Economics

THE MACROECONOMIC PERSPECTIVE

Ch.19 OUTLINE

19.1: Measuring the Size of the Economy: Gross Domestic Product

19.2: Adjusting Nominal Values to Real Values

19.3: Tracking Real GDP over Time

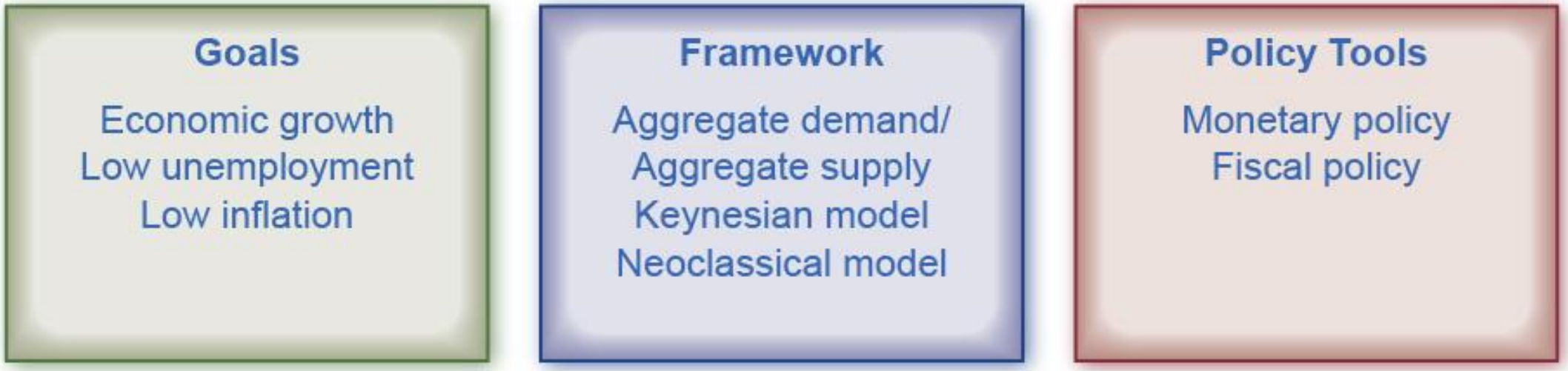
19.4: Comparing GDP among Countries

19.5: How Well GDP Measures the Well-Being of Society

The Great Depression

- At times, such as when many people have trouble making ends meet, it is easy to tell how the economy is doing.
- This photograph shows people lined up during the Great Depression, waiting for relief checks.
- At other times, when some are doing well and others are not, it is more difficult to ascertain how the economy of a country is doing.

(Credit: modification of "Waiting for relief checks. Calipatria, California" by Dorothea Lange/Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA, Public Domain)



Macroeconomic Goals, Framework, and Policies

- This chart shows what macroeconomics is about:
  - Goals - a consensus of what are the most important goals for the macro economy.
  - Framework - what economists use to analyze macroeconomic changes (such as inflation or recession).
  - Policy Tools - the tools the federal government uses to influence the macro economy.

19.1 Measuring the Size of the Economy: Gross Domestic Product

- **Gross domestic product (GDP)** - the value of the output of all final goods and services produced within a country in a given year.
  - Measures the size of a nation's overall economy.

- An economy's GDP can be measured by either:
  - the total dollar value of what consumers purchase in the economy.
  - the total dollar value of what the country produces.

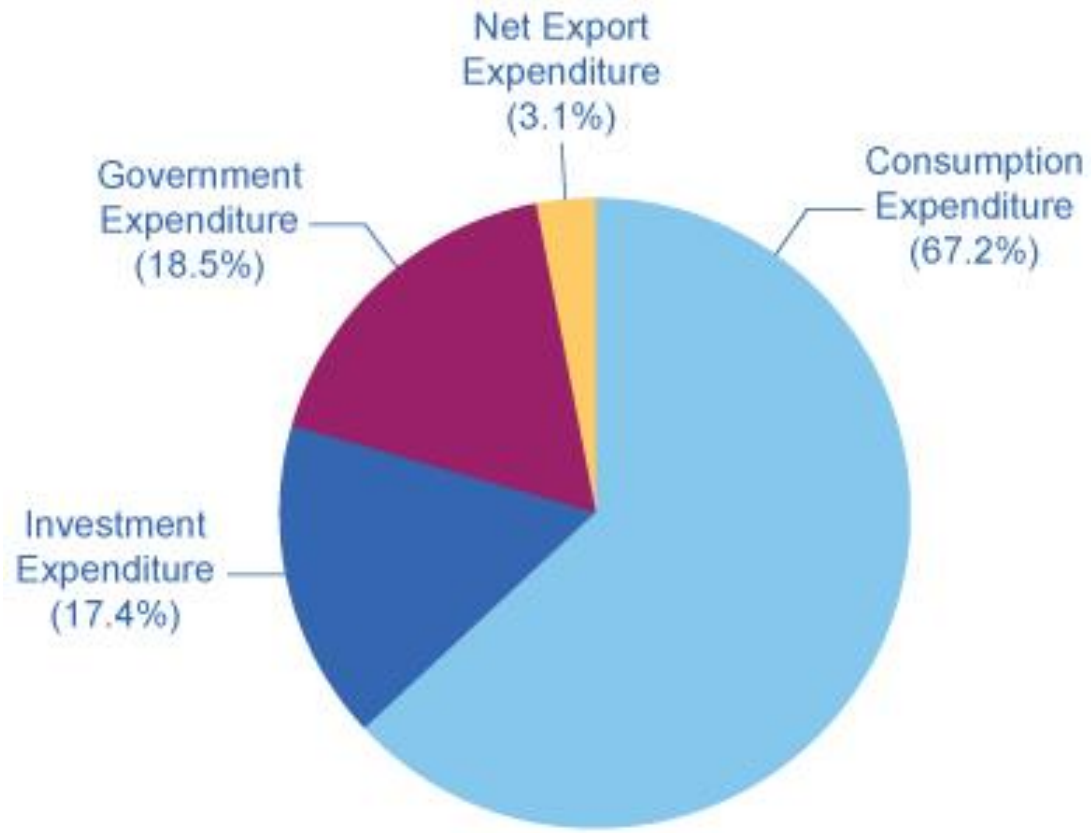
GDP Measured by Components of Demand

- Who buys all of a country's production?

