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# The Foreign Exchange Market

Canadian Securities Institute[1]

## Introduction

The foreign exchange (or forex) market encompasses all the places in which one nation's currency is exchanged for another at a specific exchange rate. An *exchange rate* is the price of one currency in terms of another. For example, a Canadian dollar exchange rate of US$0.63 means that it costs 63 US cents to buy one Canadian dollar.

In 2004, the BIS's Triennial Survey[2] showed that the global average daily turnover in the interbank foreign exchange market was US$1880 billion. This is a 36% increase from the BIS's previous survey in 2001, measured at constant exchange rates. The BIS cited four factors for the increase in activity:

- investor interest in foreign exchange as an asset class;
- greater activity by asset managers;
- the growing importance of hedge funds.

The Survey further revealed that US Dollar/euro is by far the most traded currency pair with 28% of global turnover, followed by dollar/yen with 17% and dollar/sterling with 14%. The United Kingdom continued to be the most active trading centre, accounting for 31% of total turnover, followed by the United States (19%) and Japan (8%).

The broadest definition of the forex market includes foreign currency purchases by individuals at bank branches for vacations or other personal reasons, as well as the large volumes exchanged between businesses and corporations and their respective banks. The largest component of the forex market, however, is the *interbank* market. The interbank market is an over-the-counter (OTC) market dominated by large financial institutions that buy and sell currencies among themselves. According to the 2004 BIS Survey, banks reported that 53% of foreign exchange market turnover was with other reporting banks and a further 33% with other financial institutions including hedge funds, leaving only 14% of turnover with non-financial customers.

## The Interbank Market

The interbank foreign exchange market has been described as a 'decentralised, continuous, open bid, double-auction' market. Let us look at these terms one by one.

*Decentralised.* The interbank market is an OTC market without a single location. It operates globally, through telephone and computer systems that link banks and other currency traders. Most trading activity, however, occurs in London, New York and Tokyo. Smaller but important interbank centres exist in Frankfurt, Paris, Singapore and Toronto. This decentralisation makes it extremely difficult to regulate the market. There is no true 'regulator' of foreign exchange markets, although the Bank for International Settlements (BIS) collects data on foreign exchange market activity. Forex markets are self-regulating, with associations such as the International Swaps and Derivatives Association playing an important role in fostering high standards of commercial conduct and promoting sound risk management practices. In addition, the capital adequacy requirements which apply to all financial institutions help to ensure that the risk of bank failure is minimised.

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[1] Canadian Securities Institute, Toronto.

[2] Bank for International Settlements "Triennial Central Banks Survey: Foreign exchange and derivatives market activity in 2004", March 2005, available at www.bis.org

 

*Continuous.* Price quotes in the interbank foreign exchange market vary continuously. Banks call each other and ask for the current market price for a particular currency trade. They are quoted a bid/offer price that is stated as the price of one currency in terms of the other. The bid/offer price can change from moment to moment, reflecting changes in market sentiment as well as demand and supply conditions.

*Open bid.* Those who request a bid/offer price do not have to specify the amount they wish to exchange, or even whether they intend to buy or sell the currency. This is what is meant by an open bid: the bank that provides the quotation is open to buy or sell. The amount of the transaction is also left open, although conventional limits exist on what can be exchanged at the quoted rates. Typical price quotations are for trades worth US$5–10 million or equivalent.

*Double auction.* Banks that receive calls for quotations also call other banks and ask for their market, that is, their buy (bid) and sell (ask) rates. The obligation to be both a price 'maker' and a price 'taker' is what is meant by a 'double auction'.

**Exchange-Rate Quotations**

An exchange rate can be expressed relative to either of the two currencies involved. A *direct terms* quote is based on a single unit of the domestic currency unit[3]. An exchange rate of C$1.5873 per US dollar is a direct terms quote from the perspective of an American. From a Canadian perspective, however, it is an indirect terms quote, meaning the number of *domestic* currency units that can be purchased with one foreign currency unit. An indirect terms quote expresses how much a single unit of the foreign currency is worth in terms of the domestic currency – it is simply the opposite or 'reciprocal' of a direct terms quote. Interbank participants may deal directly with one another or indirectly through a system of foreign exchange brokers or electronic brokering systems.

