

### **3. The Foreign Exchange Market**

The foreign exchange market provides the physical and institutional structure through which the money of one country is exchanged for that of another country, the rate of exchange between currencies is determined, and foreign exchange transactions are physically completed.

A foreign exchange transaction is an agreement between a buyer and a seller that a given amount of one currency is to be delivered at a specified rate for some other currency.

#### **3.1 Geographical Extent of the Foreign Exchange Market**

Geographically, the foreign exchange market spans the globe, with prices moving and currencies traded somewhere every hour of every business day.

The market is deepest, or most liquid, early in the European afternoon, when the markets of both Europe and the U.S. East coast are open.

The market is thinnest at the end of the day in California, when traders in Tokyo and Hong Kong are just getting up for the next day.

In some countries, a portion of foreign exchange trading is conducted on an official trading floor by open bidding. Closing prices are published as the official price, or 'fixing' for the day and certain commercial and investment transactions are based on this official price.

#### **3.2 The Size of the Market**

In April 1992, the Bank of International Settlements (BIS) estimated the daily volume of trading on the foreign exchange market and its satellites (futures, options, and swaps) at more than USD 1 trillion. This is about 5 to 10 times the daily volume of international trade in goods and services.

The market is dominated by trading in USD, DEM, and JPY respectively. The major markets are London (USD 300 billion), New York (USD 200 billion), and Tokyo (USD 130 billion).

### 3.3 Functions of the Foreign Exchange Market

The foreign exchange market is the mechanism by which a person or firm transfers purchasing power from one country to another, obtains or provides credit for international trade transactions, and minimizes exposure to foreign exchange risk.

#### ***Transfer of Purchasing Power:***

Transfer of purchasing power is necessary because international transactions normally involve parties in countries with different national currencies. Each party usually wants to deal in its own currency, but the transaction can be invoiced in only one currency.

#### ***Provision of Credit:***

Because the movement of goods between countries takes time, inventory in transit must be financed.

#### ***Minimizing Foreign Exchange Risk:***

The foreign exchange market provides "hedging" facilities for transferring foreign exchange risk to someone else.

### 3.4 Market Participants

The foreign exchange market consists of two tiers: the interbank or wholesale market, and the client or retail market.

Individual transactions in the interbank market usually involve large sums that are multiples of a million USD or the equivalent value in other currencies. By contrast, contracts between a bank and its client are usually for specific amounts, sometimes down to the last penny.

#### ***Foreign Exchange Dealers:***

Banks, and a few nonbank foreign exchange dealers, operate in both the interbank and client markets. They profit from buying foreign exchange at a bid price and reselling it at a slightly higher ask price.

Worldwide competitions among dealers narrows the spread between bid and ask and so contributes to making the foreign exchange market efficient in the same sense as securities markets.

Dealers in the foreign exchange departments of large international banks often function as market makers. They stand willing to buy and sell those currencies in which they specialize by maintaining an inventory position in those currencies.

***Participants in Commercial and Investment Transactions:***

Importers and exporters, international portfolio investors, multinational firms, tourists, and others use the foreign exchange market to facilitate execution of commercial or investment transactions.

Some of these participants use the foreign exchange market to hedge foreign exchange risk.

***Speculators and Arbitragers:***

Speculators and arbitragers seek to profit from trading in the market. They operate in their own interest, without a need or obligation to serve clients or to ensure a continuous market.

Speculators seek all of their profit from exchange rate changes.

Arbitragers try to profit from simultaneous exchange rate differences in different markets.

***Central Banks and Treasuries:***

Central banks and treasuries use the market to acquire or spend their country's foreign exchange reserves as well as to influence the price at which their own currency is traded.

In many instances they do best when they willingly take a loss on their foreign exchange transactions. As willing loss takers, central banks and treasuries differ in motive and behavior from all other market participants.

***Foreign Exchange Brokers:***

Foreign exchange brokers are agents who facilitate trading between dealers without themselves becoming principals in the transaction. For this service, they charge a small commission, and maintain access to hundreds of dealers worldwide via open telephone lines.

It is a broker's business to know at any moment exactly which dealers want to buy or sell any currency. This knowledge enables the broker to find a counterpart for a client quickly without revealing the identity of either party until after an agreement has been reached.

### 3.5 Transactions in the Interbank Market

Transactions in the foreign exchange market can be executed on a spot, forward, or swap basis.

#### ***Spot Transactions:***

A spot transaction requires almost immediate delivery of foreign exchange.

In the interbank market, a spot transaction involves the purchase of foreign exchange with delivery and payment between banks to take place, normally, on the second following business day.

The date of settlement is referred to as the "value date."

Spot transactions are the most important single type of transaction (43 % of all transactions).

#### ***Outright Forward Transactions:***

A forward transaction requires delivery at a future value date of a specified amount of one currency for a specified amount of another currency.

The exchange rate to prevail at the value date is established at the time of the agreement, but payment and delivery are not required until maturity.

Forward exchange rates are normally quoted for value dates of one, two, three, six, and twelve months. Actual contracts can be arranged for other lengths.

Outright forward transactions only account for about 9 % of all foreign exchange transactions.

#### ***Swap Transactions:***

A swap transaction involves the simultaneous purchase and sale of a given amount of foreign exchange for two different value dates.