- Demand for production can be divided into four main parts:
  - consumer spending (consumption)
  - business spending (investment)
  - government spending on goods and services
  - spending on net exports

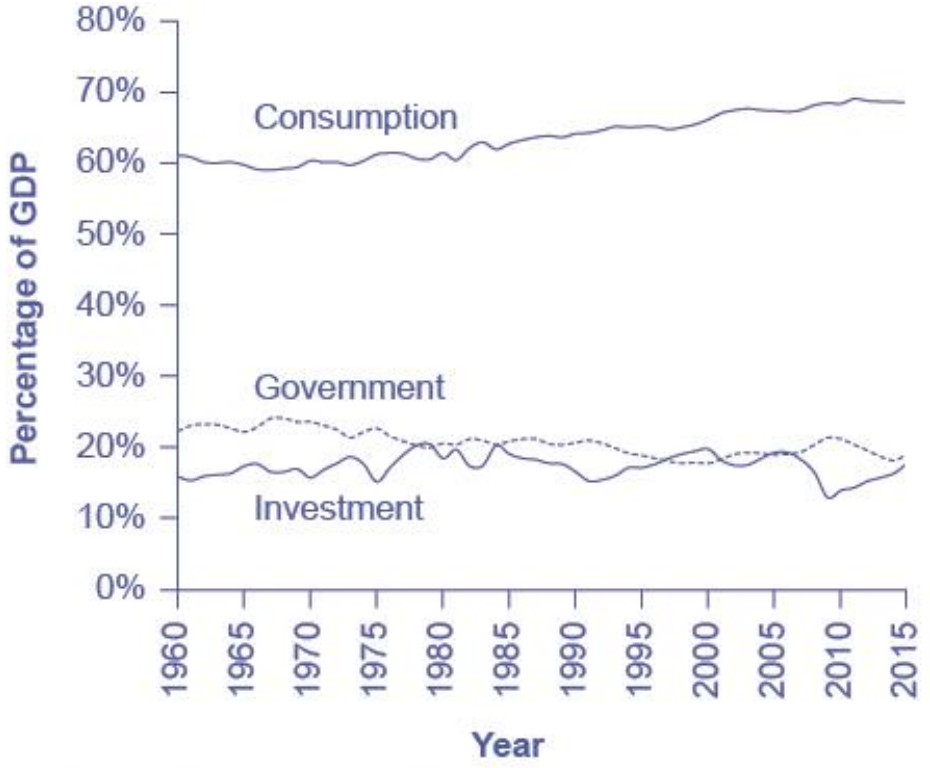
Percentage of Components of 2022 U.S. GDP on the Demand Side

- Consumption makes up over half of the demand side components of the GDP. Totals in the chart do not add to 100% because the Net Export Expenditure, Exports minus Imports, is actually a negative 3.1%, as shown in Table 19.1. (Source: http://bea.gov/iTable/index_nipa.cfm, Table 1.1.10)

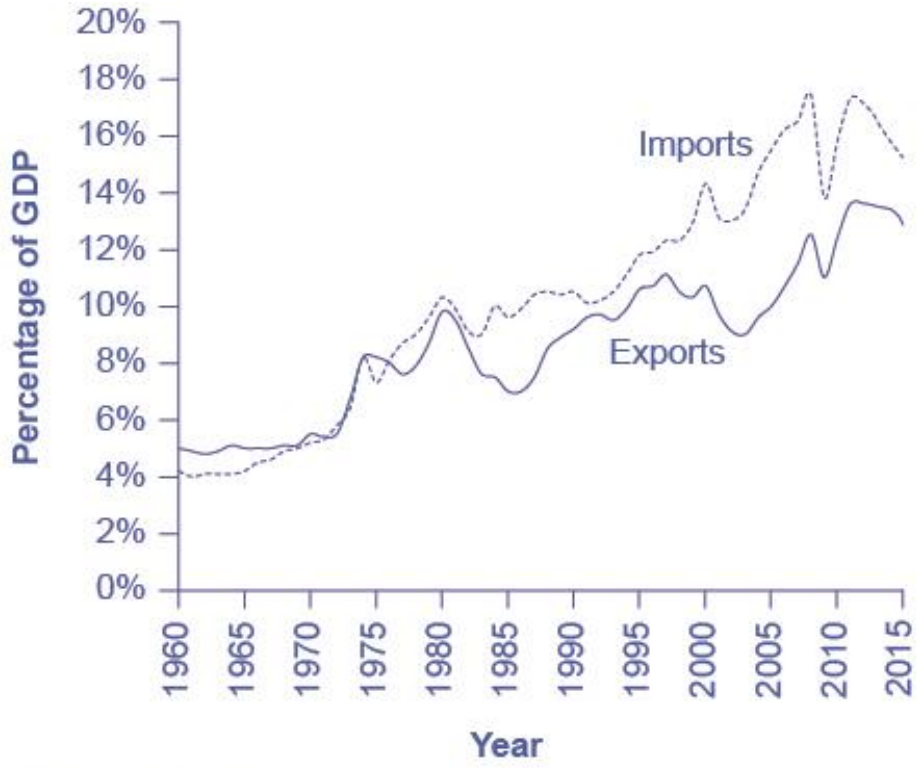


Components of GDP on the Demand Side

- For graph (a):
  - Consumption is about two-thirds of GDP, but it moves relatively little over time.
  - Business investment hovers around 15% of GDP, but it increases and declines more than consumption.
  - Government spending on goods and services is around 20% of GDP.



