

Fixed Exchange Rates and Exchange Market Intervention

Chapter 17

1. Central bank intervention in the foreign exchange market
2. Stabilization under fixed exchange rates
3. Exchange rate crises
4. Sterilized intervention
5. Historical fixed exchange rate systems

1 Central Bank Intervention in the Foreign Exchange Market

1.1 Central Bank Balance Sheet

Assets	Liabilities
domestic government securities	currency
foreign exchange reserves	private bank deposits (bank reserves)
gold	

Base money = high-powered money = currency + deposits at the Fed

= Currency held by the public + vault cash + bank reserves at the Fed

= Liabilities of Fed

1.2 Central Bank Activities and the Money Supply

- Open market purchase: Fed buys government bonds with currency (or by increasing bank reserves)
- Fed buys foreign currency paying for it with domestic currency
- Sterilized foreign exchange market intervention
 - buy \$1,000 worth of foreign currency
 - simultaneously sell \$1,000 worth of domestic government securities
 - monetary base unchanged

2 Fixing the Exchange Rate

2.1 Principle:

adjust the money supply to make the equilibrium value for the exchange rate equal to the fixed rate

2.2 Interest Rate Parity

$$R = R^* + \frac{E^e - E}{E}$$

- $R = R^*$
- $E^e = E$
- if the fixed rate (peg) is credible
- fixing the exchange rate requires pegging the interest rate to the foreign interest rate

2.3 Example: Transitory increase in G, raising Y

3 Stabilization policy under fixed exchange rates

3.1 Monetary expansion

- An open market operation is ultimately an exchange of foreign-currency assets for domestic assets with no change in the money supply
- AA never actually shifts
- A country which pegs its exchange rate loses monetary policy

3.2 Fiscal expansion (transitory)

- Requires an increase in the money supply to keep exchange rate from appreciating
- Very effective compared to flexible rates because accompanied by monetary expansion and no currency appreciation

3.3 Officially devalue currency

- Raise the exchange rate
- Requires increasing the money supply, shifting AA right
- In the short-run, output expands
- Devaluation is a way to use monetary expansion under a fixed exchange rate regime

3.4 Peg exchange rate at a higher value to escape a liquidity trap

- Interest rate parity in a liquidity trap

$$R = R^* + \frac{E^e - E}{E} = 0$$

- If $R^* > 0$, implies domestic currency is appreciating (E is falling)
- Upper bound on E implied by interest rate parity, no matter what the quantity of money

$$E = \frac{E^e}{1 - R^*}$$

- If credibly announce a higher peg, E^e rises, and if peg is high enough R rises above 0.

4 Exchange Rate Crises

4.1 Increase in E^e

- Agents expect a devaluation next period
- Interest rate parity

$$R = R^* + \frac{E^e - E}{E}$$

- Either let E rise today
- Or increase R today by selling foreign exchange reserves in exchange for domestic currency

- Once run out of foreign exchange reserves, forced to let E rise
- Or might not want contractionary effect of R up on economy

4.2 Reasons for E^e up

- Government is financing an ongoing deficit by selling bonds to the central bank
 - Central bank buys bonds with currency and is forced to sell foreign exchange reserves in exchange for currency to keep exchange rate fixed
 - Reserves are falling
 - Once reserves are gone, the increase in the money supply to finance government spending will depreciate the currency

- Country is in recession and devaluation would stimulate demand
- Country is experiencing a banking crisis and lending foreign exchange reserves to banks

5 Sterilized Intervention

5.1 Sterilized intervention has no effect

- Buy foreign currency and sell money
- Sell domestic bonds and buy money
- No effect on money and no effect on E

5.2 Sterilized intervention has a signaling effect

- Buy foreign currency and sell domestic bonds so no effect on money
- However, agents think central bank is buying foreign currency because it wants E to increase
- Therefore E^e increases, raising E
- Government must follow through in the future and increase the money supply validating the increase in E^e if the signaling effect is going to continue to work

5.3 Assets are imperfect substitutes due to risk

- Investors are more vulnerable to capital gains and losses due to exchange rate changes for a particular currency, the larger the fraction of their portfolio that is denominated in that currency
- As an asset's fraction of the world portfolio increases, the asset must offer higher returns
 - Replace interest rate parity

$$R = R^* + \frac{E^e - E}{E} + \rho(B - A)$$

- where B = government bonds outstanding

- A = bonds held by the central bank
- $B - A$ = bonds held by the public
- as $B - A$ increases, risk premium on dollar assets must increase

- Sterilized intervention

- buy foreign exchange
- sell government bonds reducing A ,
- raising $B - A$, government bonds held by the public
- raising ρ , the risk premium

- When ρ rises, interest rate parity requires E to rise

6 Fixed Exchange Rate Systems

6.1 Gold Standard

- Every country is willing to buy and sell gold at a fixed price
 - let $\$/\text{gold} = \35 per ounce
 - $\text{£}/\text{gold} = \text{£}14.58$ per ounce
 - $\$/\text{£} = \$/\text{gold} \times \text{gold}/\text{£} = 35/14.58 = 2.40$
 - Take \$35 and buy an ounce of gold

- Sell the ounce of gold for £14.58
 - Have traded \$35 for £14.58
- Fixing the price of gold fixes the exchange rate

- Adjustment mechanism

- US raises M through open market operation tending to reduce R relative to R^*
- Agents receive dollars for US bonds and take these dollars back to Fed in exchange for gold
- Domestic money supply increases less than originally, implying R falls less than originally
- Take gold to UK central bank and buy pounds increasing foreign money supply and reducing R^*
- Money supply in both countries is larger and interest rates in both countries are lower

- Effect of the initial open market operation on money and the interest rate much smaller than in closed or flexible exchange rate economy
- In the long-run prices rise and ratio of money to gold is higher
- Limits to ratio of money to gold and therefore to long-run increase in prices

- Increase in production of gold
 - Sell gold to central banks in exchange for money
 - Higher money reduces interest rates in the short run and raises prices in the long run
 - No limit to price increases caused by new gold production because ratio of money to gold is not falling

- Benefits of a gold standard
 - Stable price level if gold production grows at the rate of growth of output

- Costs of a gold standard
 - If gold production grows more slowly than output, liquidity shortage which causes deflation
 - If gold production is volatile, prices are volatile
 - Lose stabilizing role of monetary policy
 - Large producers of gold receive substantial political influence

6.2 Reserve currency (Bretton Woods)

- Every country is willing to buy and sell reserve currency (dollars) at a fixed price, fixing the exchange rate between participating countries
- Adjustment mechanism - between non-reserve currency countries same as gold standard
- US dollar plays the role of gold
 - US monetary policy determines the world money supply
 - US monetary policy determines world inflation