

## Issues in International Finance

### *Fixed exchange rates and the trilemma*

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## Roadmap

- ▶ Recap floating exchange rate regime model
- ▶ Fixed exchange rate regime model
- ▶ Trilemma: an implication of fixed exchange rates
- ▶ Examples

## Floating exchange rate regimes

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- ▶ Our focus so far has been on **floating** exchange rate regimes with **capital mobility** (UIP holds)
- ▶ In the short run, the central bank chooses  $M$  (and thus  $i$ ) and  $E_{H/F}$  was determined by UIP

$$M_H \rightarrow M_H / \bar{P}_H \rightarrow i_H$$

$$i_H = i_F + \frac{E_{H/F}^e}{E_{H/F}} - 1$$

- ▶ In the long run, the central bank chooses  $M$  which determines  $P$  and  $E$  and  $i$  is determined by the Fisher effect

$$P_H = M_H / [L(i_H)Y_H]$$

$$E_{H/F} = P_H / P_F$$

$$i_H = \pi_H^e + r^*$$

## Fixed exchange rate regimes

- ▶ In a **fixed** exchange rate regime, things change
- ▶ The central bank chooses an exchange rate level  $\bar{E}_{H/F} = \frac{1}{P}$ 
  - ▶ Why? It is a nominal anchor.
- ▶ As in our discussion of floating exchange rate regimes, assume that capital moves freely across borders: international capital mobility
- ▶ How does our analysis change?

## Fixed exchange rate regimes: Short run

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- ▶ The fixed exchange rate + capital mobility determine the interest rate

$$i_H = i_F + \underbrace{\frac{\bar{E}_{H/F}^e}{\bar{E}_{H/F}} - 1}_{=0}$$

- ▶ So  $i_H = i_F$ . Home does not control  $i_F$ , so it does not control  $i_H$ .
- ▶ What is the home money supply? Again, it is determined by  $i_F$

$$M_H = \bar{P}_H L(i_F) Y_H$$

- ▶ Once the exchange rate is fixed, the central bank must keep  $M_H$  at the appropriate level to keep the  $i_H = i_F$ .

*No policy changes.*

## Fixed exchange rate regimes: Long run

- ▶ The central bank chooses an exchange rate level  $\bar{E}_{H/F}$
- ▶ Foreign price level + fixed exchange rate determine  $P_H$

