CHAPTER 23

Measuring a Nation's Income

PRINCIPLES OF Economics

N. Gregory Mankiw

Premium PowerPoint Slides
by Ron Cronovich, Updated by Vance Ginn

In this chapter, look for the answers to these questions:

- What is Gross Domestic Product (GDP)?
- How is GDP related to a nation's total income and spending?
- What are the components of GDP?
- How is GDP corrected for inflation?
- Does GDP measure society's well-being?

Income and Expenditure

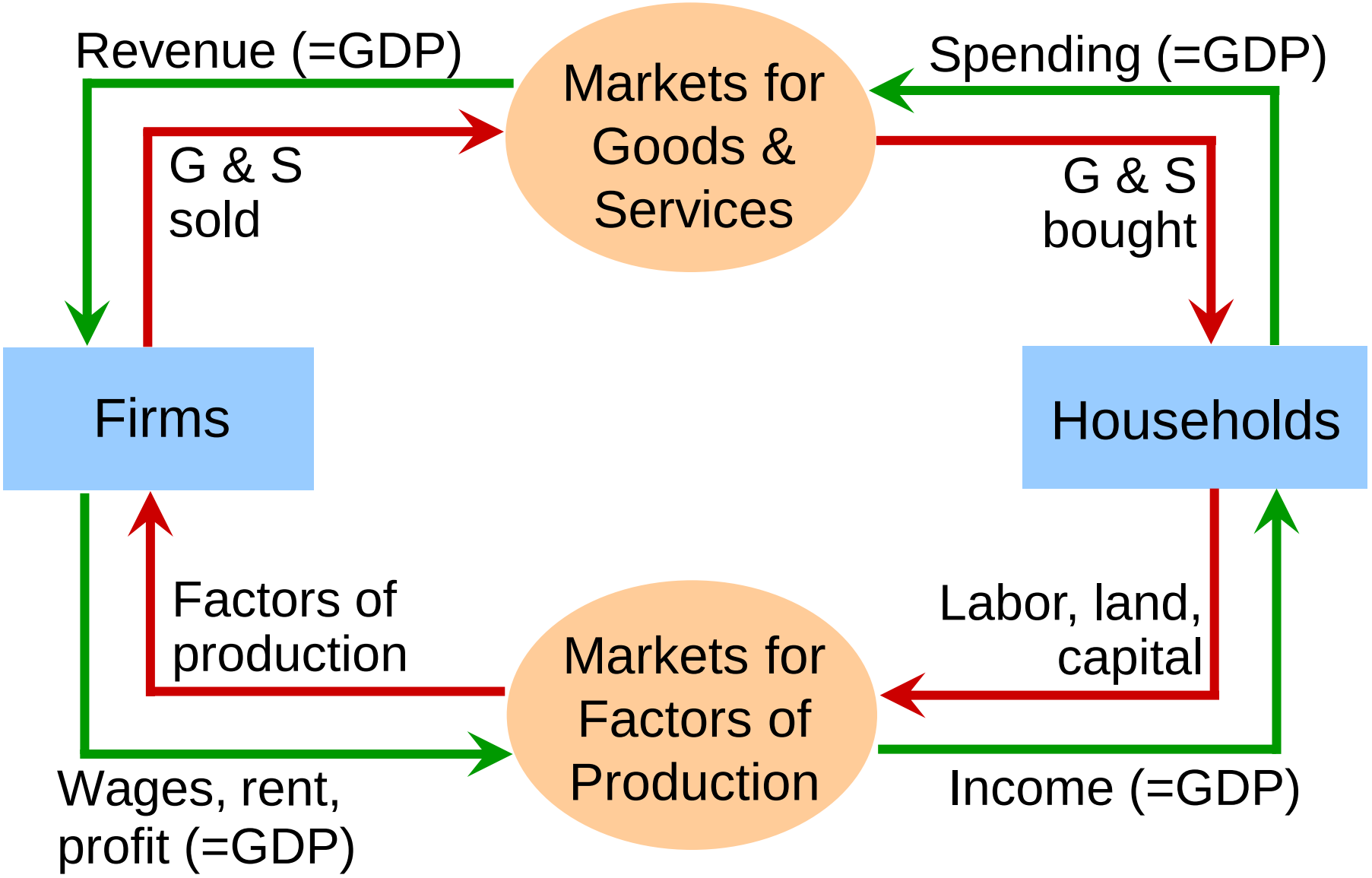
- **Gross Domestic Product (GDP)** measures total income of everyone in the economy.
- GDP also measures _____ on the economy's output of goods and services.

For the economy as a whole,
income equals expenditure
because every dollar a buyer spends is a dollar of income for the seller.

