Chapter 8

Foreign Exchange and International Financial Markets

Learning Objectives

At the end of this chapter you should be able to:

8.1 Describe how demand and supply determine the price of foreign exchange.

8.2 Discuss the role of international banks in the foreign-exchange market.

8.3 Discuss the important aspects of the international capital market.

Background

Use of more than one currency - characteristic of international business

Marks and Spencer (UK department store) imports (buys) kitchen appliances from Whirlpool Corporation (US based company) -

Mechanism for exchange of pounds (Marks and Spencer home currency) to dollars (Whirlpool home currency)

Changes in exchange rates affects : prices consumer pay, profits of firms, economic health of countries and currencies

Foreign exchange market needed

1. Facilitate conversion of currencies mechanism - allowing efficient trade between borders
2. Facilitates intl investment and capital flows - low cost financing in capital market around the world

8.1 Describe how demand and supply determine the price of foreign exchange.

The Economics of Foreign Exchange

- **Foreign exchange**: a commodity that consists of currencies issued by countries other than one's own

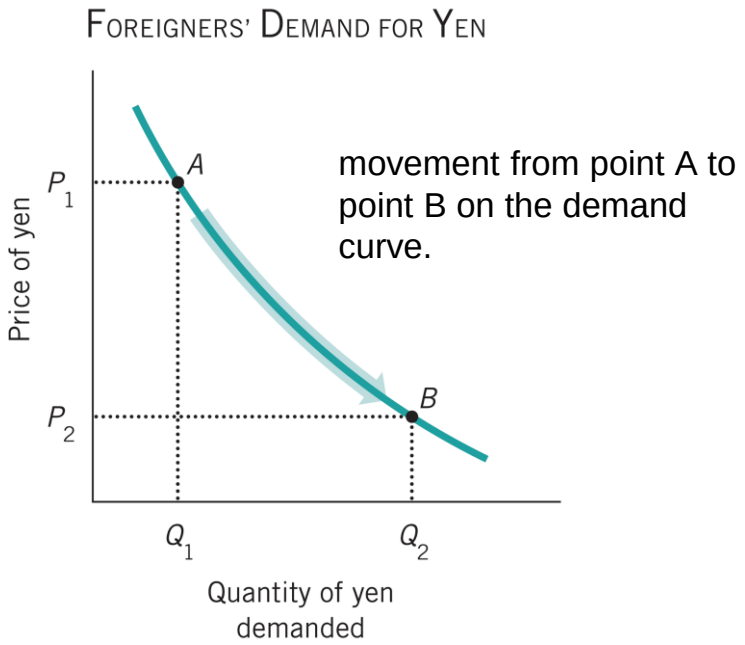
- **Price of foreign exchange**: set by demand and supply in the marketplace. (given a **flexible exchange rate system**)
- Look at example between US dollars ($) and Japanese Yen (¥)

The Economics of Foreign Exchange: Demand for Yen

The Demand for Japanese Yen is Derived from Foreigners' Demand for Japanese Products

Economists call this - *derived demand curve*

To buy Japanese goods, foreigners first need to buy Yen. As price of the yen falls, the quantity of yen demanded increases



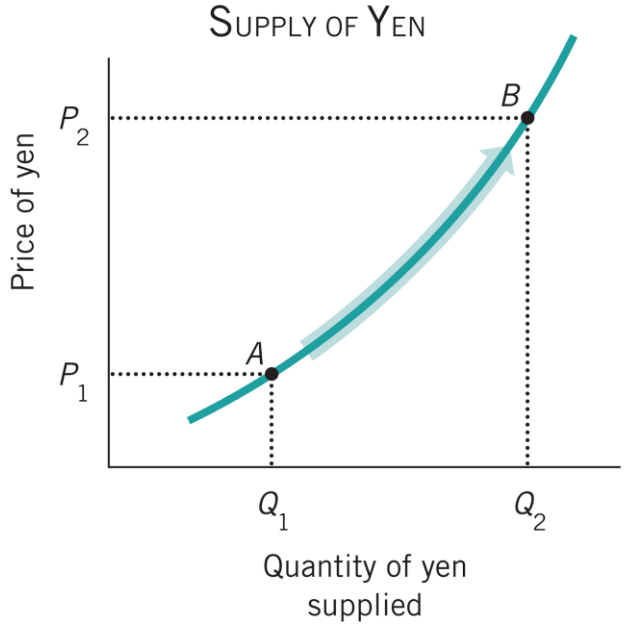
The Economics of Foreign Exchange: Supply of Yen