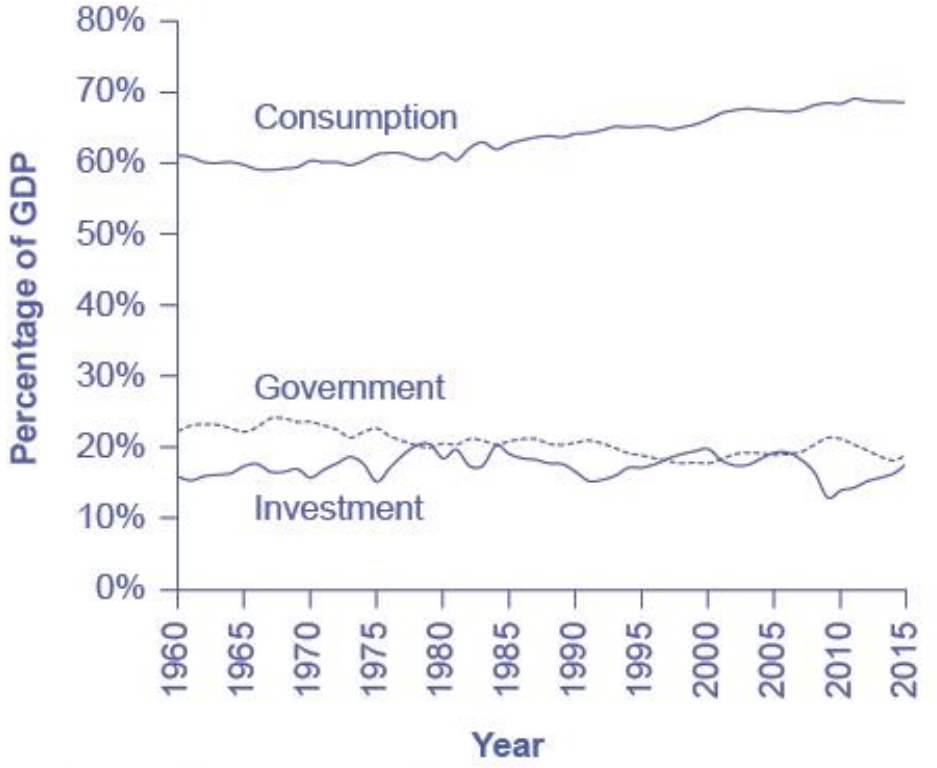
(a) Demand from consumption, investment, and government



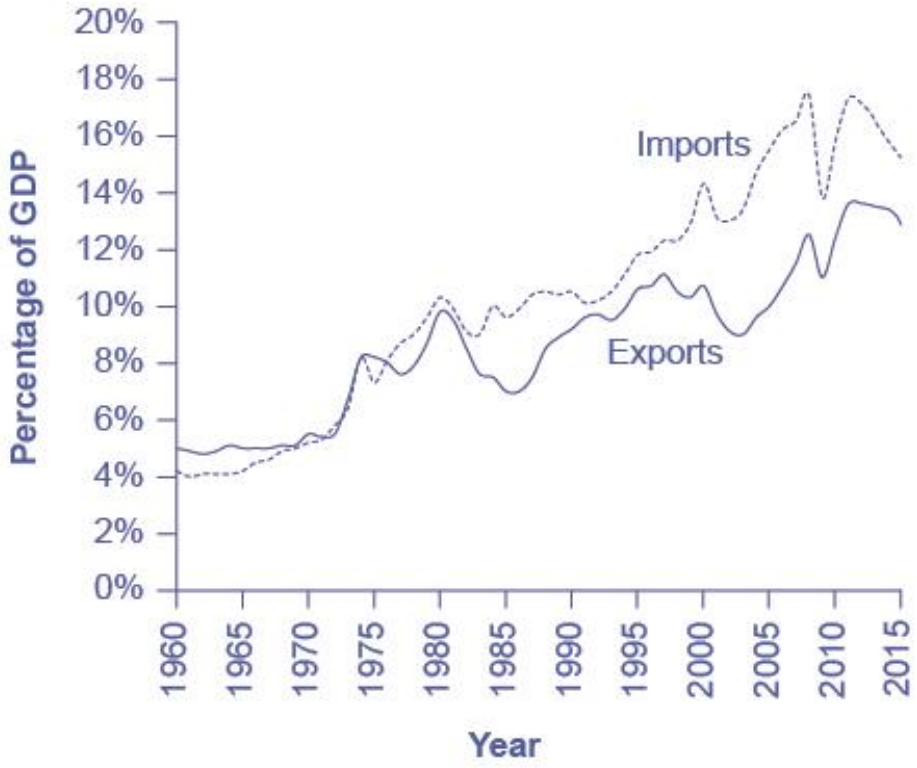
(b) Imports and exports

Components of GDP on the Demand Side, Continued

- For graph (b):
  - Exports are added to total demand for goods and services, while imports are subtracted from total demand.
  - If exports exceed imports, as in most of the 1960s and 1970s in the U.S. economy, a trade surplus exists.
  - If imports exceed exports, as in recent years, then a trade deficit exists. (Source: http://bea.gov/iTable/index_nipa.cfm, Table 1.1.10)



(a) Demand from consumption, investment, and government



(b) Imports and exports

Net Export Component

- The GDP net export component, or trade balance, is equal to the dollar value of exports (X) minus the dollar value of imports (M).
- **Trade balance** - the gap between exports and imports.
  - Trade balance = (X – M)
- **Trade surplus** - when a country's exports are larger than its imports; calculated as exports – imports.
- **Trade deficit** - when a country's imports exceed exports; calculated as imports – exports.

GDP Using Demand

- Based on the four components of demand, GDP can be measured as:

- GDP = Consumption + Investment + Government + Trade balance

OR

- GDP = C + I + G + (X – M)