The Circular-Flow Diagram

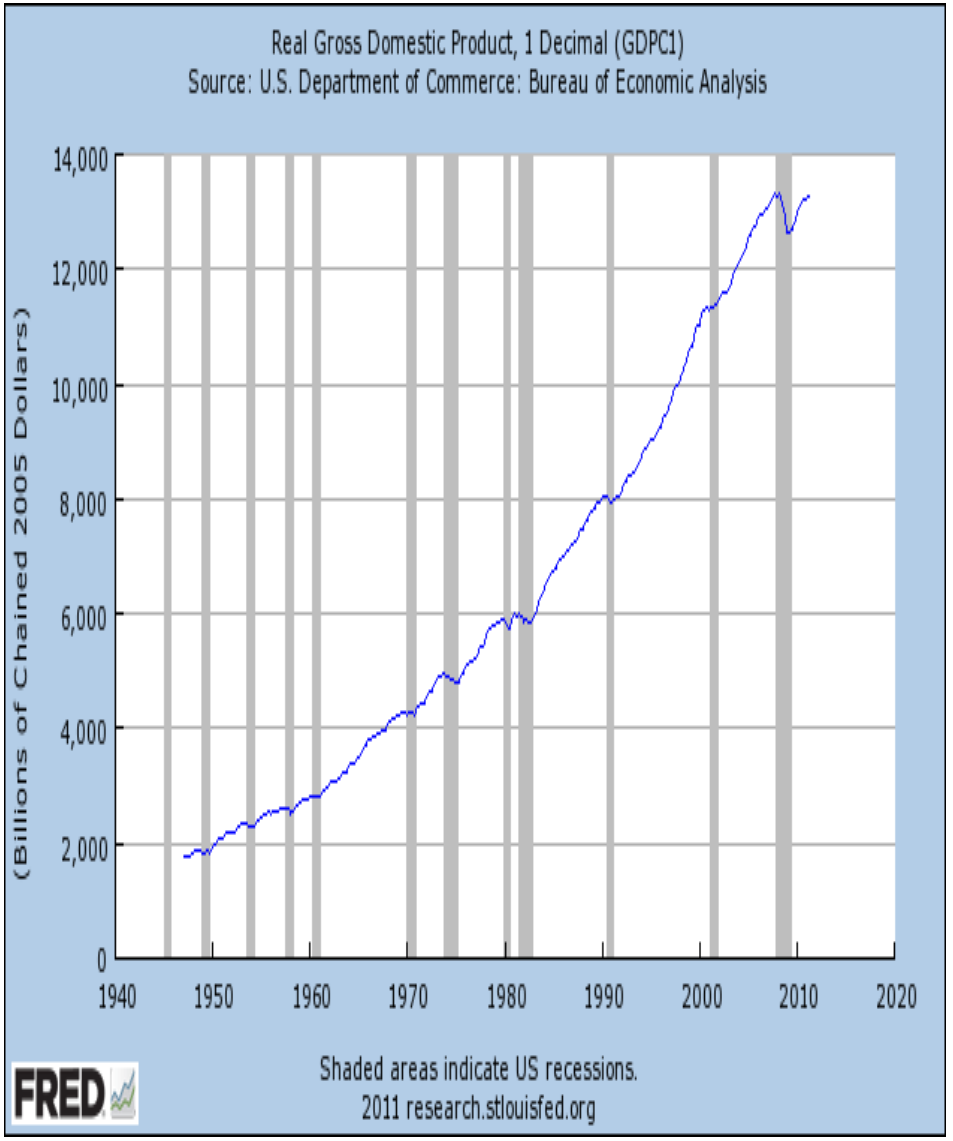
- a simple depiction of the macroeconomy
- illustrates GDP as spending, revenue, factor payments, and income
- Preliminaries:
  - **Factors of production** are inputs like labor, land, capital, and natural resources.
  - **Factor payments** are payments to the factors of production (*e.g.*, wages, rent).

The Circular-Flow Diagram



Gross Domestic Product

- GDP Defined
  - **GDP** or **gross domestic product** is the _____of all final goods and services produced in a country in a given time period.
  - This definition has four parts:
    - Market value
    - Final goods and services
    - Produced within a country
    - In a given time period



Gross Domestic Product

- **Market Value**
  - GDP is a market value—goods and services are valued at their _____. Does not include items w/out market.
  - To add apples and oranges, computers and popcorn, we add the market values so we have a total value of output in dollars.
  - includes all items produced in the economy and sold legally (does not include the underground economy which accounts for about 10% of GDP or$1.5 trillion that is never accounted for nor taxed- Reefer Madness by Schlosser)
- **Final Goods and Services**
  - GDP is the value of the *final goods and services* produced.
  - A **final good** (or service) is an item bought by its final user during a specified time period.
  - A final good contrasts with an **intermediate good**, which is an item that is produced by one firm, bought by another firm, and used as a component of a final good or service.
  - Excluding intermediate goods and services _____.
  - includes tangible (cd) or intangibles (rock concert) goods

Gross Domestic Product

- **Produced Within a Country**
  - GDP measures production within a country—domestic production. For example, this includes all of the foreign firms in the US.
  - If an American firm is in another country and produces a good, it will be included in _____.
- **In a Given Time Period**
  - GDP measures production during _____, normally a year or a quarter of a year.
  - Current period goods produced will be added, but not goods produced in a different time period. Examples: Food, Cars, Houses, etc.