The Supply of Yen is Derived from Japanese Demand for Foreign Products

Need to get foreign currencies, sell yen and buy foreign currencies

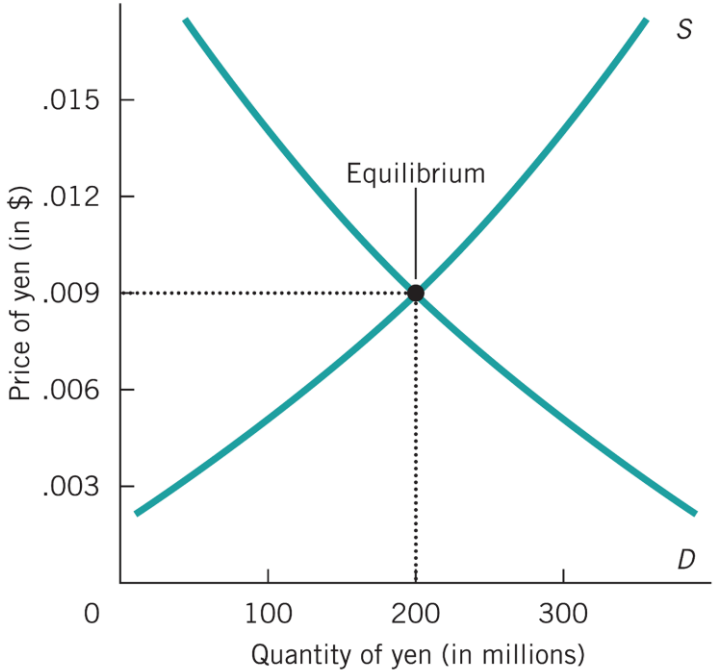
Selling yen has the effect of supplying yen to the foreign-exchange market

as price of the yen rises, quantity supplied also rises; from point A to point B



The Economics of Foreign Exchange: The Market for Yen

Figure 8.3 The Market for Yen



Points along the vertical axis show the price of the yen in dollars

Determination of the **equilibrium price of yen**

Intersection of the supply curve (S) and the demand curve (D) yields the **market-clearing**, equilibrium price **($.009/yen)** and equilibrium quantity demanded and supplied (200 million yen)

The Economics of Foreign Exchange: Foreign Exchange Rate Quotes

Direct exchange rate (or **direct quote**) is the price of the foreign currency in terms of the home currency

Indirect exchange rate (or **indirect quote**) is the price of the home currency in terms of the foreign currency

U.S. practice is to quote British pounds on a direct basis but Japanese yen on an indirect basis

Mathematically, the direct exchange rate and the indirect exchange rate are reciprocals of each other

From US resident perspective
Direct - $ 0.009/ ¥1
Indirect - ¥100.98/$1

	Direct Rates (U.S. Dollars needed to buy one unit of foreign currency)		Indirect Rates (Amount of foreign currency needed to buy one U.S. dollar)	
Country/currency	Wednesday August 8, 2018	Tuesday August 7, 2018	Wednesday August 8, 2018	Tuesday August 7, 2018
Argentina peso	0.0362	0.0365	27.6232	27.3847
Australian dollar	0.74313	0.74209	1.3457	1.3477
1-mo forward	0.74319	0.74217	1.3456	1.3474
3-ms forward	0.74333	0.74230	1.3453	1.3472
6-mo forward	0.74382	0.74281	1.3444	1.3462
Bahrain dinar	2.6497	2.6512	0.3774	0.3772
Brazil real	0.2651	0.2665	3.7728	3.7530
Bulgaria lev	0.59372	0.59305	1.684	1.686
Canada dollar	0.7680	0.7661	1.3022	1.3054
Chile peso	0.001550	0.001555	645.2	643.1
China yuan	0.1463	0.1464	6.8362	6.8323
Croatia kuna	0.1562	0.1564	6.4013	6.3936
Czech Rep. koruna	0.04535	0.04532	22.049	22.066
Denmark krone	0.1557	0.1556	6.4212	6.4257
Ecuador US dollar	1	1	1	1
Egypt pound	0.0560	0.0559	17.8715	17.8815
Euro area euro	1.1610	1.1599	0.8614	0.8621
1-mo forward	1.1636	1.1625	0.8594	0.8602
3-ms forward	1.1694	1.1680	0.8551	0.8562
6-mo forward	1.1785	1.1774	0.8485	0.8493
Hong Kong dollar	0.1274	0.1274	7.8494	7.8496
Hungary forint	0.003634	0.003625	275.21	275.89
Iceland krona	0.009333	0.009369	107.15	106.74
India rupee	0.01460	0.01458	68.475	68.595
Indonesia rupiah	0.0000694	0.0000693	14412	14428
Israel shekel	0.2718	0.2718	3.6788	3.6791
Japan yen	0.009011	0.008978	110.98	111.38
1-mo forward	0.009029	0.008997	110.76	111.15
3-ms forward	0.009071	0.009036	110.24	110.67
6-mo forward	0.009141	0.009108	109.40	109.79
Kazakhstan tenge	0.00285	0.00287	351.10	348.57
Kuwait dinar	3.301	3.300	0.3029	0.3030
Macau pataca	0.1237	0.1237	8.087	8.081

