



Chapter 7: National Income and Product Accounts

Learning Objectives

After studying this chapter, you should be able to:

- 7.1 Explain national income accounting and its purpose
- 7.2 Describe gross domestic product
- 7.3 Outline the two main methods used to measure it
- 7.4 List the components of the income approach
- 7.5 List the components of the expenditure approach
- 7.6 Compare income and expenditure shares in GDP
- 7.7 Discuss GDP by province and territory
- 7.8 Explain related national income concepts
- 7.9 Use price indexes to adjust GDP for inflation and deflation
- 7.10 Evaluate GDP as an indicator of economic well-being

Assess Your Knowledge

1. What is the name of the federal government agency that is responsible for collecting and publishing statistics for Canada?
2. Indicate whether each of the following is true (T) or false (F):
 - a. Imported goods are a part of Canada's gross domestic product because they increase our standard of living
 - b. Exports must be subtracted from Canada's gross domestic product because the goods are sent out of the country
 - c. Ontario is the largest producer of Canada's output
 - d. A family is necessarily better off if it receives more income

National Income Accounting

LO 7.1 Explain national income accounting and its importance

National income accounting

Just as individuals track their income and expenses and businesses monitor revenues and costs, governments need a system to measure the performance of the overall economy. This is the purpose of national income accounting, the process of collecting and organizing data on total output, income, and spending within a country. It provides a comprehensive snapshot of economic activity and serves as a vital tool for assessing the economy's health over time. Through national income accounting, policymakers, economists, and analysts can evaluate trends, compare growth rates, and make informed decisions based on the state of the economy.

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national income accounting the process of collecting, measuring, and recording data on the economy's output

A special federal government agency is responsible for collecting and publishing national income statistics. This agency is **Statistics Canada**, or *Statcan*, for short.

Statistics Canada the federal government agency responsible for collecting and publishing national economic and social statistics

Importance of National Income Statistics

National income accounts offer key insights into the pattern and direction of economic activity. They help answer questions such as how much output has changed from year to year and what

Reading Comprehension

1. What is national income accounting, and which government agency has the responsibility for Canada's national income accounting?
2. What is the importance of national income statistics?

the current growth rate is in the production of goods and services. These figures are vital for economists and researchers aiming to understand broader economic and social trends. They also serve as a foundation for policymakers in government and business, who rely on accurate data to shape informed economic strategies. In Canada, national income statistics are among the

most widely monitored indicators of economic performance.

The Output of a Country

LO 7.2 Explain the concept of gross domestic product

Output and Standard of Living

A country's standard of living can be measured in different ways. One option is to survey individuals and construct an index based on their responses. Still, total production of goods and services is widely used as a proxy for overall economic well-being. This measure, officially called gross domestic product (GDP), is defined as the market value of all final goods and services produced within the economy over a specific period, typically one year.

gross domestic product (GDP) the market value of all final goods and services produced in an economy during a specific period

Key Points in the Definition of GDP

There are several important points in the definition of GDP. First, GDP is a flow variable, not a stock. It measures output produced during a given year, not the total inventory of goods at a single point in time. Second, GDP is expressed in monetary terms. The Canadian economy produces a large variety of goods and services annually. How do we add all these millions of different goods and services to arrive at a single number that indicates total output? We do it by using money as a common denominator and adding the value in monetary terms of all the items produced during the year. That is the meaning of the term market value in our definition. Imagine that you went grocery shopping and you bought 50 items. Instead of itemizing the 50 items—one loaf of bread, 1 dozen eggs, 1 litre of orange juice, 2 cans of peas, and so on—as is done on the cash register receipt, you could look at the total cost shown at the bottom. That is exactly how money is used to express the value of all goods and services produced in the economy.

A Simple Example

Let us assume that we are dealing with a very simple economy that produces only 100 000 kg of potatoes, 10 000 shirts, 8000 bottles of grape juice, and 500 bicycles in a year. Let us assume also that potatoes are sold at \$0.50 per kg, shirts at \$10 each, grape juice at \$2 per bottle, and bicycles at \$50 each. The total value of the goods produced in this simple economy (its GDP) would be calculated as in Table 7.1.

Table 7.1 GDP of a Simple Economy

Product/Service	Amount Sold	Average Price	Total Output
Potatoes	100 000 kg	\$0.50	\$50 000
Shirts	10 000 items	\$10.00	\$100 000
Grape juice	8000 bottles	\$2.00	\$16 000
Bicycles	500 items	\$50.00	\$25 000
TOTAL			\$191 000

Thus, the GDP for this economy would be \$191 000.

Avoiding Double Counting

In adding the value of all goods and services produced in a year, we want to make sure that we

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count each good or service once and only once. The error that would be made by **including** an item more than once when measuring GDP is called **double counting**.

double counting *counting an item more than once when measuring GDP*

An Example of Double Counting

The following example illustrates how double counting could arise. Suppose that farmers produce \$60 million worth of wheat. The farmers then sell the wheat to flour mills. The flour mills produce flour, which they sell to bakeries for \$100 million. The bakeries produce bread, which they sell to retail grocery outlets for \$150 million. Table 7.2 illustrates the process. If we add the value of production at each stage, we arrive at a total of \$490 million. This figure, however, overstates total output because of double counting. The flour, for example, was made from \$60 million worth of wheat that has already been counted. The flour mills therefore contributed only \$40 million. Similarly, the \$150 million worth of bread sold by the bakeries contains \$100 million worth of flour already recorded in the output of the flour mills, so the bakeries added only \$50 million. The difference between output and the cost of intermediate goods is called value added. In other words, the value added by the flour producers is \$40 million, and the value added by the bakeries is \$50 million.

value added the difference between the value of the output and the cost of the inputs

Avoiding Double Counting

The wheat bought by the flour mills and the flour bought by the bakeries are called intermediate products—outputs of one firm or industry used as inputs by others. The bread sold by retail grocers is a final product, intended for consumption by the end user rather than for resale or further processing.

intermediate products *the outputs of one firm or industry that are used as inputs by other firms or industries*

final product *a good or service intended for final use and not intended for resale or further processing*

Table 7.2 Value Added in Production

	Value of Product	Value Added
Production	(\$ mil)	(\$ mil)
Wheat production	60	60
Flour production	100	40
Bread production	150	50
Sales by retail outlets	180	30
TOTAL	490	180

Table 7.2 shows the difference between the total value of output and the value added at each production stage. Although the total sales amount to \$490 million, only \$180 million represents newly created value. The remainder reflects the cost of intermediate goods—wheat, flour, and bread—that were used in later stages. To avoid double counting, GDP includes only final output, or the value added at each stage. This method captures the actual contribution of each sector to the economy.