The Components of GDP

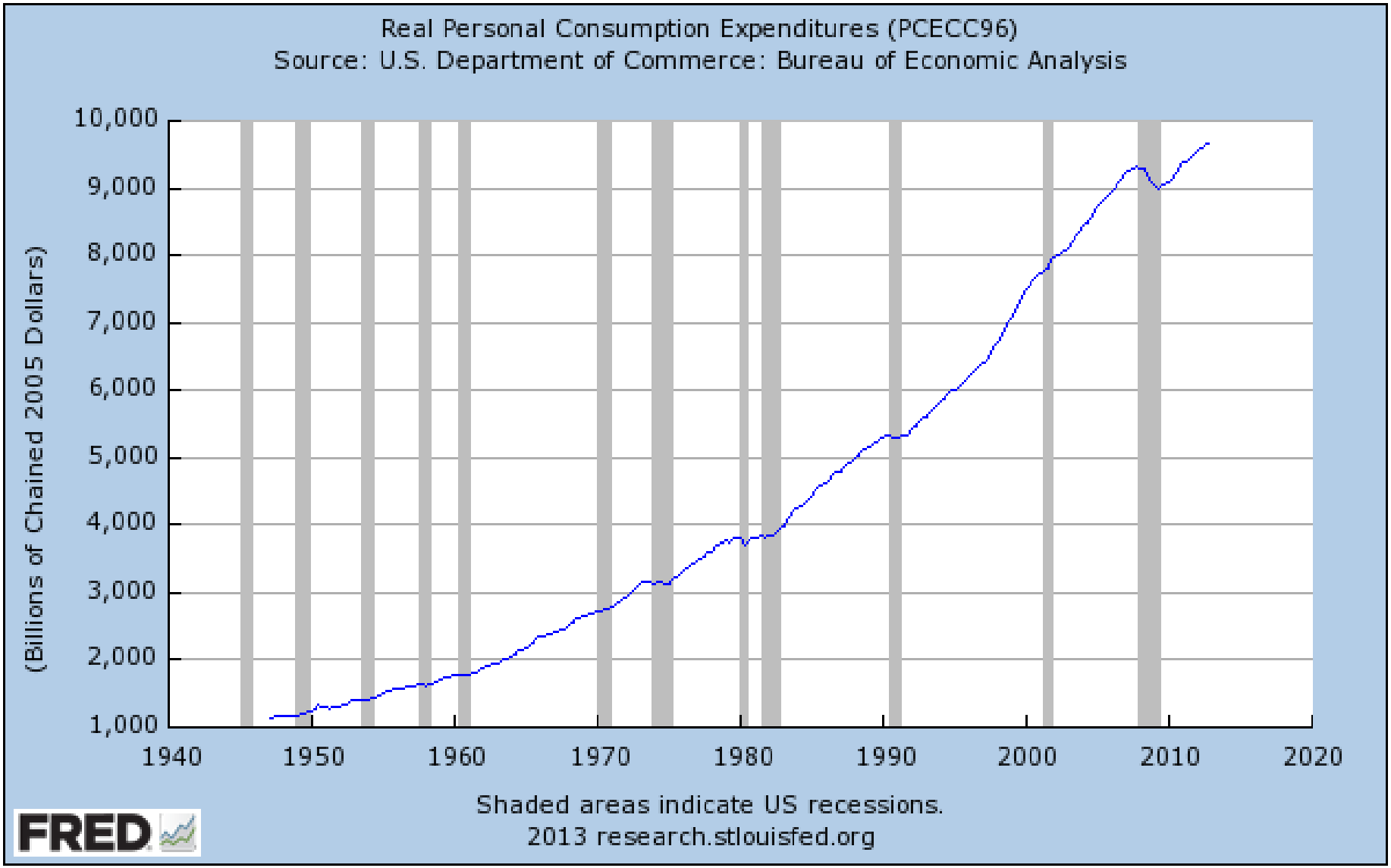
- Recall: GDP is _____.
- Four components:
  - Consumption (C)
  - Investment (I)
  - Government Purchases (G)
  - Net Exports (NX)
- These components add up to GDP (denoted **Y**):

$$Y = C + I + G + NX$$

Consumption (C)

- is total spending by households on g&s.
- _____
- Note on housing costs:
  - For renters,
    consumption includes rent payments.
  - For homeowners,
    consumption includes the imputed rental value of the house, but not the purchase price or mortgage payments.

Consumption (C)