$$P_H = \bar{E}_{H/F} / P_F$$

↑ constant

determined  
in F

- ▶ UIP implies that  $i_H = i_F$  as before...
- ▶ ...so the money supply is

$$M_H = P_H L(i_F) Y_H$$

$$M_H = \frac{\bar{E}_{H/F}}{P_F} L(i_F) Y_H$$

- ▶ Once the exchange rate is fixed, the central bank must keep  $M_H$  at the appropriate level to keep the  $i_H = i_F$ .

~~~~~ No monetary policy choice.

## Recap

- ▶ With flexible exchange rates
  - ▶ Central bank chooses  $M_H$
  - ▶ In the long run determines  $P_H$  and  $E_{H/F}$
  - ▶ In the short run determines  $i_H$  and  $E_{H/F}$
- ▶ With fixed exchange rate
  - ▶ Central bank chooses  $\bar{E}_{H/F}$
  - ▶ In the long run  $P_H$  and  $M_H$  must ensure  $i_H = i_F$
  - ▶ In the short run  $M_H$  must ensure  $i_H = i_F$
- ▶ Fixed exchange rate + capital mobility → loss of monetary policy

## The open economy trilemma

choice between 3

### ▶ Three, pick two

1. Fixed exchange rate
2. International capital mobility (UIP holds)
3. Monetary policy independence (allow  $i_H \neq i_F$ )

### ▶ Example

- ▶ Fixed rate + capital mobility: UK in the 1990s
- ▶ Fixed rate + monetary policy: China today
- ▶ Capital mobility + monetary policy: U.S. today



## The United Kingdom, 1992

- ▶ Fixed rate and free movement of capital → No monetary policy discretion
- ▶ U.K. and Germany had a fixed exchange rate as part of a system of European fixed exchange rates: The ERM, a precursor to the Euro
- ▶ Germany is worried about inflation and wants high interest rates
- ▶ High German interest rates means U.K. must adopt high interest rates to keep the exchange rate fixed (UIP says  $i_{GR} = i_{UK}$ )
- ▶ Weak U.K. economy means high interest rates are not desirable
- ▶ Lack of U.K policy credibility invites speculation
  - ▶ Will U.K. keep the exchange rate fixed?

Business cycles in Germany: OK out of sync.

## Defending a fixed exchange rate

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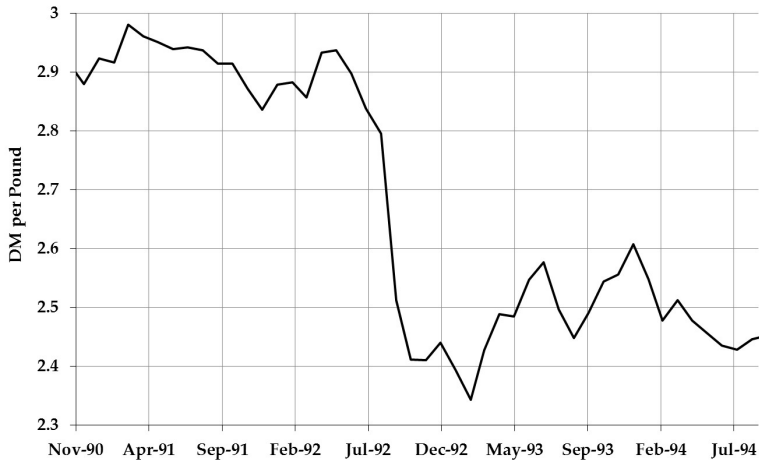
- ▶ Bank of England can
  - ▶ Keep interest rates high
  - ▶ Devalue the currency
  - ▶ Intervene in the fx market and use foreign reserves to keep the pound from devaluing (let  $i_{uk} < i_{GR}$  and make up shortage of DMs)
- ▶ Investors speculate that BoE would rather devalue than keep interest rates high during a recession: policy commitment is not credible
  - ▶ Borrow in pounds, sell pounds for marks
  - ▶ BoE must raise interest rates, drain reserves, or devalue
  - ▶ Becomes a game of chicken

## Black Wednesday

- ▶ September 16, 1992
- ▶ U.K. raises interest rates from 10% to 12%
  - ▶ Promise to raise rate to 15% later that day
- ▶ Does not stop speculators from selling pounds
  - ▶ Government abandons fixed rate regime
  - ▶ Soros reportedly makes about \$1 billion
- ▶ Thought to be a self-fulfilling crisis
  - ▶ Fixed rate may have held if not attacked
  - ▶ Fixed rate failed when attacked

## Black Wednesday ( $\approx 20\%$ devaluation)

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## China, present

- ▶ Fixed rate + independent monetary policy → No free movement of capital
- ▶ China fixes exchange rate against dollar
  - ▶ Yuan appears undervalued relative to dollar
- ▶ People's Bank can change its monetary policy
  - ▶ Can raise interest rates (compared to US) to battle inflation
  - ▶ Capital controls keep UIP from forcing fx rate to change
- ▶ Costs of capital controls?
  - ▶ Hinders efficient use of capital and limits financial development
  - ▶ Overvaluation can lead to black market for currency
  - ▶ Can discourage foreign investment
- ▶ Works for now, but conflicts with goal of “international renminbi”

## United States, present

- ▶ Capital mobility + discretionary monetary policy → floating exchange rate
- ▶ Federal Reserve's mandate
  - ▶ Low and stable inflation
  - ▶ Maximum sustainable employment
  - ▶ Nothing about exchange rates
- ▶ Monetary policy based on domestic conditions
- ▶ Free movement of capital into/out of country
- ▶ Changes in interest rates shift, expectations change the exchange rate

## Exchange rate variation (1999–2014)

|           | Floating rates |             |               | Fixed rates  |             |            |
|-----------|----------------|-------------|---------------|--------------|-------------|------------|
|           | euro-<br>usd   | yen-<br>usd | pound-<br>usd | yuan-<br>usd | hkd-<br>usd | dk-<br>usd |
| mean      | 0.84           | 105.18      | 0.61          | 7.50         | 7.78        | 7.45       |
| std.      | 0.14           | 14.48       | 0.06          | 0.84         | 0.02        | 0.01       |
| std./mean | 0.17           | 0.14        | 0.10          | 0.11         | 0.003       | 0.001      |

- ▶ More variation in floating exchange rates
- ▶ Yuan fx rates have seen some forecastable adjustment
- ▶ Fx variation makes foreign pricing more difficult

## Summary

- ▶ The trilemma: Cannot have all three
  1. Fixed exchange rate
  2. International capital mobility
  3. Independent monetary policy
- ▶ Fixed exchange rate benefits
  - ▶ Provide a nominal anchor
  - ▶ Facilitate cross-border trade and investment
- ▶ Fixed exchange costs
  - ▶ Lose either monetary policy or capital mobility
  - ▶ Subject to speculative attacks