

CHAPTER 2: THE DATA OF MACROECONOMICS

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AGGREGATE STATISTICS

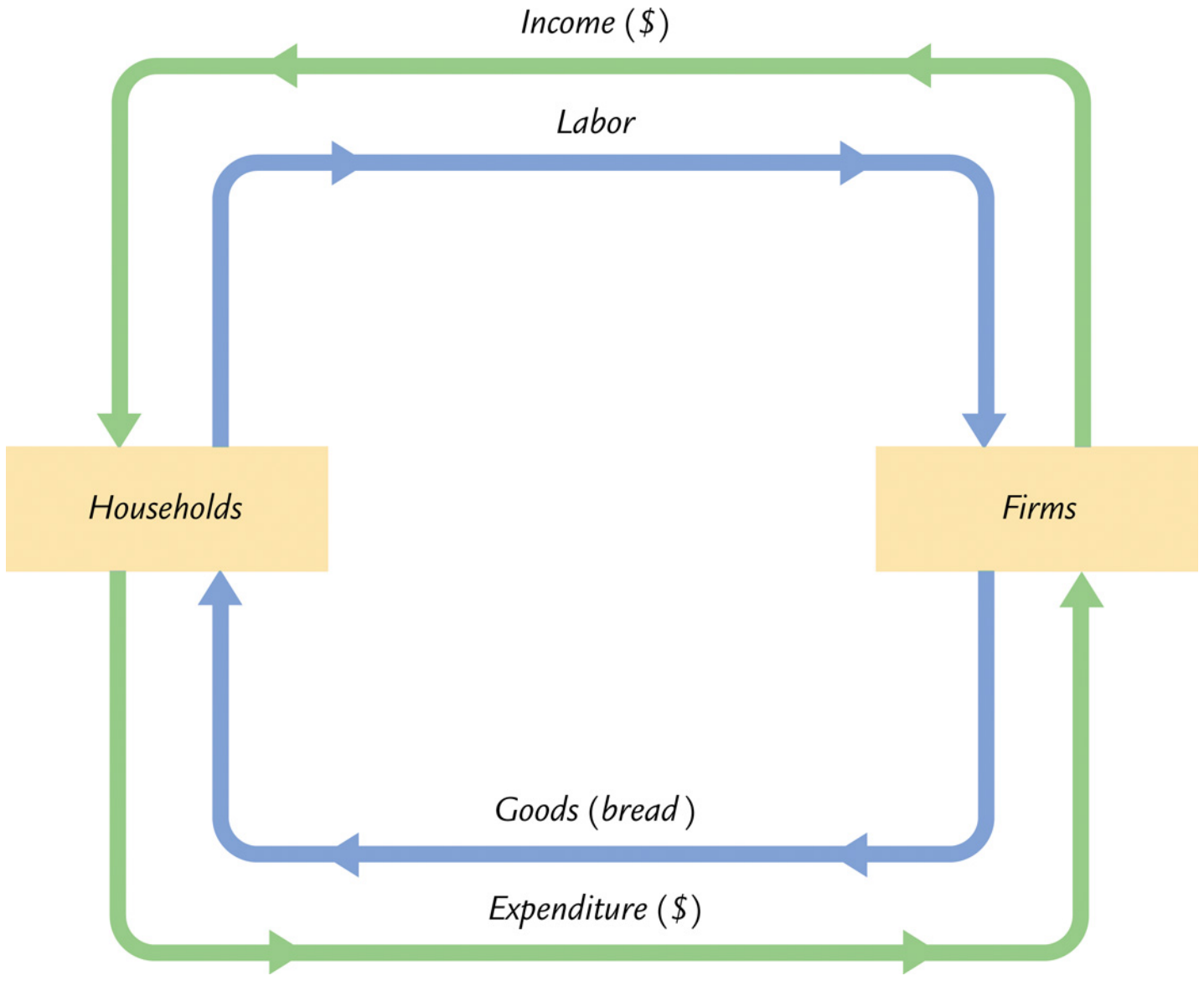
Throughout the course we will care about:

- Gross Domestic Product (GDP)
- The level of prices—consumer price index (CPI), and the GDP deflator, and the changes in the level of prices (inflation)
- Unemployment rate

GDP

GDP reflects a single money value of economic activity.

GDP is the value of final goods and services produced in the economy during a pre-specified period of time (usually quarter/year)



THE CIRCULAR FLOW DIAGRAM

The circular flow diagram tells us that:

- The value of goods produced in the economy =
 - Total income in the economy (Profits+Wages) =
 - Total expenditures on goods produced in the economy
- ★ Thus, GDP also measures the total income created in the economy, and the total expenditures on the goods produced in the economy

GDP AND GNP

Note that GDP includes the value of goods produced by employing foreign labor force and capital.

To have a better gauge of income earned by domestic households, we calculate the Gross National Product (GNP).

To obtain GNP, we need to add (to GDP) income from the value of goods produced by domestic residents abroad, and subtract income earned by foreigners while producing domestic goods.

GNP

So...

$GNP = GDP -$

(Income of Foreigners Earned Domestically - Income of Residents Earned Abroad) =

$GDP - \text{Net Foreign Income}$

RULES FOR COMPUTING GDP

- GDP is the value...

