

# Measuring National Output and National Income

## Part 2

# GNP vs GDP

- GDP is better than GNP as a measure of domestic economic activity
- GNP is better than GDP as a measure of economic well-being of the country's nationals

# Calculating GDP

- **expenditure approach** measures the total amount spent on all final goods and services during a given period.
- **income approach** measures the income—wages, rents, interest, and profits—received by all factors of production in producing final goods and services.

# Calculating GDP

## Goods not included in GDP

- Intermediate goods
- Illegal goods and services
- Transfer payment
- Sales of second-hand goods
- Commodities produced for one's own use

# The Expenditure Approach (1 of 7)

- **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)**
  - **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 Expenditure Approach *(2 of 7)*

## Consumption (C)

- **durable goods** Goods that last a relatively long time, such as cars and household appliances.
- **nondurable goods** Goods that are used up fairly quickly, such as food and clothing.
- **services** The things we buy that do not involve the production of physical things, such as legal and medical services and education.

# ECONOMICS IN PRACTICE

## Where Does eBay Get Counted?

eBay's business is to provide a marketplace for exchange. In doing so, it uses labor and capital and creates value.

In return for creating this value, eBay charges fees to the sellers that use its site. The value of these fees enter into GDP.

Items that people sell on eBay do not contribute to current GDP. The cost of finding an interested buyer for those goods, however, does get counted.

# The Expenditure Approach *(3 of 7)*

## Investment ( $I$ )

- **investment ( $I$ )** Total investment in capital—that is, the purchase of new housing, plants, equipment, and inventory by the private sector.
- **nonresidential investment** Expenditures by firms for machines, tools, plants, and so on.
- **residential investment** Expenditures by households and firms on new houses and apartment buildings.

# The Expenditure Approach *(4 of 7)*

## Investment (I)

- **change in business inventories** The amount by which firms' inventories change during a period.
- Inventories are the goods that firms produce now but intend to sell later.

$\text{GDP} = \text{final sales} + \text{change in business inventories}$

$\text{change in business inventories} = \text{GDP} - \text{final sales}$

# The Expenditure Approach *(5 of 7)*

## Gross Private Domestic Investment (I)

- **depreciation** The amount by which an asset's value falls in a given period.
- **gross investment** The total value of all newly produced capital goods (plant, equipment, housing, and inventory) produced in a given period.
- **net investment** Gross investment minus depreciation.

$$\text{capital}_{\text{end of period}} = \text{capital}_{\text{beginning of period}} + \text{net investment}$$

# The Expenditure Approach *(6 of 7)*

## Government Spending ( $G$ )

- **government spending ( $G$ )** Expenditures by federal, state, and local governments for final goods and services.

## Net Exports ( $X - M$ )

- **net exports ( $X - M$ )** The difference between exports (sales to foreigners of Thai commodities) and imports (Thai purchases of commodities from abroad). The figure can be positive or negative.

# The Income Approach *(1 of 4)*

- **national income** The total income earned by the factors of production owned by a country's citizens.
- **compensation of employees** Includes wages, salaries, and various supplements—employer contributions to social insurance and pension funds, for example—paid to households by firms and by the government.
- **proprietors' income** The income of unincorporated businesses.
- **rental income** The income received by property owners in the form of rent.

# The Income Approach *(2 of 4)*

- **corporate profits** The income of corporations.
- **net interest** The interest paid by business.
- **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.
- **net business transfer payments** Net transfer payments by businesses to others.
- **surplus of government enterprises** Income of government enterprises.

## TABLE 6.3 National Income, 2014

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

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

# The Income Approach *(3 of 4)*

- **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.
- **personal income** The total income of households.

# GDP, GNP, NNP, and National Income, 2014

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	<b>Dollars (\$, Billions)</b>
<b>GDP</b>	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: <b>Gross national product (GNP)</b>	17,630.6
Less: Depreciation	<u>-2,736.2</u>
Equals: <b>Net national product (NNP)</b>	14,894.4
Less: Statistical discrepancy	<u>-176.0</u>
Equals: <b>National income</b>	<u>15,070.4</u>

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

# The Income Approach *(4 of 4)*

- **disposable personal income** or **after-tax income**  
Personal income minus personal income taxes. The amount that households have to spend or save.
- **personal saving** The amount of disposable income that is left after total personal spending in a given period.
- **personal saving rate** The percentage of disposable personal income that is saved. If the personal saving rate is low, households are spending a large amount relative to their incomes; if it is high, households are spending cautiously.

