

National Income Accounting

Reading: Williamson, chapter 2

Want to obtain a measure of the total quantity of goods and services produced for the market in a given country over a period of time.

Two measures: Gross Domestic Product (GDP), which is the dollar value of final output produced in a given period of time within a country; and Gross National Product (GNP).

Three ways to measure GDP:

1. Expenditure approach
2. Product approach
3. Income approach

Expenditure Approach

In this approach, GDP is calculated as total spending on all final goods and services (end products) in the economy

$$\text{total expenditure} = C + I + G + NX,$$

where

C : consumption expenditure

I : investment expenditure

G : government expenditure

NX : net exports, i.e., total exports minus total imports

Product Approach

GDP is the sum of value added to goods and services across all productive units in the economy, also known as the "value added approach"

In this approach, you calculate the sum of value added at each stage of production only, excluding any goods and services used up in intermediate stages of production.

Income Approach

GDP is measured by adding all income received by economic agents contributing to production, including compensation to employees (wages, benefits), taxes (government's income), and after-tax profits.

Example to show that all three approaches are equivalent

Suppose an economy has only two business, Orangelnc, and Juicelnc. Orangelnc owns orange groves and sells some of its oranges to the public, and sells the rest of its oranges to Juicelnc, which produces and sells orange juice.

Transaction of these two companies in a year:

Orangelnc Transactions

wages paid to employees	\$15,000
taxes paid to government	\$5,000
revenue from selling oranges	\$35,000
– oranges sold to public	\$10,000
– oranges sold to Juicelnc	\$25,000
(after tax profit=revenue-costs-taxes=\$15,000)	

Juicelnc Transactions

wages paid to employees	\$10,000
taxes paid to government	\$2,000
oranges purchased from O.	\$25,000
revenue from sale of juice	\$40,000
(after tax profit=revenue-costs-taxes=\$3,000)	

Example to show that all three approaches are equivalent (con't)

Expenditure approach: what did end-users buy?

- oranges sold to public + revenue from sale of juice = \$50,000

Product approach: value added by each company?

- Orangelnc sold \$35,000 of oranges, does not use any inputs
- Juicelnc sold \$40,000 of juice, but they purchased \$25,000 of oranges, so value added = \$15,000
- so total value added = \$35,000+\$15,000=\$50,000

Income approach: what did each agent earn?

- after tax profit by both companies (\$15,000+3,000) + wages of employees at both companies (\$15,000+10,000) + taxes (\$5,000+2,000) = \$50,000

Why are all three measures equivalent?

First, observe that the market value of goods and services produced in a given period (as given by product approach) must by definition be equal to the amount that buyers must spend to purchase them (expenditure approach).

Second, observe that what the seller receives must be equal to what the buyers paid for. The seller's receipts equal the total income generated by economic activity, including incomes paid to workers and suppliers, taxes paid to government, and profits of whatever is left over. Therefore, total income generated (income approach) must be equal to total expenditure (expenditure approach).

Lastly, since product approach is equivalent to expenditure approach, and income approach is equal to expenditure approach, then product approach is equivalent to income approach, within a given period of time, or

$$\text{total production} = \text{total income} = \text{total expenditure}.$$

GNP vs GDP

$$GNP = GDP + NFP$$

where *NFP*: net factor payments from abroad

GNP is basically the value of output produced by domestic factors of production, regardless of where the production takes place. For instance, if a Toyota plant in the US is owned and managed by Japanese citizens, then the incomes accruing to Japanese factors of production include the managerial income and profits of this plant, and this is included in Japan's GNP, but not in Japan's GDP.

Depending on the country, GDP and GNP can be very similar or dissimilar.

What does GDP leave out?

GDP is simply a measure of the quantity of output produced and exchanged in the economy as a whole. It is often used as an indicator aggregate economic welfare, especially when GDP per capita is used.

This is not to say that a government should maximize GDP.

There are many problems with GDP:

1. It does not take into account how income is distributed across all the individuals in the population: think of a society which is very equal in income distribution and compare it to another where the GDP per capita is the same, but only a handful of people earn huge amounts of money while the vast majority earn very little compared to them.

2. GDP leaves out all non-market activity, like work at home (housework). Also, if people increasingly eat out at restaurants than at home, GDP rises compared to before, and since people choose to eat out presumably they are better off, but in terms of GDP accounting, GDP rises, because it does not measure the value added of cooking at home.
3. GDP does not measure the black economy, or the underground economy, i.e., any unreported economic activity.