If we include the values of both intermediate and final products in our computation of GDP, we would be counting some output more than once.

Therefore, to avoid double counting, we must calculate only the value added at each stage of production or the total value of the final products. That’s why the definition of GDP includes the phrase “final goods and services.”

Treatment of Non-productive Transactions

GDP measures the value of current production, not current sales. Thus, purely financial transactions that do not reflect current production are excluded from GDP. Examples of **non-productive** transactions include government transfer payments, private transfer payments, and the purchase or sale of securities, such as corporate bonds. Government transfer payments are payments made by the government that do not represent compensation for productive services. Examples include employment insurance benefits, welfare, Old Age Security, and student grants. Private transfer payments involve the transfer of purchasing power between individuals or groups without any exchange of goods or services. A scholarship from a private foundation or an allowance from a parent to a child are examples.

***private transfer payments** transfers of purchasing power from one individual or group to another for which no goods and services are produced*

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government transfer payments payments made by the government that do not represent payments for productive services (e.g., employment insurance payments, welfare payments, old age security payments)

Such transfers are not included in GDP because they do not represent payments for goods and services produced. The buying and selling of stocks (shares) and bonds are **also excluded** because these transactions merely involve the exchange of financial instruments—claims to ownership or debt—between individuals. They do not represent **any contribution to current production**.

Used Goods and GDP

If we focus on what national income accounting measures, the answer becomes clear. GDP reflects the value of goods and services produced during a specific period. **Only items produced within the given year are counted**. For example, if a new car is manufactured and sold in 2024, its value is included in the 2024 GDP. **If that same car is resold in 2025, the resale is excluded**. Including the sale of used goods would result in **double counting**.

BUSINESS SITUATION

7.1

A Canadian manufacturer of automobile tires sells its products from coast to coast. It is now planning its production levels for the coming year.

How can national income accounting figures help with the production decision?

Measuring the Total Output of an Economy

LO 7.3 Explain the two major approaches to measuring GDP

Measuring Total Output

The total value of goods and services produced in an economy can be measured in two main ways: **by income or by expenditure**. Apart from statistical discrepancies, both methods yield the same result because they measure the same flow of value.

This can be illustrated using a circular flow diagram, like Figure 7.1. In this model, one approach measures the total income earned by those who contribute to production—represented by the

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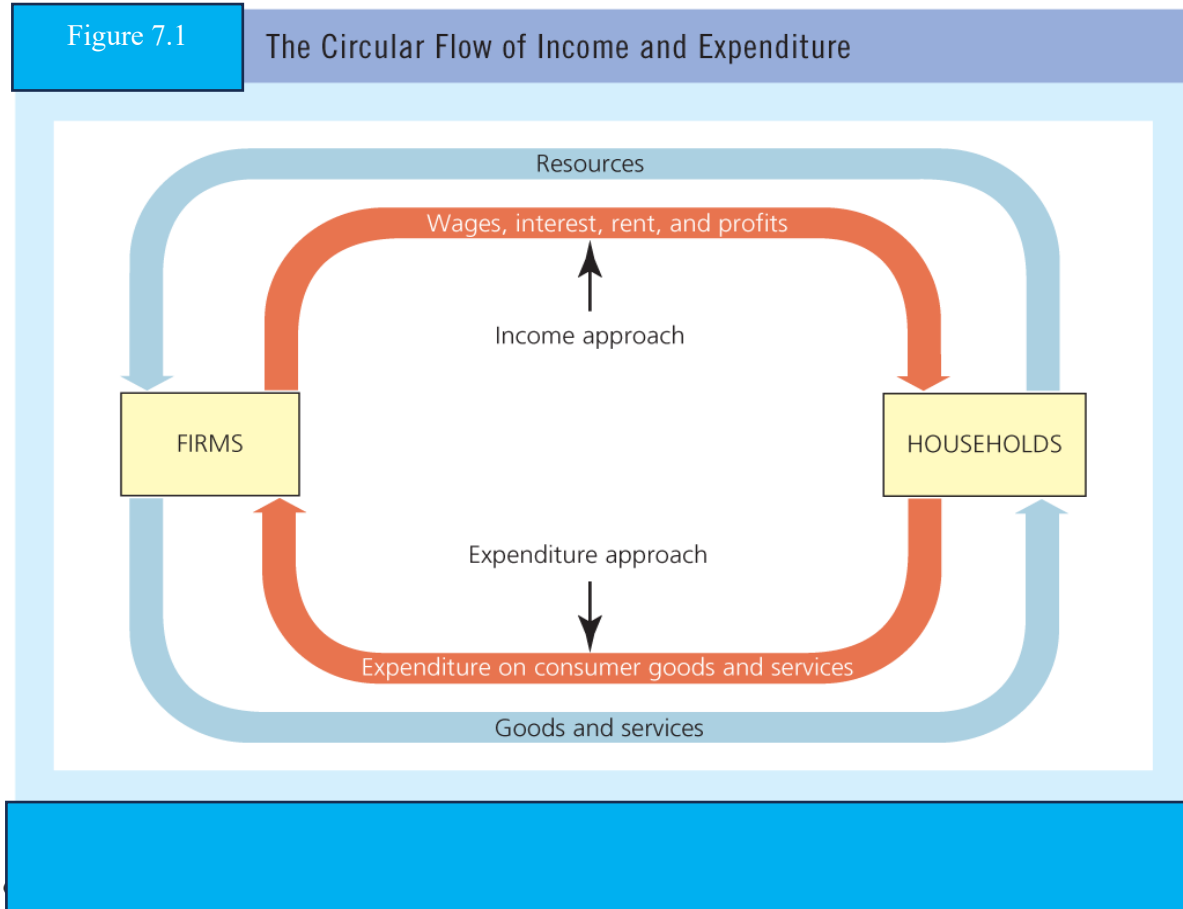
inner flow in the top part of the diagram. It involves adding the incomes received by owners of labour, capital, and other productive resources. This method is called the income approach—a way of calculating GDP based on the total income generated in producing goods and services.

income approach a method of calculating GDP that involves measuring the total income generated in the process of producing the economy's goods and services

Reading Comprehension

1. What is the relationship between the total quantity of goods and services produced by an economy and its standard of living?
2. Define the gross domestic product (GDP) of a country.
3. Give an example of how double counting might occur. How can double counting be avoided?
4. Briefly explain the concept of value added.
7. Why are transfer payments not included in GDP?