	Direct Rates (U.S. Dollars needed to buy one unit of foreign currency)		Indirect Rates (Amount of foreign currency needed to buy one U.S. dollar)	
Country/currency	Wednesday August 8, 2018	Tuesday August 7, 2018	Wednesday August 8, 2018	Tuesday August 7, 2018
Malaysia ringgit	0.2454	0.2453	4.075	4.076
Mexico peso	0.0541	0.0542	18.4685	18.4561
New Zealand dollar	0.6747	0.6736	1.4821	1.4846
Norway krone	0.1217	0.1219	8.2178	8.2020
Oman sul rial	2.59730	2.59744	0.39	0.38
Pakistan rupee	0.00807	0.00812	123.98	123.10
Philippines peso	0.0189	0.0189	53.025	52.864
Poland zloty	0.2723	0.2723	3.6727	3.6727
Qatar rial	0.2746	0.2746	3.6418	3.6410
Romania leu	0.2503	0.2497	3.9956	4.0050
Russia ruble	0.01524	0.01574	65.602	63.515
Saudia Arabia riyal	0.2666	0.2666	3.7503	3.7505
Singapore dollar	0.7339	0.7329	1.3626	1.3644
South Africa rand	0.0746	0.0750	13.4093	13.3351
South Korea won	0.0008952	0.0008945	1117.09	1117.94
Sri Lanka rupee	0.0062559	0.0062594	159.85	159.76
Sweden krona	0.1117	0.1122	8.9526	8.9151
Switzerland franc	1.0067	1.0044	0.9933	0.9956
1-mo forward	1.0093	1.0070	0.9908	0.9930
3-ms forward	1.0150	1.0124	0.9852	0.9878
6-mo forward	1.0239	1.0217	0.9767	0.9788
Taiwan dollar	0.03269	0.03272	30.59	30.56
Thailand baht	0.03008	0.03010	33.24	33.22
Turkey lira	0.1894	0.1907	5.2804	5.2443
U.K. pound	1.2882	1.2939	0.7763	0.7729
1-mo forward	1.2897	1.2955	0.7754	0.7719
3-ms forward	1.2934	1.2990	0.7732	0.7698
6-mo forward	1.2994	1.3052	0.7696	0.7662
Ukraine hryvnia	0.0371	0.0370	26.956	26.998
Uruguay peso	0.03288	0.03255	30.41	30.72
Venezuela bolivar	0.00000483	0.00000483	206985	206985
Vietnam dong	0.00004295	0.00004291	23284	23303

Sources: Based on data from www.wsj.com, accessed August 8, 2018; www. Hsbcnet.com, accessed August 8, 2018; www.oanda.com, accessed August 8, 2018; Bloomberg database; author's calculations.

