

CHAPTER 25

Measuring and Describing the Aggregate Economy

Chapter Goals

- Calculate GDP using the expenditures and value-added approaches.
- Calculate aggregate income and explain how it relates to aggregate production.
- Distinguish real from nominal concepts.
- Describe the limitations of using GDP and national income accounting.

Aggregate Accounting

Aggregate accounting (or national income accounting) is a set of rules and definitions for measuring economic activity in the economy as a whole.

Aggregate accounting is a way of measuring total, or aggregate production, expenditures, and income.

Gross domestic product (GDP) is the total market value of all final goods and services produced in an economy in a one-year period.

Calculating GDP

- Calculating GDP requires adding together millions of different services and products.
- All of the quantities of goods and services produced are multiplied by their market price per unit to determine a value measure of the good or service.
- This is weighting the importance of each good by its price.
- The sum of all of these values is GDP.

The Components of GDP

GDP is divided into four expenditure categories:

1. **Consumption (C)** is spending by households on goods and services.
2. **Investment (I)** is spending for the purpose of additional production.
3. **Government spending (G)** is goods and services that government buys. Transfer payments are not included (Social Security, etc.)
4. **Net exports** is spending on **exports (X)** minus spending on **imports (M)**.

The Components of GDP

Since all production is categorized into one of these four divisions, by adding up these four categories, we get total production of U.S. goods and services

$$\begin{aligned}\text{GDP} = & \text{Consumption} \\ & + \text{Investment} \\ & + \text{Government spending} \\ & + \text{Net exports}\end{aligned}$$

$$\text{GDP} = C + I + G + (X - M)$$

Expenditure Breakdown of GDP

Country	GDP (billions \$)	= C (%)	+ I (%)	+ G (%)	+ X (%)	- I (%)
U.S.	19,485	69	17	17	12	15
China	25,240	39	44	15	20	18
Germany	4,370	53	20	17	47	40
Japan	5,620	56	24	20	16	15
Mexico	2,570	65	24	12	37	39
Nigeria	1,170	79	15	7	13	14
Poland	1,190	59	20	18	54	50

GDP is a Flow Concept

GDP is a *flow* concept, the market value of total final output a country produces per year.

Wealth accounts are a balance sheet of an economy's assets and liabilities and it is a *stock* concept.

GDP Measures Final Output

GDP does not measure total transactions in the economy.

It counts final output, but not intermediate goods.

- **Final output** is goods and services purchased for final use.
- **Intermediate products** are used as an input in the production of some other product.

Counting the sale of both final and intermediate goods would result in double counting.

Two Ways of Eliminating Intermediate Goods

Calculate only final output.

- A firm would report how much it sold to consumers and how much it sold to producers (intermediate goods).

Follow the value added approach.

- **Value added** is the increase in value that a firm contributes to a product or service.
- It is calculated by subtracting intermediate goods (the cost of materials that a firm uses to produce a good or service) from the value of its sales.

Value Added Approach Example: Ice Cream Production

Participants	Cost of Materials (\$)	Value of Sales (\$)	Value Added (\$)
Farmer	0	100	100
Cone factory and ice cream maker	100	250	150
Middleperson (final sales)	250	400	150
Vendor	400	500	100
Totals	750	1,250	500

What Is Counted in GDP?

Not Counted	Counted
• Secondhand sales	• Value added by a used car dealer
• Sales of stocks or bonds	• Commissions paid to stock brokers
• Government transfer payments	
• Work of house-spouses	

Gross and Net Concepts

Net domestic product (NDP) is GDP adjusted for depreciation.

Depreciation is the amount of capital used up in producing that year's GDP.

NDP measures output available for purchase.

$$\mathbf{NDP = C + I + G + (X - M) - depreciation}$$

Net Investment is gross investment minus depreciation.

National and Domestic Concepts

GDP is the total value of all final goods and services produced in an economy in a one-year period.

- GDP is output produced within a country's borders.

Gross National Product (GNP) is the aggregate final output of citizens and businesses of an economy in one year.

- GNP is output produced by a country's citizens.
- $GNP = GDP + \text{Net foreign factor income}$

Net foreign factor income is the income from foreign domestic factor sources minus foreign factor income earned domestically.

Calculating Aggregate Income

Aggregate income is the total income earned by citizens and businesses in a country in a year.

Aggregate income consists of:

- Employee compensation
- Rent
- Interest
- Profits

Aggregate income = Employee compensation +
Rents + Interest + Profits

Equality of Aggregate Income and Aggregate Production

Whenever a good or service is produced (output), somebody receives an income for producing it.

