

Principles of Macroeconomics

Topic 2 Part 2

National Income and National Product (CH 6)

The Expenditure Approach

- **GDP = C + I + G + (X - M)**
 - **consumption (C)**: household spending on consumer goods
 - **investment (I)**: spending by firms and households on new capital—that is, plant, equipment, inventory, and new residential structures
 - **government spending (G)**: consumption and investment spending of the government
 - **net exports (X - M)**: exports (X) minus imports (M)

TABLE 6.2 Components of U.S. GDP, 2014: The Expenditure Approach

	Billions of Dollars (\$)	Percentage of GDP (%)
<u>Personal consumption expenditures (C)</u>	11,930.3	68.5
Durable goods	1,302.5	7.5
Nondurable goods	2,666.2	15.3
Services	7,961.7	45.7
<u>Gross private domestic investment (I)</u>	2,851.6	16.4
Nonresidential	2,210.5	12.7
Residential	559.1	3.2
Change in business inventories	82.0	0.5
<u>Government consumption and gross investment (G)</u>	3,175.2	18.2
Federal	1,219.2	7.0
State and local	1,956.1	11.2
<u>Net exports (EX – IM)</u>	–538.2	–3.1
Exports (EX)	2,337.0	13.4
Imports (IM)	2,875.2	16.5
Gross domestic product	<u>17,418.9</u>	<u>100.0</u>

Source: U.S. Bureau of Economic Analysis, March 27, 2015.

The Income Approach

- We now use Income Approach to calculate GDP.
- This approach looks at GDP in terms of who receives it as income, rather than as who purchases it (Exp. App.).

National Income (NI) The total income earned by the factors of production owned by a country's citizens.

Note that ultimately,

National Income (NI) = Net National Product (NNP).

TABLE 6.3 National Income, 2014

	Billions of Dollars (\$)	Percentage of National Income (%)
National income	15,070.4	100.0
1. Compensation of employees	9,221.6	61.2
2. Proprietors' income	1,380.2	9.2
3. Rental income	640.2	4.2
4. Corporate profits	2,089.8	13.9
5. Net interest	486.3	3.2
6. Indirect taxes minus subsidies	1,145.8	7.6
7. Net business transfer payments	140.6	0.9
8. Surplus of government enterprises	-34.2	-0.2

Source: U.S. Bureau of Economic Analysis, March 27, 2015.

The Income Approach

1. **compensation of employees** Includes wages, salaries, employer contributions to social insurance, and pension funds paid by firms and the government.
2. **proprietors' income** The income of unincorporated businesses.
3. **rental income** The income received by property owners in the form of rent.
4. **corporate profits** The income of corporations.
5. **net interest** The interest paid by business.

Side Note – Payment to FoP

Owners of the factors of production receive the following payments:

- **Rent** for Land
- **Wage** for Labor
- **Interest** for Capital
- **Profit** for Entrepreneurship

These are counted towards **National Income.**

The Income Approach

- 6. indirect taxes minus subsidies** Taxes such as sales taxes, customs duties, and license fees less subsidies that the government pays for which it receives no goods or services in return.
- 7. net business transfer payments** Net transfer payments by businesses to others.
- 8. surplus of government enterprises** Income of government enterprises.

The Income Approach

- **net national product (NNP)** Gross national product minus depreciation; a nation's total product minus what is required to maintain the value of its capital stock.
- **statistical discrepancy** Data measurement error.

Assuming no statistical error, we have

- $GNP = GDP + \text{Net Foreign Factor Income (NFFI)}$
- $NNP = GNP - \text{Depreciation}$
- $NI = NNP$

GDP, GNP, NNP, and National Income, 2014

	Dollars (\$, Billions)
GDP	17,418.9
Plus: Receipts of factor income from the rest of the world	+827.7
Less: Payments of factor income to the rest of the world	<u>-616.0</u>
Equals: Gross national product (GNP)	17,630.6
Less: Depreciation	<u>-2,736.2</u>
Equals: Net national product (NNP)	14,894.4
Less: Statistical discrepancy	<u>-176.0</u>
Equals: National income	15,070.4

Source: U.S. Bureau of Economic Analysis, March 27, 2015.