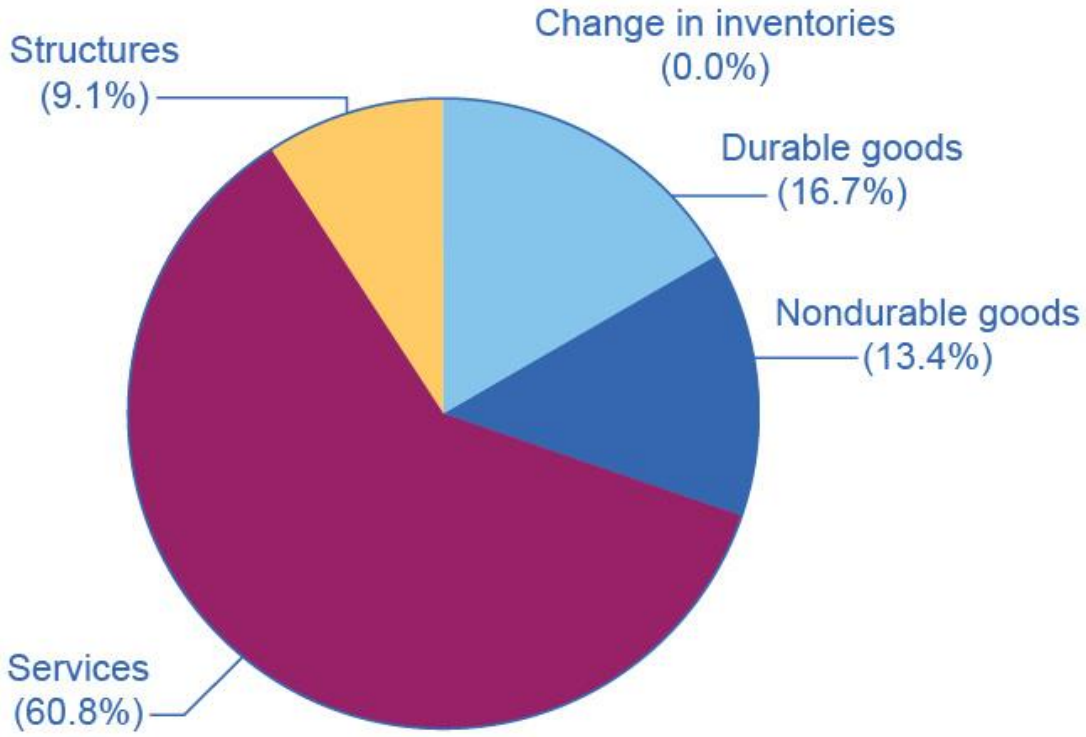
GDP Measured by What is Produced

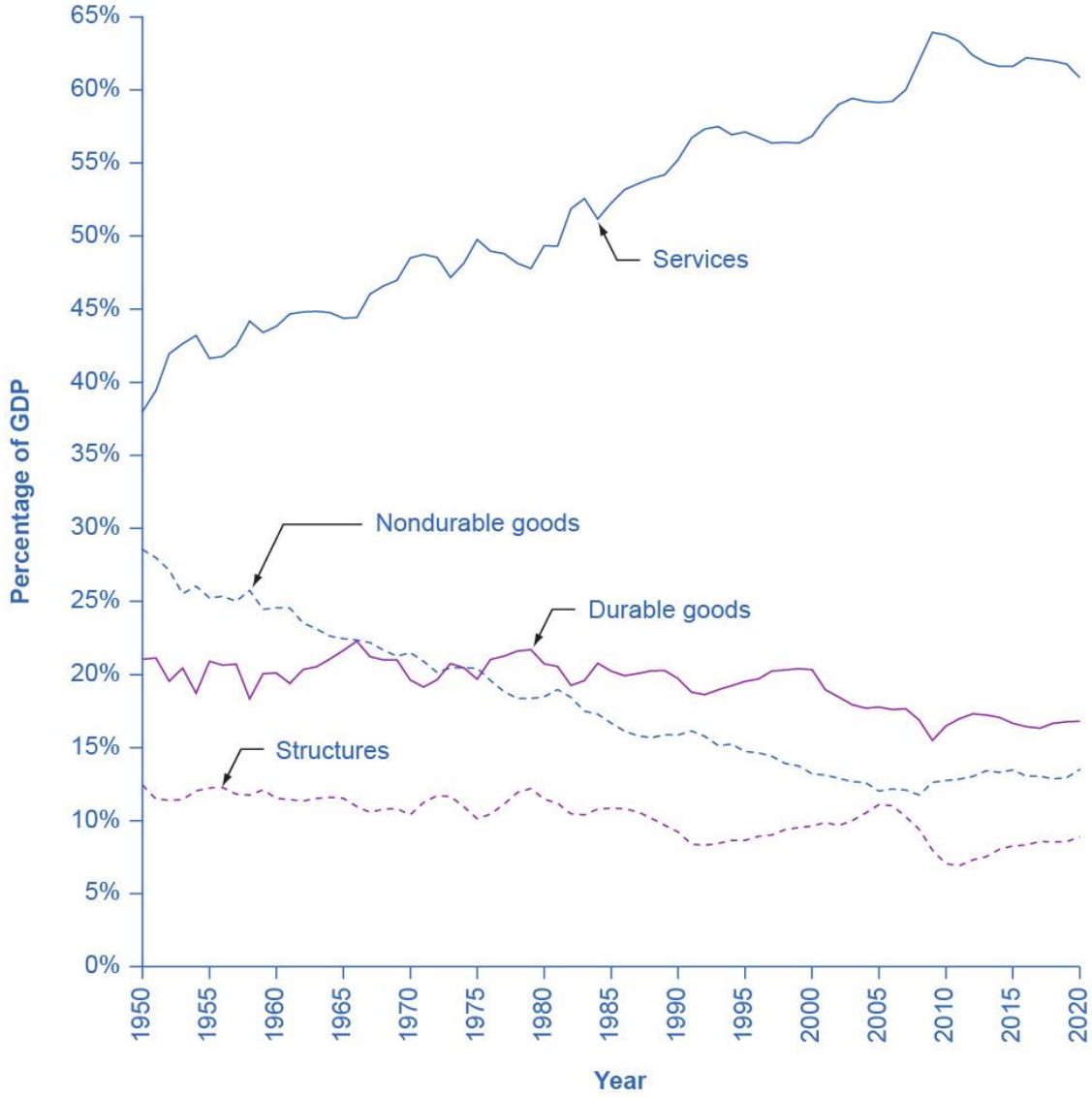
- Production can be divided into five main parts:
  - **Durable goods** - long-lasting good like a car or a refrigerator.
  - **Nondurable goods** - short-lived good like food and clothing.
  - **Services** - product which is intangible (in contrast to goods) such as entertainment, healthcare, or education.
  - **Structures** - building used as residence, factory, office building, retail store, or for other purposes.
  - Change in **inventories** - good that has been produced, but not yet been sold.

- Every market transaction must have both a buyer and a seller, so GDP must be the same whether measured by what is demanded or by what is produced.

Percentage of Components of GDP on the Production Side

- Services make up over 60 percent of the production side components of GDP in the United States.
- Note that the change in inventories is not shown since it is typically less than 1% of GDP.



