CHAPTER 31

Open-Economy Macroeconomics: Basic Concepts

PRINCIPLES OF Economics

N. Gregory Mankiw

Premium PowerPoint Slides
by Ron Cronovich

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

Closed vs. Open Economies

- A **closed economy** does not interact with other economies in the world.
- An **open economy** interacts freely with other economies around the world.

The Flow of Goods & Services

- **Exports**:
  domestically-produced g&s sold abroad
- **Imports**:
  foreign-produced g&s sold domestically
- **Net exports (NX)**, aka the **trade balance**
  = value of exports – value of imports

ACTIVE LEARNING 1

Variables that affect NX

What do you think would happen to Indian net exports if:

A. U.S. experiences a recession (falling incomes, rising unemployment)

B. Indian consumers decide to be patriotic and buy more products "Made in India"

C. Prices of goods produced in France rise faster than prices of goods produced in India

ACTIVE LEARNING 1
Answers

A. U.S. experiences a recession (falling incomes, rising unemployment)

Indian net exports would fall due to a fall in American consumers' purchases of Indian exports

B. Indian consumers decide to be patriotic and buy more products "Made in India"

India net exports would rise due to a fall in imports

ACTIVE LEARNING 1
Answers

C. Prices of French goods rise faster than prices of Indian goods

This makes Indian goods more attractive relative to France's goods.

Exports to France rise,
imports from France fall,
so Indian net exports rise.

Variables that Influence Net Exports

- Consumers' preferences for foreign and domestic goods
- Prices of goods at home and abroad
- Incomes of consumers at home and abroad
- The exchange rates at which foreign currency trades for domestic currency
- Transportation costs
- Govt policies

Trade Surpluses & Deficits

NX measures the imbalance in a country's trade in goods and services.

- **Trade deficit**:
  an excess of imports over exports
- **Trade surplus**:
  an excess of exports over imports
- **Balanced trade**:
  when exports = imports

The Flow of Capital

- **Net capital outflow (NCO)**:
  domestic residents' purchases of foreign assets
  minus
  foreigners' purchases of domestic assets
- ***NCO*** is also called **net foreign investment**.

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

- Adapted for India- Café 92 opens an outlet in Kathmandu

- **Foreign portfolio investment**:
  Domestic residents purchase foreign stocks or bonds, supplying "loanable funds" to a foreign firm.

The Flow of Capital

NCO measures the imbalance in a country's trade in assets:

- When ***NCO*** > 0, "capital outflow"
  Domestic purchases of foreign assets exceed foreign purchases of domestic assets.
- When ***NCO*** < 0, "capital inflow"
  Foreign purchases of domestic assets exceed domestic purchases of foreign assets.

Variables that Influence NCO

- Real interest rates paid on foreign assets
- Real interest rates paid on domestic assets
- Perceived risks of holding foreign assets
- Govt policies affecting foreign ownership of domestic assets

The Equality of NX and NCO

- An accounting identity: ***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 India,
  - Indian exports and ***NX*** increase
  - the foreigner pays with currency or assets, so India acquires some foreign assets, causing ***NCO*** to rise.

The Equality of NX and NCO

- An accounting identity: ***NCO*** = ***NX***
  - arises because every transaction that affects ***NX*** also affects ***NCO*** by the same amount (and vice versa)
- When an Indian citizen buys foreign goods,
  - Indian imports rise, ***NX*** falls
  - the Indian buyer pays with Indian rupees or assets, so the other country acquires Indian assets, causing Indian ***NCO*** to fall.

Saving, Investment, and International Flows of Goods & Assets

$$Y = C + I + G + NX \qquad \text{accounting identity}$$

$$Y - C - G = I + NX \qquad \text{rearranging terms}$$

$$S = I + NX \qquad \text{since } S = Y - C - G$$

$$S = I + NCO \qquad \text{since } NX = NCO$$

- When $S > I$, the excess loanable funds flow abroad in the form of positive net capital outflow.
- When $S < I$, foreigners are financing some of the country's investment, and $NCO < 0$.