Figure 7.1 The Circular Flow of Income and Expenditure



Income Approach

If a person earns an annual salary of \$30,000, then this person's labour services contribute \$30,000 to total output. Thus, the total income earned by the factors of production and received by their owners **equals** the value of goods and services produced.

Alternatively, we can measure the economy's output by calculating the total spending on final goods and services. This corresponds to the inner flow in the bottom section of Figure 7.1. This method is called the expenditure approach—a way of calculating GDP based on total expenditures on the economy's output.

expenditure approach a method of calculating GDP that involves measuring the total amount spent on the economy's total output of goods and services

The logic here is straightforward. If a total of \$500,000 is spent in purchasing the economy's total output of goods and services, then the value of those goods and services must be \$500,000.

Let us examine these two approaches more closely. Every dollar spent on goods and services becomes income for those involved in their production. This leads to the following identity:

Total Expenditure = Total Income = GDP

Reading Comprehension

1. What are the two main approaches to measuring the total output of an economy? What does each approach measure?
2. Explain why total expenditure on the economy's output of goods and services equals the total income generated in producing that output.

The Income Approach

LO 7.4 Identify the main items included in the income approach to measuring GDP

Items in the Income Approach

The incomes derived from labour, land, capital, and entrepreneurship are wages and salaries, rent, interest and dividends, and profits, respectively. The income approach to measuring GDP totals these various types of factor incomes. To reach total GDP, further adjustments are required, which will be explained later. Table 7.3 shows the components of Canada's GDP in 2023 using the income approach.

The income approach adds all forms of income generated during production within the domestic economy. In 2023, compensation of employees reached \$1.2 trillion, the largest share of national income. Gross operating surplus, which covers corporate profits and depreciation, contributed \$800 billion. Gross mixed income, which reflects returns to unincorporated businesses and self-employed workers, amounted to \$400 billion. Governments collected \$300 billion in net taxes on production and imports. A small statistical discrepancy of ±\$10 billion adjusts for data inconsistencies. The resulting GDP at market prices totaled \$2.7 trillion.

Discussion of Income Components in Canada's GDP, 2023

Table 7.3

Table 7.3 Gross Domestic Product, Income-Based, 2023

Component	Value (\$ millions)
Compensation of Employees	1,200,000
Gross Operating Surplus	800,000
Gross Mixed Income	400,000
Taxes less Subsidies on Production and Imports	300,000
Statistical Discrepancy	±10,000
Total GDP at Market Prices	2,700,000

Source: Statistics Canada,
<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610010301>

surplus accrues to capital owners—shareholders and investors—who supply physical capital such as machinery, buildings, and infrastructure. It reflects the return to investment in productive assets.

1. **Compensation of Employees (\$1,200,000 million)**

This category includes all payments to labour. It covers wages, salaries, employer contributions to pension plans, and employment insurance. It reflects the total income received by workers in exchange for their contribution to production. In 2023, this category accounted for the largest share of GDP, which indicates the central role of labour in the Canadian economy.

2. **Gross Operating Surplus (\$800,000 million)**

This component represents income earned by corporations before tax. It includes gross profits and capital consumption allowances. The term “gross” refers to the absence of deductions for depreciation. This

3. **Gross Mixed Income (\$400,000 million)**

This category applies to unincorporated businesses and self-employed individuals. It mixes the returns to both labour and capital because self-employed persons contribute their own labour and use their own capital. For example, a freelance designer or a family-owned farm earns income that combines wage and profit elements. Gross mixed income captures this blended contribution.

Reading Comprehension

1. What are the main items included in the income approach to measuring GDP?
2. How can net domestic product be converted to gross domestic product?

4. **Taxes less Subsidies on Production and Imports (\$300,000 million)**

Governments collect taxes on goods and services produced and imported, including sales taxes, property taxes on businesses, and import duties. Subsidies reduce the tax burden or raise profitability for producers. The net figure—taxes minus subsidies—enters the GDP because it forms part of the value of output at market prices. This

amount does not accrue to households or businesses but goes to government revenue.

5. **Statistical Discrepancy ($\pm \$10,000$ million)**

This figure adjusts for differences between the income and expenditure approaches. It reflects timing mismatches, incomplete data, and reporting errors. Statistics Canada includes it to ensure consistency in the final GDP estimate. The discrepancy does not represent actual income but serves to balance the accounts.

6. **Total GDP at Market Prices (\$2,700,000 million)**

This final figure sums all components to give the total value of goods and services produced within Canada in 2023. Market prices include all costs—factor incomes and taxes—so this measure reflects the full value of domestic production as it reaches final users.

The Expenditure Approach

LO 7.5 Identify the main items included in the expenditure approach to measuring GDP

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The Principle of the Expenditure Approach

If an economy produced only wheat, we could find the value of output by calculating the total amount spent on wheat. The money spent by buyers equals the value of what producers supplied. The same logic applies to the broader economy. **Total spending on goods and**

services equals the value of total production—GDP.

Table 7.4 Gross Domestic Product, Expenditure-Based, 2023

Table 7.4: Gross Domestic Product by Expenditure Approach, Canada, 2023	
<i>(values in millions of Canadian dollars)</i>	
Component	Amount
Household Final Consumption Expenditure	1,400,000
Government Final Consumption Expenditure	700,000
Gross Fixed Capital Formation	600,000
Investment in Inventories	50,000
Exports of Goods and Services	800,000
Less: Imports of Goods and Services	750,000
Statistical Discrepancy	±10,000
Total GDP at Market Prices	2,700,000

Source : <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610010301>

This method groups buyers into four categories:

households, firms, governments, and foreign purchasers.

