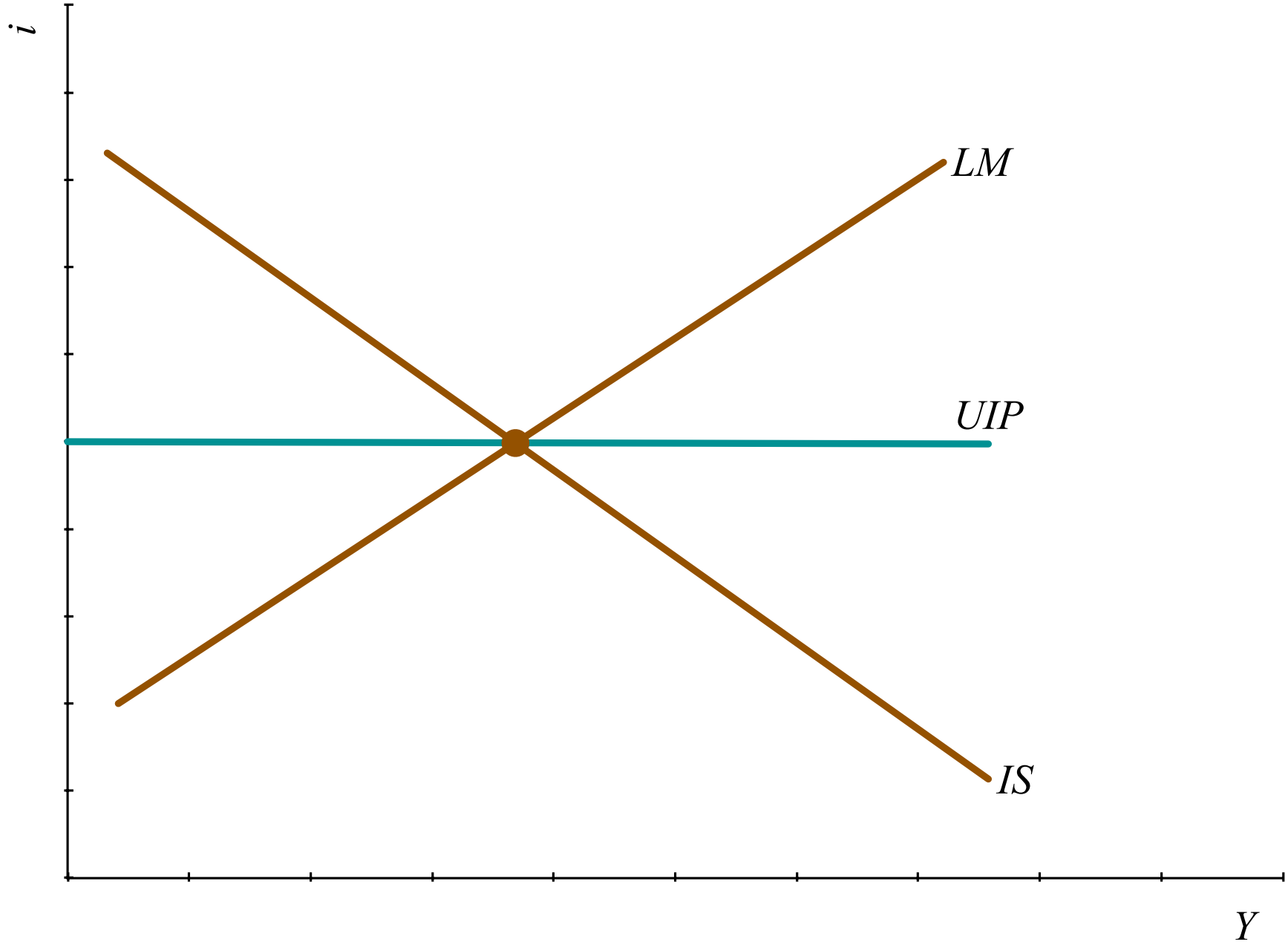
- $I \uparrow$ worsens the trade balance
- $S^p \uparrow$ pays for all of this

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