The Nominal Exchange Rate

- **Nominal exchange rate**: the rate at which one country's currency trades for another
- We express all exchange rates as foreign currency per unit of domestic currency.
- Some exchange rates as of 16 July 2008, all per US$

Canadian dollar:	1.00
Euro:	0.63
Japanese yen:	104.77
Mexican peso:	10.25

Appreciation and Depreciation

- **Appreciation** (or "strengthening"):
  an increase in the value of a currency
  as measured by the amount of foreign currency
  it can buy
- **Depreciation** (or "weakening"):
  a decrease in the value of a currency
  as measured by the amount of foreign currency
  it can buy
- Examples: During 2007, the U.S. dollar…
  - depreciated 9.5% against the Euro
  - appreciated 1.5% against the S. Korean Won

The Real Exchange Rate

- **Real exchange rate**: the rate at which the g&s of one country trade for the g&s of another
- Real exchange rate = $\frac{\boldsymbol{e} \times \boldsymbol{P}}{\boldsymbol{P^*}}$

  where

  $\boldsymbol{P}$ = domestic price

  $\boldsymbol{P^*}$ = foreign price (in foreign currency)

  $\boldsymbol{e}$ = nominal exchange rate, *i.e.*, foreign currency per unit of domestic currency

Example With One Good

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

$$\frac{e \times P}{P^*} = \frac{\text{300 yen per U.S. Big Mac}}{\text{400 yen per Japanese Big Mac}}$$

= 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"

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.

ACTIVE LEARNING 2

Compute a real exchange rate

e = 10 pesos per $

price of a tall Starbucks Latte

P = $3 in U.S., ***P**** = 24 pesos in Mexico

A. What is the price of a US latte measured in pesos?

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

ACTIVE LEARNING 2

Answers

e = 10 pesos per $

price of a tall Starbucks Latte

P = $3 in U.S., ***P**** = 24 pesos in Mexico

A. What is the price of a US latte in pesos?

e x ***P*** = (10 pesos per $) x (3 $ per US latte)

= 30 pesos per US latte

B. Calculate the real exchange rate.

$$\frac{e \times P}{P^*} = \frac{\text{30 pesos per U.S. latte}}{\text{24 pesos per Mexican latte}}$$

= 1.25 Mexican lattes per US latte

The Real Exchange Rate With Many Goods

P = U.S. price level, *e.g.,* Consumer Price Index, measures the price of a basket of goods

P* = foreign price level

Real exchange rate
= (***e*** x ***P***)/***P****
= price of a domestic basket of goods relative to price of a foreign basket of goods

- If U.S. real exchange rate appreciates, U.S. goods become more expensive relative to foreign goods.

The Law of One Price

- **Law of one price**: the notion that a good should sell for the same price in all markets
  - Suppose coffee sells for $4/pound in Seattle and $5/pound in Boston,
    and can be costlessly transported.
  - There is an opportunity for **arbitrage**, making a quick profit by buying coffee in Seattle and selling it in Boston.
  - Such arbitrage drives up the price in Seattle and drives down the price in Boston, until the two prices are equal.

Purchasing-Power Parity (PPP)

- **Purchasing-power parity**:
  a theory of exchange rates whereby a unit of any currency should be able to buy the same quantity of goods in all countries
- based on the law of one price
- implies that nominal exchange rates adjust to equalize the price of a basket of goods across countries

Purchasing-Power Parity (PPP)

- Example: The "basket" contains a Big Mac.

  P = price of US Big Mac (in dollars)

  P^* = price of Japanese Big Mac (in yen)

  e = exchange rate, yen per dollar

- According to PPP, $e \times P = P^*$

  $e \times P$: price of US Big Mac, in yen

  P^*: price of Japanese Big Mac, in yen

- Solve for e:

$$e = \frac{P^*}{P}$$

PPP and Its Implications

- PPP implies that the nominal exchange rate between two countries should equal the ratio of price levels.

$$e = \frac{P^*}{P}$$

- If the two countries have different inflation rates, then ***e*** will change over time:
  - If inflation is higher in Mexico than in the U.S., then ***P**** rises faster than ***P***, so ***e*** rises – the dollar appreciates against the peso.
  - If inflation is higher in the U.S. than in Japan, then ***P*** rises faster than ***P****, so ***e*** falls – the dollar depreciates against the yen.