Table 7.4 shows how Statistics Canada classifies these groups to calculate GDP using the expenditure approach.

Table 7.4 presents GDP based on total spending in the economy. Household final consumption expenditure, at \$1.4 trillion, formed the largest share, reflecting strong domestic demand. Government expenditure reached \$700 billion, indicating substantial public sector activity. Gross

fixed capital formation amounted to \$600 billion, showing high levels of business investment in

machinery, infrastructure, and housing. Inventory investment added \$50 billion, pointing to production exceeding sales.

Exports totaled \$800 billion, while imports reached \$750 billion, resulting in a net export surplus of \$50 billion. The positive trade balance contributed to GDP growth. Together, these components yield a GDP of \$2.7 trillion at market prices in 2023.

[Detailed discussion of the categories](#)

1. Household Final Consumption Expenditure (\$1,400,000 million)

This category covers all spending by households on goods and services for personal use. It includes purchases of food, clothing, transportation, health care, and recreation. Housing services, both rented and imputed values for owner-occupied dwellings, also fall under this category. In 2023, household consumption accounted for the largest portion of GDP, which suggests that domestic consumption remained the primary driver of economic activity.

2. Government Final Consumption Expenditure (\$700,000 million)

This component reflects current spending by all levels of government on goods and services that directly benefit citizens—public education, health care, defence, public administration, and more. It excludes transfers, such as pensions or employment insurance. The size of this category indicates the role of public institutions in delivering services that support household welfare and economic stability.

3. Gross Fixed Capital Formation (\$600,000 million)

Gross fixed capital formation refers to investment in fixed assets that support future production. This includes spending on residential and non-residential construction, machinery, equipment, and intellectual property. A total of \$600 billion in 2023 points to strong investment in long-term productive capacity across sectors—real estate, manufacturing, and digital infrastructure.

4. Investment in Inventories (\$50,000 million)

Inventory investment measures the change in the stock of goods held by businesses. It includes raw materials, work in progress, and finished goods. A positive value indicates that production exceeded sales, which may reflect expectations of higher future demand or temporary slowdowns in consumption. In 2023, inventory accumulation added \$50 billion to GDP.

7. Exports of Goods and Services (\$800,000 million)

Exports represent the value of Canadian goods and services sold to foreign buyers. This includes energy products, automotive goods, agriculture, tourism, and business services. Exports contributed \$800 billion to GDP in 2023, highlighting the importance of international trade to Canada's economic performance.

6. Imports of Goods and Services (–\$750,000 million)

Imports must be subtracted because they represent spending on goods and services produced outside Canada. This category includes consumer goods, industrial machinery, and professional services purchased from abroad. A deduction of \$750 billion in 2023 ensures that GDP reflects only domestic production, not foreign output.

7. Statistical Discrepancy (±\$10,000 million)

This category adjusts for differences between the income and expenditure methods. It reflects limitations in data collection, reporting lags, and classification inconsistencies. The \$10 billion

discrepancy is standard in national accounts and does not reflect any real transaction.

Reading Comprehension

1. What are the main items included in the expenditure approach to measuring GDP?
2. Why are imports entered with a negative sign in the expenditure approach to calculating GDP?
3. What is the role of the *statistical discrepancy* item in the national accounts?

Summary

We can summarize expenditure-based GDP using the symbols introduced earlier. Let **GDPE** represent expenditure-based GDP:

$$\text{GDPE} = C + Ig + G + (X - M)$$

Here, **C** stands for consumption, **Ig** for gross investment, **G** for government expenditure, **X** for

exports, and **M** for imports. GDP measured by income (GDPY) and by expenditure (GDPE) **refer to the same total output**, so the following identity must hold:

$$\text{GDPY} = \text{GDPE}$$

We have already introduced gross investment. **Net investment also exists as a related concept.** Gross investment (**Ig**) refers to the total value of capital produced in a year. By subtracting depreciation, or capital consumption, from gross investment, we obtain **net investment (I)**.

If **I** represents net investment and **D** represents depreciation, then:

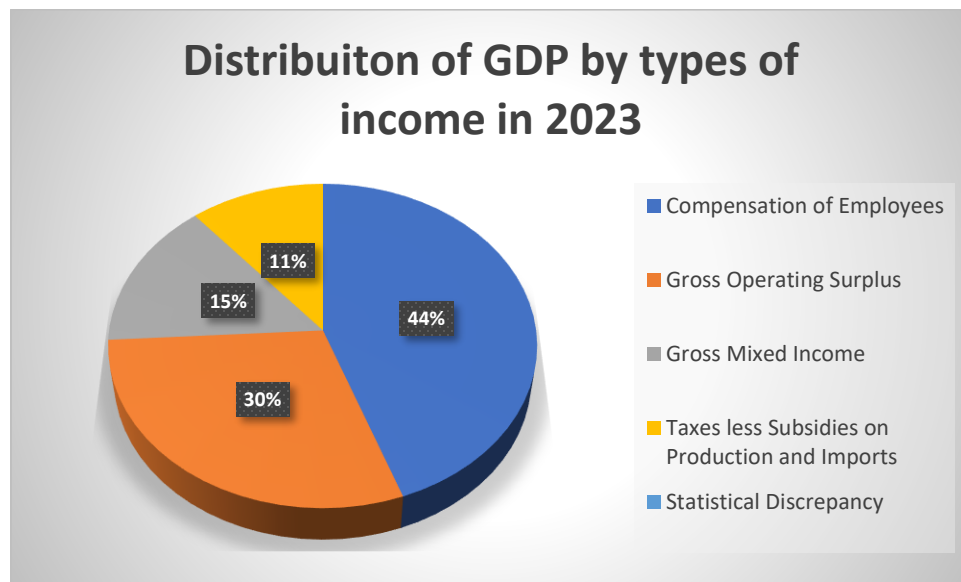
$$I_g - I = D$$

This equation shows the link between gross and net investment.