**Direct Dealing**

Direct dealing is the common practice by which a trader at one bank telephones a trader at another bank to get a quote on a certain currency. One of the advantages of this type of dealing is that a professional business relationship between the two traders develops over time, which could prove valuable in certain market situations. For example, if a certain currency is experiencing a temporary or even prolonged bout of illiquidity, an established relationship with another bank that deals in that currency may help a trader complete a deal at a reasonable price.

Banks control the amount of trading that they do with each other by placing limits on the amount of business that they will do with any other bank. The setting of these limits is a credit decision, made by senior risk managers. Banks limit their exposure to any given counterparty in order to minimise default risk, which is the risk that the other party to a trade cannot meet its contractual obligations on any given trade.

**Foreign Exchange Brokers**

The use of brokers allows a bank to economise on its contacts with other market participants in one location. A foreign exchange broker acts as a middleman, bringing together two banks that have expressed an interest in buying or selling a currency at a specific price. For this service, brokers charge both the buyer and the seller a commission based on the size of the deal. Commission rates are generally very similar across the board, but in certain cases discounts may be provided to banks that do very large trades.

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[3] Oxford Dictionary of Finance

 

Most brokers work in the large financial trading centres of London, New York and Tokyo, although some work in the smaller trading centres. Banks submit bids and offers for pairs of currencies to the brokers and the brokers are expected to disseminate or 'work' the orders to their respective networks. They do this by broadcasting the best bids and offers in various currencies over speakers that are physically located at a bank's trading desk. When a trader wants to execute a deal based on the prices that are being broadcast, they will shout back to the broker via an open, direct telephone line, 'mine' (that is, I want to buy the currency) or 'yours' (I want to sell the currency).

Brokers will not reveal which banks are behind the prices until a deal is actually approved by both parties, assuming that both banks are able to deal with the other based on the limits they have imposed on their dealings. Brokers try to avoid matching banks that do not or cannot deal with each other. This is known as being aware of 'who will take which names' and which banks are 'full' (no more available on their credit limit) on a given name.

The use of a broker guarantees anonymity to the buyer and seller. This is important to the trading process, because traders usually prefer not to reveal their position or market view to others in the market. Once a deal is concluded and both parties agree on the details, the deal is processed and confirmed by the respective back offices of the parties involved, including the broker. Brokers try to remain neutral in their dealings with banks and are not allowed to take positions the way banks can.

**Electronic Brokering Systems**

Until recently, 'physical' brokering – the process just described – was a key source of quotes and counterparties. However, due to the rapid evolution of technology and computing power, the physical brokering business is rapidly being supplanted by electronic brokering systems. Electronic brokering is similar to physical brokering, except that orders are placed into a computer system rather than with a person. The system automatically matches bids and offers as the price of a currency fluctuates and 'market' orders are matched with open orders.

**The Role of the US Dollar**

Historically, because the majority of global trade transactions have taken place in US dollars, the US dollar has been the accepted benchmark currency against which most other currencies are quoted. Most currency trading in the interbank market involves the US dollar on one side of the transaction – the BIS 2004 Survey showed that the US dollar is involved in 89% of all reported transactions. In addition, it is readily accepted as legal tender in some countries, and can be easily exchanged into the domestic currency in most others.

Most currencies are quoted in direct terms from the US perspective. For example, a 120.92 quote for JPY means that one US dollar is worth ¥120.92, or that it takes ¥120.92 to buy one US dollar. A JPY quote of 120.92 translates into a value of US$0.00827 for one Japanese yen. If a currency is quoted in this manner, a rising quote signifies a strengthening of the US dollar relative to the other currency or a weakening of the currency relative to the US dollar.

Some currencies, however, are quoted indirectly from the US perspective, including the British pound sterling (GBP), the euro (EUR), the Australian dollar (AUD) and the New Zealand dollar (NZD). This type of quote indicates the value of a single unit of the relevant currency in terms of US dollars. For example, a 1.6234 quote for GBP means that one British pound is worth US$1.6234, or that it takes US$1.6234 to buy one British pound. A GBP quote of 1.6234 translates into a value of £0.6160 for one US dollar. If a currency is quoted in this way, a rising quote

 

signifies strength in the other currency relative to the US dollar (and weakness in the US dollar versus the currency).