# National Income, Personal Income, Disposable Personal Income, and Personal Saving, 2014

	<b>Dollars (Billions, \$)</b>
<b>National income</b>	15,070.4
Less: Amount of national income not going to households	<u>-341.8</u>
Equals: <b>Personal income</b>	14,728.6
Less: Personal income taxes	<u>-1,742.9</u>
Equals: <b>Disposable personal income</b>	12,985.8
Less: Personal consumption expenditures	-11,930.3
Personal interest payments	-256.8
Transfer payments made by households	<u>-170.3</u>
Equals: <b>Personal saving</b>	628.3
<b>Personal saving as a percentage of disposable personal income:</b>	4.8%

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

# Nominal versus Real GDP

- **current dollars** The current prices that we pay for goods and services.
- **nominal GDP (nominal output)** Gross domestic product measured in current dollars.
- **real GDP (real output)** Gross domestic product adjusted for price change (inflation/deflation).

# Calculating Real GDP

- **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.

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

$$\begin{aligned} &GDP \text{ of } 2019 \text{ with } 2018 \text{ as the base year} \\ &= \sum (P_{2018} \times Q_{2019}) \end{aligned}$$

# Calculating the GDP Deflator

- Policy makers need not only good measures of how real output is changing but also good measures of how the overall price level is changing.
- The GDP deflator is one measure of the overall price level.

$$\text{Real Value} = \frac{\text{Nominal Value}}{\text{Price Index}} \times 100$$

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

# A Three-Good Economy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Prod ucti on		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

Year	Nominal GDP	Real GDP	Rate of inflation	GDP deflator
2013†	\$3930 b	\$3 930	-	100
2014	\$4 011b	$\frac{4\ 011}{102} \times 100 = \mathbf{\$3\ 932.35b}$	2%	$100 + 2.0 = \mathbf{102}$
2015	\$4 202 b	$\frac{4\ 202}{103.5} \times 100 = \mathbf{\$4\ 059.90b}$	1.5%	$100 + 1.5 + 2 = \mathbf{103.5}$
2016	\$4 335 b	$\frac{4\ 335}{106.4} \times 100 = \mathbf{\$4\ 074.25b}$	2.9%	$100 + 2.9 + 1.5 + 2.0 = \mathbf{106.4}$
2017	\$4 299 b	$\frac{4\ 299}{105.9} \times 100 = \mathbf{\$4\ 059.49b}$	-0.5%	$100 - 0.5 + 2.9 + 1.5 + 2.0 = \mathbf{105.9}$

# The Problems of Fixed Weights

- Many structural changes took place in the U.S. economy between the 1950s and 1987.
- The use of fixed-price weights does not account for the responses in the economy to supply shifts.
- The fixed-weight procedure ignores the substitution away from goods whose prices are increasing towards goods whose prices are decreasing.

# Limitations of the GDP Concept *(1 of 2)*

## **GDP and Social Welfare**

- 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 nonmarket and domestic activities, such as housework and child care, are not counted in GDP.
- GDP also has nothing to say about the distribution of output among individuals in a society.

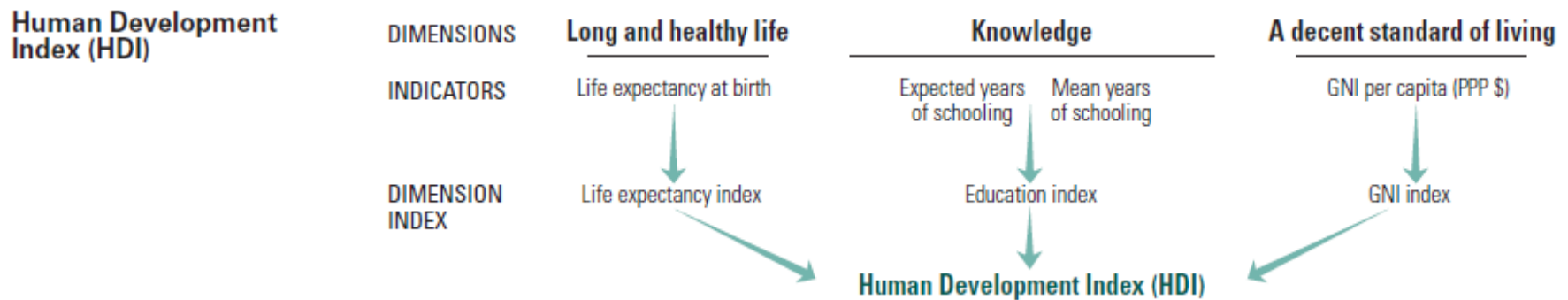
# ECONOMICS IN PRACTICE

## 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 county's well-being such as human rights or political participation.



# Limitations of the GDP Concept *(2 of 2)*

## The Informal Economy

- **informal economy** The part of the economy in which transactions take place and in which income is generated that is unreported and therefore not counted in GDP.