Aggregate Income $\equiv$ Aggregate Production

Profit is what remains after all the firm's other income (employee compensation, rent and interest) is paid out.

This aggregate accounting identity allows us to calculate GDP either by adding up all values of final outputs (C, I, G, net exports) or by adding up the values of all earnings or income.

As globalization has expanded, net exports have become increasingly important.

National Income Equality

Output	Income
Consumption	Employee Compensation
Investment	Rent
Government Spending	Interest
Net Exports	Profit

Inflation: Distinguishing Real from Nominal

Inflation is a continual rise in the overall price level.

Price Index is a measure of the composite price of a specified group of goods.

Nominal GDP is the amount of goods and services produced measured at current prices.

Real GDP is the total amount of goods and services produced, adjusted for price-level changes.

Real versus Nominal GDP

GDP deflator is the price index that includes all goods and services in the economy expressed relative to a base year of 100.

Example: GDP rises 10%, from \$16 trillion to \$17.6 trillion. How much of that 10% is real?

If prices have risen 5%, that means the GDP deflator has increased from 100 to 105 (100 + 5).

Real GDP = $\$17.6 \div 105 \times 100 = \16.76 trillion

Other Real-World Price Indexes

Consumer Price Index (CPI) measures the prices of a fixed basket of goods, weighted according to each component's share of an average consumer's expenditures.

Personal Consumption Expenditure Deflator (PCE) is a measure of prices of goods that consumers buy that allows yearly changes in the basket of goods that reflect actual consumer purchasing habits.

Producer Price Index (PPI) is an index of prices that measures the average change in the selling prices received by domestic producers of goods and services over time.

Other Real and Nominal Distinctions

Nominal interest rate is the rate you pay or receive to borrow or lend money.

Real interest rate is the nominal interest rate adjusted for inflation.

Real wealth is the value of the productive capacity of the assets of an economy measured by the goods and services it can produce now and in the future.

Nominal wealth is the value of those assets measured at their current market prices.

Asset price inflation is a rise in the price of assets unrelated to increases in their productive capacity.

Some Limitations of Aggregate Accounting

Per capita GDP can be misused in comparing various countries' living standards.

Because of differences in nonmarket activities and difference in product prices, per capita GDP may be a misleading measure of living standards.

Purchasing power parity is a method of comparing income that takes into account the different relative prices among countries.

Some Limitations of Aggregate Accounting

GDP measures neither happiness nor economic welfare

Measurements inflation can involve significant measurement errors.

Possible misinterpretation of the components.
For example, the line between consumption and investment may be unclear.

Some Limitations of Aggregate Accounting

Measurement is necessary, and the GDP measurements and categories have made it possible to think and talk about the aggregate economy.

The **genuine progress indicator (GPI)** makes a variety of adjustments to GDP to better measure the progress of society rather than just economic activity.

The GPI includes social goals such as pollution reduction, education, and health.

Chapter Summary (1 of 4)

Aggregate accounting is a set of rules and definitions for measuring economic activity in the aggregate economy.

GDP is the total market value of all final goods and services produced in an economy in one year.

GDP is divided up into four types of expenditures: $\text{GDP} = \text{Consumption} + \text{Investment} + \text{Government spending} + \text{Net exports}$

Intermediate goods can be eliminated from GDP in two ways: 1. By measuring only final sales. 2. By measuring only value added.

Chapter Summary (2 of 4)

Net domestic product = GDP – depreciation.

GNP describes the economic output produced by the citizens of a country.

Aggregate income = GDP = Compensation of employees + Rent + Interest + Profit

The stock equivalent of the national income accounts is the national wealth accounts.

Aggregate income equals aggregate production because whenever a good is produced, somebody receives income for producing it, and profit is key to that equality.

Chapter Summary (3 of 4)

The United States has a trade deficit. Total spending by U.S. citizens is greater than production in the United States.

To compare income over time, we must adjust for price-level changes. After adjusting for inflation, nominal measures are changed to “real” measures.

$$\text{Real GDP} = \text{Nominal GDP} \div \text{GDP deflator} \times 100$$

The percentage change in real GDP equals the percentage change in nominal GDP minus inflation.

Chapter Summary (4 of 4)

Inflation is a continual rise in the price level.

To compare income over time, we must adjust for price-level changes and obtain “real” measures using either CPI, PPI, PCE deflator or GDP deflator.

Real interest rate = Nominal interest rate – Inflation

GDP has its problems:

- It is difficult to compare across countries.

- GDP does not measure economic welfare.

- It does not include transactions in the underground economy.