Income and Expenditure Shares in the GDP

LO 7.6 Discuss the shares of income and expenditure in the gross domestic product

Diagram A: Income shares



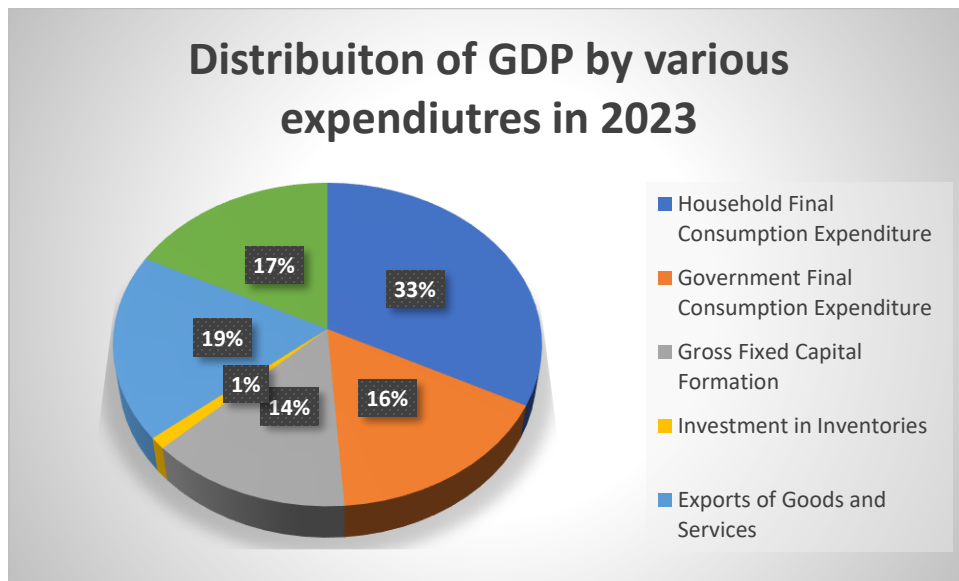
Source: [Statistics Canada](#), Table 36-10-0238-01 — Gross domestic product (GDP) at market prices, income-based, quarterly (seasonally adjusted at annual rates), 2023.

The pie chart shows the income shares in Canada's GDP for 2023. Compensation of employees made up the largest share, followed by gross operating surplus and gross mixed income. Taxes less subsidies accounted for a smaller portion, and the statistical discrepancy was minimal. The chart highlights the central role of labour income in the economy.

Diagram B presents the expenditure components of Canada's GDP in 2023. Household final consumption formed the largest share, highlighting the central role of consumer spending in driving the economy. Government consumption followed, reflecting public expenditure on services like health care and education.

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Diagram B: Expenditure shares



Source: [Statistics Canada](#), Table 36-10-0238-01 — Gross domestic product (GDP) at market prices, income-based, quarterly (seasonally adjusted at annual rates), 2023.

Gross fixed capital formation made up a substantial portion, indicating strong investment in buildings, machinery, and infrastructure. Inventory investment and net exports each contributed smaller shares, while the statistical discrepancy remained minimal, confirming consistency in expenditure data. The chart underscores the importance of domestic demand—both private and public—in shaping national output.

The Provincial Accounts

LO 7.7 Discuss the provincial and territorial gross domestic product

When we add up the GDP of all provinces and territories, we get a number slightly smaller than the total GDP of Canada. For example, in 2023, the sum of provincial GDPs was about \$2.41 trillion, while the official national GDP was \$2.7 trillion. Why the difference?

The main reason is that Statistics Canada uses different methods and price concepts to report these figures.

1. **Provincial and Territorial GDPs**

These are usually reported at basic prices, which include the value of production from businesses but exclude product taxes and subsidies. They measure how much each region produces, regardless of taxes paid or government transfers received.

2. **National GDP**

This is reported at market prices, which include taxes on products (like sales taxes) and subtract subsidies. It also includes the value of exports (goods and services sold abroad) and subtracts imports (goods and services bought from other countries). This gives a more complete picture of the economy as a whole.

So, the gap—about \$290 billion in 2023—comes mainly from two things:

- Net taxes on products and imports, which are counted at the national level
- Net exports, which affect national income but are not assigned to specific provinces

In short, the sum of provincial GDP shows what Canada produces region by region, while the national GDP includes taxes and international trade, giving the full value of what Canadians earn and spend.

Table 7.5

Table 7.5: Provincial and Territorial GDP at Market Prices, Canada, 2023	
Province/Territory	GDP at Market Prices (millions)
Newfoundland and Labrador	\$37,000
Prince Edward Island	\$8,500
Nova Scotia	\$51,000
New Brunswick	\$38,000
Quebec	\$450,000
Ontario	\$900,000
Manitoba	\$80,000
Saskatchewan	\$85,000
Alberta	\$400,000
British Columbia	\$350,000
Yukon	\$3,000
Northwest Territories	\$4,500
Nunavut	\$3,200
Canada (Total)	\$2,409,200

Table 7.5 presents the value of GDP at market prices across Canada's provinces and territories in 2023, along with each region's approximate share of national output. Ontario produced the largest share—almost 38% of national GDP. Its economy reflects a mix of advanced manufacturing, finance, and services. Quebec followed with about 19%, driven by hydroelectric power, aerospace, and public services.

Alberta contributed close to 17%, reflecting its resource-rich economy, especially oil and gas. British Columbia added about 15%, with economic strength in trade, construction, and technology.

Together, these four provinces—Ontario, Quebec, Alberta, and British Columbia—accounted for nearly 90% of Canada's GDP. This concentration underscores the weight of central and western Canada in the national economy.

100.00%

Source: Statistics Canada – Table 36-10-0222-01: Gross domestic

Saskatchewan and Manitoba contributed about 4% and 3%, respectively. Both provinces rely heavily on agriculture, mining, and basic manufacturing.

Reading Comprehension

1. Which component of income-based GDP accounts for the largest share of GDP?
2. Which component of expenditure-based GDP accounts for the largest share of GDP?

The Atlantic provinces—Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick—together made up slightly under 6% of national output. These economies remain smaller and more resource-dependent, though they benefit from tourism, fisheries, and public sector activity.

