

## Exchange Rate Determination and Impacts

### I. EXCHANGE RATE DETERMINATION (FLEXIBLE RATES)

#### A. Terms and Definitions

1. Foreign exchange as a dollar-valued asset,  $\$/FC$ : Higher  $\$/FC$  is rise in asset value (their currency appreciates); it takes more dollars to buy their currency ( $\$$  depreciates)
2. Dollar as a foreign asset,  $FC/\$$ : Higher  $FC/\$$  is rise in dollar value (dollar appreciation); it takes more FC to buy one dollar (FC depreciation)
3. When exchange rates are fixed: devaluation, revaluation

#### B. Foreign currency as a "good", with price expressed in $\$/FC$ on the vertical axis

1. Demand for a foreign currency is a function of
  - a. home demand for foreign goods (commodities, products)
  - b. home demand for foreign services (tourism, insurance....)
  - c. home demand for foreign investment (financial / physical)
    - 1) Demand for goods and services a function of tastes and preferences, substitutes and relative prices
    - 2) Demand for physical investment: expected profits (purchase price, interest rates, taxes, etc.)
    - 3) Demand for financial investment: interest rates

#### **Their demand for our currency reflects our exports.**

2. Supply of a foreign currency is a function of their demand for our goods, services, and investment. They supply their currency as they demand U.S. dollars.

#### **Our supply of our currency reflects our imports.**

3. Supply/demand intersection determines dollar price of foreign currency, i.e., the buying and selling of currencies determines exchange rates.

#### C. Shifts in demand and supply functions (2 and 3 above) lead to changes in the dollar price of foreign currency.

1. As  $\$/FC$  increases, dollar depreciates: more dollars to purchase same amount of FC
2. As  $\$/FC$  decreases, dollar appreciates: less dollars to purchase same amount of FC.

#### D. Multilateral Exchange Rates and Arbitrage

1. Suppose  $\$1 = 2 \text{ DM}$  and  $1 \text{ DM} = 3 \text{ FF}$  ---->  $\$1 = 6 \text{ FF}$ 
  - a. If  $\$1$  trading for 5 FF, take  $\$100$  and sell it to buy 200 DM, then buy 600 FF and convert that to  $\$120$  making money.
  - b. Alternatively, take  $\$100$  and buy 500 FF, then buy 166.66 DM and convert that to  $\$83.33$ , losing money.
2. In the  $\$$ -FF market in 1) above, arbitreurs are selling their FF to get undervalued  $\$$ , thereby bidding up the value of the  $\$$  and driving down the value of the FF. In the  $\$$ -FF market in 2), the opposite is happening.

#### E. A change in the money supply affects exchange rates indirectly:

1. As M increases, P increases (inflation): decreases demand for U.S. goods, services and investment, depreciating the dollar.
2. As M increases, U.S. interest rate falls, decreasing foreign demand for U.S. financial instruments.
- 3 Hence, increasing U.S. money supply leads to  $\$$  depreciation.

## II. A BRIEF MONETARY HISTORY

### A. Precious Metals (weighing out gold and silver)

1. Goods (saddles, blankets) and services (blacksmith, doctor) are paid for in gold and silver bullion
2. Price - specie flow as an automatic adjustment mechanism
  - a. All prices quoted in gold/silver
  - b. Exporting country has gold inflow, prices inflate, becomes too expensive
  - c. Importing country has gold outflow, deflation, more competitive internationally

### B. The Gold Standard (1880-1914)

1. Standardized coinage
2. One U.K. pound sterling contained 113 grains of pure gold
3. One U.S. gold dollar contained 23.22 grains of pure gold
4. Therefore, 4.87 U.S. dollars equaled one U.K. pound sterling  
----> This is known as "mint parity". Note:  $(4.87 = 113 \text{ divided by } 23.22)$
5. Under gold standard (specie-flow mechanism): gold is the money supply
  - a. With exports, gold flows in, prices inflate, exports dry up.
  - b. With imports, gold flows out, prices deflate, imports dry up.
  - c. Major problems
    - 1) Sterilization: not allowing prices to inflate.
    - 2) No nation had control of its money supply.
    - 3) World commerce was at the mercy of gold discoveries.
    - 4) Constant price fluctuations, up and down.