**Market and Quoting Conventions**

Traders have special ways of quoting bid and offer prices for foreign currencies. For example, a trader at bank A may call a trader at bank B and ask for B's market on the Canadian dollar (CAD) versus USD. B shows a market price of 1.5599–1.5604. Normally the trader at B would not waste his and the caller's time by saying 'one fifty-five ninety-nine' and 'one fifty-six-oh-four', but would rather quote only the last two decimal places, or points, as in 'ninety-nine' and 'oh-four'. Traders are always aware of what this means and will always know what the initial numbers are (often referred to as the 'big figure').

Sometimes a trader may quote a 'choice' market, meaning the bid/offer price is the same and the interested party has the choice of buying or selling at this price. A choice market suggests extremely high liquidity in the market.

**Cross Trades and Cross Rates**

Most foreign currencies are not traded or quoted directly against one another. For example, if a corporation wants to sell Mexican pesos (MXN) in exchange for Hong Kong dollars (HKD), the transaction would take place as a cross trade that involves selling MXN for USD and then selling USD for HKD. The quote that is supplied for this trade would be derived from the two currencies' quotes versus the US dollar. This quote is known as a cross rate.

**Determinants of Foreign Exchange Rates**

This section will give only a brief overview of the determinants of the value of a currency. Whole books have been written on how and why currency values change. Ask a forex trading professional why a currency is appreciating and sometimes, half-jokingly, he or she will say that there is more demand than supply. In fast-changing markets, when it is not immediately evident what is influencing currency value changes, this short answer is true, but it is not the whole story.

**The Fundamental Approach**

Foreign exchange rates have strong, long-term relationships with a country's identifiable economic fundamentals. These include: gross domestic product (GDP); rate of inflation; productivity; interest rates; employment levels; balance of payments; and current account balance. The performance of a national economy is generally measured by changes in its GDP. From quarter to quarter, and from year to year, various statistical agencies report on this measure. If the economy of one country is performing well relative to that of another country, the country with the stronger economic performance will usually have a stronger currency. Comparisons of the economic strength of countries are most often conducted relative to the United States.

Currencies are affected not only by what has happened in the past but also by expectations and forecasts of future performance. Attempts to anticipate the future movement of a currency are also usually done relative to the US dollar, because most currencies trade directly against the dollar. It is difficult to anticipate where the Swedish krona will be relative to the Mexican peso, but both these currencies can be compared to the American dollar. From there it is possible to come up with a calculated or projected cross rate, but this rate will have a larger margin for error.

Real GDP is related to inflation levels. Higher levels of inflation will erode the domestic value of the currency, because it now takes more domestic currency to buy foreign goods. Higher levels of inflation also reduce the real level of interest

 

rates. Foreign investors will have less incentive to invest in a country with high inflation.

Real interest rates also help determine the value of a currency. For instance, if the Bank of Canada advocates a 'tight' monetary policy by raising interest rates, then (all things being equal) this policy will attract more foreign investment in Canadian money assets. Conversely, if monetary policy is 'loose', foreign investors may abandon the Canadian dollar in favour of higher-yielding currencies.

The level of employment in a nation also influences the value of a currency. When employment levels are high, consumer and general household consumption will be strong and the economy will benefit. During much of the 1990s, the US economy performed relatively well. Good employment opportunities and consumer purchases helped prevent the US economy from slowing down and bolstered the value of the US dollar.

A country's balance of payments helps determine the value of a currency. The larger the positive balance of payments, the stronger the currency value relative to other world currencies. A major component of the balance of payments equation is the current account balance. While the current account balance is derived from the value of a country's merchandise and service imports and exports, as well as the flow of interest and dividends to and from the country, it can also be related to the level of savings and investment in the country and the government's budget balance. In general, the greater the government's surplus, the greater the current account balance. When the current account balance is positive and the trend is positive, the domestic currency will be strong. It makes sense that as governments move from deficits to surpluses, the value of the currency will rise.

