中南财经政法大学

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Financial Markets

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Chapter 15: The Foreign Exchange Market

Chapter Preview

- In the mid-1980s, American businesses became less competitive relative to their foreign counterparts. By the 2000s, though, competitiveness increased. Why?
- Part of the answer can be found in exchange rates. In the 1980s, the dollar was strong, and US goods were expensive to foreign buyers.
- By the 1990s and 2000s, the dollar weakened, so American goods became cheaper and American businesses became more competitive.

Chapter Preview

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WORLD | ASIA

U.S. Designates China as Currency Manipulator

Stocks tumble as the two nations swap blows over trade

The Dow Jones Industrial Average on Monday fell 767 points, or 2.9%, to 25,717.74, with the S&P 500 index dropping 3% to 2,844.74.
PHOTO: SPENCER PLATT/GETTY IMAGES

By William Mauldin, Nick Timiraos and Paul Kiernan
Updated Aug. 5, 2019 10:47 pm ET

WASHINGTON—The U.S. Treasury labeled China a currency manipulator after the Chinese central bank let the yuan depreciate, capping a day of trade-war escalations that sparked a global fall in financial markets and fears the clash could stall the U.S.'s economic expansion.

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U.S. Drops China's Currency Manipulator Label Ahead of Trade Deal

Move comes two days before planned signing of a trade deal

The U.S. named China as a currency manipulator last August amid trade tensions between the nations.
PHOTO: AGENCE FRANCE-PRESSE/GETTY IMAGES

By Joshua Zumbrun and Kate Davidson
Updated Jan. 13, 2020 5:00 pm ET

WASHINGTON—The U.S. Treasury Department dropped its designation of China as a currency manipulator just two days before negotiators from Beijing and Washington are set to sign the first phase of the trade deal between the two countries.

Chapter Preview

- In this chapter, we develop a modern view of exchange rate determination that explains recent behavior in the foreign exchange market. Topics include:
  - Foreign Exchange Market
  - Exchange Rates in the Long Run
  - Exchange Rates in the Short Run
  - Explaining Changes in Exchange Rates

Foreign Exchange Market

- Most countries of the world have their own currencies: the U.S dollar., the euro in Europe, the Brazilian real, and the Chinese yuan, just to name a few.
- The trading of **currencies** and **banks deposits** is what makes up the foreign exchange market.
- Two kinds of exchange rate transactions make up the foreign exchange market:
  - **Spot transactions** involve the near-immediate exchange of bank deposits, completed at the **spot rate**.
  - **Forward transactions** involve exchanges at some future date, completed at the **forward rate**.

Foreign Exchange Market Major Players

(1) Commercial Banks
(2) Central Banks
(3) Governments
(4) Hedge Fund Managers
(5) Exchange-trade Funds (ETFs)
(6) Multinational Corp. (MNC)
(7) Institutions
(8) Brokers
(9) Retail Traders
(10) Regulators

Source: https://www.atfx.com/en/analysis/trading-strategies/10-major-participants-in-forex-market/

Foreign Exchange Market: Historical Exchange Rates

Source: www.xe.com

Why Are Exchange Rates Important?

- When the currency of your country appreciates relative to another country, your country's goods prices ↑ abroad and foreign goods prices ↓ in your country.
  - Makes domestic businesses less competitive
  - Benefits domestic consumers (you)

- For example, in 1999, the euro was valued at $1.18. On June 23, 2010, it was valued at $1.23.
  - Euro appreciated 4.2% (1.23 – 1.18) / 1.18
  - Dollar depreciated 4.2% (0.812 – 0.847) / 0.847
    - Note: 0.812 = 1 / 1.23, and 0.85 = 1 / 1.18

Why Are Exchange Rates Important?

Let’s look at a more recent case.

Apple released a series of new iPads on 18th Oct. 2022. Meanwhile, they INCREASED the prices of some old version iPads, e.g. iPad Air.

The main reason, according to Tim Cook, CEO of Apple, is that the USD is too strong.

一觉醒来 苹果iPad全系大涨价：iPad Air 5起步涨400元

2022年10月19日07:41 CNMO 收藏本文

新酷产品第一时间免费试玩，还有众多优质达人分享独到生活经验，快来新浪众测，体验各领域最前沿、最有趣、最好玩的产品吧~！下载客户端还能获得专享福利哦！

昨晚，苹果发布了新一代iPad Pro系列和全新十代iPad，其起步价有所上调，分别售6799元和3599元。其中，新iPad Pro 11寸贵了600元，12.9寸更是贵了800元。与此同时，其它iPad产品也纷纷涨价。

新一代iPad Pro

在苹果官网上，iPad Air 5起步价为4399元，现售4799元，涨了400元。iPad Air 5有四种版本：Wi-Fi 64GB/256GB、LTE 64GB/256GB。现在这四个版本分别贵了400元、500元、500元、600元，价格来到4799元、5999元、5999元、7199元。

iPad Pro

iPad Air

iPad

iPad

iPad mini

Why Are Exchange Rates Important?

