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Three econometricians went out hunting, and came across a large deer. The first econometrician fired, but missed, by a meter to the left.
The second econometrician fired, but also missed, by a meter to the right.

The third econometrician didn't fire, but shouted in triumph, "We got it! We got it!"
In the mid-1930s, two Keynesians, Simon Kuznets and Richard Stone, began to develop this terminology.
They developed *national income accounting* – a set of rules and definitions for measuring economic activity in the aggregate economy – that is, in the economy as a whole.
MEASURING TOTAL ECONOMIC OUTPUT OF GOODS AND SERVICES

- **Gross National Product (GNP)** is the aggregate final output of citizens and businesses of an economy in one year.
Gross Domestic Product (GDP) is the total market value of all final goods and services produced in an economy in a one-year period. It is the single most-used economic measure.
MEASURING TOTAL ECONOMIC OUTPUT OF GOODS AND SERVICES

- GDP measures the economic activity that occurs within a country.
- GNP measures the economic activity of the citizens and businesses of a country.
MEASURING TOTAL ECONOMIC OUTPUT OF GOODS AND SERVICES

- Net foreign factor income is added to GDP to create the GNP.

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

- In other words, we must add the foreign income of our citizens and subtract the income of residents who are not citizens.
Calculating GDP requires adding together million of goods and services.

All goods and services produced by an economy must be weighted, that is, each good and service must be multiplied by its price.
Once quantities of a particular good or service are multiplied by its price, we arrive at a value measure of the good or service.

Finally, all the value measures are added to calculate that year’s GDP. GDP is a flow measure (an amount per year).
GDP IS A FLOW CONCEPT

- GDP is a measure of final output per year – it is a flow concept, not a stock (an amount at a particular moment in time).
GDP IS A FLOW CONCEPT

- The store of wealth, in contrast, is a stock concept.
- The stock equivalent to national income accounts is the *national balance sheet* – a balance sheet of an economy’s stocks of assets and liabilities.
GDP measures final output

- GDP does not measure total transactions in the economy.
- It counts final output but not intermediate goods.
**GDP Measures Final Output**

- *Final output* – goods and services purchased for final use.

- *Intermediate products* are used as inputs in the production of some other product.
GDP MEASURES FINAL OUTPUT

- Counting the sale of final goods and intermediate products would result in double and triple counting.
- If we did not eliminate intermediate goods, a change in organization—say, a merger—would look like a change in output.
TWO WAYS OF ELIMINATING INTERMEDIATE GOODS

- There are two ways of eliminating intermediate goods.
- The first is to calculate only final sales.
TWO WAYS OF ELIMINATING INTERMEDIATE GOODS

- A second way is to 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 from the value of its sales.
CALCULATING GDP: SOME EXAMPLES

- Selling your car to a neighbor does not add to GDP.
- Selling your car to a used car dealer who sells your car to someone else for a higher price, does add to GDP.
- The value added is the dealer's services.
CALCULATING GDP: SOME EXAMPLES

- Selling a stock or bond does not add to GDP.

  - The stock broker's commission for the sales does add to GDP.
Pension payments, welfare payments, employment insurance benefits, and other government transfer payments are not included in GDP.

The work of unpaid house spouses does not appear in GDP calculations.
There are two methods of calculating GDP: the expenditure approach and the income approach.

This is because of the national income accounting identity.
The equality of output and income is an accounting identity in the national income accounts.

The identity can be seen in the circular flow of income in an economy.
THE CIRCULAR FLOW

Household

Wages, rents, interest, profits

Factor services

Goods

Firms (production)

Government

Financial markets

Imports

Exports

Savings

Investment

Personal consumption

Other countries
The expenditure approach is shown on the bottom half of the circular flow. Specifically, GDP is equal to the sum of the four categories of expenditures.

\[ GDP = C + I + G + (X - IM) \]
CONSUMPTION

- When individuals receive income, they can spend it on domestic goods, save it, pay taxes, or buy foreign goods.
Consumption

- Consumption is the largest and most important of the flows.
  - It is also the most obvious way in which income received is returned to firms.
The portion of income that individuals save leaves the spending stream and goes into financial markets.

Business spending on equipment, structures, and inventories is counted as part of gross private investment, together with household spending on new owner-occupied housing.
Sooner or later, plant and equipment wears out.

This wearing-out process is called *depreciation* — the decrease in an asset's value.
Economists differentiate between total or gross private domestic investment and the new investment that is above and beyond replacement investment.

◆ *Net private investment* – gross private investment less depreciation.
When individuals pay taxes, those taxes are either spent by government on goods and services or are returned to individuals in the form of transfer payments.
Government expenditures are government payments for goods and services or investment in equipment and structures. This is referred to as government expenditures.
There is a connection between the government and the financial markets.

- If the government runs a deficit, it must borrow from financial markets to make up the difference.
NET EXPORTS

- Spending on foreign goods escapes the system and does not add to domestic production, thus spending on imports are subtracted from total expenditures.
NET EXPORTS

- Exports to foreign nations are added to total expenditures.