The most common type of swap is a spot against forward, where the dealer buys a currency in the spot market and simultaneously sells the same amount back to the same back in the forward market. Since this agreement is executed as a single transaction, the dealer incurs no unexpected foreign exchange risk.

Swap transactions account for about 48 % of all foreign exchange transactions.

### 3.6 Foreign Exchange Rates and Quotations

A foreign exchange rate is the price of a foreign currency.

A foreign exchange quotation or quote is a statement of willingness to buy or sell at an announced rate.

#### ***Interbank Quotations:***

The most common way that professional dealers and brokers state foreign exchange quotations, and the way they appear on all computer trading screens worldwide, is called *European terms*. The European terms quote shows the number of units of foreign currency needed to purchase one USD:

$$CAD\ 1.5770 / USD$$

An alternative method is called the *American terms*. The American terms quote shows the number of units of USD needed to purchase one unit of foreign currency:

$$USD\ 0.6341 / CAD$$

Clearly, those two quotations are highly related. Define the price of a USD in CAD to be

$$S(CAD / USD) = CAD1.5770 / USD$$

Also, define the price of a CAD in USD to be

$$S(USD / CAD) = USD0.6341 / CAD$$

Then, it must be that

$$S(CAD / USD) = \frac{1}{S(USD / CAD)}$$

Because  $CAD\ 1.5770 / USD = 1 / \{USD\ 0.6341 / CAD\}$ .

These rules also apply to forward rates as well. We will denote an outright forward quote using the following notation:

$$F(CAD / USD)$$

#### ***Direct and Indirect Quotations:***

A direct quote is a home currency price of a unit of foreign currency.

An indirect quote is a foreign currency price of a unit of home currency.

In the US, a direct quote for the CAD is

USD 0.6341 / CAD

This quote would be an indirect quote in Canada.

***Bid and Ask Quotations:***

Interbank quotations are given as "bid" and "ask".

A bid is the exchange rate in one currency at which a dealer will buy another currency

An ask is the exchange rate at which a dealer will sell the other currency.

Dealers buy at the bid price and sell at the ask price, profiting from the spread between the bid and ask prices: bid < ask.

Bid and ask quotations are complicated by the fact that the bid for one currency is the ask for another currency:

$$S^b(USD / CAD) = \frac{1}{S^a(CAD / USD)}$$

$$S^a(USD / CAD) = \frac{1}{S^b(CAD / USD)}$$

Example 4.1: A dealer provides you the following quote:

USD 0.6333 - 0.6349/ CAD.

This suggests that the bid price for the CAD is USD 0.6333/CAD and that the ask price is USD 0.6349/ CAD.

The indirect version of this quote would be

CAD 1.5750 - 1.5790/USD

Clearly, a dealer willing to purchase CAD at a price of USD 0.6333/USD is implicitly willing to sell USD at the reciprocal price of CAD 1.5790/USD.

The spread between bid and ask prices exists for two reasons:

1. Transaction costs and dealers as financial intermediaries and
2. Profits.

### 3.7 The Law of One Price and Cross Rates

The law of one price states that homogenous goods and assets should have the same price everywhere (efficient markets and free trade).

#### **Cross Rates:**

Many currency pairs are only inactively traded, so their exchange rate is determined through their relationship to a widely traded third currency (generally the USD):

For example, imagine that an investor in Thailand would like to purchase some Barbados Dollars (BBD). As both currencies are quoted against the USD, the investor can figure out the price of the Thai Baht (THB) against the BBD. Assuming that the exchange rates are:

Quotations:	
Thai Baht:	THB 41.6982/USD
Barbados Dollars:	BBD 2.0116/USD

The cross rate is THB/BBD is:

$$\frac{THB41.6982 / USD}{BBD2.0116 / USD} = THB20.7289 / BBD$$

In general, the formula for cross rate is:

$$S(i / j) = \frac{S(i / USD)}{S(j / USD)} = S(i / USD) \times S(USD / J)$$

### 3.8 Summary

- The foreign exchange market is the mechanism by which a person or firm transfers purchasing power from one country to another, obtains or provides credit for international trade transactions, and minimizes exposure to foreign exchange risk.
- A foreign exchange transaction is an agreement between a buyer and a seller that a given amount of one currency is to be delivered at a specified rate for some other currency.
- A foreign exchange rate is the price of a foreign currency. A foreign exchange quotation or quote is a statement of willingness to buy or sell at an announced rate.
- The foreign exchange market consists of two tiers: the interbank or wholesale market, and the client or retail market. Participants include banks and nonbank foreign exchange dealers, individuals and firms conducting commercial and investment transactions, speculators and arbitragers, central banks and treasuries, and foreign exchange brokers.
- Transactions are effectuated either on a spot basis or on a forward or swap basis. A spot transaction is for an (almost) immediate value date while a forward transaction is for a value date somewhere in the future.
- Quotations can be classified either as European and American terms or as direct and indirect quotes.
- In the real world, quotations include a bid-ask spread. A bid is the exchange rate in one currency at which a dealer will buy another currency. An ask is the exchange rate at which a dealer will sell the other currency. The spread is the difference between the bid price and the ask price. This spread reflects the existence of commissions and transaction costs.
- A cross rate is an exchange rate between two currencies, calculated from their common relationship with a third currency.
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