Why Are Exchange Rates Important?

Why Are Exchange Rates Important?

Foreign Exchange Market: Exchange Rates

Current foreign exchange rates
https://www.federalreserve.gov/releases/h10/current/

Foreign Exchange Rates -- H.10 Weekly

(Rates in currency units per U.S. dollar except as noted by an asterisk)

COUNTRY	CURRENCY	Dec. 8	Dec. 9	Dec. 10	Dec. 11	Dec. 12
*AUSTRALIA	DOLLAR	0.6622	0.6653	0.6642	0.6671	0.6640
BRAZIL	REAL	5.4431	5.4359	5.4728	5.4037	5.4072
CANADA	DOLLAR	1.3846	1.3832	1.3834	1.3769	1.3783
CHINA, P.R.	YUAN	7.0710	7.0633	7.0640	7.0579	7.0548
DENMARK	KRONE	6.4241	6.4164	6.4109	6.3538	6.3665
*EMU MEMBERS	EURO	1.1626	1.1639	1.1650	1.1756	1.1731
HONG KONG	DOLLAR	7.7798	7.7820	7.7814	7.7818	7.7835
INDIA	RUPEE	90.1200	89.9000	89.9800	90.3500	90.4100
JAPAN	YEN	155.8900	156.8500	156.3300	155.1500	155.8100
MALAYSIA	RINGGIT	4.1103	4.1130	4.1159	4.1080	4.0927
MEXICO	PESO	18.2319	18.1778	18.2198	18.0301	18.0386
*NEW ZEALAND	DOLLAR	0.5771	0.5793	0.5788	0.5819	0.5793
NORWAY	KRONE	10.1338	10.1357	10.1358	10.0658	10.1510
SINGAPORE	DOLLAR	1.2980	1.2964	1.2947	1.2905	1.2919
SOUTH AFRICA	RAND	17.0396	17.0537	16.9856	16.8415	16.8635
SOUTH KOREA	WON	1469.1900	1469.4800	1470.2000	1471.3800	1477.7200
SRI LANKA	RUPEE	308.5000	308.6000	308.7000	309.2000	308.9500
SWEDEN	KRONA	9.4065	9.3471	9.3072	9.2363	9.2935
SWITZERLAND	FRANC	0.8078	0.8061	0.8027	0.7932	0.7960
TAIWAN	DOLLAR	31.1700	31.1800	31.1800	31.2600	31.1800
THAILAND	BAHT	31.9100	31.8200	31.8000	31.6100	31.6000
*UNITED KINGDOM	POUND	1.3321	1.3320	1.3340	1.3428	1.3351
VENEZUELA	BOLIVAR	254.2333	254.5519	261.4483	264.4035	267.0805
Memo:						
UNITED STATES	DOLLAR					
1) BROAD	JAN06=100	121.1478	121.0601	121.0557	120.3821	120.5383
2) AFE	JAN06=100	112.4456	112.4016	112.2742	111.4377	111.7305
3) EME	JAN06=100	131.8199	131.6836	131.8135	131.3119	131.3200

* U.S. dollars per currency unit.
ND = No data for this date.

How is Foreign Exchange Traded?

- FX traded in over-the-counter market
  1. Most trades involve buying and selling bank deposits denominated in different currencies.
  2. Trades in the foreign exchange market involve transactions in excess of $1 million.
  3. Typical consumers buy foreign currencies from retail dealers, such as American Express.

- FX volume around $9.6 trillion per day in April 2025.

(source: https://www.compareforexbrokers.com/forex-trading/statistics/)

Exchange Rates in the Long Run: Law of One Price

- Exchange rates are determined in markets by the interaction of supply and demand.

- An important concept that drives the forces of supply and demand in the long run is the Law of One Price.

- The Law of One Price states that the price of an identical good will be the same throughout the world, regardless of which country produces it.

Example: American steel costs $100 per ton, while Japanese steel costs 10,000 yen per ton.

Exchange Rates in the Long Run: Law of One Price

If E = 50 yen/$ then price are:

	American Steel	**Japanese Steel**
In U.S.	$100	$200
In Japan	5000 yen	10,000 yen

If E = 100 yen/$ then price are:

	American Steel	**Japanese Steel**
In U.S.	$100	$100
In Japan	10,000 yen	10,000 yen

- Law of one price $\Rightarrow$ E = 100 yen/$

Law of One Price Quiz

- Recently the yen price of Japanese steel has increased by 10% to (11,000 yen) relative to the dollar price of American steel (unchanged at $100).

- By What amount must the dollar increase or decrease in value for the law of one price to hold?

- Explain.