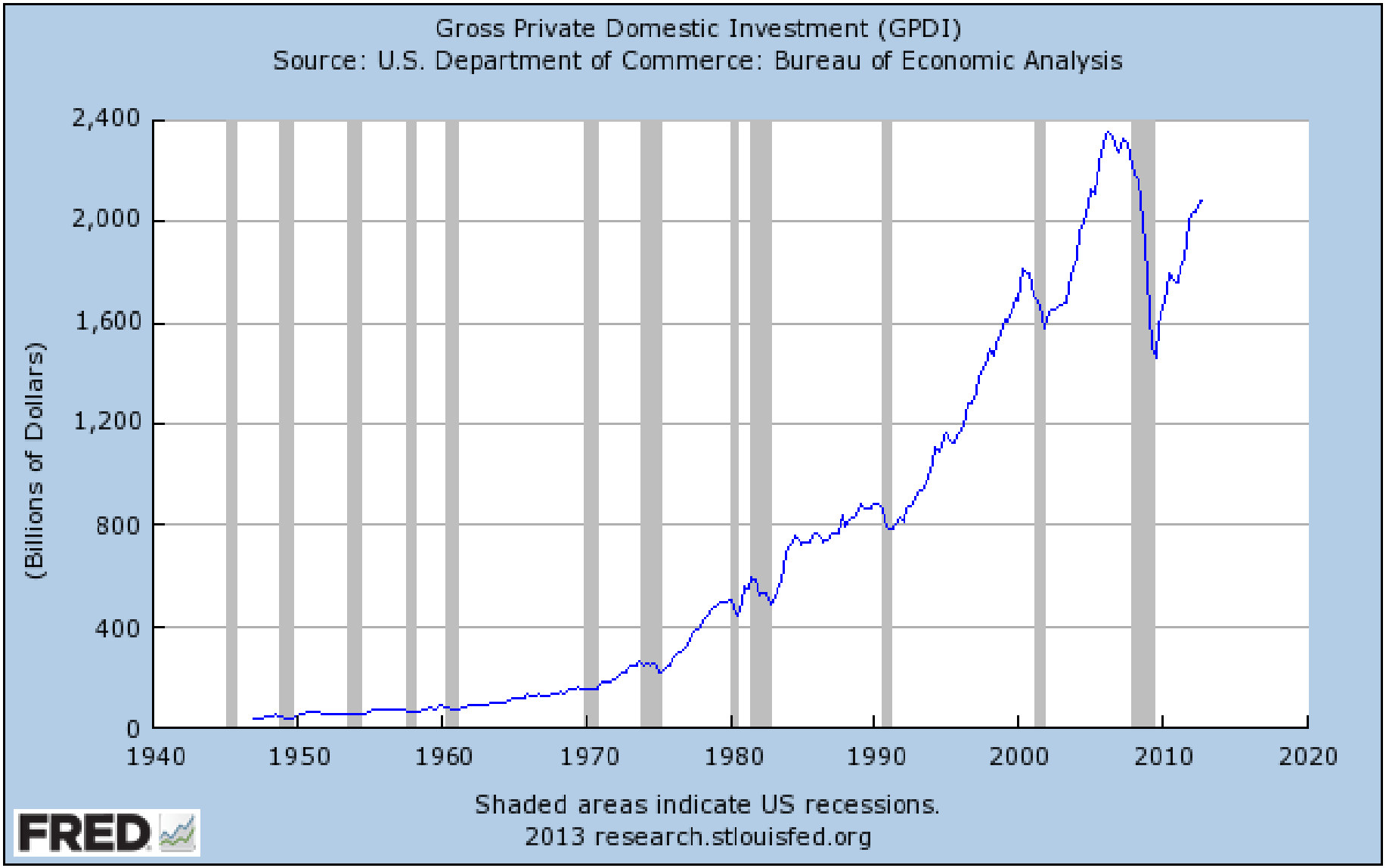


Investment (I)

- is total spending on goods that will be used in the _____.
- 15% of GDP.
- includes spending on
  - capital equipment (*e.g.*, machines, tools)
  - structures (factories, office buildings, houses)
  - inventories (goods produced but not yet sold)

*Note: **"Investment"** does not mean the purchase of financial assets like stocks and bonds.*

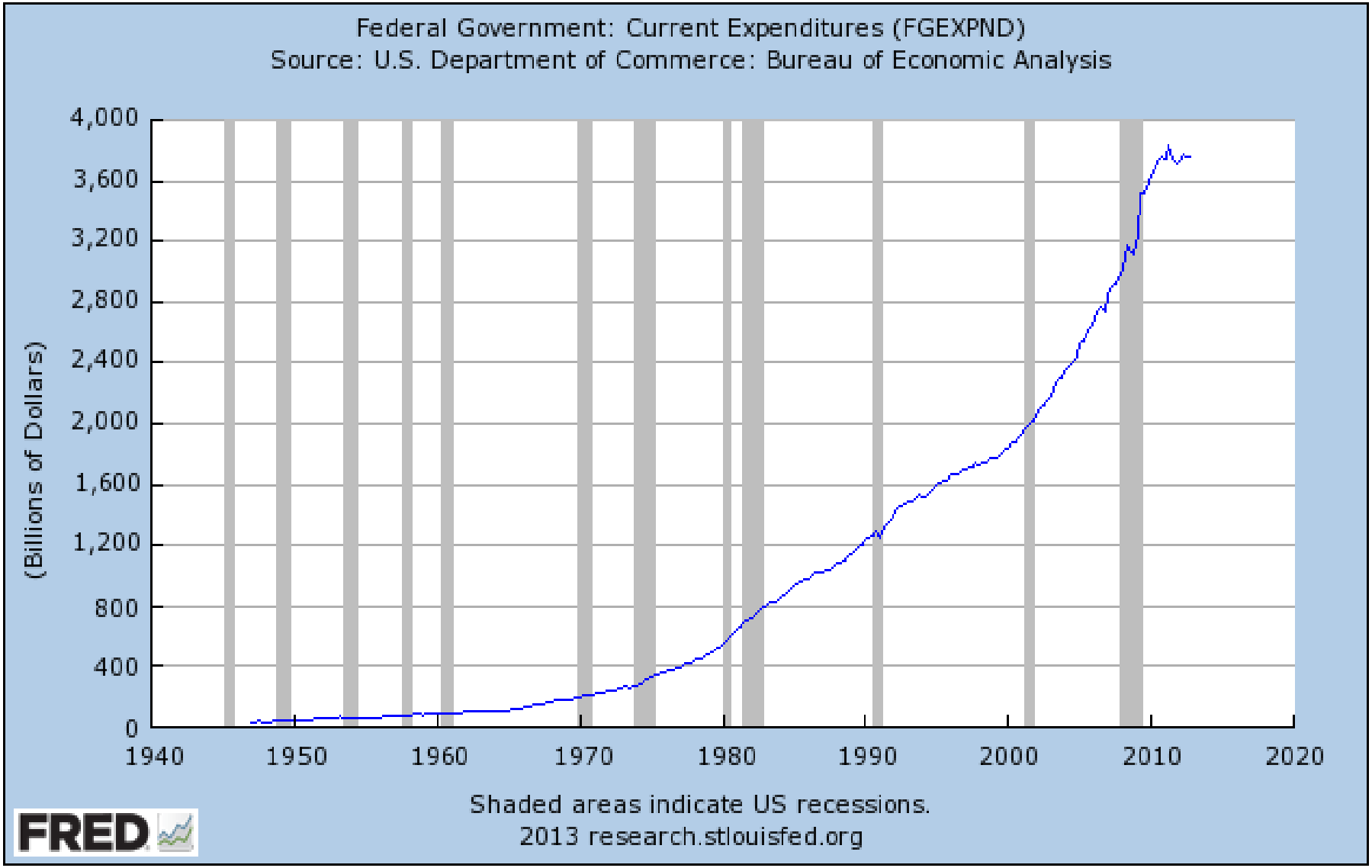
Investment (I)



Government Purchases (G)

- is all spending on the g&s purchased by govt at the federal, state, and local levels.
- 20% of GDP
- _____, such as Social Security or unemployment insurance benefits.
- They are not purchases of g&s.