Limitations of PPP Theory

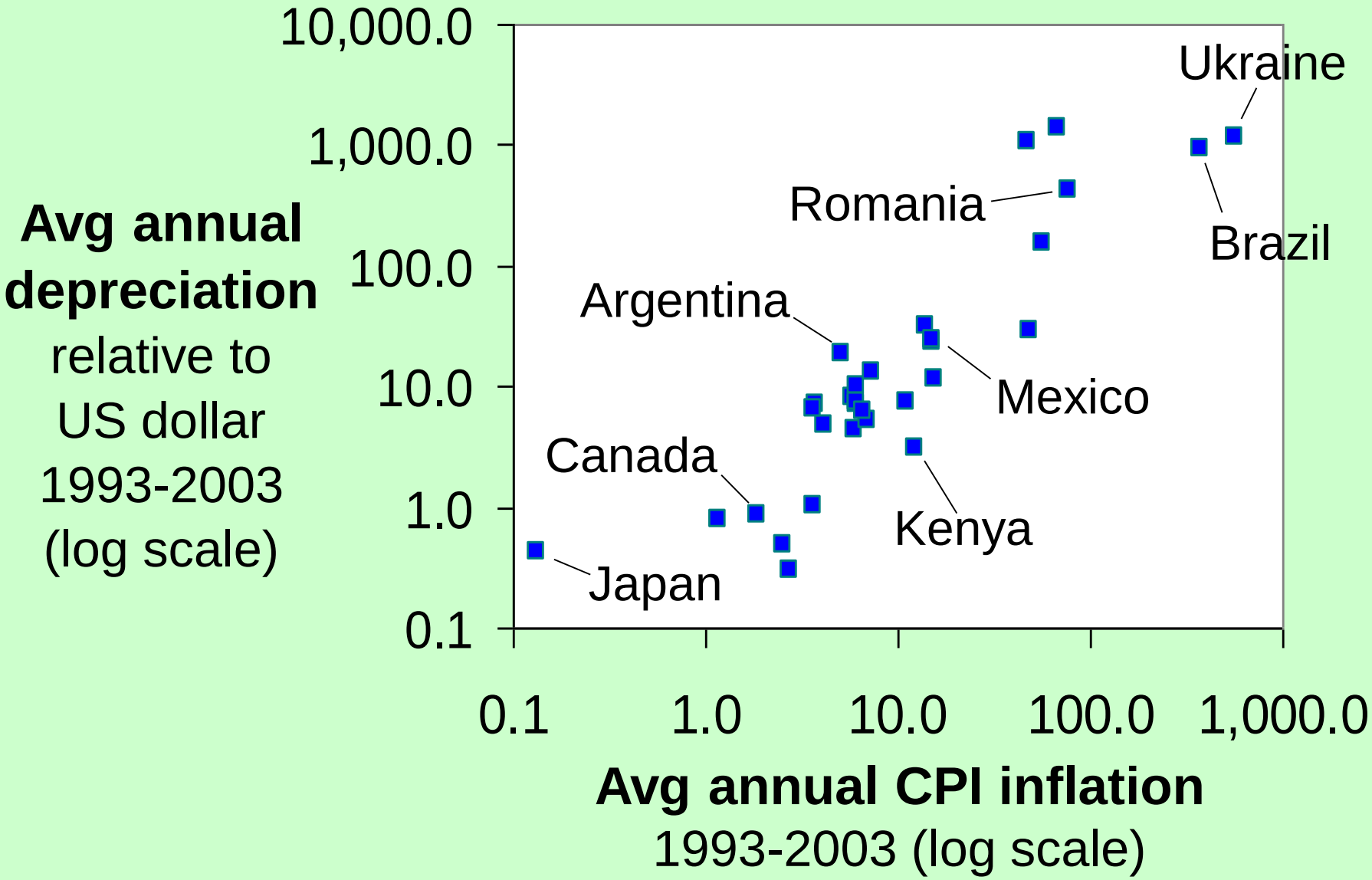
Two reasons why exchange rates do not always adjust to equalize prices across countries:

- Many goods cannot easily be traded
  - Examples: haircuts, going to the movies
  - Price differences on such goods cannot be arbitraged away
- Foreign, domestic goods not perfect substitutes
  - *E.g.,* some U.S. consumers prefer Toyotas over Chevys, or vice versa
  - Price differences reflect taste differences

