

# CHAPTER 2

## THE DATA OF MACROECONOMICS

### Objectives:

- To review the principal measures of **aggregate economic activity**;
- To review the distinction between **real** and **nominal** GDP and the calculation of the ***GDP deflator***.

# I. Measuring Aggregate Economic Activity.

- There are **two** traditional measures of aggregate economic activity:
  - **GDP** (Gross *Domestic* Product) = the value of all final goods and services produced in Canada over some period.
  - **GNP** (Gross *National* Product) = the value of all final goods and services produced in Canada, or elsewhere, by Canadian-owned resources over some period.

□ 
$$\text{GDP} = \text{GNP} + \text{foreign incomes earned from production in Canada} - \text{Canadian incomes earned from production abroad}$$

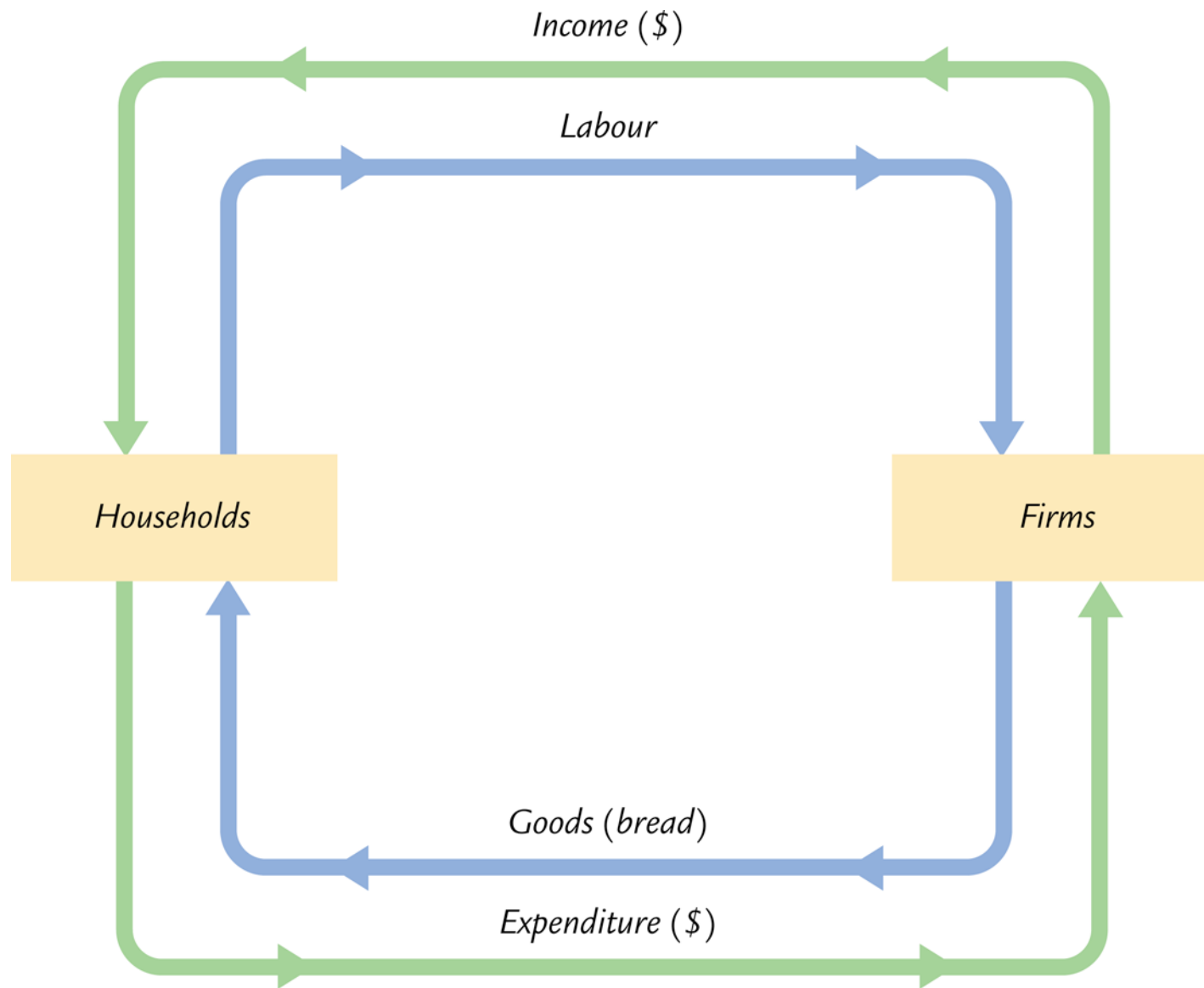
Note: In 2005, Canadian GNP was 1.7% less than GDP

➤ **GDP** is the best measure of **domestic economic activity** but **GNP** is a better measure of the total value of **Canadians' incomes**.

## 2. Three approaches to calculating GDP.

□ GDP measures each of:

- total **output** of final goods and services produced in Canada;
- total **income** generated by production of output in Canada;
- total **expenditure** on final goods and services produced in Canada.