Government Purchases (G)



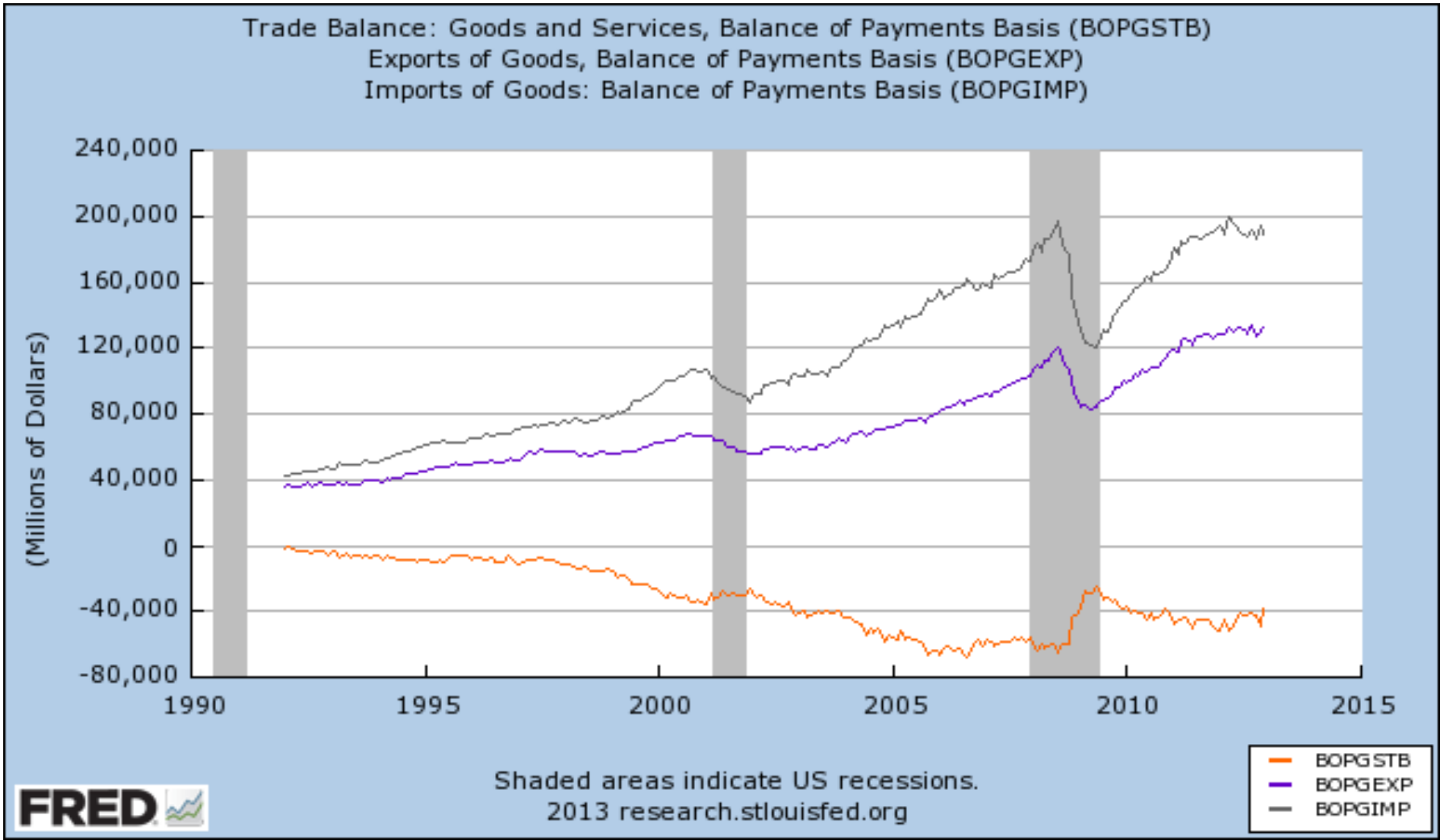
Net Exports (NX)

- _____
- Exports represent foreign spending on the economy's goods and services (g & s).
- Imports are the portions of C, I, and G that are spent on g&s produced abroad.
- Adding up all the components of GDP gives:

$$Y = C + I + G + NX$$

Net Exports: NX = EX – IM

- def: the value of total exports (X) minus the value of total imports (M). Makes up -5% of GDP. Currently there is a current account deficit of _____.



U.S. Nominal GDP and Its Components, 4th Q 2011 (in billions) (314 million Pop.)

	trillions	*% of GDP*	*per capita*
Y	$15.83	100.0	$50,414
C	11.24	71	35,796
I	1.42	9	4,518
G	3.77	24	12,006
NX	–557	–4	–1,755

What about Income Inequality? (video)

ACTIVE LEARNING 1

GDP and its components

In each of the following cases, determine how much GDP and each of its components is affected (if at all).

A. Debbie spends $200 to buy her husband dinner at the finest restaurant in Boston.

B. Sarah spends $1800 on a new laptop to use in her publishing business. The laptop was built in China.

C. Jane spends $1200 on a computer to use in her editing business. She got last year's model on sale for a great price from a local manufacturer.

