

# Macroeconomics: Principles & Applications

## CHAPTER 6

### *Production, Income, and Employment*

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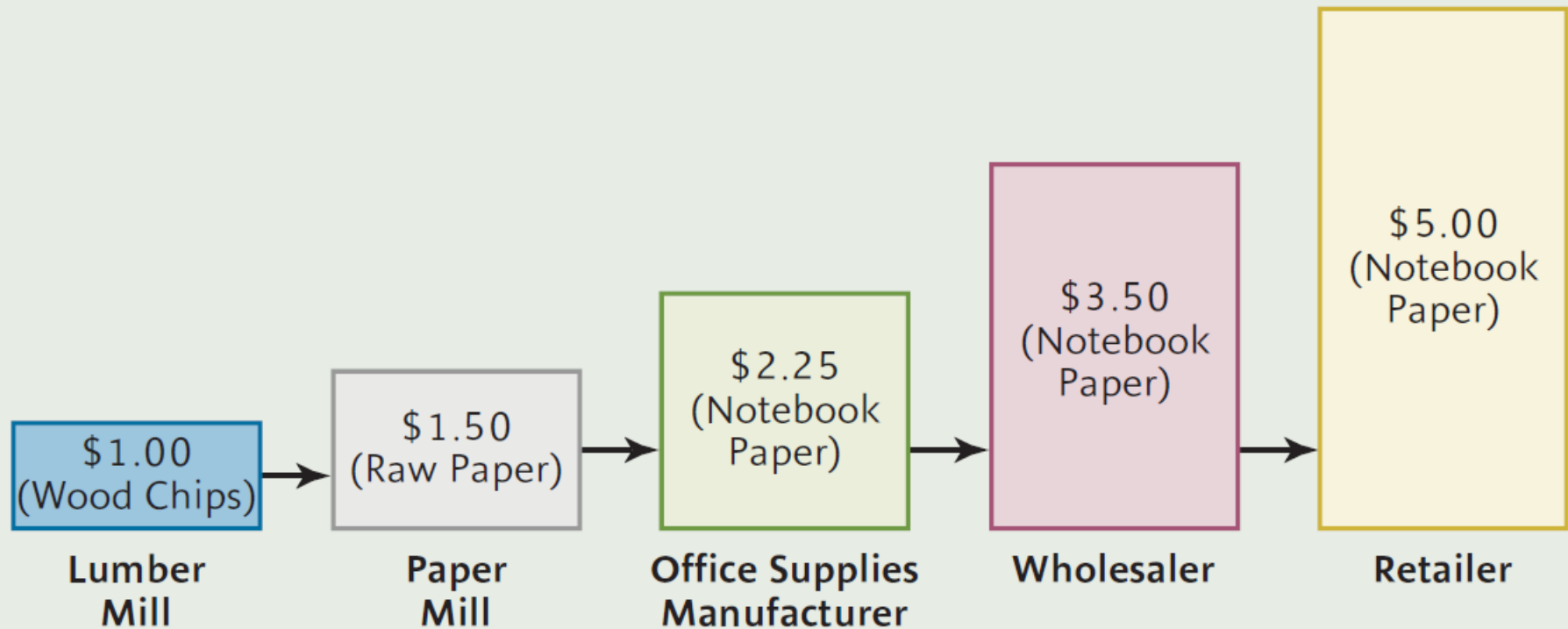
# Production and Gross Domestic Product

- **Gross domestic product (GDP)**
  - Total value
  - Of all final goods and services
  - Produced for the marketplace
  - During a given year,
  - Within the nation's borders

# Production and Gross Domestic Product

- The total value...
  - GDP – measured in dollar values
- ...of all final...
  - Final goods and services
    - Sold to their final user
- Intermediate goods
  - Goods used up in producing final goods
  - Value of all intermediate goods
    - Included in the value of final products

# Figure 1: Stages of Production



# Production and Gross Domestic Product

- ...goods and services...
  - Goods – tangibles
  - Services – intangibles
- ...produced...
  - Not included: land, stocks and bonds, etc
- ...for the marketplace...
  - With the intention of being sold

