In this chapter, look for the answers to these questions:

- How are international flows of goods and assets related?
- What’s the difference between the real and nominal exchange rate?
- What is “purchasing-power parity,” and how does it explain nominal exchange rates?

Introduction

- One of the Ten Principles of Economics from Chapter 1:
  Trade can make everyone better off.
- This chapter introduces basic concepts of international macroeconomics:
  - the trade balance (trade deficits, surpluses)
  - international flows of assets
  - exchange rates

Open-Economy Macroeconomics: Basic Concepts

- An open economy interacts with other countries in two ways.
  - It buys and sells goods and services in world product markets.
  - It buys and sells capital assets in world financial markets.

THE INTERNATIONAL FLOW OF GOODS AND CAPITAL

- The Flow of Goods: Exports, Imports, and Net Exports
  - The United States is a very large and open economy—it imports and exports huge quantities of goods and services.
  - Over the past four decades, international trade and finance have become increasingly important.
### The Flow of Goods: Exports, Imports, Net Exports

- **Exports** are goods and services that are produced domestically and sold abroad.
- **Imports** are goods and services that are produced abroad and sold domestically.
- **Net exports** (NX) are the value of a nation’s exports minus the value of its imports.
- Net exports are also called the *trade balance*.

### The Flow of Goods: Exports, Imports, Net Exports

- A *trade deficit* is a situation in which net exports (NX) are negative.
- Imports > Exports
- A *trade surplus* is a situation in which net exports (NX) are positive.
- Exports > Imports
- *Balanced trade* refers to when net exports are zero—exports and imports are exactly equal.

### Variables that affect NX

What do you think would happen to U.S. net exports if:

- **A.** Canada experiences a recession (falling incomes, rising unemployment)
  
  U.S. net exports would fall due to a fall in Canadian consumers’ purchases of U.S. exports

- **B.** U.S. consumers decide to be patriotic and buy more products "Made in the U.S.A."
  
  U.S. net exports would rise due to a fall in imports

- **C.** Prices of Mexican goods rise faster than prices of U.S. goods
  
  This makes U.S. goods more attractive relative to Mexico’s goods. Exports to Mexico increase, imports from Mexico decrease, so U.S. net exports increase.

### The Flow of Financial Resources: Net Capital Outflow

- **Net capital outflow** refers to the purchase of foreign assets by domestic residents minus the purchase of domestic assets by foreigners.
- NCO is also called net foreign investment.
- A U.S. resident buys stock in the Toyota corporation and a Mexican buys stock in the Ford Motor corporation.
- When a U.S. resident buys stock in Telmex, the Mexican phone company, the purchase raises U.S. net capital outflow.
- When a Japanese resident buys a bond issued by the U.S. government, the purchase reduces the U.S. net capital outflow.

### Figure 1 The Internationalization of the U.S. Economy

![Graph showing the internationalization of the U.S. economy](image-url)
The Flow of Capital

The flow of capital abroad takes two forms:

- **Foreign direct investment:** Domestic residents actively manage the foreign investment, e.g., McDonalds opens a fast-food outlet in Moscow.
- **Foreign portfolio investment:** Domestic residents purchase foreign stocks or bonds, supplying “loanable funds” to a foreign firm.

The Flow of Financial Resources: Net Capital Outflow

- Variables that Influence Net Capital Outflow
  - The real interest rates being paid on foreign assets.
  - The real interest rates being paid on domestic assets.
  - The perceived economic and political risks of holding assets abroad.
  - The government policies that affect foreign ownership of domestic assets.

The Equality of NX and NCO

- When a U.S. citizen buys foreign goods,
  - U.S. imports rise, NX falls
  - the U.S. buyer pays with U.S. dollars or assets, so the other country acquires U.S. assets, causing U.S. NCO to fall.