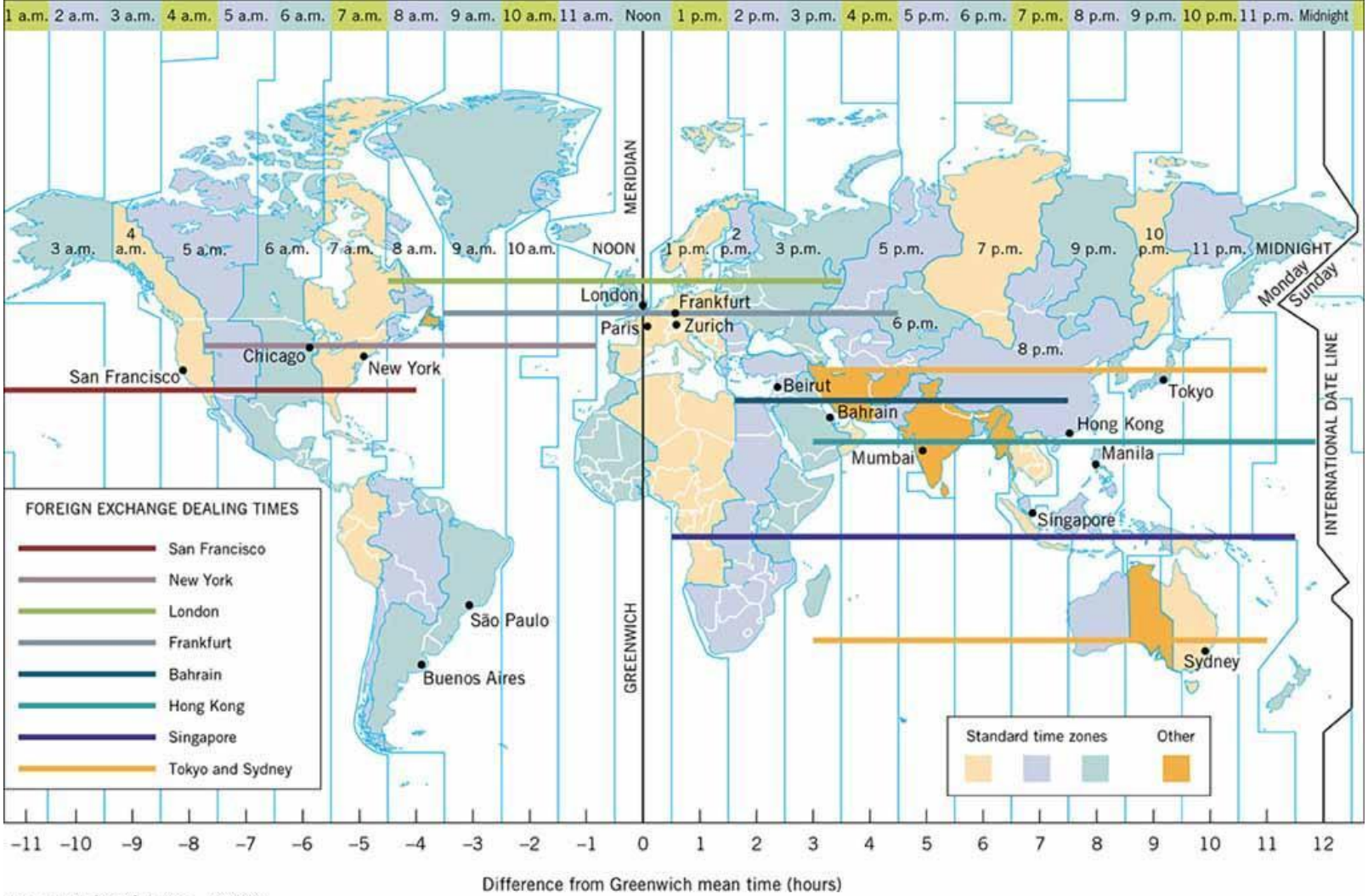
Direct and Indirect Exchange Rates

8.2 Discuss the role of international banks in the foreign-exchange market.

Structure of the Foreign Exchange Market

(1 of 2)

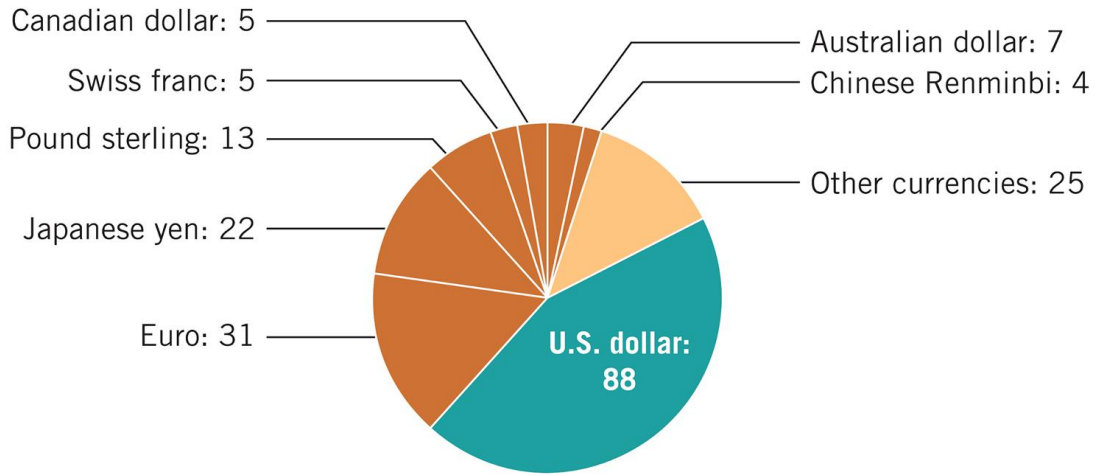
- Foreign-exchange market consists of buyers and sellers - anyone can participate - Tourist buying Yen in Narita Airport, Toyota export cars to Canada from Nagoya, British Govt loan to Bangladesh
- Volume of foreign-exchange trading is **estimated at $5.1 trillion per day - See Map**
- The largest foreign-exchange market: **London**, followed by New York, Singapore, Hong Kong, and Tokyo
- Approximately 88% of the transactions involve the U.S. dollar
- U.S. dollar is the primary **transaction currency** for the foreign-exchange market