# Production and Gross Domestic Product

- ...during a given period...
  - Specific period of time
  - Not included: used goods
- ...within a nation's borders
  - Regardless of who owns the resources

# Tracking and Reporting GDP

- GDP
  - Flow variable
    - \$39 billion worth of output each day
    - \$1.2 trillion each month
    - \$14.1 trillion for the year
  - Government reports GDP as an annual rate
    - Measured and reported each quarter
    - Actual production during the three month period and *annualize it*

Table 1: Annualized data for GDP, real GDP, and growth rate, by quarters

<b>Quarters</b>	<b>GDP (billions of dollars)</b>	<b>Real GDP (billions of 2005 dollars)</b>	<b>Real GDP Growth Rate (from previous quarter)</b>
2008–I	\$14,373.9	\$13,366.9	–0.7%
2008–II	\$14,497.8	\$13,415.3	1.5%
2008–III	\$14,546.7	\$13,324.6	–2.7%
2008–IV	\$14,347.3	\$13,141.9	–5.4%
2009–I	\$14,178.0	\$12,925.4	–6.4%
2009–II	\$14,143.3	\$12,892.5	–1.0%

# Tracking and Reporting GDP

- **Nominal variable**
  - Measured without adjustment for the dollar's changing value
  - Nominal GDP
- **Real variable**
  - Adjusted for changes in the dollar's value
  - Real GDP
- **Growth rates**
  - Reported quarterly, Annualized

# The Expenditure Approach to GDP

- Expenditure approach,  $GDP = C + I + G + NX$ 
  - Adding the value of goods and services purchased by each type of final user
    1. Consumption goods and services (C)
      - Purchased by households
    2. Private investment goods and services (I)
      - Purchased by businesses
    3. Government goods and services (G)
      - Purchased by government agencies
    4. Net exports (NX)
      - Purchased by foreigners

# The Expenditure Approach to GDP

- **Consumption (C)**
  - Part of GDP purchased by households as final users
  - 70% of total production
  - Not included:
    - Used goods
    - Assets (stocks, bonds, land)
    - Newly constructed homes

# The Expenditure Approach to GDP

- **Consumption (C)**
  - Included - even though households don't actually buy them
    - Total value of food products produced on farms that are consumed by the farmers and their families themselves
    - Total value of housing services provided by owner-occupied homes

# The Expenditure Approach to GDP

- **Private investment (I)**
  - Business purchases of plant, equipment, and software
  - New-home construction
  - Changes in business firms' inventory stocks
- **Net investment**
  - Investment minus depreciation

# The Expenditure Approach to GDP

- **Private investment**
  - Corresponds only roughly to the increase in the nation's capital stock
  - Excludes
    - Government investment
    - Consumer durables
    - Human capital
  - Ignores depreciation

# The Expenditure Approach to GDP

- **Government purchases (G )**
  - Spending by federal, state, and local governments on goods and services
  - Government consumption and investment purchases
- **Government outlays**
  - Government purchases
  - Transfer payments

# The Expenditure Approach to GDP

- **Transfer payments**
  - Payment that is not compensation for supplying goods, services, or resources
  - Money redistributed from one group of citizens (taxpayers) to another (the poor, the unemployed, the elderly)
  - Included in government budgets as outlays
  - Not included in the government purchases component of GDP

# The Expenditure Approach to GDP

- **Net exports (NX)**
  - Total exports minus total imports
- **Total exports**
  - U.S. production that is purchased by foreigners
- **Total imports**
  - Americans' purchases of goods produced outside of the United States