The Equality of Net Exports and Net Capital Outflow

- For an economy as a whole, NX and NCO must balance each other so that:
  \[ NCO = NX \]
  - arises because every transaction that affects NX also affects NCO by the same amount (and vice versa)
- When a foreigner purchases a good from the U.S.,
  - U.S. exports and NX increase
  - the foreigner pays with currency or assets, so the U.S. acquires some foreign assets, causing NCO to rise.

Saving, Investment, and Their Relationship to the International Flows

- Net exports is a component of GDP:
  \[ Y = C + I + G + NX \]
- National saving is the income of the nation that is left after paying for current consumption and government purchases:
  \[ Y - C - G = I + NX \]
- National saving (S) equals \( Y - C - G \) so:
  \[ S = I + AX \]

Saving = Domestic Investment + Net Capital Outflow
\[ S = I + NCO \]
Table 1 International Flows of Goods and Capital: Summary

This table shows the three possible outcomes for an open economy.

<table>
<thead>
<tr>
<th>Trade Deficit</th>
<th>Balanced Trade</th>
<th>Trade Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports &lt; Imports</td>
<td>Exports = Imports</td>
<td>Exports &gt; Imports</td>
</tr>
<tr>
<td>Net Exports &lt; 0</td>
<td>Net Exports = 0</td>
<td>Net Exports &gt; 0</td>
</tr>
<tr>
<td>Y &lt; C + I + G</td>
<td>Y = C + I + G</td>
<td>Y &gt; C + I + G</td>
</tr>
<tr>
<td>Saving &lt; Investment</td>
<td>Saving = Investment</td>
<td>Saving &gt; Investment</td>
</tr>
<tr>
<td>Net Capital Outflow &lt; 0</td>
<td>Net Capital Outflow = 0</td>
<td>Net Capital Outflow &gt; 0</td>
</tr>
</tbody>
</table>

Case Study: The U.S. Trade Deficit

- In 2004, the U.S. had a record trade deficit.
- Recall, \( NX = S - I = NCO \).
  A trade deficit means \( I > S \), so the nation borrows the difference from foreigners.
- In 2004, foreign purchases of U.S. assets exceeded U.S. purchases of foreign assets by $585 million.
- Such deficits have been the norm since 1980...

U.S. Saving, Investment, and NCO

Why U.S. saving has been less than investment:
- In the 1980s and early 2000s, huge budget deficits and low private saving depressed national saving.
- In the 1990s, national saving increased as the economy grew, but domestic investment increased even faster due to the information technology boom.

Is the U.S. trade deficit a problem?
- The extra capital stock from the '90s investment boom may well yield large returns.
- The fall in saving of the '80s and '00s, while not desirable, at least did not depress domestic investment, as firms could borrow from abroad.
- A country, like a person, can go into debt for good reasons or bad ones.
- A trade deficit is not necessarily a problem, but might be a symptom of a...
THE PRICES FOR INTERNATIONAL TRANSACTIONS: REAL AND NOMINAL EXCHANGE RATES

- International transactions are influenced by international prices.
- The two most important international prices are the nominal exchange rate and the real exchange rate.

nominal exchange rates

- Appreciation refers to an increase in the value of a currency as measured by the amount of foreign currency it can buy.
- Depreciation refers to a decrease in the value of a currency as measured by the amount of foreign currency it can buy.
- If a dollar buys more foreign currency, there is an appreciation of the dollar.
- If it buys less there is a depreciation of the dollar.

real exchange rates

- The real exchange rate is the rate at which a person can trade the goods and services of one country for the goods and services of another.
- The real exchange rate compares the prices of domestic goods and foreign goods in the domestic economy.
- If a case of German beer is twice as expensive as American beer, the real exchange rate is 1/2 case of German beer per case of American beer.
Real Exchange Rates

- The real exchange rate depends on the nominal exchange rate and the prices of goods in the two countries measured in local currencies.
- The real exchange rate is a key determinant of how much a country exports and imports.

\[
\text{Real exchange rate} = \frac{\text{Nominal exchange rate} \times \text{Domestic price}}{\text{Foreign price}}
\]