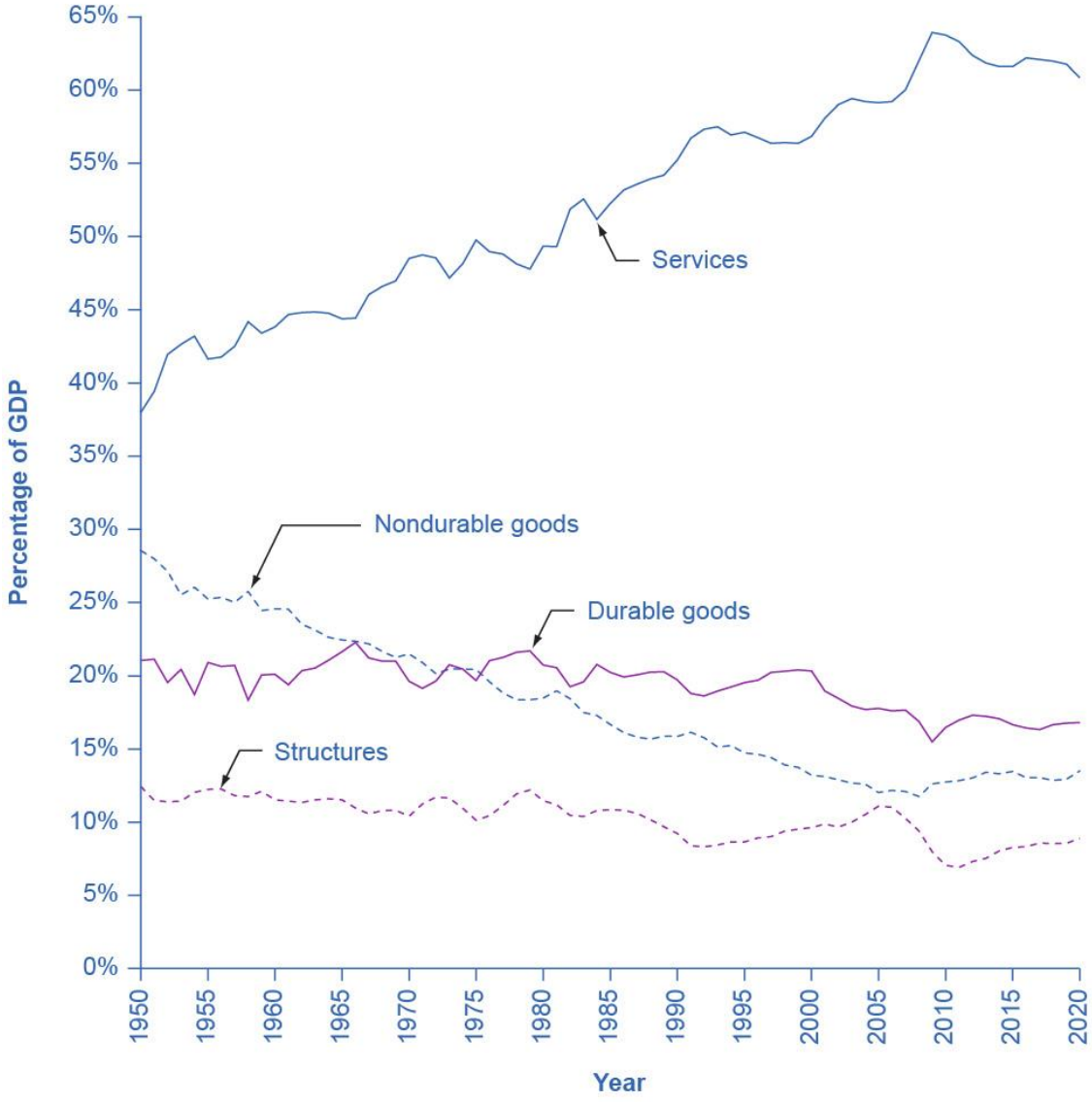


Types of Production

- Services are the largest single component of total supply, representing over 60 percent of GDP, up from about 45 percent in the early 1950s.
- Durable and nondurable goods constitute the manufacturing sector, and they have declined from 40 percent of GDP in 1950 to about 30 percent in 2016.

Types of Production, Continued

- Nondurable goods used to be larger than durable goods, but in recent years, nondurable goods have been dropping to below the share of durable goods, which is less than 20% of GDP.
- Structures hover around 10% of GDP.
- The change in inventories is not shown here since it is typically less than 1% of GDP.



The Problem of Double Counting

- **Final goods and services** - output used directly for consumption, investment, government, and trade purposes.
  - Goods at the furthest stage of production at the end of a year.

vs.

- **Intermediate goods** - output provided to other businesses at an intermediate stage of production, not for final users.
  - Excluded from GDP calculation.

- **Double counting** - output that is counted more than once as it travels through the stages of production.
  - A potential mistake to avoid in measuring GDP.

- GDP is the dollar value of all *final* goods and services produced in the economy in a year.

Other Ways to Measure the Economy

- **Gross national product (GNP)** - includes what is produced domestically and what is produced by domestic labor and business abroad in a year.
- **Net national product (NNP)** - GNP minus the value of depreciation.
- **Depreciation** - the process by which capital ages over time and therefore loses its value.
- NNP can be further subdivided into **national income** - includes all income earned: wages, profits, rent, and profit income.
- **Gross national income (GNI)** – includes the value of all goods and services produced by people from a country—whether in the country or not.

19.2 Adjusting Nominal Values to Real Values

- **Nominal value** - the economic statistic actually announced at that time; not adjusted for inflation.