Exchange Rates in the Long Run: Theory of Purchasing Power Parity (PPP)

- The theory of PPP states that exchange rates between two currencies will adjust to reflect changes in the price levels of the two countries.

- PPP $\Rightarrow$ Domestic price level $\uparrow$ 10%, domestic currency $\downarrow$ 10%
  - PPP is an application of law of one price to price levels
  - **Works in long run, not short run.**

Real Exchange Rate

- **Real Exchange Rate** is a concept helps us understand PPP. It is the rate at which domestic goods can be exchanged for foreign goods.

- For example, if a basket of goods in New York costs $50, while the cost of the same basket of goods in Tokyo is 7,500 yen. Currently, the exchange rate is at 100 yen per dollar, then the real exchange rate is:

$$\frac{50}{\frac{7500}{100}} = 0.66$$

- The real exchange rate is below 1, indicating that it is cheaper to buy the basket of goods in the US.

- PPP predicts that real exchange rate should be 1.

Exchange Rates in the Long Run: Theory of Purchasing Power Parity (PPP)

Problems with PPP:

1. What is the exchange rate between Beijing and Wuhan? Shouldn't houses in Beijing and Wuhan cost the same?

2. All goods are not identical in both countries (i.e., Windows PC versus MacBook)

3. Many goods and services are not traded (e.g., haircuts, land, etc.)

Exchange Rates in the Long Run: PPP

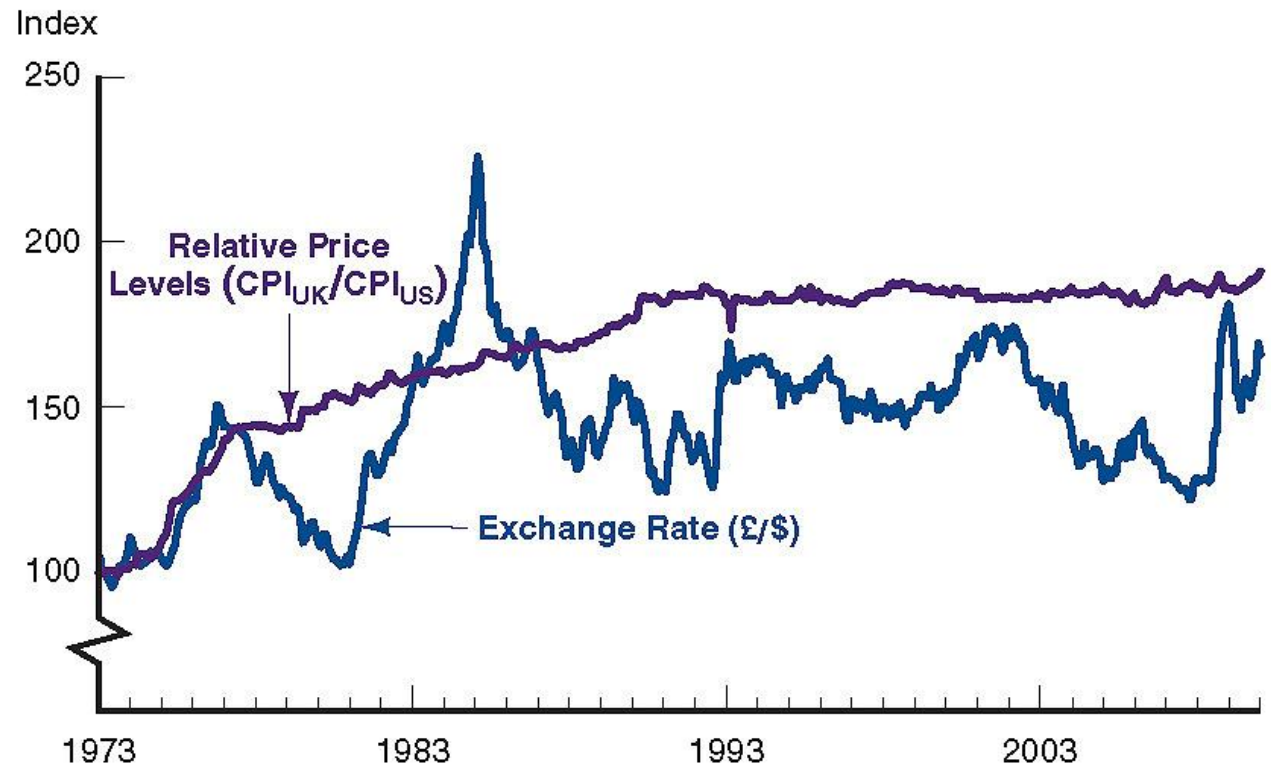


FIGURE 15.2 Purchasing Power Parity, United States/United Kingdom, 1973–2010 (Index: March 1973 = 100)

Source: www.statistics.gov.uk/statbase/tsdataset2.asp.

