Foreign exchange markets

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Foreign exchange markets

• Markets in which cash flows from the sale of products or assets denominated in a foreign currency are transacted.

Foreign exchange markets

- Facilitate foreign trade
- Facilitate raising capital in foreign markets
- Facilitate the transfer of risk between market participants
- Facilitate speculation in currency values

Foreign exchange rate

• Price at which one currency can be exchanged for another currency

Foreign exchange risk

• Risk that cash flows will vary as the actual amount of domestic currency received on a foreign investment changes due to a change in foreign exchange rates.

Currency depreciation

- Domestic currency falls in value relative to other currencies.
- Domestic goods become cheaper for foreign buyers and
- Foreign goods become more expensive for domestic buyers

Currency appreciation

- Domestic currency rise in value relative to other currencies
- Domestic goods are more expensive for foreign buyers
- Foreign goods are cheaper for domestic consumers

Foreign exchange transactions

- Spot foreign exchange transactions
- Forward foreign exchange transactions

Foreign exchange transactions

- Foreign exchange rates may be listed in two ways
- Domestic currency received per unit of foreign currency. (SAR 2.939/ SGD 1) – Direct quote
- Foreign currency received per unit of domestic currency. (SGD 0.340/ SAR 1) – Indirect quote

Spot foreign exchange transactions

• Foreign exchange transactions involving the immediate exchange of currencies at the current (or spot) exchange rate.

Forward foreign exchange transaction

• Exchange of currencies at a specified exchange rate (or forward exchange rate) at some specified date in the future.

Return and risk of foreign exchange transactions

- The risk involved with a spot foreign exchange transaction is that the value of the foreign currency may change relative to domestic currency
- Foreign exchange risk is introduced by adding foreign currency assets and liabilities to a firm's balance sheet.

Return and risk of foreign exchange transactions

- Like domestic assets and liabilities, return result from the contractual income from or costs paid on a security.
- With foreign assets and liabilities, returns are also affected by changes in foreign exchange rates.

Return and risk of foreign exchange transactions

- Suppose a firm makes an investment in a foreign country:
 - convert domestic currency to foreign currency at spot rates
 - invest in foreign country security
 - repatriate foreign investment and investment earnings at prevailing **spot rates** in the future

Foreign exchange risk

• Firms can hedge their foreign exchange exposure either on or off the balance sheet

On-balance-sheet hedging

- Involves matching foreign assets and liabilities
 - as foreign exchange rates move any decreases in foreign asset values are offset by decreases in foreign liability values (and vice versa)

Off-balance-sheet hedging

- Involves the use of forward contracts
 - forward contracts are entered into (at t = 0) that specify exchange rates to be used in the future (i.e., no matter what the prevailing spot exchange rates are at t = 1)

Role of financial institutions in foreign exchange transactions

- Conducted among dealers mainly over the counter (OTC) using telecommunication and computer networks.
- Traders generally specialize in a few currencies.

• A financial institution's overall **net foreign exchange exposure** in any given currency is measured as

Net exposure_{*i*} = (FX assets_{*i*} – FX liabilities_{*i*}) + (FX bought_{*i*} – FX sold_{*i*})

= net foreign $assets_i + net FX bought_i$

= net position_{*i*}

where

i = ith country's currency

• A net long (short) position is a position of holding more (fewer) assets than liabilities in a given currency

Positive net exposure – Net long

- Financial institution will profit if the foreign currency appreciates in value against the home currency
- Faces risk that the foreign currency will fall in value against the domestic currency

Negative net exposure – Net short

- Institution will profit if the foreign currency depreciates in value against the domestic currency
- Faces the risk that the foreign currency will rise in value against the domestic currency

Net exposure

• Failure to maintain a fully balanced position in any currency exposes the financial institution to volatility of foreign exchange rates.