D. General Motors builds $500 million worth of cars, but consumers only buy $470 million worth of them.

ACTIVE LEARNING 1
Answers

A. Debbie spends $200 to buy her husband dinner at the finest restaurant in Boston.

_____.

B. Sarah spends $1800 on a new laptop to use in her publishing business. The laptop was built in China.

_____

_____

ACTIVE LEARNING 1
Answers

C. Jane spends $1200 on a computer to use in her editing business. She got last year's model on sale for a great price from a local manufacturer.

D. General Motors builds $500 million worth of cars, but consumers only buy $470 million of them.

Real versus Nominal GDP

- Inflation can distort economic variables like GDP, so we have two versions of GDP:
  One is corrected for inflation, the other is not.
- **Nominal GDP** values output using current prices. It is not corrected for inflation.
- **Real GDP** values output using the prices of a _____. Real GDP is corrected for inflation.

EXAMPLE:

	Pizza		Latte	
year	***P***	***Q***	***P***	***Q***
2005	$10	400	$2.00	1000
2006	$11	500	$2.50	1100
2007	$12	600	$3.00	1200

Compute nominal GDP in each year:

Increase:

2005: $10 x 400 + $2 x 1000 = $6,000

2006: $11 x 500 + $2.50 x 1100 = $8,250

2007: _____

_____

30.9%

EXAMPLE:

	Pizza		Latte	
year	***P***	***Q***	***P***	***Q***
2005	$10	400	$2.00	1000
2006	$11	500	$2.50	1100
2007	$12	600	$3.00	1200

Compute real GDP in each year,
using 2005 as the base year:

Increase:

2005: $10 x 400 + $2 x 1000 = $6,000

2006: $10 x 500 + $2 x 1100 = $7,200 — 20.0%

2007: _____ — _____

EXAMPLE:

year	*Nominal GDP*	*Real GDP*
2005	$6000	$6000
2006	$8250	$7200
2007	$10,800	$8400

In each year,

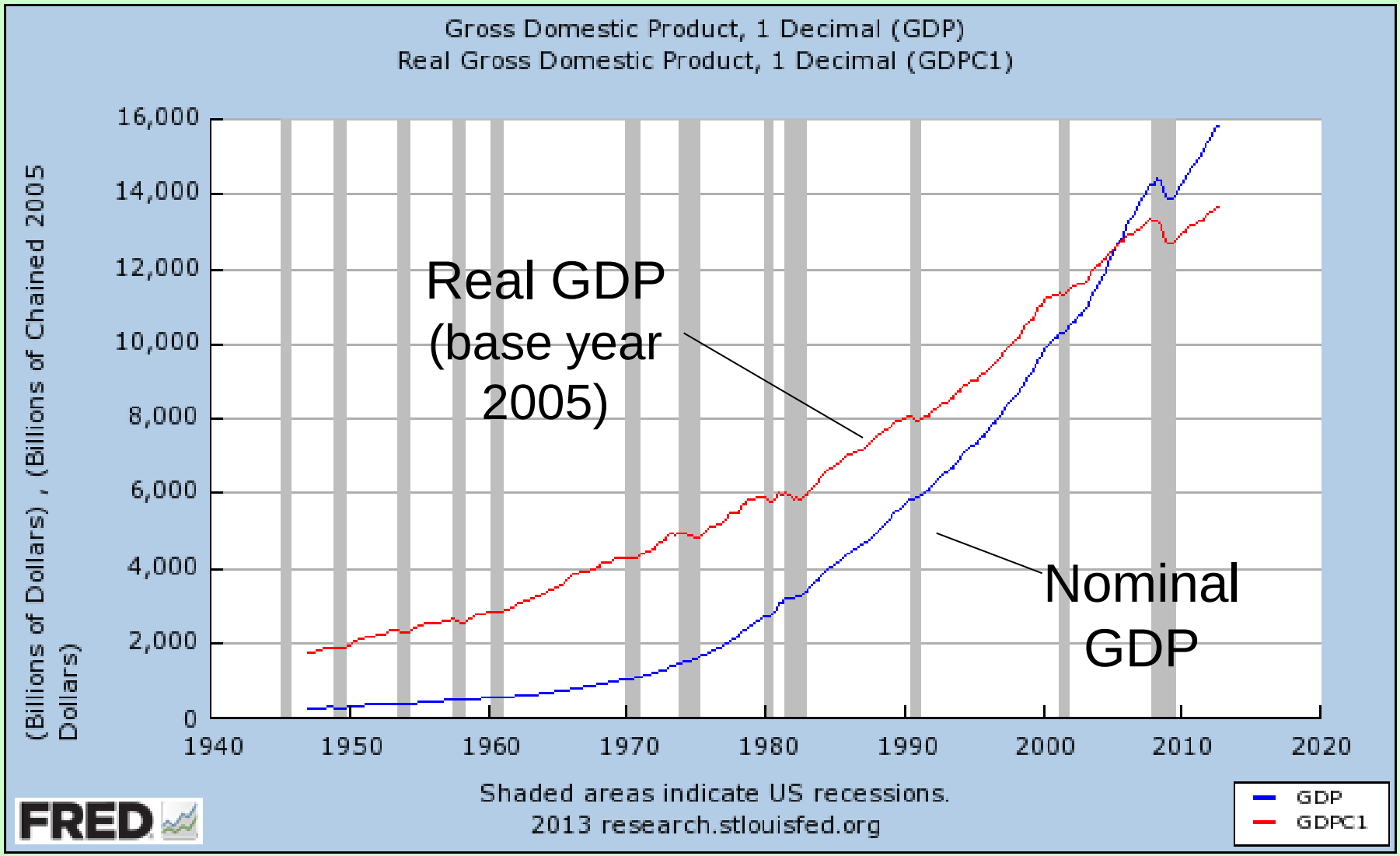
- nominal GDP is measured using the (then) _____.
- real GDP is measured using constant prices from the _____(2005 in this example).