**Figure 2.1** The Circular Flow

Mankiw and Scarth: Macroeconomics, Canadian Third Edition

Copyright © 2008 by Worth Publishers

### 3. Some rules in calculating GDP by measuring output.

#### 1. Adding apples and oranges:

⇒ multiply quantities by prices and add dollar values.

#### 2. Intermediate goods:

⇒ to avoid **double counting**, exclude and count only **final** goods and services (or sum **value added** at each stage of production.)

#### 3. Inventories:

⇒ since we measure production ⇒ add increase in inventories (treated as “expenditure” on output by producer.)

## 4. Imputations:

If goods do not have prices  $\Rightarrow$  use imputed value

- imputed rent on owner-occupied housing
- government services - valued at cost.

## 5. Exclusions from GDP:

- used goods
- home production;
- underground economy;
- services of durable goods (fridge);
- environmental effects of production.

## II. Real and Nominal GDP.

- **Nominal GDP** = output valued at *current-period* prices:

$$\sum_i P_{2009}^i Q_{2009}^i$$

- where:  $P_{2009}^i$  = price of  $i$ th good in 2009;  
 $Q_{2009}^i$  = quantity of  $i$ th good in 2009
- Nominal GDP measures the **value** of goods and services produced in Canada.

- **Real GDP** = output valued at *constant (base year, 2002)* prices:

$$\sum_i P_{2002}^i Q_{2009}^i$$

- Where:  $P_{2002}^i$  = price of  $i$ th good in 2002;  
 $Q_{2009}^i$  = quantity of  $i$ th good in 2009
- Real GDP measures the ***volume*** of goods and services produced in Canada.

### III. The GDP Deflator

1. **Def.** *The GDP deflator is a price index which measures the average price of output relative to its level in the base year.*

#### 2. Calculation of GDP Deflator:

➤ **GDP deflator =  $\frac{\text{Nominal GDP}}{\text{Real GDP}}$**

➤ Hence,  
**Nominal GDP = Real GDP x GDP Deflator**

## IV. The Components of Aggregate Expenditure

- **C - consumption:** goods and services bought by consumers
  
- **I - investment:** goods bought for future use:
  - 📁 business fixed investment
  - 📁 residential investment
  - 📁 inventory investment

### Exclude:

- existing things (purchase of an existing factory)
- claims to existing things (stocks and bonds).

- **G - government purchases** of goods and services, all levels of government

Exclude:

-govt spending on transfer payments e.g. CPP benefits, EI benefits, welfare.

- **NX - net exports** = exports - imports.

□ **National Accounts Identity:**

$$Y \text{ 📦 } C + I + G + NX \quad (Y = \text{GDP})$$

- Note: Output is identically equal to **actual** expenditure because goods produced and put into inventory for future sale are treated as being “purchased” by the producer.

TABLE 2-1

**GDP and the Components of Expenditure: 2005**

	Total (billions of dollars)		Per Person (dollars)
<b>Gross Domestic Product</b>	<b>\$1,368.7</b>		<b>\$42,414</b>
<b>Consumption</b>	<b>762.0</b>	<b>(55.7%)</b>	<b>23,613</b>
Durables and nondurables	354.0		10,970
Services	408.0		12,643
<b>Investment</b>	<b>254.4</b>	<b>(18.6%)</b>	<b>7,883</b>
Business fixed investment (factories, machinery)	155.3		4,813
Residential construction	89.6		2,777
Inventory investment	9.5		294
<b>Government Purchases</b>	<b>297.5</b>	<b>(21.7%)</b>	<b>12,318</b>
<b>Net Exports</b>	<b>54.8</b>	<b>(4.0%)</b>	<b>1,698</b>
Exports	518.8		16,077
Imports	464.0		14,379

Source: Statistics Canada, *National Income and Expenditure Accounts*,  
<http://www40.statcan.ca/01/cst01/econ04.htm>

**Table 2.1**

Mankiw and Scarth: Macroeconomics, Canadian Third Edition  
 Copyright © 2008 by Worth Publishers

## V. Various Measures of Income.

- The principal measure of aggregate income is **National Income** which can be derived from GDP in three steps as follows:

1. **GNP** = GDP - Net Income of Foreigners.

- Why subtract net income of foreigners? Because we wish to calculate **Canadian** income.

2. **NNP (Net National Product)** = GNP - depreciation.

- Why subtract depreciation? Capital gets used up in the production process. That's a cost of production which does **not** result in **income** to the factors of production.

### 3. **National Income** = NNP - Indirect Business Taxes (e.g. GST, PST)

- Why subtract indirect business taxes? Because firms (or their workers/ shareholders) do not receive indirect taxes as **income**.

#### □ **Composition of National Income in 2005:**

- compensation of employees - 67%
- corporate profits - 19%
- nonincorporated business income - 7% (includes imputed rent!)
- net interest - 7%.