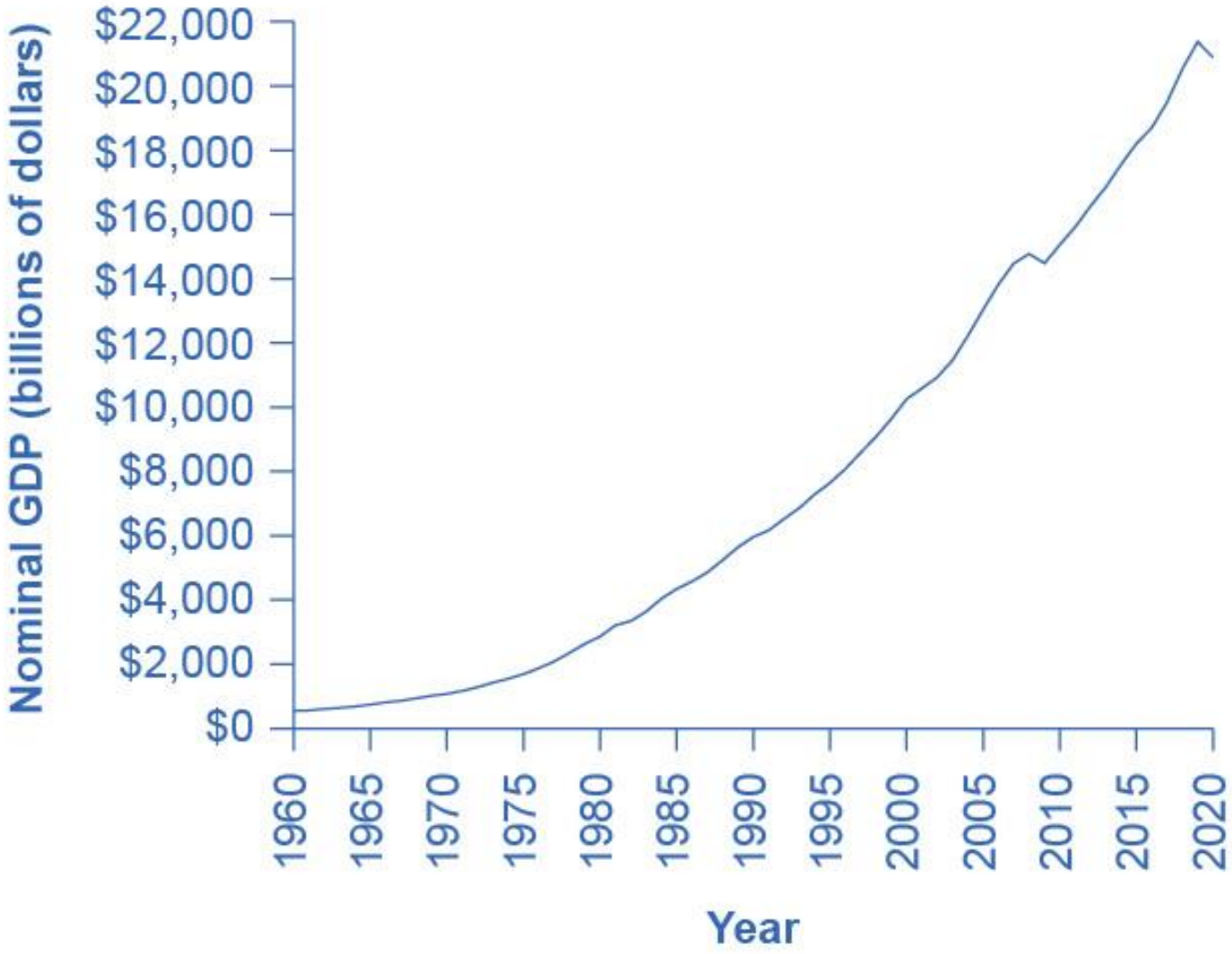
vs.

- **Real value** - an economic statistic after it has been adjusted for inflation.

- Generally, the real value is more important.

U.S. Nominal GDP, 1960–2020

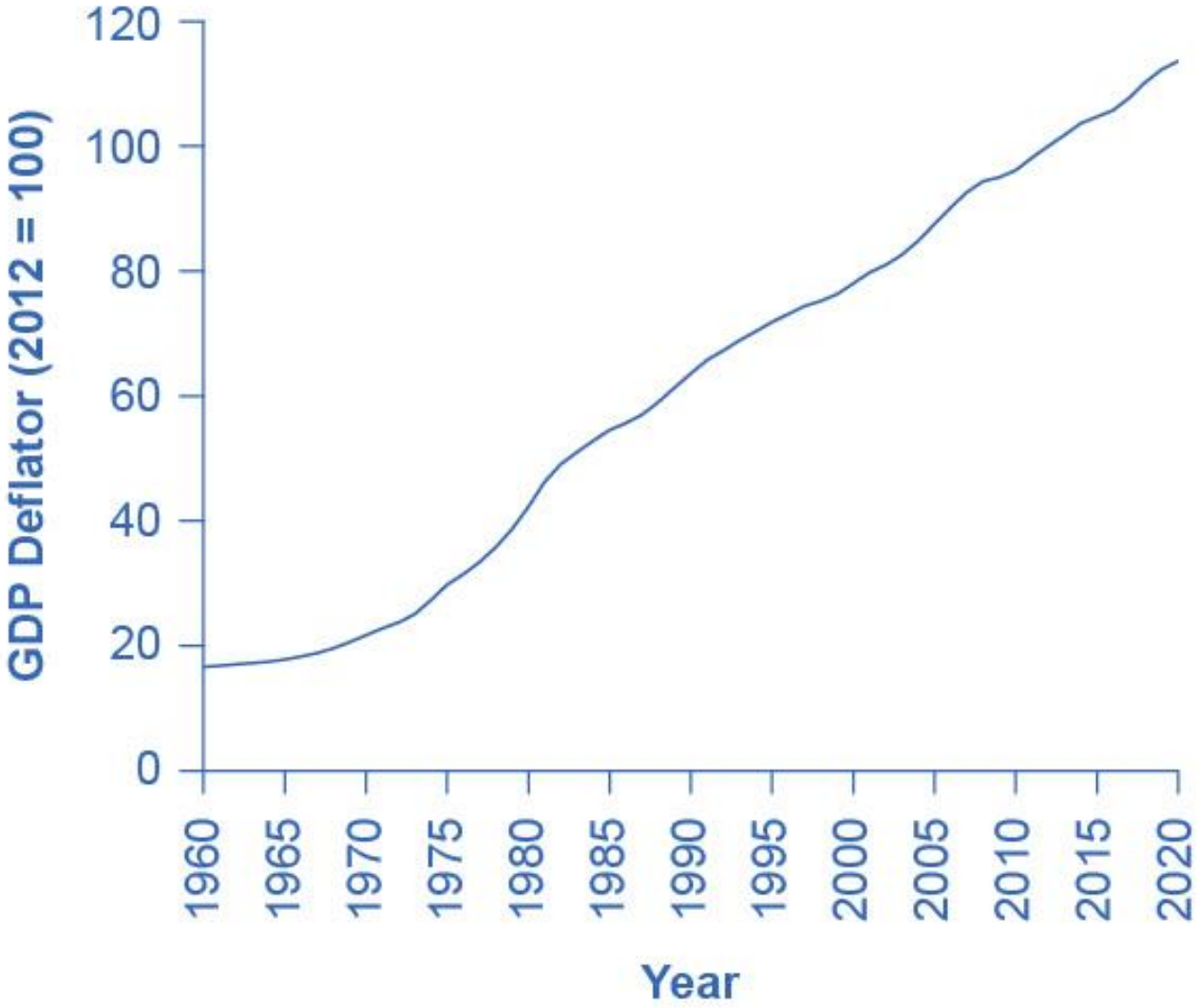
- Nominal GDP values have risen exponentially from 1960 through 2020, according to the BEA.



GDP Deflator, 1960–2020

- The GDP deflator is a price index measuring the average prices of all goods and services included in the economy.

- Much like nominal GDP, the GDP deflator has risen exponentially from 1960 through 2020. (Source: BEA, https://apps.bea.gov/itable/index.cfm, Table 1.1.9)



Calculating Real GDP

- Real GDP = $\frac{\text{Nominal GDP}}{\text{Price Index / 100}}$

- Notes:
  - Price index is the same as GDP deflator.