Structure of the Foreign Exchange Market

(2 of 2)

Figure 8.5 Currencies Involved in Foreign-Exchange Market Transactions



Source: Based on data from Bank for International Settlements, *Triennial Central Bank Survey:* Foreign exchange turnover in April 2016. (N.B. These numbers add up to 200 percent— there are two currencies in each transaction.)

Structure of the Foreign Exchange Market: The Role of Banks

- Foreign-exchange departments of large international banks (e.g. JPMorgan Chase and Deutsche Bank) in major financial centers - New York, London, and Hong Kong
- Play dominant role in the foreign-exchange market
- Ready to buy or sell the major traded currencies.

10,000,000/1.648 = $ 6,067,961.16

10,000,000/1.649 = $ 6,064,281.38

$ 3,679.78

Structure of the Foreign Exchange Market: The Role of Banks

Bank profits - spread bid and ask (offer) prices

Question?

JPMorgan buys 10 million Swiss Francs(SwFr) customer A at price SwFr 1.648/$1 and sells at SwFr 1.649/$1 to customer B.

How much profit does JPMorgan makes?

International banks - sometimes act as speculators (risky) and arbitrageurs (discussed later)

Structure of the Foreign Exchange Market: The Role of Banks

- **Major Players**
  - **International Banks**
  - Corporate Treasurers
  - Pension Funds
  - Hedge Funds
  - Insurance Companies
  - Central Banks
  - Treasury Departments

- **International Banks**
  - Wholesale Market -
  - Retail Market
  - Interbank Transactions - involve $1 million (or equiv foreign currency) - majority of foreign-market

Structure of the Foreign Exchange Market: The Role of Banks

- **Other Major Players in Foreign Exchange**
  - **Corporate Treasurers**
  - **Pension Funds**
  - **Hedge Funds**
  - **Insurance Companies**

  - Central Banks
  - Treasury Departments

Structure of the Foreign Exchange Market: The Role of Banks

- **Clients**
  - **Commercial Customers**
  - Exchange-Rate Speculators
  - Currency Arbitrageurs

- Engage in foreign-exchange transactions in normal business activities : export/ import goods and services, paying / receiving dividends and interest from foreign sources, purchasing or selling foreign assets and investments

- Hedge against unfavorable changes in foreign-exchange rates for moneys to be paid or received in the future.

Structure of the Foreign Exchange Market: The Role of Banks

- **Clients**
  - Commercial Customers
  - **Exchange-Rate Speculators**
  - **Currency Arbitrageurs**

- **Deliberately** assume exchange rate risks by acquiring positions in a currency

- Attempt to exploit small differences in the price of a currency between markets
- Seek to obtain riskless profits by simultaneously buying the currency in the lower-priced market and selling it in the higher-priced market.

Structure of the Foreign Exchange Market: The Role of Banks

- **Types of Currencies**
  - **Convertible/Hard**

Currencies that are freely tradable

Hard currencies - euro, British pound, Swedish krona, Canadian dollar, Swiss franc, Yen, and the US$

  - **Inconvertible/Soft**

Not freely tradable because of domestic laws or the unwillingness of foreigners to hold them

Currencies of many developing countries

Structure of the Foreign Exchange Market: Spot and Forward Markets

- International business transactions - payments to be made in future - lending, purchase on credits
- Fluctuation in currency - how a firm know for sure future value of foreign currency?
- Time dimension of money: bought and sold for immediate delivery or for future delivery
- Foreign-exchange transactions that are to be consummated immediately (normally defined as two days after the trade date).