EXAMPLE:

year	Nominal GDP		Real GDP	
2005	$6000		$6000	
		37.5%		20.0%
2006	$8250		$7200	
		30.9%		16.7%
2007	$10,800		$8400	

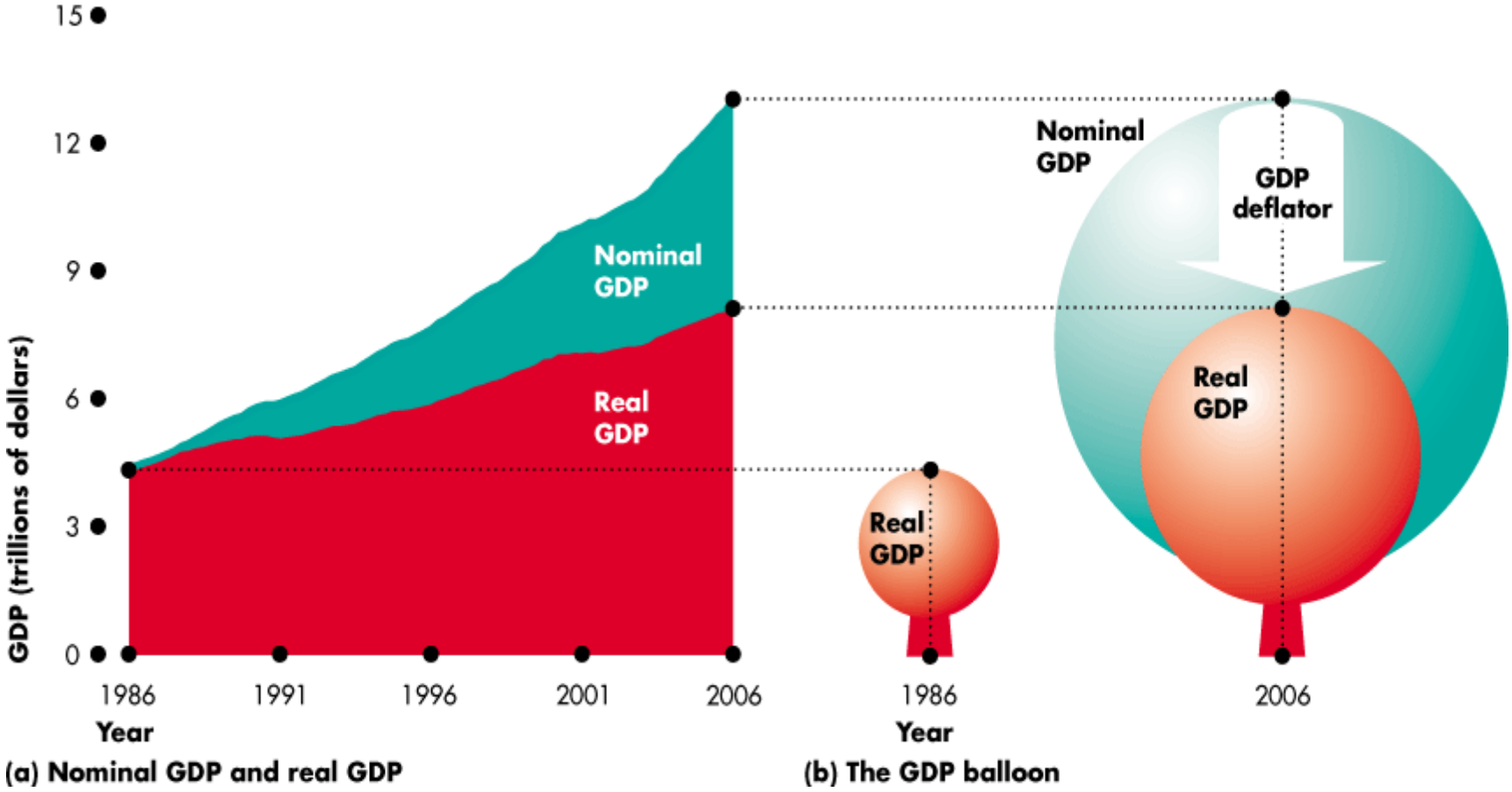
- The change in nominal GDP reflects both prices and quantities.
- The change in real GDP is the amount that GDP would change if prices were constant (*i.e.,* if zero inflation).

Nominal and Real GDP in the U.S., 1947-2013



Real GDP and the Price Level

- We use the GDP deflator to let the inflation air out of the nominal GDP balloon and reveal real GDP.



The GDP Deflator

- The GDP deflator is a measure of the overall _____.
- Definition:

$$\text{GDP deflator} = 100 \times \frac{\text{nominal GDP}}{\text{real GDP}}$$

- One way to measure the economy's **inflation rate** is to compute the percentage increase in the GDP deflator from one year to the next.