Exchange Rates in the Long Run: Factors Affecting Exchange Rates in Long Run

- Basic Principle: If a factor increases demand for domestic goods relative to foreign goods, the exchange rate ↑

- Four major factors
  1. relative price levels
  2. tariffs and quotas
  3. preferences for domestic v. foreign goods
  4. and productivity.

Exchange Rates in the Long Run: Factors Affecting Exchange Rates in Long Run

- Relative price levels

A rise in relative price levels cause a country's currency to depreciate.

- Tariffs and quotas

Increasing trade barriers causes a country’s currency to appreciate.

- Preferences for domestic v. foreign goods

Increased demand for a country’s good causes its currency to appreciate; increased demand for imports causes the domestic currency to depreciate.

- Productivity

If a country is more productive relative to another, its currency appreciates.

Exchange Rates in the Long Run: Factors Affecting Exchange Rates in Long Run

TABLE 15.1 SUMMARY Summary Factors That Affect Exchange Rates in the Long Run

Factor	Change in Factor	Response of the Exchange Rate, *E*
Domestic price level†	↑	↓
Trade barriers†	↑	↑
Import demand	↑	↓
Export demand	↑	↑
Productivity†	↑	↑

†Relative to other countries.
*Units of foreign currency per dollar: ↑ indicates domestic currency appreciation; ↓, depreciation.

Note: Only increases (↑) in the factors are shown; the effects of decreases in the variables on the exchange rate are the opposite of those indicated in the "Response" column.

Exchange Rates in the Short Run

- In the short run, it is key to recognize that an exchange rate is nothing more than the price of domestic bank deposits in terms of foreign bank deposits.

- If you treat bank deposits in different countries as perfect substitutes, then all an investor cares about is the expected return for deposits in each country.

- The old approach to supply-demand analysis focused on import/export demand. Here, we emphasize stocks of assets rather than flows of goods, because flows are small relative to the domestic and foreign asset stocks.

Exchange Rates in the Short Run: Supply Curve Analysis

- We will use the US as the “home country”, so domestic assets are denominated in US dollars. We will use “euros” to generically represent any foreign country's currency.

- Dollar assets supplied is primarily the quantity of bank deposits, bonds, and equities in the United States. This is fairly fixed in the short-run.

- The quantity supplied at any exchange rate does not change, so the supply curve, *S*, is vertical.

Exchange Rates in the Short Run: Demand Curve Analysis

- The demand curve traces out the quantity demanded at each current exchange rate.

- Everything else is held constant in this analysis, especially the expected future exchange rate.

- Let's see a specific example that illustrates this point.

Exchange Rates in the Short Run: Supply and Demand Curves

Assume $i^{F} = 5\%$, $E^{e}_{t+1} = 1$ euro/$

Point	
A: $E_t = 1.05$	(1.00 – 1.05)/1.05 = -4.8%
B: $E_t = 1.00$	(1.00 – 1.00)/1.00 = 0.0%
C: $E_{t+1} = 0.95$	(1.00 – 0.95)/0.95 = 5.2%

- The demand curve connects these points and is downward sloping because when E^t is lower, the expected appreciation of the dollar is greater.
- The lower the current exchange rate, the greater the demand for $ assets.

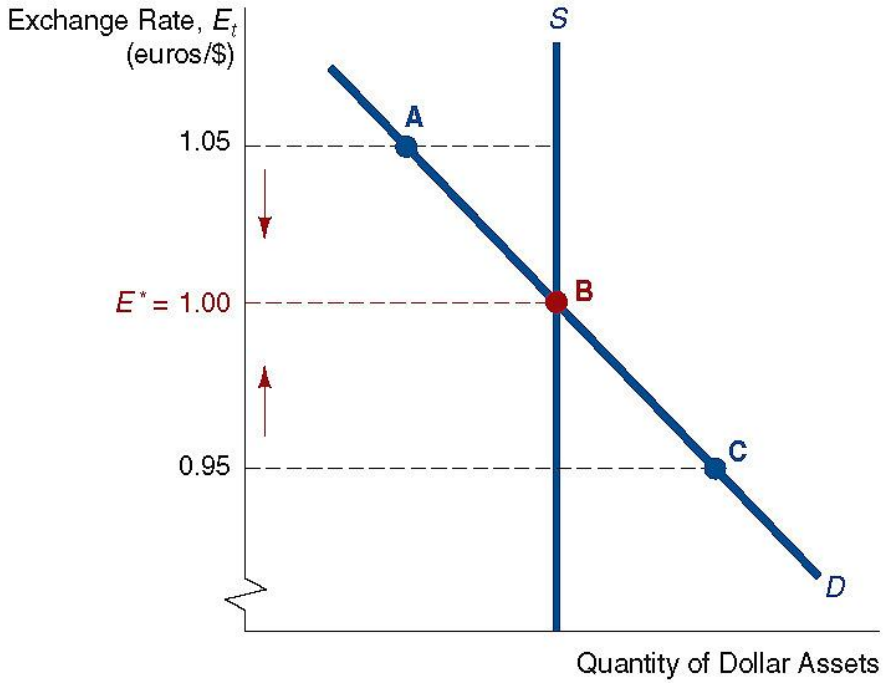


FIGURE 15.3 Equilibrium in the Foreign Exchange Market

Equilibrium in the foreign exchange market occurs at point B, the intersection of the demand curve *D* and the supply curve *S*. The equilibrium exchange rate is E^* = 1 euro per dollar.