The territories—Yukon, Northwest Territories, and Nunavut—each accounted for well under 1%,

contributing only a fraction to national GDP. Despite small shares, their per capita production can be high because of capital-intensive resource projects.

This distribution highlights the regional imbalance in Canada's economy. Most output originates in the larger and more diversified provinces, while smaller provinces and territories contribute modest shares, often tied to natural resources and public spending.

Related Concepts

LO 7.8 Discuss concepts related to the national income accounts

The Difference Between GDP and GNP

Gross domestic product (GDP) and gross national product (GNP) are closely related concepts, but they measure economic output in different ways.

GDP refers to the total value of all final goods and services produced **within a country's borders**, regardless of who owns the productive assets. It captures the domestic economy's activity, whether the income goes to residents or foreign investors.

GNP, in contrast, measures the total income earned by **a country's residents**, regardless of where the production takes place. It includes income earned by Canadians abroad and excludes income earned by foreigners within Canada.

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Before 1986, Statistics Canada used GNP as the main measure of national output. In that year, Canada shifted to GDP, aligning with most Western countries. The United States remained the last major country to use GNP—until it adopted GDP in 1991.

The shift to GDP reflects the growing importance of foreign investment and multinational operations, making a location-based measure more relevant for economic analysis.

Difference Between Gross Domestic Product and Gross National Product

Gross domestic product (GDP) and gross national product (GNP) both measure the value of final goods and services, but they apply different rules about location and ownership.

GDP measures the market value of all final goods and services **produced within Canada's borders**, regardless of whether the production is carried out by Canadians or foreigners.

GNP, by contrast, measures the market value of all final goods and services **produced using Canadian-owned resources**, regardless of whether the production occurs in Canada or abroad.

This distinction means that GDP includes income earned by foreigners in Canada, such as profits earned by American companies operating in Alberta, but excludes income earned by Canadians abroad. GNP reverses this: it excludes income paid to foreign investors in Canada but includes income earned by Canadians from foreign investments, such as profits from a Canadian-owned bank operating in the Caribbean.

To calculate GNP from GDP, we adjust for these income flows:

$$\text{GNP} = \text{GDP} + \text{Net investment income from non-residents}$$

This adjustment involves adding investment income that Canadians receive from abroad and subtracting income paid to foreign investors in Canada.

In Canada's case, **GDP is usually larger than GNP**. This pattern reflects the fact that foreigners tend to earn more from their investments in Canada than Canadians earn from investments abroad. The result is a **net outflow of investment income**, which reduces GNP relative to GDP.

Personal Income

Personal income refers to the total income received by individuals from all sources before paying personal income taxes. It includes wages and salaries, rental income, interest and dividends, and transfer payments from governments and businesses. Although the full aggregate for 2023 is not yet available, Statistics Canada reported that the median after-tax income for Canadian households in 2022 was \$70,500

(<https://www150.statcan.gc.ca/prosperity-prosperite/household-income-revenu-menage-eng.htm>).

Reading Comprehension

1. In what way does a knowledge of the provincial and territorial accounts aid our understanding of the Canadian economy?
2. Which province or territory accounts for the largest share of Canada's GDP?

Disposable Income

Disposable income is personal income minus personal income taxes and personal transfers to government. It reflects the amount that individuals can either spend or save. In 2022, total household disposable income in Canada reached approximately \$1.56 trillion

(<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610013501>).

Personal Saving

Personal saving refers to the portion of disposable income not used for consumption. In 2022, Canada's household saving rate was 7.4%, which translates to total household savings of about \$84.2 billion for the year (<https://www150.statcan.gc.ca/n1/daily-quotidien/231108/cg-b002-png-eng.htm>). This decline from pandemic-era highs reflects shifts in interest rates, inflation, and household spending patterns.

4. Refer to the circular flow diagram shown as Figure 7.3. What is the role of the financial sector?

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Inflating and Deflating the Gross Domestic Product

LO 7.9 Explain how to use price indexes to deflate and inflate the gross domestic product

Changes in Prices Affect GDP?

GDP measures the value of goods and services in **monetary terms**, so changes in prices affect the measured value of output. An increase in GDP can result from either a rise in production or a rise in prices. Without adjusting for prices, GDP growth can misrepresent real economic performance.

Consider the following example. Suppose an economy produces only one product: potatoes. In Year 1, the economy produces 500,000 kg of potatoes, each sold for \$0.50 per kg. The GDP equals:

$$500,000 \times \$0.50 = \$250,000$$

In Year 2, output increases slightly to 520,000 kg, but the price rises to \$0.75 per kg. GDP becomes:

$$520,000 \times \$0.75 = \$390,000$$

This represents a **56% increase in GDP**, while actual output rises by only **4%**. Most of the increase reflects higher prices, not higher production. This example shows how market prices can inflate GDP figures without an actual increase in physical output.

How to Adjust GDP for Price Changes

To compare output across time, economists select a **base year**, also called a reference year. The base year holds the price level constant and carries an index value of **100**. Using base-year prices allows for consistent valuation of output in different years.

This method produces **real GDP**, which isolates changes in production. Real GDP uses constant prices, while **nominal GDP** uses current market prices. The difference between the two reveals the role of price changes in GDP growth.

base year or base period a year chosen as a reference point against which other years are measured

Price Indexes and GDP Comparisons

To measure changes in prices across years, economists construct **price indexes**. A price index captures the percentage change in prices relative to a chosen base year.

In the potato example, the price in Year 1 was \$0.50, and in Year 2, it rose to \$0.77. This represents a 50% increase in price. The base year always carries an index of 100. To reflect the 50% price rise, we assign Year 2 an index of 150.

This index allows us to separate the impact of price changes from actual production. With it, we can compare nominal GDP across time and isolate the real growth in output.

price indexes numbers that measure changes in prices over time

Reading Comprehension

1. What is the difference between GDP and GNP?
Which of these economic aggregates is likely to be larger in Canada and why?
2. What are the components of personal income?
Which of these components do not constitute income *earned* by the owners of the factors of production?
3. What is personal income? What is the relationship between personal income and disposable income?

Nominal and Real GDP

GDP that does not account for price changes is known as **nominal GDP**. It reflects the value of output at current market prices, so it includes the effects of inflation or deflation.