The above list is by no means exhaustive and other factors can influence the value of a currency. Forecasters must consider the effects of dozens of factors that may influence the value of a currency, which can be a difficult and tedious process with no guarantee of success or accuracy.

**A Short-Term Approach**

Many interested parties participate in the foreign exchange market, including both passive and active stakeholders. Foreign exchange professionals, including traders and account executives at banks, all watch the above factors to discern long-term trends in the value of a currency. However, foreign exchange traders tend to have a much shorter-term view and work within certain limits. They have to meet profit targets that may be daily, weekly or monthly, so they react to events that influence a currency in the shorter term.

The forex market is fast-moving and volatile. On any given day, a currency may move a few points or several hundred points. Traders try to take advantage of these changes, large or small, to make a profit. Traders consult charts and use technical analysis to understand currencies the same way that equity analysts and traders try to understand the position and future of a particular company or industry. Charts show short-term patterns that may help a trader make a decision.

One factor that influences the value of a currency in the short term is the general level of liquidity. Markets usually exhibit a certain degree of fluidity, but at times liquidity dries up. During these times, currency values may be quite volatile. Speculators enter the market and try to push the currency in a certain direction to suit their position. Movements can be abrupt and exaggerated, and traders must take care not to get trapped in this environment with an unfavourable position. Fortunately, this situation is usually temporary.

 

The interplay between the futures and the cash markets can affect currency values. Usually, the cash market leads the futures market. However, at times this pattern is reversed for a very brief period. This reversal creates short-term disequilibrium and markets become very volatile until liquidity is restored. Temporary opportunities may open up, creating a trading frenzy for a short period.

Unexpected political events or world crises can affect currency values. In a crisis, investors look for safe places to invest and certain currencies, such as the US dollar or the Swiss franc, are considered safe havens. Money will flow from weaker second-tier currencies to these safe havens. These markets are temporary and impossible to predict, but can have devastating long-term results for an individual market participant. In fast-changing markets, only the bravest or most foolhardy participants come out to play; most business is done on an as-needed basis.

**Central Bank Intervention**

Central banks (CBs) carry enormous clout in the foreign exchange markets but they usually exercise their power cautiously. However, from time to time, CBs intervene in the foreign exchange markets. Some CBs are more active than others and levels of transparency vary. Most CBs try to keep a variety of options available to ensure the greatest impact when they do intervene.

CBs generally let the market determine the level of a currency. Most CBs in industrialised countries work to foster sustainable economic prospects and keep prices stable, rather than dictating or managing the level of the home currency. From time to time, however, CBs do intervene in the foreign exchange market. The intervention can take the form of what is known as *moral suasion*, whereby a CB spokesperson may offer the markets the CB's views on the current value of the home currency. These views reveal the CB's preferred position for the currency. Usually, the market acts to adjust the currency value to the desired levels to prevent direct intervention from the CB. However, market participants occasionally take positions opposite to the CB's preference. This can be a dangerous game, as the consequence may be high for both the CB and these contrary market participants. The CB may lose face because its credibility is at stake. The contrary market participants risk big losses if the CB decides to intervene.

CBs intervene from time to time when markets get disorderly. Opinions may differ as to whether a market is behaving in a disorderly way, but CBs like the Bank of Canada employ professional forex personnel who can interpret market conditions so that intervention is accurate and effective and stability can be restored. Some interventions are focused on keeping a certain pair of currencies within a certain range. For instance, the Bank of Japan tends to state openly where it would like to see the value of the Japanese yen relative to the US dollar. Market participants know the Bank's biases and try to avoid provoking the Bank of Japan for fear that it will intervene directly. CBs also communicate with their counterparts in other countries to monitor conditions. They may ask their counterparts to intervene on their behalf if the situation is sufficiently serious.

In summary, CBs in industrialised nations intervene in the marketplace to influence the short-term movement of currencies. This intervention is different from the post World War II to 1971 Bretton Woods regime, under which intervention by a CB was an official proclamation of a structural change in the value of a currency. Today, the general philosophy is that the markets will ultimately dictate currency equilibrium.

**Spot and Forward Markets**

A currency can be bought or sold in either the spot market or the forward market.