- A financial institution's position in foreign exchange markets generally reflects four trading activities
 - purchase and sale of foreign currencies for customers' international trade transactions
 - purchase and sale of foreign currencies for customers' investments
 - purchase and sale of foreign currencies for customers' hedging
 - purchase and sale of foreign currencies for speculation (i.e., profiting through forecasting foreign exchange rates)

- In the first two activities, financial institution normally acts as an agent on behalf of its customers for a fee but does not assume the foreign exchange risk itself.
- In the third activity, financial institution acts defensively as a hedger to reduce foreign exchange exposure.

- Foreign exchange risk essentially relates to open (or speculative) positions taken by the financial institution by fourth activity.
- Open position is the unhedged position in a particular currency.

Interaction of interest rates, inflation and exchange rates

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• Relationship between nominal interest rates, real interest rates and expected inflation is *Fisher effect*

Fisher effect

- Fisher effect theorizes that nominal interest rates observed in financial markets should
- 1. compensate investors for any reduced purchasing power due to inflationary price changes and
- 2. provide an additional premium above the expected rate of inflation for forgoing present consumption due to the time value of money (which reflects the real interest rate) such that

Fisher effect

- i = IP + RIR
- i = interest rate
- IP = inflation rate
- RIR = real rate of interest

• Theory explaining the change in foreign currency exchange rates as inflation rates in the countries change

$$i_{US} = IP_{US} + RIR_{US}$$
 and $i_{S} = IP_{S} + RIR_{S}$

i = interest rate

IP = inflation rate

RIR = real rate of interest

US= the United States

S = foreign country

- Assuming real rates of interest are equal across countries
- $RIR_{US} = RIR_{S}$

Then

$$i_{US} - i_S = IP_{US} - IP_S$$

Nominal interest rate spread between the two countries reflects the difference in inflation rates between the two countries

• As relative inflation rates (and interest rates) change, foreign currency exchange rates that are not constrained by government regulation should also adjust to account for relative differences in the price levels (inflation rates) between the two countries.

- According to PPP, foreign currency exchange rates between two countries adjust to reflect changes in each country's price levels (or inflation rates and implicitly interest rates)
- As consumers and importers switch their demands for goods from relatively high inflation (interest) rate countries to low inflation (interest) rate countries

• Finally, the PPP theorem states that the change in the exchange rate between two countries' currencies is proportional to the difference in the inflation rates in the countries

$$i_{US} - i_S = IP_{US} - IP_S$$

 $S_{US/S}$ = the spot exchange rate of U.S. dollars per unit of foreign currency

$$IP_{US} - IP_S = \Delta S_{US/S} / S_{US/S}$$

• According to PPP, the most important factor determining exchange rates is the fact that in open economies, differences in prices (and by implication, price level changes with inflation) drive trade flows and thus demand for and supplies of currencies.

- Long run exchange rates should move toward rates that would equalize the prices of an identical basket of goods and services in any two countries.
- This is called law of one price

Law of one price

- An economic rule which states that
- In an efficient market
- Identical goods and services produced in different countries
- Should have a single price

Interest rate parity

- Theory that the domestic interest rate should equal the foreign interest rate minus the expected appreciation of the domestic currency
- Relationship that links spot exchange rates, interest rates, and forward exchange rates.

Interest rate parity

- Given that investors have an opportunity to invest in domestic or foreign markets
- IRPT implies that, by hedging in the forward exchange rate market, an investor should realize the same returns, whether investing domestically or in a foreign country
- Hedged domestic return on foreign investments just equals the return on domestic investments

Interest rate parity

$$1 + i_{USt} = (1/S_t) \times (1 + i_{UKt}) \times F_t$$

 i_{USt} = the interest rate on a U.S. investment maturing at time t

 i_{UKt} = the interest rate on a U.K. investment maturing at time t

 $S_t =$ \$/£ spot exchange rate at time t

 $F_t =$ forward exchange rate at time t

Balance of payments accounts

- Balance of payments accounts summarize all transactions between citizens of two countries
 - current accounts summarize foreign trade in goods and services, net investment income, and gifts, grants, and aid given to other countries
 - capital accounts summarize capital flows into and out of a country