## Table 2: GDP in 2008: The Expenditure Approach

Consumption Purchases (\$ billion)		Private Investment Purchases (\$ billion)		Government Purchases (\$ billion)		Net Exports (\$ billion)	
Services	\$6,727	Plant, Equipment, and Software	\$1,694	Government Consumption	\$2,387	Exports	\$1,831
Nondurable Goods	\$2,308	New-Home Construction	\$477	Government Investment	\$496	Imports	\$2,539
Durable Goods	\$1,095	Changes in Business Inventories	– \$35				
<b>Consumption = \$10,130</b>		<b>Private Investment = \$2,136</b>		<b>Government Purchases = \$2,883</b>		<b>Net Exports = –\$708</b>	

$$\begin{aligned}
 \text{GDP} &= C + I + G + NX \\
 &= \$10,130 + \$2,136 + \$2,883 + (-\$708) \\
 &= \$14,441 \text{ billion}
 \end{aligned}$$

# Other Approaches to GDP

- **Value added**
  - Revenue a firm receives
  - Minus the cost of the intermediate goods it buys
- **Value-added approach**
  - $\text{GDP} = \text{sum the values added by all firms in the economy}$

## Table 3: Value Added at Different Stages of Production

<b>Firm</b>	<b>Cost of Intermediate Goods</b>	<b>Revenue</b>	<b>Value Added</b>
Lumber Company	\$ 0	\$1.00	\$1.00
Paper Mill	\$1.00	\$1.50	\$0.50
Office Supplies Manufacturer	\$1.50	\$2.25	\$0.75
Wholesaler	\$2.25	\$3.50	\$1.25
Retailer	\$3.50	\$5.00	\$1.50
			<u>        </u>
			Total: \$5.00

# Other Approaches to GDP

- **Factor payments**
  - Payments to the owners of resources that are used in production
- **Factor payments approach**
  - $\text{GDP} = \text{sum the factor payments earned by all households in the economy}$
- **Total output of the economy (GDP) = total income earned in the economy**