In a one-product economy, the calculation of a price index remains straightforward. But in a modern economy that produces millions of different goods and services, the construction of a comprehensive price index requires more complex

methods. We will examine those techniques in a later chapter.

Once a price index is available, we can adjust GDP to remove the effect of price changes. This adjustment produces **real GDP**, which reflects the actual volume of production.

To calculate the *real* increase in output, we deflate the GDP by dividing it by the price index (P) and multiplying by 100. Thus, we can calculate the real gross domestic product (real GDP) for Year 2 as follows:

$$\frac{390\,000 \times 100}{150} = \$260\,000$$

In general, the formula for converting GDP to real GDP is

$$\text{Real GDP} = \frac{\text{GDP}}{P} \times 100$$

Table 7.6

Table 7.6 Deflating GDP for Price Level Changes (hypothetical data)

Year	Nominal GDP (\$ mil)	Price Index (2022=100)	Real GDP in 2022 dollars (\$ mil)
2013	2100	81	2592.6
2014	2180	84	2595.2
2015	2275	86	2645.3
2016	2390	89	2685.4
2017	2505	92	2722.8
2018	2640	95	2778.9
2019	2775	98	2831.6
2020	2900	100	2900
2021	3030	103	2941.7
2022	3175	106	2995.3

where P is the price index.

Of course, if we know real GDP and nominal GDP, we can easily calculate the price index by using the following formula:

$$\text{Price index} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

Example: If nominal GDP in a given year was \$1374 billion, and the real GDP in the same was \$1248 billion, then the price index can be calculated as:

$$\text{Price index} = \frac{1374 \times 100}{1248} = 110$$

Real vs. Nominal GDP

Let us study Table 7.6. All the figures for the years before 2002 (the base year) have been adjusted upward, and the figures for the years after 2002 have been

adjusted downward. We can now compare the figures in column 4, because they are all expressed in the same unit—namely, 2002 dollars. The figures for GDP in column 2 are expressed in current dollars. We call these figures nominal GDP—GDP valued at current prices. The figures for gross domestic product in column 4 are expressed in constant (2023) dollars. We call these figures real GDP—GDP valued at base-year prices.

nominal GDP GDP expressed in current dollars

real GDP GDP expressed in constant dollars

To express the 2023 GDP in 2017 constant dollars, we apply the GDP deflator published by Statistics Canada. The deflator for 2023 stands at 114.7, using 2017 as the base year (2017 = 100), indicating an average price increase of 14.7% since 2017. The conversion relies on the standard deflation formula:

$$\text{Real GDP} = \left(\frac{\text{Nominal GDP}}{\text{GDP Deflator}} \right) * 100$$

$$\text{Real GDP} = \left(\frac{2,700,000}{114.7} \right) * 100 = 3,500,000$$

This formula adjusts for inflation and enables a comparison of economic output over time in real terms. Gross Domestic Product as a Measure of Economic Well-Being

LO 7.10 Discuss gross domestic product as a measure of economic well-being

GDP and Living Standards

Real GDP—the value of goods and services produced in an economy, adjusted for inflation—provides a basic measure of a country’s output. It is often used to compare living standards over time or across countries. But real GDP does not capture all aspects of well-being.

Several factors limit its usefulness as an indicator of living standards. These include population size, which affects per-person output; income distribution, which determines how evenly output is shared; and non-market activity, such as unpaid care work or volunteer services. Underground transactions—from cash-only side jobs to unregistered businesses—go unreported. Leisure time, which contributes to well-being, is not measured. Nor does real GDP

reflect environmental health or quality of life indicators, like access to healthcare, education, and safe housing.

Real GDP is useful for tracking changes in economic activity, but it provides only a partial view of how well people in a country actually live.

Factors that affect standard of living

Population Size

GDP alone does not indicate how many people share in the output of goods and services. A country's real GDP may rise, but if the population grows faster than output, average living standards may fall.

A better measure of economic well-being is real GDP per capita—total real GDP divided by the population. For example, according to Statistics Canada, Canada's real GDP grew by 1.2% in 2023, but real GDP per capita declined by 0.4% because of rapid population growth driven by immigration. This decline suggests that the average Canadian experienced a reduction in economic well-being, despite overall output increasing.

***real per capita output** real GDP divided by the population*

$$\text{Real GDP per capita} = \frac{\text{Real GDP}}{\text{Population}}$$

Real per capita output, or output per person, is a measure of how much each individual in the country would receive if the total output were divided equally among the population.

Reading Comprehension

1. Explain why a change in prices will affect a country's GDP.
2. What is the difference between nominal GDP and real GDP?
3. How are price indexes used to deflate a country's GDP?

Distribution and Non-Market Activity

Real GDP per capita is an average—it does not show how output is distributed across a population. A society with high per capita output may still have widespread poverty if a small share of people controls most of the wealth. For instance, consider two countries, each producing \$50 billion in real GDP. In one, income is broadly shared; in the other, 10% of the population controls 90% of total output.

Despite having the same GDP per capita, the first country offers a higher standard of living for most of its population.

Canada's 2021 Census shows that the top 20% of earners held over 44% of total after-tax income, indicating persistent inequality. GDP does not account for this distributional imbalance.

GDP also excludes many non-marketed goods and services that contribute to well-being. These include unpaid household labour, childcare, cooking, yard work, and volunteer service. For example, Statistics Canada estimates that unpaid household work would add hundreds of billions to GDP if monetized. Because these services are not exchanged in formal markets, they are omitted from GDP—even though they are essential to daily life. This omission means official GDP may understate a society's real output and standard of living.

Underground Economy

GDP excludes economic activity that goes unreported to avoid taxes or regulation. This underground economy includes both illegal transactions—such as drug trafficking and unlicensed gambling—and informal activities, like cash payments to construction workers or cleaners without receipts.

These unreported transactions can represent a substantial portion of total output. According to a 2021 estimate by Statistics Canada, Canada's underground economy was valued at \$68.5

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billion—about 2.7% of GDP. Excluding this activity from national accounts means that official GDP figures may understate the actual volume of goods and services produced in the economy.

underground economy all economic activities that are not reported to government and on which no taxes are paid

Illegal Activity, Leisure, and Quality of Life

The impact of illegal activity on well-being is ambiguous. Individuals who participate in illegal markets—such as selling drugs or stolen goods—may gain private benefits. But for society as a whole, these transactions are usually considered “discommodities” that reduce collective welfare. They generate crime, insecurity, and health problems, all of which impose costs not captured in GDP.