Example With One Good

- A Big Mac costs $2.50 in U.S., 400 yen in Japan
- \( e = 120 \) yen per $ \( e \times P = \text{price in yen of a U.S. Big Mac} \)
- \( e \times P = (120 \text{ yen per $}) \times (2.50 \text{ per Big Mac}) \)
- \( e \times P = 300 \text{ yen per U.S. Big Mac} \)
- Compute the real exchange rate:

\[
\frac{e \times P}{P^*} = \frac{300 \text{ yen per U.S. Big Mac}}{400 \text{ yen per Japanese Big Mac}}
\]
- \( e \times P \) per U.S. Big Mac
- 0.75 Japanese Big Macs per US Big Mac

Interpreting the Real Exchange Rate

- "The real exchange rate = 0.75 Japanese Big Macs per U.S. Big Mac"
- This does not mean a Japanese citizen literally exchanges Japanese burgers for American ones.
- Correct interpretation:
  To buy a Big Mac in the U.S., a Japanese citizen must sacrifice an amount that could purchase 0.75 Big Macs in Japan.

Compute a real exchange rate

- \( e = 10 \text{ pesos per $} \) price of Tall Starbucks Latte
- \( P = $3 \text{ in U.S., } P^* = 24 \text{ pesos in Mexico} \)

A. What is the price of a US latte measured in pesos?
- \( e \times P = (10 \text{ pesos per $}) \times (3 \text{ $ per US latte}) \)
- \( e \times P = 30 \text{ pesos per US latte} \)

B. Calculate the real exchange rate, measured as Mexican lattes per US latte.

\[
\frac{e \times P}{P^*} = \frac{30 \text{ pesos per US latte}}{24 \text{ pesos per Mexican latte}}
\]
- \( e \times P \) per US latte
- \( e \times P \) per Mexican latte

Real Exchange Rates

- A depreciation (fall) in the U.S. real exchange rate means that U.S. goods have become cheaper relative to foreign goods.
- This encourages consumers both at home and abroad to buy more U.S. goods and fewer goods from other countries.
- As a result, U.S. exports rise, and U.S. imports fall, and both of these changes raise U.S. net exports.
- Conversely, an appreciation in the U.S. real exchange rate means that U.S. goods have become more expensive compared to foreign goods, so U.S. net exports fall.

A FIRST THEORY OF EXCHANGE-RATE DETERMINATION: PURCHASING-POWER PARITY

- The purchasing-power parity theory is the simplest and most widely accepted theory explaining the variation of currency exchange rates.
- Purchasing-power parity is a theory of exchange rates whereby a unit of any given currency should be able to buy the same quantity of goods in all countries.
- According to the purchasing-power parity theory, the ratio of the price of a product in one country and the price of the same product in another country should be constant over time.
**Purchasing-Power Parity (PPP)**

- Example: The “basket” contains a Big Mac.
  \[ P = \text{price of US Big Mac (in dollars)} \]
  \[ P^* = \text{price of Japanese Big Mac (in yen)} \]
  \[ e = \text{exchange rate, yen per dollar} \]
- According to PPP, \[ e \times P = P^* \]
- Solve for \( e \): \[ e = \frac{P^*}{P} \]

**The Basic Logic of Purchasing-Power Parity**

- The theory of purchasing-power parity is based on a principle called the law of one price.
- According to the law of one price, a good must sell for the same price in all locations.
- If the law of one price were not true, unexploited profit opportunities would exist.
- The process of taking advantage of differences in prices in different markets is called arbitrage.

**Implications of Purchasing-Power Parity**

- If arbitrage occurs, eventually prices that differed in two markets would necessarily converge.
- According to the theory of purchasing-power parity, a currency must have the same purchasing power in all countries and exchange rates move to ensure that.

**Limitations of Purchasing-Power Parity**

- Many goods are not easily traded or shipped from one country to another.
- Tradable goods are not always perfect substitutes when they are produced in different countries.