Exchange Rates in the Short Run: Equilibrium

- Equilibrium
  - ➢ *Supply* = *Demand* at E^*
  - ➢ If $E_t > E^*$, *Demand* < *Supply*, $E_t \downarrow$
  - ➢ If $E_t < E^*$, *Demand* > *Supply*, $E_t \uparrow$

- To understand how exchange rates shift in time, we need to understand the factors that shift expected returns for domestic and foreign deposits.

- We will examine these separately, as well as changes in the money supply and exchange rate overshooting.

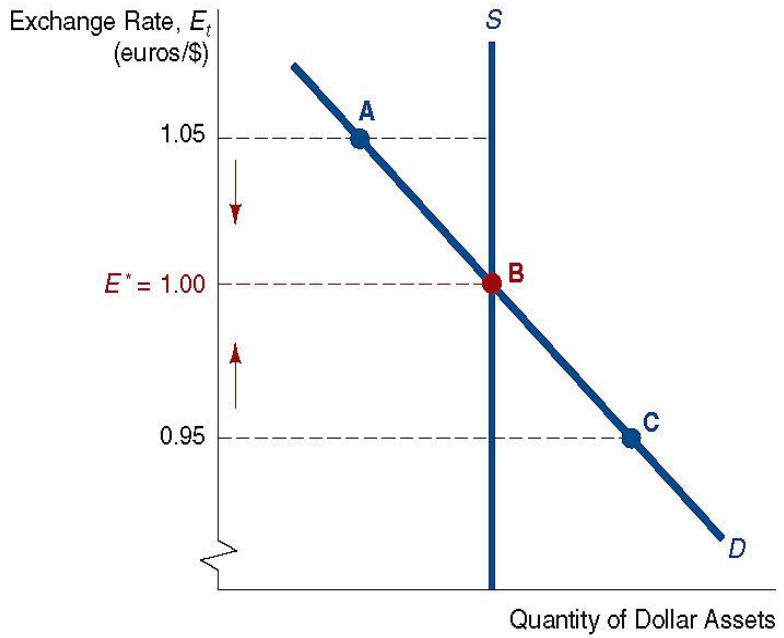


FIGURE 15.3 Equilibrium in the Foreign Exchange Market

Equilibrium in the foreign exchange market occurs at point B, the intersection of the demand curve *D* and the supply curve *S*. The equilibrium exchange rate is E^* = 1 euro per dollar.

Explaining Changes in Exchange Rates: Increase in i^D

- *Demand* curve shifts right when $i^D \uparrow$: because people want to hold more dollars

- This causes domestic currency to appreciate.

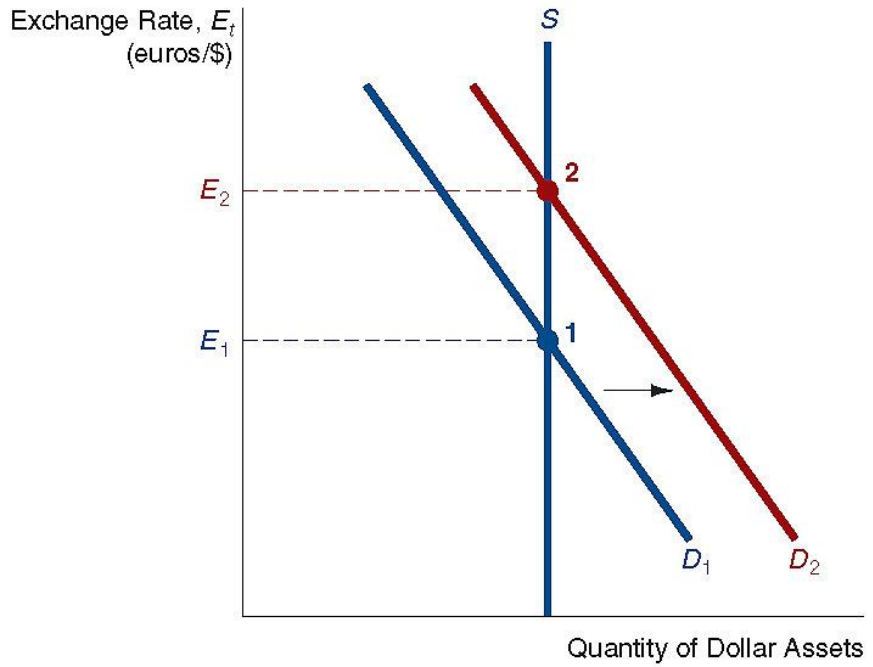


FIGURE 15.4 Response to an Increase in the Domestic Interest Rate, i^D

When the domestic interest rate i^D increases, the relative expected return on domestic (dollar) assets increases and the demand curve shifts to the right. The equilibrium exchange rate rises from E_1 to E_2.