Structure of the Foreign Exchange Market: Spot and Forward Markets

- **Spot Market**
- **Forward Market**
- **Swap Transaction**
- Currency Futures
- Currency Options
  - Call Option
  - Put Option

- Foreign-exchange transactions - occur sometime in the future
- Prices are often published for foreign exchange - delivered one month, three months, and six months in the future.

- Users of the forward market engage in **swap transactions**

- Transaction in which the same currency is bought and sold simultaneously, but delivery is made at two different points in time

Future Rates

Currency	U.S. $ equiv.		per U.S. $	
	Wed.	Tues.	Wed.	Tues.
Britain (Pound)	1.5212	1.5159	0.6574	0.6597
1-month Forward	1.5209	1.5155	0.6575	0.6598
3-month Forward	1.5203	1.5149	0.6578	0.6601
6-month Forward	1.5196	1.5142	0.6581	0.6604

Structure of the Foreign Exchange Market: Spot and Forward Markets

- Spot Market
- Forward Market
- Swap Transaction
- **Currency Futures**
- **Currency Options**
  - **Call Option**
  - **Put Option**

- Publicly traded on many exchanges worldwide, a currency future is a contract that resembles a forward contract - a standard amount on a standard delivery date

- second mechanism, the **currency option** allows, but does not require, a firm to buy or sell a specified amount of a foreign currency at a specified price on a specified date

- **A call option** grants the right to buy the foreign currency in question; **a put option** grants the right to sell the foreign currency

Structure of the Foreign Exchange Market: Spot and Forward Markets (2 of 2)

- Forward Discount
  - Forward Price < Spot Price
- Forward Premium
  - Forward Price > Spot Price

- If the forward price (using a direct quote) is less than the spot price, the currency is selling at a **forward discount**. If the forward price is higher than the spot price, the currency is selling at a **forward premium**.

Annualized Forward Premium or Discount

On 8 August 2018

Spot price British Pound = **$1.2882**

3-month forward rate = **$ 1.2934** [Forward Price > Spot Price == Forward premium]

Formula to calculate

Annualized Premium or discount = **(Pf -Ps)/Ps x n**

; n=no of periods in a year; (Because 3-months forward rate. Therefore 12/3= 4)

= (1.2934 - 1.2882)1.2882 x 4 = 0.0161 = 1.61%

If forward rate is lower than spot, the result will gave negative value, annualized discount rate.

- **Arbitrage** is the riskless purchase of a product in one market for immediate resale in a second market, in order to profit from a price discrepancy.

Structure of the Foreign Exchange Market: Arbitrage and the Currency Market

- **Arbitrage of Goods**
  - Law of One Price
  - Purchasing Power Parity (PPP)

- If the price of a good differs between two markets, people will tend to buy the good in the market offering the lower price, the “cheap” market, and resell it in the market offering the higher price, the “expensive” market

- ***law of one price***, such arbitrage activities will continue until the price of the good is identical in both markets (excluding transaction costs, transportation costs, taxes)

Structure of the Foreign Exchange Market: Arbitrage and the Currency Market

- **Arbitrage of Goods**
  - Purchasing Power Parity (PPP)

- theory states that the prices of tradable goods, when expressed in a common currency, will tend to equalize across countries as a result of exchange rate changes. PPP occurs because buying a good in cheap market and reselling it in expensive market affects: the **demand for and the price of the foreign currency** and the **market price of the good itself in the two product markets** in question

Example: PPP

Assume Exchange Rate US and Canadian Dollars US$ 0.80 = Can $ 1

Suppose Levi's jeans sells US48 in US and Can $60 in Canada ⇒>>>>>> PPP exist Can $60 x US 08/Can $ 1= US$48 . no reason to cross border to get cheaper price

Suppose Canadian firms invest in Mexico and sell currency to buy pesos, increasing Can$ in foreign exchange, causing Can $ to fall. Suppose new exchange rate is US $ 0.60= Can $1. No longer PPP >>>>> US residents cross border to Canada, US 36 for one piece Levi's savings US$12

Arbitrage affects 3 markets - 1) foreign exchange market between US and Canada, 2) market for Levi's in US, and 3) market for Levi's in Canada