EXAMPLE:

year	*Nominal GDP*	*Real GDP*	*GDP Deflator*	
2005	$6000	$6000	100.0	
2006	$8250	$7200	114.6	14.6%
2007	$10,800	$8400	128.6	12.2%

Compute the GDP deflator in each year:

2005: 100 x (6000/6000) = 100.0

2006: 100 x (8250/7200) = 114.6

2007: 100 x (10,800/8400) = 128.6

ACTIVE LEARNING 2

Computing GDP

	2007 (base yr)		2008		2009	
	P	*Q*	*P*	*Q*	*P*	*Q*
Good A	$30	900	$31	1,000	$36	1050
Good B	$100	192	$102	200	$100	205

Use the above data to solve these problems:

A. Compute nominal GDP in 2007.

B. Compute real GDP in 2008.

C. Compute the GDP deflator in 2009.

ACTIVE LEARNING 2
Answers

	2007 (base yr)		2008		2009	
	P	*Q*	*P*	*Q*	*P*	*Q*
Good A	$30	900	$31	1,000	$36	1050
Good B	$100	192	$102	200	$100	205

A. Compute nominal GDP in 2007.

B. Compute real GDP in 2008.

ACTIVE LEARNING 2
Answers

	2007 (base yr)		2008		2009	
	P	*Q*	*P*	*Q*	*P*	*Q*
Good A	$30	900	$31	1,000	$36	1050
Good B	$100	192	$102	200	$100	205

C. Compute the GDP deflator in 2009.

Nom GDP = $36 x 1050 + $100 x 205 = $58,300

Real GDP = $30 x 1050 + $100 x 205 = $52,000

GDP deflator = 100 x (Nom GDP)/(Real GDP)

= _____

GDP and Economic Well-Being

- ***Real GDP per capita is the main indicator of the average person's standard of living.***
- But GDP is not a perfect measure of well-being.
- However, Economic Freedom and a Better Life (video) are correlated. (Correlation, does not mean causation)
- Robert Kennedy issued a very eloquent yet harsh criticism of GDP:

Gross Domestic Product…

"… does not allow for the health of our children, the quality of their education, or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our courage, nor our wisdom, nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile, and it can tell us everything about America except why we are proud that we are Americans."

- Senator Robert Kennedy, 1968

World Rankings for Nominal GDP

Rank	Country	GDP (trillions of USD)	
	World	**71.6**	
			% of world GDP
	European Union	16.2	(23%)
1	United States	15.8	(22%)
2	China	8.3	(12%)
3	Japan	6.0	(8%)
4	Germany	3.4	
5	France	2.6	

GDP Does Not Value:

- the quality of the environment
- leisure time
- non-market activity, such as the child care a parent provides his or her child at home
- an equitable distribution of income

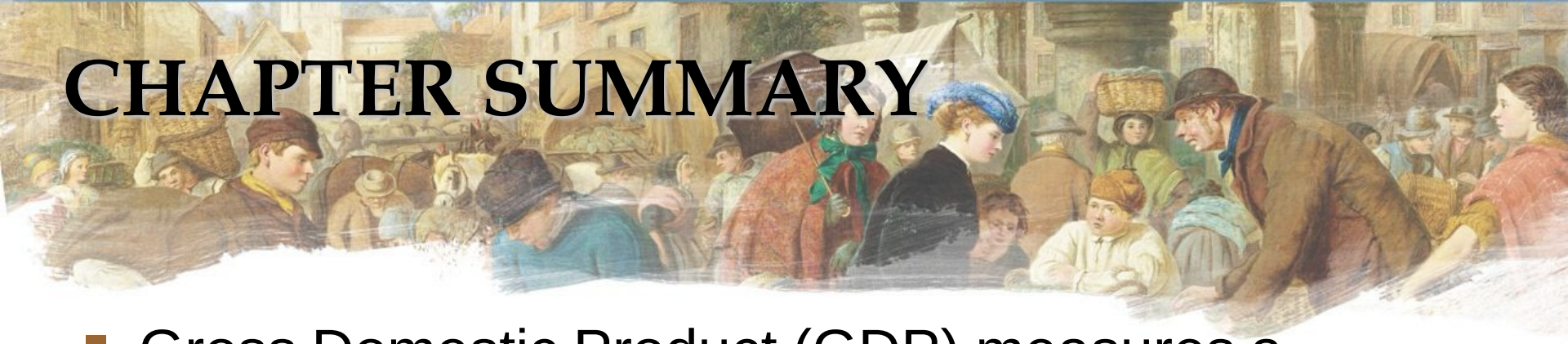
Then Why Do We Care About GDP?

- Having a large GDP enables a country to afford better schools, a cleaner environment, health care, etc.
- Many indicators of the quality of life are positively correlated with GDP. For example…

GDP and the quality of life

Country	Real GDP per person (2005)	Life expectancy	Adult literacy (% of population)	Internet usage (% of population)
United States	$41,890	78 years	99%	63 %
Japan	31,267	82	99	67
Germany	29,461	79	99	45
Russia	10,845	65	99	15
Mexico	10,751	76	92	18
Brazil	8,402	72	89	19
China	6,757	72	91	9
Indonesia	3,843	70	90	7
India	3,452	64	61	3
Pakistan	2,370	65	50	7
Bangladesh	2,053	63	47	0.3
Nigeria	1,128	47	69	4

The table shows GDP per person and three other measures of the quality of life for twelve major countries.



CHAPTER SUMMARY

- Gross Domestic Product (GDP) measures a country's total income and expenditure.
- The four spending components of GDP include: Consumption, Investment, Government Purchases, and Net Exports.
- Nominal GDP is measured using current prices. Real GDP is measured using the prices of a constant base year and is corrected for inflation.
- GDP is the main indicator of a country's economic well-being, even though it is not perfect.