Explaining Changes in Exchange Rates: Increase in i^F

- *Demand* curve shifts left when $i^F \uparrow$: because people want to hold fewer dollars

- This causes domestic currency to depreciate.

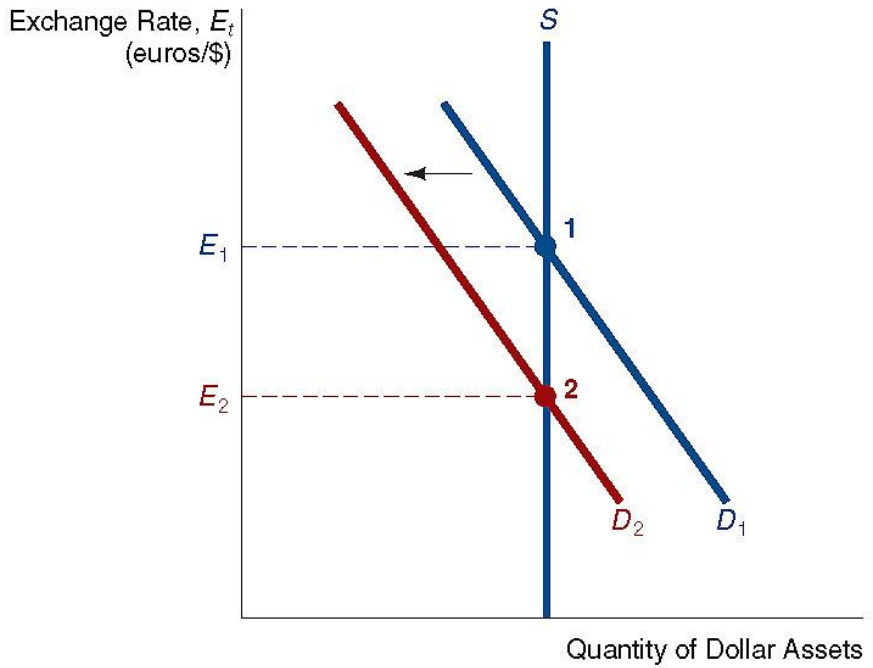


FIGURE 15.5 Response to an Increase in the Foreign Interest Rate, i^F

When the foreign interest rate i^F increases, the relative expected return on domestic (dollar) assets falls and the demand curve shifts to the left. The equilibrium exchange rate falls from E_1 to E_2.

Explaining Changes in Exchange Rates: Increase in Expected Future FX Rates

- *Demand* curve shifts right when $E^e_{t+1}\uparrow$: because people want to hold more dollars

- This causes domestic currency to appreciate.

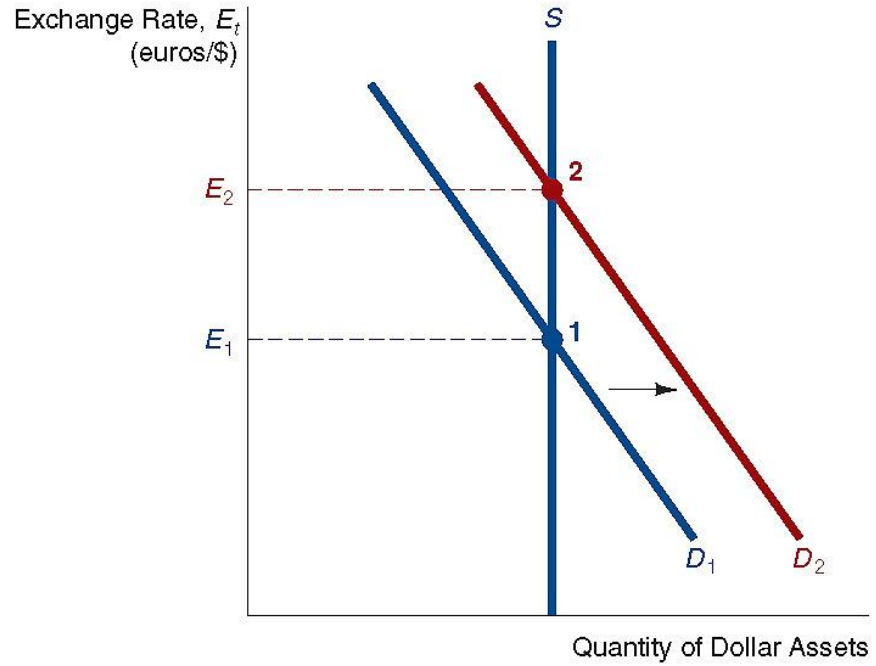


FIGURE 15.6 Response to an Increase in the Expected Future Exchange Rate, E^e_{t+1}

When the expected future exchange rate increases, the relative expected return on domestic (dollar) assets rises and the demand curve shifts to the right. The equilibrium exchange rate rises from E_1 to E_2.