 

**The Spot Market**

The interbank spot market consists of purchases and sales of currency for *immediate delivery*. For CAD and USD transactions, 'immediate delivery' occurs on the next business day after the trade is completed. For most other currencies, including the major European and Asian currencies, 'immediate delivery' occurs two business days after the trade date. Each currency transaction involves two sets of payments, one for each of the two currencies involved in the trade.

Suppose that on Monday a trader at BMO buys US$10 million spot from a trader at CIBC at a CAD exchange rate of 1.5604. To settle this transaction, CIBC will notify its correspondent bank in New York to debit its US dollar account by US$10 million and send the money to BMO's correspondent bank in New York for further credit to BMO.[4] The transfer of US dollars through the correspondent banks is done through the Clearing House Interbank Payments System (CHIPS), a central clearing house for USD transactions conducted by its member banks. The CHIPS transfer will settle the next business day, on Tuesday (assuming both Monday and Tuesday are US business days).

At the same time, BMO will send CIBC C$15,604,000 through the Large Value Transfer System (LVTS) operated by the Canadian Payments Association (CPA). BMO will use the Society for Worldwide Interbank Financial Telecommunications (SWIFT) system to transmit the instructions. At the end of the day, the LVTS balance for each CPA member is settled by a debit or credit to its account with the Bank of Canada. If this forex trade is the only transaction between CIBC and BMO on this day (an unrealistic assumption), then BMO's account with the Bank of Canada will be debited by C$15,604,000 and CIBC's would be credited for the same amount, all for settlement on Tuesday.

**The Forward Market**

The main thing that distinguishes the forward market from the spot market is the timing of delivery. Spot market transactions settle one or two business days after the trade date, but the settlement of forward market transactions can occur from one week after the trade date to as much as 10 years after the trade date. Because of this delayed settlement, forward prices are different from spot prices.

Liquid forward markets exist in the major currencies for one-month, two-month, three-month, six-month and one-year delivery dates.[5] Longer delivery periods are possible for certain pairs of currencies (such as CAD/USD). All the pertinent details of the trade – the price (exchange rate), the size of the trade, and the settlement procedures – are agreed to at the time of the trade. This commitment to trade currencies at a previously agreed exchange rate is known as a forward contract.

The characteristics of trading in the spot interbank market also apply to trading in the forward interbank market. That is, the market is a decentralised, continuous, open-bid, double-auction market. Most currencies are quoted relative to the US dollar in either American or European terms. Transactions are conducted either directly between bank traders, or through physical or electronic brokering systems. Forward transactions are settled just like spot transactions, and involve a transfer of currencies in two different countries.

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[4] A correspondent bank is a member of a national payments clearing system that clears and settles transactions on behalf of a foreign customer. Each bank involved in the interbank market has at least one correspondent bank in each country in which it conducts forex transactions. All of a bank's foreign exchange balances are held by its correspondent banks on its behalf.

[5] The actual delivery date is the number of months after the spot delivery date. For example, a one-month CAD/USD forward settles in one month and one day.

 

**Forward Discounts and Premiums**

Apart from the delivery date, the other major difference between spot and forward transactions is the price at which forward trades occur. The absolute difference between the spot and forward price of a currency is called the *currency swap rate* or, simply, 'swap points'. The relative annualised difference is known as a *forward premium* or *forward discount*, depending on whether the forward price is higher or lower than the spot price.

**Interest-Rate Parity**

What determines the forward exchange rate – and hence the swap rate and the forward discount or premium? As with most other financial forward contracts, the forward price is derived from the spot price, based on the cost-of-carry model. If it is not, arbitrage can produce risk-free profits. The arbitrage transactions that keep forward exchange rates in line with spot exchange rates are known as covered interest arbitrage. In foreign exchange trading, the effect of covered interest arbitrage is known as interest-rate parity.

Interest-rate parity means that the currency of a country with a low interest rate should trade at a forward premium relative to the currency of a country with a high interest rate. Interest-rate parity effectively eliminates the interest-rate differential between countries after foreign exchange risk has been eliminated with a forward contract.