### C. The Gold Exchange Standard (1947-1971)

1. Bretton Woods, New Hampshire, 1946
  - a. The International Monetary Fund (IMF)
  - b. Standard Drawing Rights (SDRs)
  - c. Because of WWII and problems with gold, \$ became central exchange currency...
    - 1) All currencies tied to dollar, dollars exchange for gold:  $\$35 = 1 \text{ ounce gold}$ 
      - a) Other currencies exchange for dollars: 1 British pound =  $\$2.40$
      - b) Thus, 14.6 British pounds  $(= 35 / 2.4)$  would buy 1 ounce gold
    - 2) Other nations buy and sell dollars to hold rates stable.
    - 3) Change in rates only with "fundamental disequilibrium"
    - 4) Unfortunately, only devaluations occurred because only deficits were painful
    - 5) Speculation was "with the wind": sell weak currencies!

### D. Flexible or "Floating" Exchange Rates (1971 - present)

### E. Fixed / Pegged Exchange Rates

1. Fixed / pegged exchange rates are rates that are fixed with respect to a larger currency and do not change, except by government order (devaluation, revaluation).
2. Used by smaller countries (smaller currencies), many LDCs
3. Why pegged exchange rates?
  - a. Risk reduction / stability
  - b. Transactions costs
4. The ultimate "fixed exchange rate": One currency

### III. EXCHANGE RATE IMPACTS ON TRADE

- A. \$ depreciation means lower U.S. imports: Our import price is  $FC * \$/FC$ ; \$ depreciation is rise in  $\$/FC =$  higher \$ import price
- B. \$ depreciation means higher U.S. exports: their import price (yen) is  $\$ \text{ price} * FC/\$$ ; \$ depreciation is lower  $FC/\$ =$  lower yen price
- C. Exchange rate changes have no impacts on domestic demand and supply functions: Prices change due to demand or supply shifts.

### IV. RECENT INTERNATIONAL EVENTS

#### A. Introduction of the Euro (January 1, 1999)

NOTE: EC = France, Germany, Italy, “BeNeLux” (1958)  
United Kingdom, Denmark, Ireland (1973)  
Greece (1981)  
Spain, Portugal (1986)  
Austria, Finland, Sweden (1995)  
Under consideration: Poland, Czechia, Hungary  
Conspicuously absent: Switzerland, Norway

#### 1. A European “common currency”

- a. Eleven countries (of 15) have agreed to fix their currency exchange rates to a common currency, the EURO.
- b. United Kingdom, Denmark, Sweden opted out  
Greece did not meet the “convergence criteria”:
  - 1) Inflation < 1.5 percent above average of 3 EC lowest
  - 2) Interest rates < 2 points above same three in 1) above
  - 3) Budget deficits < 3 percent of GDP
  - 4) Debt < 60 percent of GDP
- c. Introduced (1/1/99) at  $\$1.1669 / \text{EUR}$  or  $0.8566 \text{ EUR}/\$$
- d. Today (2/28/00):  $\$1.0259 / \text{EUR}$  or  $0.9744 \text{ EUR}/\$$

#### 2. Good Internet sites:

<http://www.oanda.com/>  
<http://www.ecb.int/home/eurofxref.htm>

#### B. The Asian Currency Crisis

- 1. Long-standing problems: Russia, Japan
- 2. July 2, 1997: Devaluation of the Thai bhat  
Then followed: Indonesia, South Korea, Philippines,  
Malaysia, Taiwan, Hong Kong, Singapore
- 3. Largely unnoticed in U.S. until August 31, 1998: 512 point drop in Dow-Jones index, >20% down from July 17 peak!
- 4. The problem: Currency overvaluation -- excess investment!
  - a. Too much foreign money, looking for bigger returns
  - b. Corruption and a lack of oversight resulted in a reverse dollar flow, back into U.S. assets (stocks, mutual funds)

- VI. Balance of Payments
  - A. The Bookkeeping
    - 1. Exports are Credited (dollar demand): Exchange rate strengthening
    - 2. Imports are Debited (dollar supply): Exchange rate weakening
  - B. The Balances
    - 1. Balance on merchandise trade
    - 2. Balance on goods and services
    - 3. Balance on current account
  - C. Capital Account
    - 1. With double-entry bookkeeping:  $\text{CURRENT account} + \text{CAPITAL account} = 0$
    - 2. Autonomous vs. accommodating entries
      - a. Autonomous entries are investment demands
      - b. Accommodating entries are payments for goods, services
  - D. Government
    - 1. The Official Settlements Balance
    - 2. The only accurate account
  - E. Generally associated with fixed or "pegged" exchange rates
  - F. Deficits in the Balance of Payments
    - 1. Intervention for temporary deficits
    - 2. Price deflation
    - 3. Reduce aggregate demand with restrictive monetary & fiscal policies
    - 4. Raise interest rates to attract foreign capital
    - 5. Devaluation for persistent deficits