Informal, under-the-table work is different. Services like babysitting, home repairs, or private tutoring paid in cash contribute to real output and improve household welfare. Yet if unreported, they are omitted from GDP. As Statistics Canada noted, Canada’s underground economy in 2021 was valued at \$68.5 billion, or 2.7% of GDP, with residential construction, retail trade, and personal services as major contributors (Statistics Canada, Table 36-10-0653-01).

GDP also ignores leisure, a major component of living standards. Productivity gains have reduced the time needed to produce the same output. For instance, average weekly hours worked in Canada fell from 38.4 in 1976 to 36.9 in 2023 (Statistics Canada, Table 14-10-0043-01), allowing more time for rest, family, or recreation. This increase in leisure represents a real gain in well-being—though not reflected in GDP because leisure is not traded in markets. A society that works fewer hours at the same level of output is better off, even if GDP remains constant.

Finally, GDP does not capture environmental degradation or broader quality-of-life factors. Polluted water, toxic air, habitat loss, and noise all reduce human welfare. For example, wildfires in British Columbia in 2023 led to hazardous air quality across major cities, affecting health and daily activity (Statistics Canada, The Daily, July 7, 2023). These harms are not deducted from GDP, even though they diminish well-being. Conversely, spending on cleanups or hospital visits may raise GDP without improving life.

In short, GDP omits both positive elements like leisure and informal work, and negative elements like pollution and crime—making it an incomplete measure of true living standards.

Better Measures of Well-Being

GDP offers a limited view of a nation's economic and social health. While it captures market-based output, it ignores key dimensions of welfare—both positive and negative. To develop a better measure of economic well-being (BMEW), economists propose adjusting GDP by adding non-market and informal production while subtracting environmental degradation and other social costs. This yields a more comprehensive estimate:

$$\text{BMEW} = \text{GDP} + \text{Non-marketed goods and services} + \text{Underground economy} - \text{Environmental damage}$$

Statistics Canada, for instance, estimates that unpaid household work would have added over \$350 billion to GDP in 2019 if valued at market wages ([Statistics Canada, 2021](#)). Meanwhile, Canada's underground economy was valued at \$68.5 billion in 2021 ([Statistics Canada, Table 36-10-0653-01](#)). These figures suggest that real economic activity exceeds official output measures. On the cost side, Canada's total greenhouse gas emissions stood at 708 mega tonnes in 2021, imposing environmental and health burdens not captured in GDP ([Statistics Canada, Table 38-10-0097-01](#)).

These adjustments, however, are rarely integrated into a single official measure, making it difficult to compare well-being across time and countries using only GDP.

Human Development Index (HDI)

To address GDP's limitations, the United Nations introduced the Human Development Index (HDI) in 1990. Developed by Pakistani economist Mahbub ul Haq, the HDI combines three components: real GDP per capita (adjusted for purchasing power), life expectancy at birth, and educational attainment—specifically, mean years of schooling and expected years of schooling ([UNDP, Human Development Reports](#)).

The HDI reflects a broader definition of development: not just the production of goods and services, but the expansion of human capabilities. As the UN notes, “human development is about much more than the rise or fall of national incomes... it is about enabling people to live productive, creative lives in accord with their needs and interests.”

In the 2023 Human Development Report, Canada ranked 15th globally, below countries like Switzerland, Norway, and Ireland, despite its high GDP per capita. This ranking reflects the fact that strong income levels do not guarantee top performance in health and education.

The HDI thus serves as a useful complement to GDP, offering a more balanced measure of human well-being by accounting for both material prosperity and the broader conditions that shape quality of life.

Reading Comprehension

1. Discuss the advantage of real GDP over real GDP per capita as a measure of the standard of living.
2. Does GDP adequately measure the standard of living of a country? Explain why or why not. If GDP does not adequately measure the well-being of a country, what adjustments can be made to obtain a better measure of economic well-being?
3. Give four examples of non-marketed goods and services. How do these affect GDP as a measure of economic well-being?
4. What do you understand by the term “underground economy”? Give some indication of the magnitude of Canada’s underground economy.
7. Describe the composition of the Human Development Index (HDI). For what is this index used?

Review

1. Return to the learning objectives listed at the beginning of the chapter. These outline what you were expected to understand after completing the section.

2. Check your understanding by answering the Reading Comprehension Questions at the end of each section. These questions are designed to help you evaluate whether you have met the objectives.
3. If any objective remains unclear, revisit the relevant content before moving on. Reviewing the material will reinforce your understanding and help you build a stronger foundation for the next topic.

Key Points to Remember

1. **LO 7.1** National income accounting involves collecting and organizing data on the economy's output of goods and services. **These statistics guide both public policy and private-sector decisions.**
2. **LO 7.2 Gross Domestic Product (GDP)** is the **market value of all final goods and services** produced in a country over a given time period.
3. **LO 7.3** GDP can be measured using **two main approaches**: the **income approach**, which sums all incomes generated in production, and the **expenditure approach**, which totals all spending on goods and services.
4. **LO 7.4 & 7.5** The **income approach** includes wages and salaries, rental income, investment income, and profits. The **expenditure approach** includes household consumption, business investment, government spending on goods and services, and net exports.
5. **LO 7.6 Wages and salaries** form the largest share of income in GDP. **Household consumption** makes up the largest share of total spending.
6. **LO 7.7** Breaking down GDP by **province and territory** helps us better understand **regional contributions** to Canada's total output.
7. **LO 7.8** Related aggregates in national accounting include **gross national product (GNP)**, **personal income, disposable income**, and **personal savings**. These are illustrated using the **circular flow model**, which shows how income and spending circulate in the economy.
8. **LO 7.9** To compare GDP across years, we use **constant (real) dollars**, adjusting for inflation using a **price index** like the GDP deflator.
9. **LO 7.10** GDP has several limitations as a measure of well-being:
 - It does not account for **population size**

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