Explaining Changes in Exchanges Rates

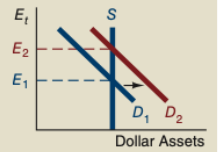
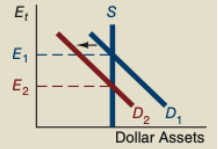
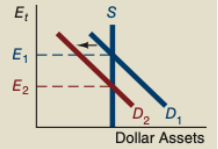
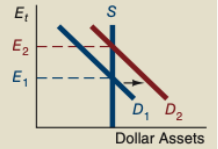
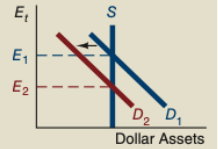
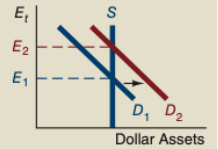
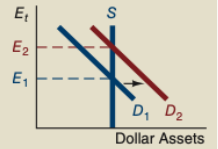
Similar to determinants of exchange rates in the long-run, the following changes can increase E^e_{t+1} and shift the demand curve to the right:

1. Expected fall in relative U.S. price levels
2. Expected increase in relative U.S. trade barriers
3. Expected lower U.S. import demand
4. Expected higher foreign demand for U.S. exports
5. Expected higher relative U.S. productivity

These are summarized in the following slides.

Explaining Changes in Exchanges Rates

TABLE 15.2 SUMMARY Summary Factors That Shift the Demand Curve for Domestic Assets and Affect the Exchange Rate

Factor	Change in Factor	Change in Quantity Demanded of Domestic Assets at Each Exchange Rate	Response of Exchange Rate, E_t	
Domestic interest rate, i^D	↑	↑	↑	
Foreign interest rate, i^F	↑	↓	↓	
Expected domestic price level*	↑	↓	↓	
Expected trade barriers*	↑	↑	↑	
Expected import demand	↑	↓	↓	
Expected export demand	↑	↑	↑	
Expected productivity*	↑	↑	↑	

*Relative to other countries.

Note: Only increases (↑) in the factors are shown; the effects of decreases in the variables on the exchange rate are the opposite of those indicated in the "Response" column.

Applications : Interest Rate Changes

Our analysis allows us to take a look at the response of exchange rates to a variety of macro-economic factors. For example, we can use this framework to examine :

(1) the impact of changes in interest rates

(2) the impact of money growth. (Q: does money growth changes interest rates?)

Application: Interest Rate Changes

- Changes in domestic interest rates are often cited in the press as affecting exchange rates.

- We must carefully examine the source of the change to make such a statement. Interest rates change because either (a) the real rate or (b) the expected inflation is changing. The effect of each differs.

Effect of Changes in Interest Rates on the Equilibrium Exchange Rate

- When the **domestic real interest rate** increases:
  - Increase the relative expected return on dollar assets, raises the quantity of dollar assets demanded. (move along the curve or shift the curve?)
  - The domestic currency (USD) appreciates.

- When the **domestic expected inflation** increases:
  - Domestic inflation leads to a decline in the expected appreciation of the dollar, which is typically thought to be larger than the increase in the domestic interest rate.
  - Investors want to get ride of dollar assets.
  - The domestic currency (USD) depreciates.

Application: The Dollar and Interest Rates

- Value of $ and real rates rise and fall together, as theory predicts

- No association between $ and nominal rates: $ falls in late 1970s as nominal rate rises