  These flows are usually combined into *net exports* (exports minus imports).
**GDP AND NDP**

- *Net domestic product (NDP)* is the sum of consumption expenditures, government expenditures, net foreign expenditures, and investment less depreciation.
Net domestic product is GDP adjusted for depreciation:

\[ \text{GDP} = C + I + G + (X - IM) \]
\[ \text{NDP} = \text{GDP} - \text{Depreciation} \]
GDP AND NDP

- NDP is actually preferable to GDP as an expression of a nation's domestic output.
Since it is so hard to measure depreciation in the real world, economists use capital consumption allowance rather than depreciation.
THE FACTOR INCOMES APPROACH

- The income approach is shown on the top half of the circular flow.
- Firms make payments to households for supplying their services as factors of production.
National income is the total income earned by citizens and businesses of a country.

- It consists of employee compensation, rent, interest, and profits.
- When we add indirect taxes (less subsidies) and depreciation to nations income, we have GDP.
Wages, salaries and supplementary labour income that firms pay to workers constitute the largest component of GDP.

Corporate profits before taxes are also included in income.
Interest and investment income measures the difference between interest payments that households receive on loans they have made, and interest payments that they make on borrowed funds.
THE FACTOR INCOMES APPROACH

- Further included in incomes are those incomes earned by owner-operators. Rental income is included in this category.
- Gains and losses from holding inventories have to be removed from calculation, as well as indirect taxes and subsidies, and depreciation.
Income and expenditures must be equal because of the rules of double-entry bookkeeping.

Profit is the balancing item.
The national income accounting identity allows GDP to be calculated either by adding up all values of final output or by adding up the values of all earnings or income.
To go from GDP to national income:

- Add net foreign factor income.
  - National income is all income earned by citizens of a nation and is equal to GNP.
  - To move from "domestic" to "national" we add net foreign factor income.
- Subtract depreciation from GDP.
- Subtract indirect business taxes less subsidies from GDP.
EQUALITY OF EXPENDITURE AND INCOME

1. Expenditures
   - Net exports
   - Government expenditures
   - Investment
   - Consumption

   =

2. Output
   - Net foreign factor income

   =

3. Income
   - Depreciation
     - Indirect taxes-subsidies
     - Inventory adjustment
     - Farm income
     - Interest and investment income
     - Profits before taxes
   - Wages and salaries

GDP = GNP

National Income
Other income terms are personal income and disposable personal income.

Personal income measures all income actually received by individuals.
Personal income ($PI$) is national income plus net transfer payments from government minus amounts attributed but not received.

\[ PI = NI + \text{transfer payments from government} - \text{corporate retained earnings} - \text{corporate income taxes} - \text{employment taxes (CPP, EI)} \]
Disposable personal income is personal income minus personal income taxes and payroll taxes.

Disposable personal income is what people have readily available to spend.

\[ DPI = PI - \text{personal taxes} \]
GDP figures are used to make comparisons among countries and to measure economic welfare over time.
GDP gives a measure of economic size and power.

*Per capita GDP* is another measure often used to compare various nations' income.
Because of differences in nonmarket activities, per capita GDP can be a poor measure of the living standards in various nations.
COMPARING GDP AMONG COUNTRIES

- To get around the problems of per capita GDP, economists use *purchasing power parity (PPP)*, which adjusts for different relative prices among nations before making comparisons.
ECONOMIC WELFARE OVER TIME

- Just because GDP rose does not mean welfare rose—it could be that only prices rose.
- Comparing output over time is best done with real output which is nominal output adjusted for inflation.
**Nominal GDP** is GDP calculated at existing prices.

**Real GDP** is nominal GDP adjusted for inflation.
Real and Nominal GDP

- Real GDP is important to society because it measures what is really produced.
REAL AND NOMINAL GDP

- Real GDP is calculated by dividing nominal GDP by the GDP deflator.

\[ \text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP deflator}} \]
Although Canadian national income accounting statistics are among the most accurate in the world, they still have some serious limitations.
GDP does not measure happiness, nor does it measure economic welfare.

Welfare is a complicated idea, very difficult to measure.
GDP figures do not measure all market economic activity.
MEASUREMENT ERRORS

GDP figures do not measure:

- Illegal drug sales.
- Under-the-counter sales of goods to avoid income and sales taxes.
- Work performed and paid for in cash.
- Unreported sales.
- Prostitution, loan sharking, extortion, and other illegal activities.
A second type of measurement error occurs in adjusting GDP for inflation.

- If the price and the quality of a product go up together, has the price really gone up?
- Is it possible to measure the value of quality increases?
Some social scientists have developed alternatives to GDP such as the Genuine Progress Indicator (GPI).

The GPI tries to measure pollution, education, health concerns, as well as GDP.
CONCLUSION

- National income accounting should be used with sophistication.
- It is a powerful economic tool that informs average citizens about the direction of the economy.