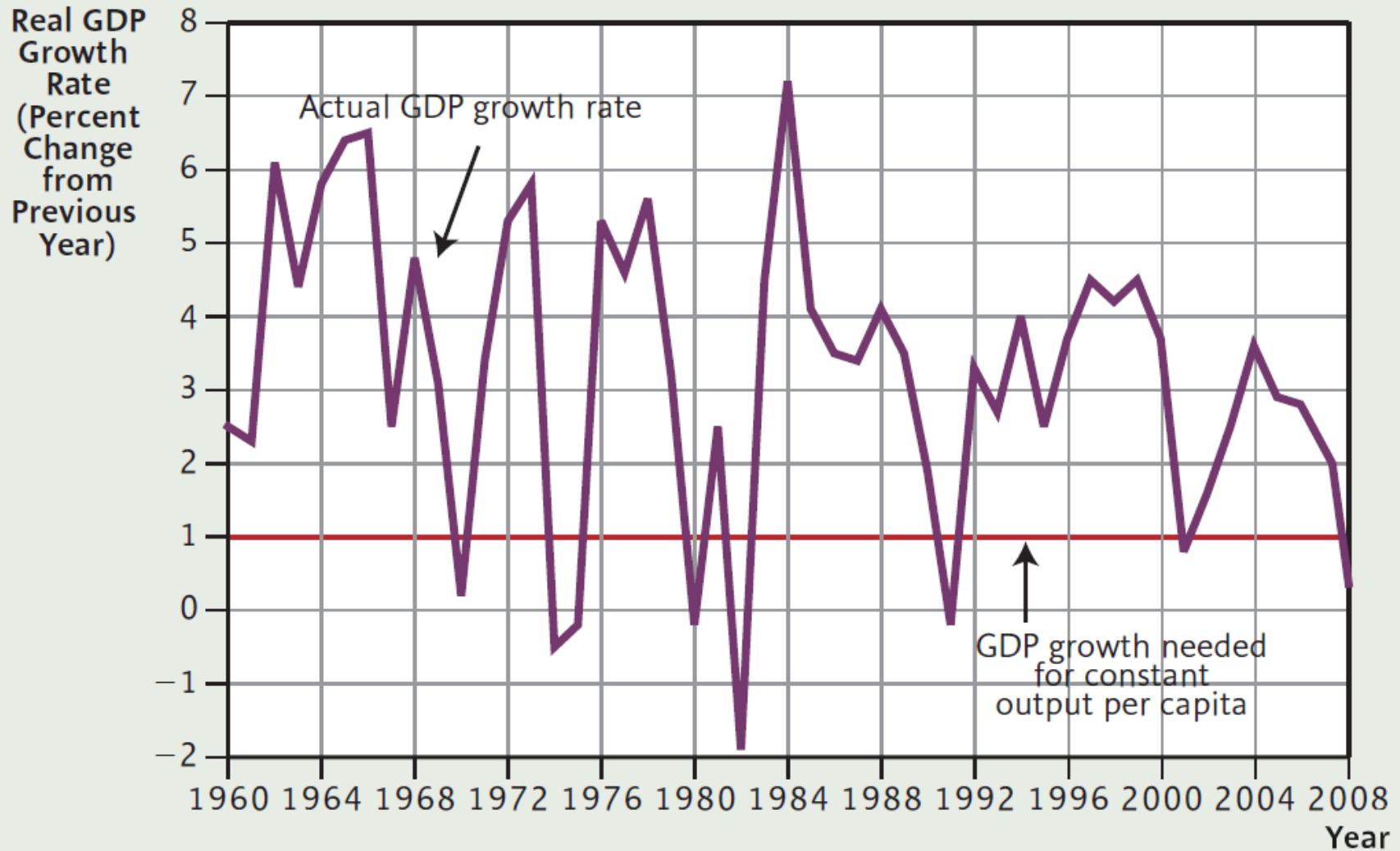
# Tracking and Reporting GDP

- **Expenditure Approach:**
  - $GDP=C+I+G+NX$
- **Value-Added Approach:**
  - $GDP=\text{Sum of value added by all firms}$
- **Factor Payments Approach:**
  - $GDP=\text{Sum of factor payments earned by all households}$
  - = Wages and salaries + interest + rent + profit
  - = Total household income

# Tracking and Reporting GDP

- **How GDP is used**
  - National income accounts, 1931
  - To steer the economy in short and long run
    - Short-run: onset of a recession or too-rapid expansion
    - Long-run growth in real GDP
      - Real GDP growth rate of 1% per year - needed just to maintain our output per capita
      - To ensure the economy generates sufficient new jobs

# Figure 2: Real GDP Growth Rate, 1960–2008



# Tracking and Reporting GDP

- **Problems with GDP**
  - Doesn't include:
    - Quality changes
    - Most non-market production
    - Leisure time, fairness, 'bads'
  - Underground economy – estimated
  - Doesn't distinguish between
    - Production that makes us better off
    - Production that only prevents us from becoming worse off

# Tracking and Reporting GDP

- Using GDP properly
  - Short-term changes in real GDP
    - Fairly accurate reflections of the state of the economy
    - A significant quarter-to-quarter change in real GDP
      - Indicates a change in actual production
      - Rather than a measurement problem

# Employment and Unemployment

- **Unemployed**
  - Not working and
  - Actively seeking a job
- **Categories of unemployment**
  - Frictional
  - Seasonal
  - Structural
  - Cyclical

# Employment and Unemployment

- **Frictional unemployment**
  - People who are between jobs
  - People who are just entering or reentering the labor market
  - Is short-term unemployment
  - Important benefits
    - Workers - Better suited for the job, more productive, higher incomes
    - Firms - more productive employees
    - Society - more goods and services

# Employment and Unemployment

- **Seasonal unemployment**
  - Related to changes in weather, tourist patterns, or other seasonal factors
  - Short term
  - Entirely predictable
- **Seasonal Adjustment**
  - Adjusting an economic variable
  - To remove the effects of changes predicted to occur at that time of year

# Employment and Unemployment

- **Structural unemployment**
  - Skill mismatch
    - Between workers' skills and employers' requirements
  - Geographic mismatch
    - Between workers' locations and employers' locations
  - Stubborn, long-term problem