If we produce goods X and Y , and good X costs P_X and good Y costs P_Y dollars, then $GDP = P_X \times Q_X + P_Y \times Q_Y$

- ...of final goods and services

We do not include the value of intermediate goods in GDP since it is accounted for while pricing the final goods.

RULES FOR COMPUTING GDP—CONTD.

- ...produced
The value of unsold but produced goods are included into GDP. Goods stored by firms are counted as inventories and included into investment. When sold in another year, investment becomes negative and spending positive, and GDP next year is unaffected.
- ...during a quarter/year
We do not include transactions that involve resales of goods produced previously (e.g., garage sales).
- ...in the economy. We do not include the value of imports purchased by domestic residents (imported cars, computers, etc.)

REAL AND NOMINAL GDP

- GDP measured at current year prices is called nominal GDP.
- GDP measured at the base year (fixed) prices is called real GDP.
- Real GDP is a better measure of the overall economic well-being since its value is not dependent on the fluctuations in the economy's prices.

REAL GDP: EXAMPLE

Want to measure GDP in years 2005 and 2006. Two goods produced in the economy: oil and maple syrup.

BASE YEAR 2005:

REAL GDP IN 2005=NOMINAL GDP IN 2005=P OF MAPLE SYRUP IN 2005×Q OF MAPLE SYRUP IN 2005 + P OF OIL IN 2005×Q OF OIL IN 2005

REAL GDP IN 2006=P OF MAPLE SYRUP IN 2005×Q OF MAPLE SYRUP IN 2006 + P OF OIL IN 2005×Q OF OIL IN 2006

BASE YEAR 2006:

REAL GDP IN 2005=P OF MAPLE SYRUP IN 2006×Q OF MAPLE SYRUP IN 2005 + P OF OIL IN 2006×Q OF OIL IN 2005

REAL GDP IN 2006=NOMINAL GDP IN 2006=P OF MAPLE SYRUP IN 2006×Q OF MAPLE SYRUP IN 2006 + P OF OIL IN 2006×Q OF OIL IN 2006

EXPENDITURE COMPONENTS OF GDP

The National Accounts Identity:

$$GDP = C + I + G + X - IM,$$

where C are consumer's expenditures on goods and services

I are investment expenditures of firms/households (e.g., inventories, residential structures, equipment)—purchases of goods used for production of other goods

G are expenditures of government (e.g., military expenses, police, highways)

IM are expenditures on imported goods. Included in C , and so is subtracted

X are foreigners' expenditures on goods produced domestically

MEASURES OF THE COSTS OF LIVING: CPI

Consumer Price Index (CPI) measures the cost of a representative basket of goods in current year prices relative to the cost of the same basket in the base year.

Statistics Canada surveys households and defines the representative basket of goods.

Example. If Q of maple syrup is 10 in 2005, and 20 in 2006; and Q of oil is 20 in 2005 and 5 in 2006, and the base year is 2005, then

$$\text{CPI}_{2006} = \frac{(2006 \text{ P of oil} \times 20 + 2006 \text{ P of syrup} \times 10)}{(2005 \text{ P of oil} \times 20 + 2005 \text{ P of syrup} \times 10)}$$

MEASURES OF THE COSTS OF LIVING: THE GDP DEFLATOR

$$\begin{aligned} \text{GDP Deflator} &= \\ \text{Nominal GDP/Real GDP} &= \\ (P \times Q) / (P_{base} \times Q) &= P / P_{base} \end{aligned}$$

The GDP deflator measures the price of all goods produced in one year relative to the baseline prices of these goods.

DIFFERENCES BETWEEN GDP DEFLATOR AND CPI

- CPI accounts for changes in prices of the goods included in the basket, while the GDP deflator accounts for changes in prices of all goods produced in the economy
- The GDP deflator measures the prices of goods produced only domestically
- In CPI, prices are weighted by the same weights (the same basket); GDP deflator uses different weights in different years (e.g., zero weight to maple syrup in 2005 if it is not produced in 2005), and thus is based upon different composition of goods in different years

MEASURES OF INFLATION

Define inflation to be the percentage change in the overall level of prices in the economy.

Two measures of inflation (measured in percent):

- Inflation at time $t = 100 \times (\text{GDP Deflator in year } t - \text{GDP Deflator in year } t - 1) / (\text{GDP Deflator in year } t - 1)$
- Inflation at time $t = 100 \times (\text{CPI in year } t - \text{CPI in year } t - 1) / (\text{CPI in year } t - 1)$

Note that, by definition of the GDP deflator and CPI, inflation defined using the deflator will measure the percentage changes in prices of all the goods produced in year t and year $t - 1$ (not necessarily the same goods in different years); while inflation defined by the CPI measures the percentage changes in prices of the same basket of goods.

UNEMPLOYMENT RATE

Define:

- Unemployed as those who are currently not working but are looking for work; temporarily laid off or waiting to commence a job.
- The total labor force (LF) as the sum of employed and unemployed population in the economy.
- Unemployment rate = $(\text{Number of Unemployed} / \text{Labor Force}) \times 100$
- Labor Force Participation Rate = $(\text{Labor Force} / \text{Adult Population}) \times 100$

Practice: Exercises 6 and 7 in the end of Chapter 2.