- For simplicity, the price index is traditionally published after being multiplied by 100 in order to get an integer number.
  - So, remember to divide the published price index by 100 when doing the math.

- Whenever a real statistic is computed, one year (or period) is called the base year (or base period).
  - The base year is the year whose prices we use to compute the real statistic.

Example: Calculating Real GDP

- To calculate the real GDP in 1960:
- Real GDP = Nominal GDP

  Price Index / 100

  = $543.3 billion

  19 / 100

  = $2,859.5 billion
- 2005 is the base year.
- Question: What will the Real GDP be in 2005? Why?

Year	Nominal GDP (billions of dollars)	GDP Deflator (2005 = 100)	Calculations	Real GDP (billions of 2005 dollars)
1960	543.3	19.0	543.3 / (19.0/100)	[redacted]
2005	13095.4	100.0	[redacted]	13095.4
2010	14958.3	110.0	14,958.3 / (110.0/100)	13598.5

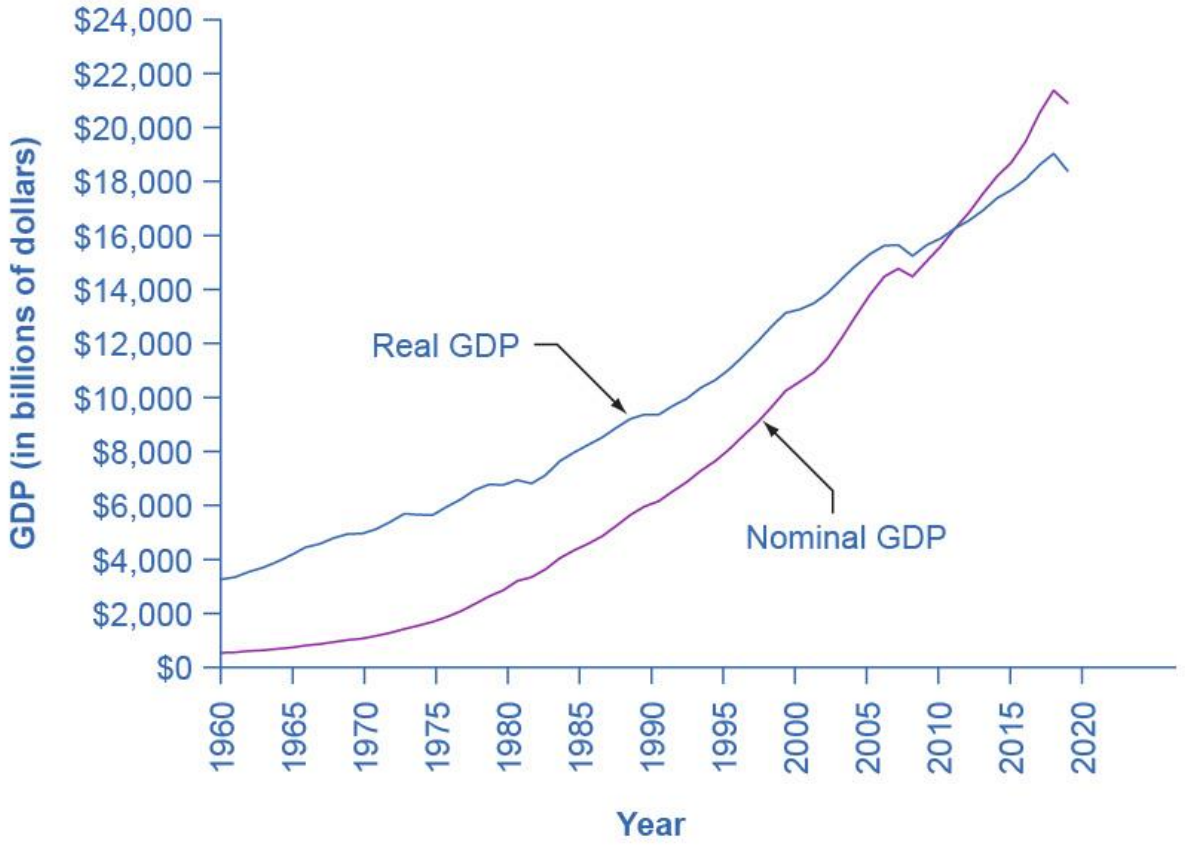
Example: Calculating Real GDP, Continued

- To calculate the real GDP in 2010:
- Real GDP = Nominal GDP
- Price Index / 100
- = $14,958.3 billion
- 110 / 100
- = $13,598.5 billion
- As long as inflation is positive (prices increase on average from year to year) real GDP should be less than nominal GDP in any year *after* the base year.

Year	Nominal GDP (billions of dollars)	GDP Deflator (2005 = 100)	Calculations	Real GDP (billions of 2005 dollars)
1960	543.3	19.0	543.3 / (19.0/100)	2859.5
2005	13095.4	100.0	13,095.4 / (100.0/100)	13095.4
2010	14958.3	110.0	14,958.3 / (110.0/100)	13598.5

U.S. Nominal and Real GDP, 1960–2020

- The black line measures U.S. GDP in real dollars, where all dollar values are converted to 2012 dollars.
- Since we express real GDP in 2012 dollars, the two lines cross in 2012.
- Real GDP will appear higher than nominal GDP in the years before 2012, because dollars were worth less in 2012 than in previous years.
- Conversely, real GDP will appear lower in the years after 2012, because dollars were worth more in 2012 than in later years.



Example: Calculating Real GDP Growth Rate

- What was the real GDP growth rate from 1960 to 2012?

$$\frac{2020\ real\ GDP\ -1960\ real\ GDP}{1960\ real\ GDP} \times 100 = \%\ Change$$

$$\frac{13{,}598.5\ -2{,}859.5}{2{,}859.5} \times 100 = 376\%$$

- The U.S. economy increased real production of goods and services by nearly a factor of four since 1960.