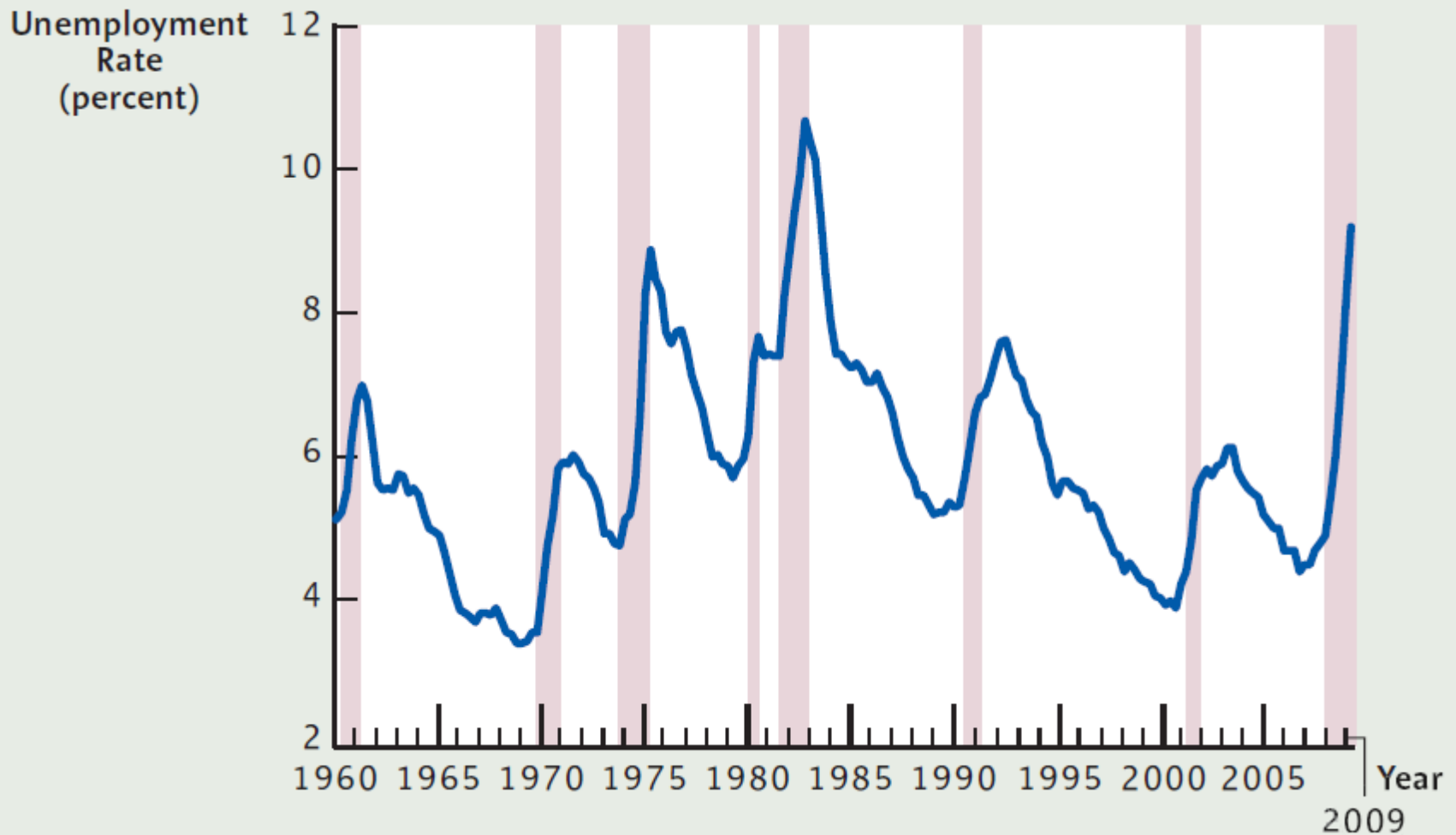
Table 4: Average unemployment rates in several countries, 1995–2005, 2007

<b>Country</b>	<b>Average Unemployment Rate, 1995–2005</b>	<b>Average Unemployment Rate, 2007</b>
France	10.2 %	8.6 %
Italy	9.9 %	6.2 %
Canada	7.2 %	5.3 %
United Kingdom	6.2 %	5.4 %
Germany	8.9 %	8.7 %
Sweden	7.2 %	6.1 %
United States	5.2 %	4.6 %