Limitations of PPP Theory

- Nonetheless, PPP works well in many cases, especially as an explanation of long-run trends.
- For example, PPP implies:
  the greater a country's inflation rate,
  the faster its currency should depreciate
  (relative to a low-inflation country like the US).
- The data support this prediction…

Inflation & Depreciation in a Cross-Section of 31 Countries



ACTIVE LEARNING 3

Chapter review questions

1. Which of the following statements about a country with a trade deficit is <u>not true</u>?
   - **A.** Exports < imports
   - **B.** Net capital outflow < 0
   - **C.** Investment < saving
   - **D.** $Y < C + I + G$

2. A Ford Escape SUV sells for $24,000 in the U.S. and 720,000 rubles in Russia.

   If purchasing-power parity holds, what is the nominal exchange rate (rubles per dollar)?

ACTIVE LEARNING 3

Answers

1. Which of the following statements about a country with a trade deficit is <u>not true</u>?

A. Exports < imports

B. Net capital outflow < 0

C. Investment < saving *not true!*

D. $Y < C + I + G$

A trade deficit means $NX < 0$.

Since $NX = S - I$,
a trade deficit implies $I > S$.

ACTIVE LEARNING 3
Answers

2. A Ford Escape SUV sells for $24,000 in the U.S. and 720,000 rubles in Russia.

   If purchasing-power parity holds, what is the nominal exchange rate (rubles per dollar)?

   P* = 720,000 rubles

   P = $24,000

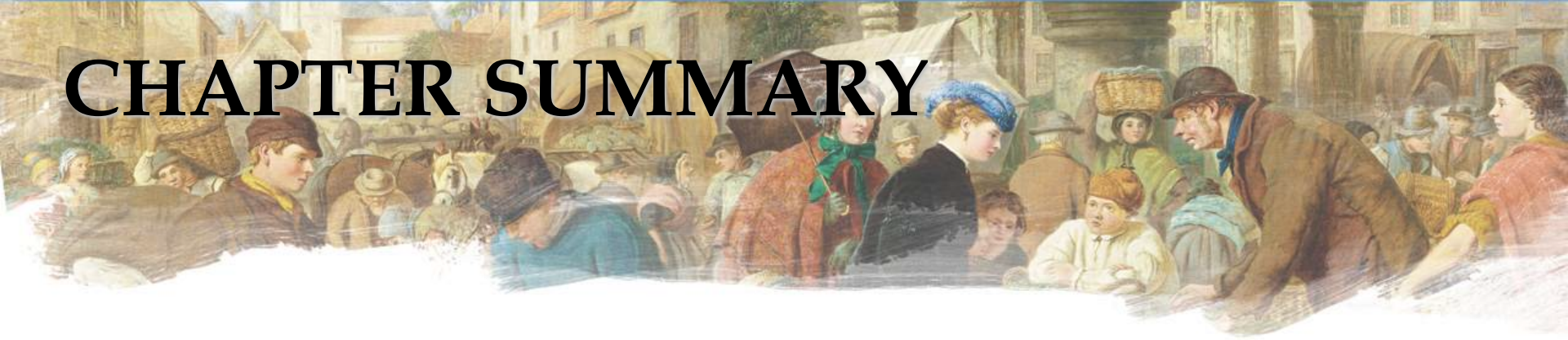
   e = ***P****/***P*** = 720000/24000 = 30 rubles per dollar

CHAPTER SUMMARY

- Net exports equal exports minus imports. Net capital outflow equals domestic residents' purchases of foreign assets minus foreigners' purchases of domestic assets.
- Every international transaction involves the exchange of an asset for a good or service, so net exports equal net capital outflow.

CHAPTER SUMMARY

- Saving can be used to finance domestic investment or to buy assets abroad. Thus, saving equals domestic investment plus net capital outflow.
- The nominal exchange rate is the relative price of the currency of two countries.
- The real exchange rate is the relative price of the goods and services of the two countries.



CHAPTER SUMMARY

- According to the theory of purchasing-power parity, a unit of any country's currency should be able to buy the same quantity of goods in all countries.
- This theory implies that the nominal exchange rate between two countries should equal the ratio of the price levels in the two countries.
- It also implies that countries with high inflation should have depreciating currencies.