Year	Nominal GDP (billions of dollars)	GDP Deflator (2005 = 100)	Calculations	Real GDP (billions of 2005 dollars)
1960	543.3	19.0	543.3 / (19.0/100)	2859.5
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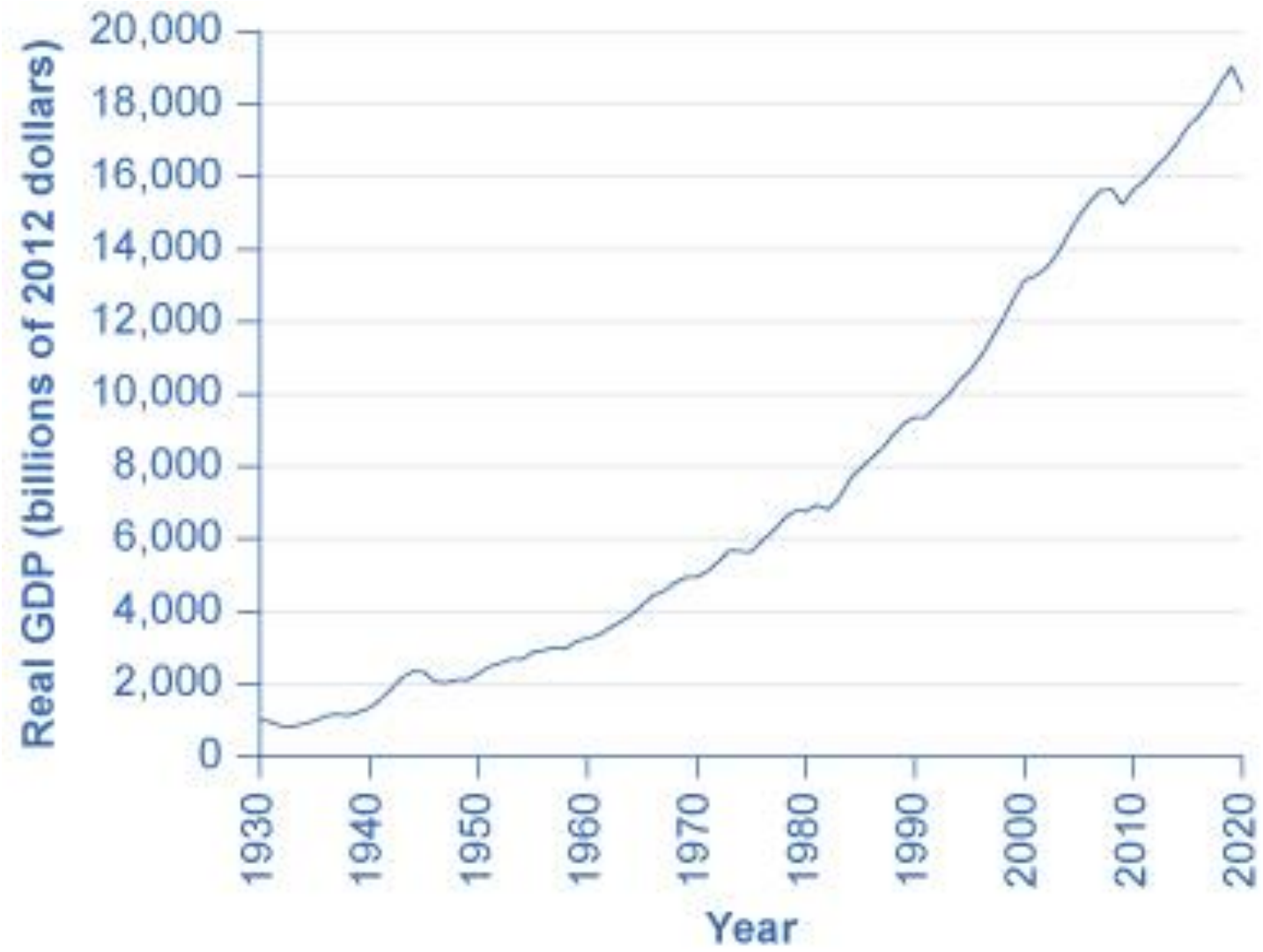
19.3 Tracking Real GDP over Time

- Governments report GDP growth as an annualized rate.
  - When analyzing growth in a quarter, the calculated growth in real GDP for the quarter is multiplied by four when it is reported (as if the economy were growing at that rate for a full year).
- **Recession** - a significant decline in national output/GDP.
- **Depression** - an especially lengthy and deep decline in output.

U.S. GDP, 1930–2020

- Real GDP in the United States in 2020 (in 2012 dollars) was about $18.4 trillion.
- After adjusting to remove the effects of inflation, this represents a roughly 20-fold increase in the economy's production of goods and services since 1930. (Source: bea.gov)



Patterns of Recessions and Expansions

- **Peak** - during the business cycle, the highest point of output before a recession begins.
- **Trough** - during the business cycle, the lowest point of output in a recession, before a recovery begins.
- A recession lasts from peak to trough, and an economic upswing runs from trough to peak.
- **Business cycle** - the economy's relatively short-term movement in and out of recession

19.4 Comparing GDP among Countries

- To compare the GDP of countries with different currencies, it is necessary to convert to a "common denominator" using an exchange rate.

- **Exchange rate** - the value or price of one currency in terms of another currency.

Example: Converting GDP to a Common Currency

- Example: Compare Brazil's GDP in 2020 of 7.4 trillion reals with the U.S. GDP of $20.9 trillion for the same year.
  - In 2020, the exchange rate was 2.362 reals = $1.
  - Convert Brazil's GDP into U.S. dollars:

$$Brazil's\ GDP\ in\ \$US = \frac{Brazil's\ GDP\ in\ reals}{Exchange\ rate\ (\frac{reals}{\$US})}$$

$$= \frac{7.4\ trillion\ reals}{2.362\ reals\ per\ \$US} = \$3.1\ trillion\ GDP$$

- Compare this value to the GDP in the United States in the same year.
- The U.S. GDP was $20.9 trillion in 2020, which is almost seven times that of GDP in Brazil.

GDP Per Capita

- The U.S. economy has the largest GDP in the world, and is also a populous country.
- Is its economy also larger on a per-person basis?
- **GDP per capita** - the GDP divided by the population.
- $GDP\ per\ capita = \frac{GDP}{population}$

19.5 How Well GDP Measures the Well-Being of Society

- **Standard of living** - all elements that affect people's happiness and well-being, whether they are bought and sold in the market or not.

- Difference between GDP and standard of living.

  - GDP does <u>not</u> include:
    - leisure time
    - actual levels of environmental cleanliness, health, and learning
    - production that is not exchanged in the market
    - the level of inequality in society
    - what technology and products are available

Credits: Greenlaw, S. A., Shapiro, D., & MacDonald, D. (2022). *Principles of economics* (3rd ed.). OpenStax. https://openstax.org/books/principles-economics-3e