# Employment and Unemployment

- **Cyclical unemployment**
  - Arising from changes in production over the business cycle
  - Macroeconomic policy
  - Economy – produces less output
    - Some groups within society – consume less output

Figure 3: U.S. quarterly unemployment rate, 1960 -2009, 2nd quarter



# Employment and Unemployment

- **Full employment**
  - Zero cyclical unemployment
  - Overall unemployment rate  $> 0$ 
    - Frictional, seasonal, and structural unemployment
- **Potential output**
  - Level of output the economy could produce if operating at full employment

# Employment and Unemployment

- **Costs of unemployment**
  - Economic cost
    - Opportunity cost of lost output
    - Output produced < Potential output
  - Psychological and physical effects
  - Setbacks in achieving important social goals
  - Burden of unemployment
    - Not shared equally among different groups in the population
    - Most heavily: minorities, especially minority youth

Figure 4: Actual and Potential Real GDP, 1960–2009 (2nd quarter)

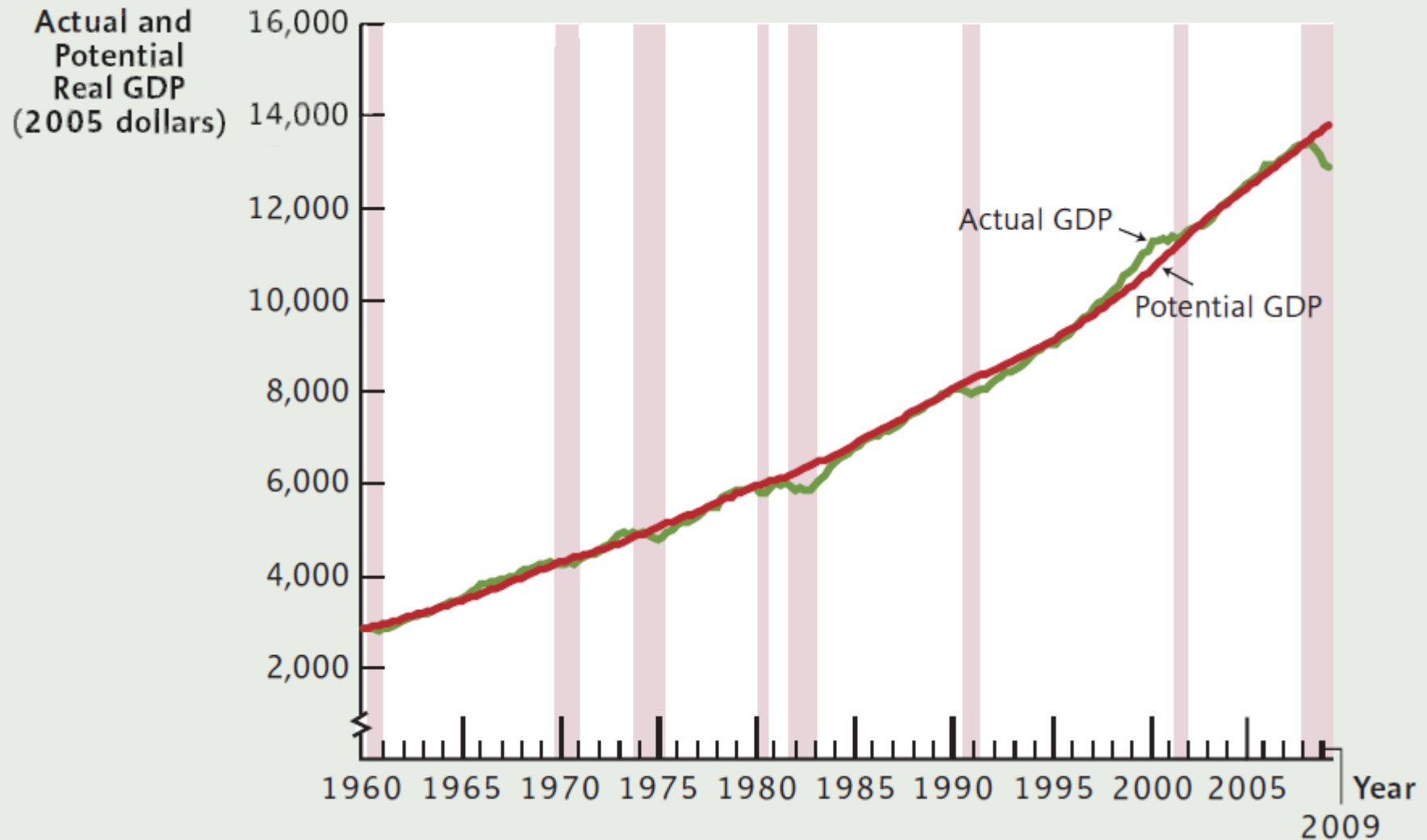
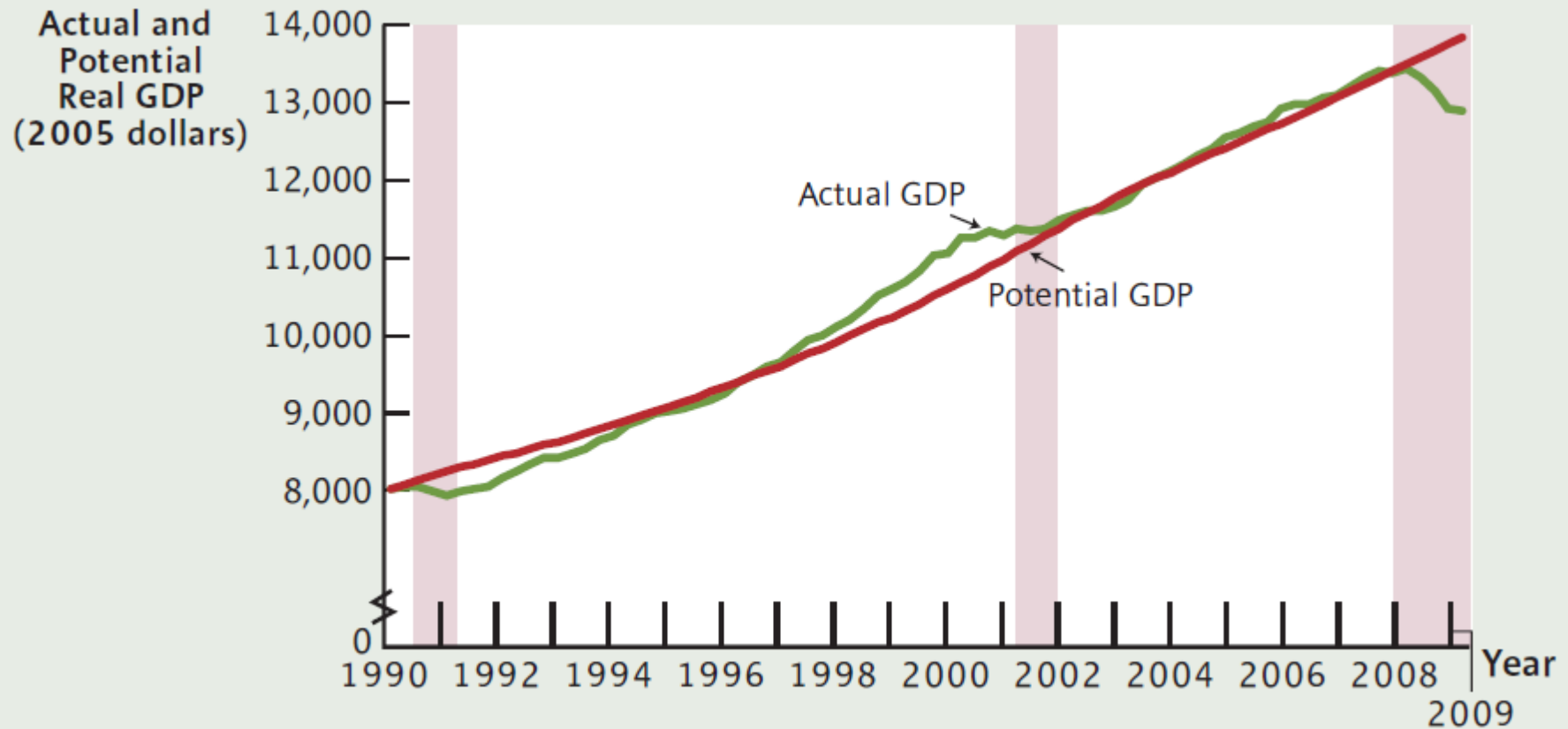