By buying in Canada, supply of US $ increase in foreign market, raising value of Canadian $ relative to US$, 2) reduces demand of Levi's in US, 3) increase demand for Levi's in Canada. Arbitrage behavior continue until - law of one is met -

PPP = 'price of tradable goods tend to equalize'

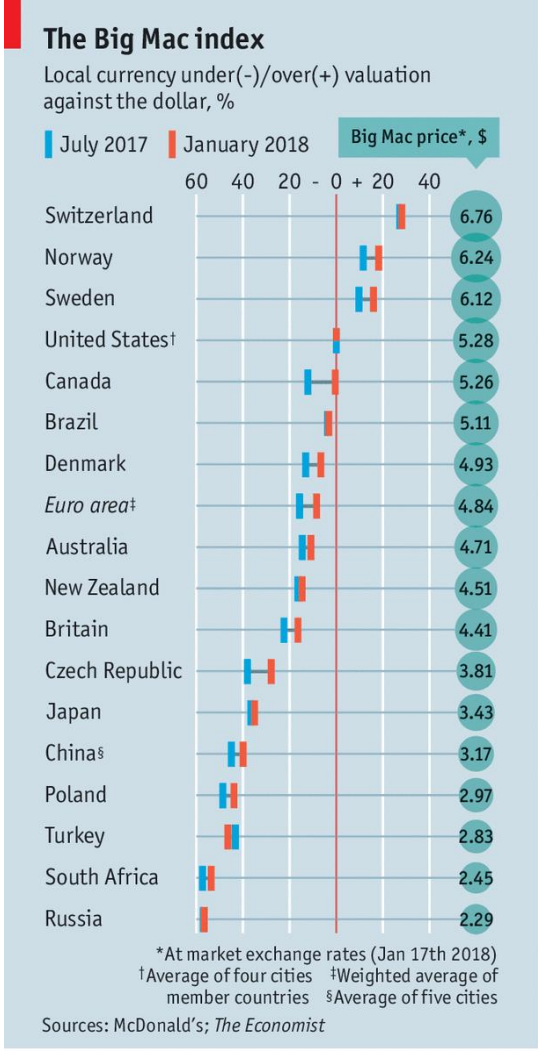
Using PPP to compare standards of living between countries (Example)
2016 Per Capita (converted to US$)
Germany - $43,850
Australia - $54,920

Fail to consider differences in price levels

After Adjusting for PPP
Germany $49,710
Australia $45,970

Foreign exchange use PPP to forecast long term changes in exchange rates

Big Mac Index - provide helpful signals whether currency undervalued or overvalued



Structure of the Foreign Exchange Market: Arbitrage and the Currency Market

- **Arbitrage of Money**
  - Two-Point/Geographic Arbitrage
  - Three-Point Arbitrage
  - Covered Interest Arbitrage

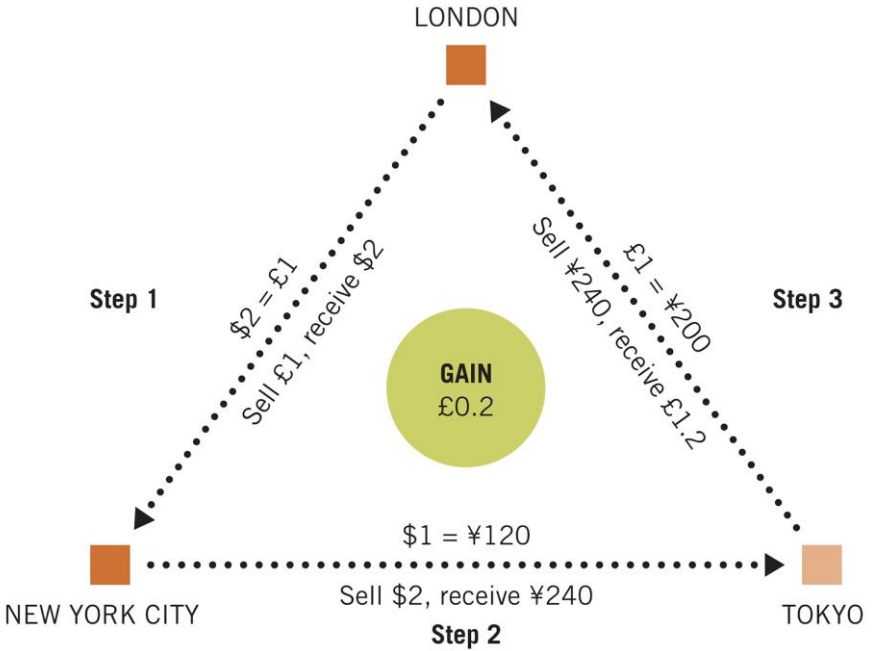
- profiting from price differences in two geographically distinct markets