Nominal versus Real GDP

- **nominal GDP (nominal output)** Gross domestic product, measured in current prices.
- **real GDP (real output)** Gross domestic product, adjusted for price change (inflation/deflation).
- **base year** The year chosen for the weights in a fixed-weight procedure.
- **fixed-weight procedure** A procedure that uses weights from a given base year.

Calculating Real GDP

Nominal GDP of 2019

$$= \sum (P_{2019} \times Q_{2019})$$

*Real GDP of 2019 with **2018 as the base year***

$$= \sum (P_{2018} \times Q_{2019})$$

- In the Base Year, Nominal GDP = Real GDP.

Nominal versus Real GDP

Why are we interested in REAL GDP?

Assume Countries A and B both produce 1 good in 2019.

Country A: $P = 20$ and $Q = 5$ >>> Nominal GDP = 100

Country B: $P = 5$ and $Q = 18$ >>> Nominal GDP = 90

Based on Nominal GDP, A is richer than B.

But is this true?

A Three-Good Economy, operating in Years 1 and 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Output		Price per Unit		GDP in Year 1 in Year 1 Prices	GDP in Year 2 in Year 1 Prices	GDP in Year 1 in Year 2 Prices	GDP in Year 2 in Year 2 Prices
	Q_1	Q_2	P_1	P_2	$P_1 \times Q_1$	$P_1 \times Q_2$	$P_2 \times Q_1$	$P_2 \times Q_2$
Good A	6	11	\$ 0.50	\$ 0.40	\$ 3.00	\$ 5.50	\$ 2.40	\$ 4.40
Good B	7	4	0.30	1.00	2.10	1.20	7.00	4.00
Good C	10	12	0.70	0.90	7.00	8.40	9.00	10.80
Total					\$ 12.10	\$ 15.10	\$ 18.40	\$ 19.20
					Nominal GDP in year 1			Nominal GDP in year 2

Calculating the GDP Deflator

- We studied about CPI and how to calculate the inflation rate from CPI. CPI focuses on consumer goods.
- Like CPI, the **GDP deflator is a measure of the overall price level**, and can be used to find the inflation rate. GDP deflator considers all goods in the economy.

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

$$\text{CPI} = \frac{\text{Market Basket in Desired Year}}{\text{Market Basket in Base Year}} \times 100$$

Calculating the GDP Deflator

GDP Deflator Example				
	Nominal GDP	Real GDP	GDP Deflator	
2010	7,000	7,000	100.0	Base Year
2011	8,350	7,500	111.3	
2012	9,740	8,355	116.6	
2013	10,120	9,412	107.5	
2014	11,111	10,852	102.4	
2015	12,582	11,473	109.7	

- The inflation rate = **%change in GDP deflator**.
- For example, the annual inflation rate from 2011 to 2012 is $(116.6 - 111.3)/111.3 = 0.048 = 4.8\%$.

The Problems of Fixed Weights

- CPI and GDP deflator are price indices that are calculated using fixed weights. **They fix prices at some base year.**

Problems of Fixed Weights

- When the economic structure changes greatly, the base year has to be updated. Otherwise, prices at the base year (before the structural change) will not be good weights.
- When prices rise, people substitute for cheaper goods. Fixing prices therefore completely remove how the typical market responds to price changes.

Limitations of the GDP Concept

- If crime levels went down, society would be better off, but a decrease in crime is not an increase in output and is not reflected in GDP.
- An increase in leisure is also an increase in social welfare, sometimes associated with a decrease in GDP.
- Most non-market and domestic activities, such as housework and child care, are not counted in GDP.

Limitations of the GDP Concept

- Inequality: GDP also has nothing to say about the distribution of output among individuals in a society.
- Informal Economy: GDP does not count the unreported income generated in the hidden part of the economy.
- Externality: GDP does not take into account the costs or benefits on the third party, as a result of production, e.g. pollution and environmental costs.

ECONOMICS IN PRACTICE

An alternative to GDP: The Human Development Index

GDP and GNI indicate economic welfare but do not measure the nation's overall well-being.

As a result of discussions about the multiple dimensions of economic development, a new indicator-the Human Development Index was created by the United Nations in 1990 to compare well-being across nations.

However, it neglects important aspects of a country's well-being such as human rights or political participation.