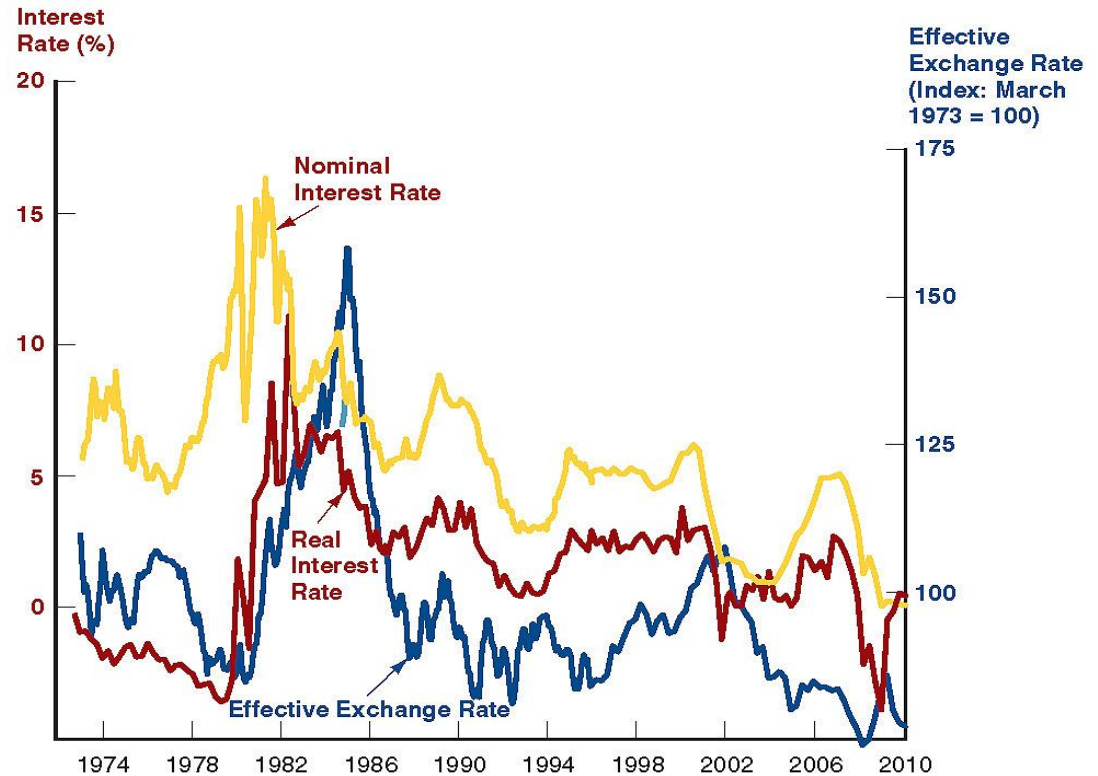


FIGURE 15.8 Value of the Dollar and Interest Rates, 1973–2010

Sources: Federal Reserve: www.federalreserve.gov/releases/h10/summary/indexn_m.txt; real interest rate from Figure 3.1 in Chapter 3.

The Dollar and Interest Rates

- A failure to distinguish between real and nominal interest rates can lead to poor predictions of exchange rate movements!

- Note the difference between real and nominal rates in the figure. Which better explains the weakness of the dollar in the late 1970s and the strength of the dollar in the early 1980s?

FIGURE 15.9 Real and Nominal Interest Rates (Three-Month Treasury Bill), 1953–2010

Case: The Subprime Crisis and the Dollar

The figure shows EUR/USD exchange rate during the subprime financial crisis period.

Is there a relationship between the subprime crisis and swings in the value of the dollar?

Source: https://www.macrotrends.net/2548/euro-dollar-exchange-rate-historical-chart

Case: The Subprime Crisis and the Dollar

Is there a relationship between the subprime crisis and swings in the value of the dollar?

- In August 2007, the dollar began an accelerated decline in value, falling by 9% against the euro through July 2008
- The dollar suddenly shot upward, by over 20% against the euro by the end of October 2008.
- In 2007, the Fed lowered the fed funds rate by 325 bps, while ECBs did not need to do this. Relative return on the dollar fell, shifting demand to the left.
- By mid-2008, ECBs starting cutting their domestic rates, increasing the relative expected return of the US dollar (a rightward shift). A “flight to quality” in T-bonds also increased the demand for dollars.

Exchange rate volatility

- **Exchange rate overshooting** is important because it helps explain why foreign exchange rates are so volatile.

- Another explanation deals with changes in the expected appreciation of exchange rates. As *anything* changes our expectations (price levels, productivity, inflation, etc.), exchange rates will change immediately.

The Practicing Manger: Profiting from FX Forecasts

- Forecasters look at factors discussed in this chapter

- FX forecasts affect financial institutions managers' decisions

- If forecast euro appreciate, yen depreciate,
  - Sell yen assets, buy euro assets
  - Make more euros loans, less yen loans
  - Instruct FX traders to sell yen, buy euros on the FX market

Chapter Summary

- Foreign Exchange Market: the market for deposits in one currency versus deposits in another.
- Exchange Rates in the Long Run: driven primarily by the law of one price and it is affected by the four factors discussed.
- Exchange Rates in the Short Run: short-run rates are determined by the demand for assets denominated in both domestic and foreign currencies.
- Explaining Changes in Exchange Rates: factors leading to shifts in the demand and supply schedules were explored.

Acknowledgment

Slides here are adopted from the official slides published by Pearson Education Ltd