When interest-rate parity holds, the *covered interest differential* – that is, the difference between the interest rate in one country and the interest rate in another country, combined with a forward contract – is zero. Put another way, the interest-rate differential should be approximately equal to the forward discount or premium. If it is not, covered interest arbitrage by interbank and large institutional traders will quickly eliminate the interest-rate differential. Interbank and large institutional traders focus on Eurocurrency interest rates, because they can easily borrow and lend large amounts of money in this market.

**Structure of a Foreign Exchange Operation**

Trading rooms around the world are set up in a similar fashion. Although the number of employees and floor space may vary, a large trading operation in London, Tokyo or New York will look very similar. Most foreign exchange operations have the following structure.

A spot desk consists of several employees who trade various currencies on a spot basis in the interbank market. The domestic currency most likely is the focal point of the whole trading operation and a chief or senior trader is responsible for generating a certain profit figure for the trading operation. This proprietary trading uses the bank's capital and a certain return is expected on the capital employed. Depending on the risk profile, certain traders may be assigned to work with other currencies that represent the bank's interests or for which the bank has economies of scale. For example, many banks trade euros, yen, pounds sterling and Swiss francs because of the depth and liquidity of these markets. Some banks employ traders to work with second- or third-tier currencies. These 'exotics' are typically tied to customer transactions; although the trades are smaller, they can be very profitable.

The spot desk is complemented by a forward desk, staffed by employees who trade and manage the bank's forward currency positions. Depending on its scope of operation, the forward desk may also be involved in other banking operations, such as the money market or funding desk. A bank may try to fund its loan obligations by trading in currencies other than the domestic currency; this is where the forward

 

desk plays a key role. The forward desk also manages the bank's cumulative forward position derived from the activities of the bank's corporate clients.

A chief trader usually manages the spot desk and the forward foreign exchange desk. These two desks are responsible for trading, as opposed to advisory services to clients. The compensation paid to trading professionals in this area is usually tied to the profits generated by their trades. A medium-sized or larger forex trading operation may also include a forex derivatives desk. This desk would be responsible for trading exchange-traded or OTC options and currency futures. Most banks have a section within the forex department known as *foreign exchange advisory services*, sometimes called a sales desk. The role of the advisory desk's sales account executives is to attract new forex business or clients to the bank, provide professional services to existing clients, and provide pricing for clients. Sales account executives work closely with other officers of the bank, especially credit personnel, to ensure that deals with clients remain within prescribed credit limits. The sales desk can be further divided into three subcategories: institutional coverage to larger, more sophisticated accounts, such as governments or money managers; corporate or commercial accounts; and the retail business from the branch network.

All these desks together constitute the *front office*. A healthy conflict often exists between the trading and sales desks because of different objectives related to the pricing of forex products. Sales executives always want competitive rates for their existing clients or for sales prospecting opportunities, while the traders need to maximise profits.

All the dealing operations in the front office are supported by *back office* departments. The back office processes the transactions, including record keeping, applying checks and balances, ledger and sub-ledger activity accounting, reconciliations, deal confirmations and deal settlements. In smaller operations, the back office may also be required to monitor the dealing limits of the foreign exchange traders to ensure compliance.

The increasing sophistication of financial products and some high-profile financial fiascos have led to the evolution of an area often referred to as the *middle office*. This group is essentially a risk management group mandated to ensure compliance within the trading room. The risk management group identifies, quantifies, monitors, and analyses the risk–reward profile of a trading operation in terms of market, liquidity, profitability, credit and operations.

Front office (i.e. trading and sales) and back office objectives are not the same. The former is profit-motivated, while the latter is focused on the checks and balances required for safe and timely settlement of the trades. The personnel in these two different groups should report to different senior officers of a bank to ensure that no conflict of interest arises.

Foreign exchange operations vary from firm to firm, with differences mostly in degree as opposed to kind. For instance, a smaller forex group may have some crossover in responsibility, whereby a spot trader also trades forex derivatives or a trader of secondary currency also trades the forward book. Some organisations employ a 'corporate dealer' who carries out both trading and advisory functions.

It is also important to distinguish the responsibilities of a forex trader from those of an account executive. The forex trader is paid to take positions in the marketplace, but the account executive is not. Although this distinction may vary from one firm to another, advisory personnel are generally not supposed to take positions either from the market directly or from clients.

 