- buying and selling of three different currencies to make a riskless profit

- arbitrage that occurs when the difference between two countries' interest rates is not equal to the forward discount/premium on their currencies

Structure of the Foreign Exchange Market: Arbitrage and the Currency Market

Figure 8.6 Three-Point Arbitrage



8.3 Discuss the important aspects of the international capital market.

International Capital Market: Major International Banks (1 of 3)

Table 8.1 The World's 20 Largest Banks, 2017

Rank	Company	Country	Revenues ($ Billions of US dollars)
1	Industrial & Commercial Bank of China	China	153.0
2	China Construction Bank	China	138.6
3	Agricultural Bank of China	China	122.4
4	BNP Paribas	France	117.4
5	Bank of China	China	115.4
6	JP Morgan Chase & Co.	United States	113.9
7	Bank of America	United States	100.3
8	Wells Fargo	United States	97.7
9	Citigroup	United States	88.0
10	Banco Santander	Spain	87.4
11	Crédit Agricole	France	84.2
12	HSBC Holdings	United Kingdom	79.6

International Capital Market: Major International Banks (2 of 3)

Table 8.1 [Continued]

Rank	Company	Country	Revenues ($ Billions of US dollars)
13	Société Générale	France	69.9
14	Itau Unibanco Holding	Brazil	66.3
15	Groupe BPCE	France	61.1
16	Banco Bradesco	Brazil	58.1
17	Bank of Communications	China	57.7
18	ING Group	Netherlands	56.3
19	Banco do Brasil	Brazil	55.3
20	Mitsubishi UFJ Financial Group	Japan	54.8

Source: Based on www.fortune.com, accessed August 7, 2018; various corporate websites.

International Capital Market: Major International Banks (3 of 3)

Forms

- Correspondent Relationship
- Subsidiary Bank
- Branch Bank
- Affiliated Bank

Services

- Commercial Banking Services
- Investment Banking Services

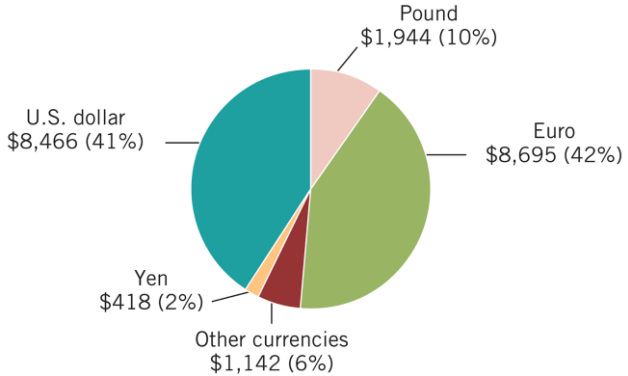
International Capital Market: Eurocurrency Market

- Eurodollars
- Eurocurrency
- Euroloan
- London Interbank Offer Rate (LIBOR)
- International Banking Facilities (IBFs)

International Capital Market: International Bond Market

- Foreign Bonds
- Eurobonds
- Global Bonds

Figure 8.7 International Bonds and Notes Outstanding in June 2015, by Currency (in billions of U.S. dollars)



Source: Based on data from Bank of International Settlements, "International bonds and notes, Table 13B," *BIS Quarterly Review*, September 2015.

International Capital Market: Global Equity Markets

- The globalization of equity markets
- Country Funds

International Capital Market: Offshore Financial Centers

- Benefits
  - Political Stability
  - Regulatory Climate
  - Communications Links
  - Legal, accounting, financial and other expertise

Review Questions (1 of 2)

- What determines the demand for any given currency in the foreign-exchange market?
- What determines the **supply** of any given currency in the foreign-exchange market?
- How are prices established in the foreign-exchange market?
- What is the **role of international banks** in the foreign-exchange market?
- Explain the **different techniques that firms can use to protec**t themselves from **future changes in exchange rates**.

Review Questions (2 of 2)

- Discuss the **major types of arbitrage activities** that affect the foreign-exchange market.
- **What is hedging**? Why is it commonly used by companies in international business?
- What is arbitrage? Give examples.
- Explain the function of Eurocurrency and its use in international transactions.