Figure 5: Actual and Potential Real GDP, 1990–2009 (2nd quarter)



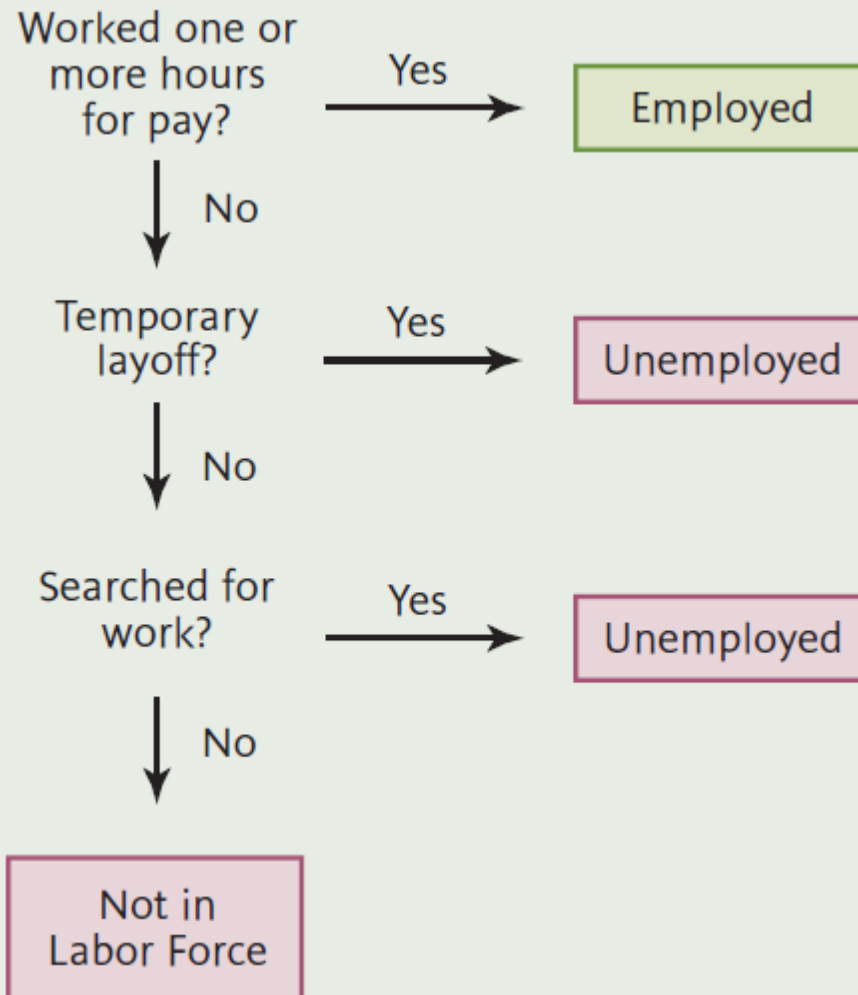
## Table 5: Unemployment Rates for Various Groups, June 2009

<b>Group</b>	<b>Unemployment Rate</b>
Whites	8.7%
Hispanics	12.2%
Blacks	14.7%
White Teenagers	21.4%
Black Teenagers	37.9%

# How Unemployment is Measured

- **Census Bureau's Household Survey**
  - Every month
  - 60,000 households
  - Don't have a job
  - Actively search for work during the previous four weeks

## Figure 6: How the BLS Measures Employment Status



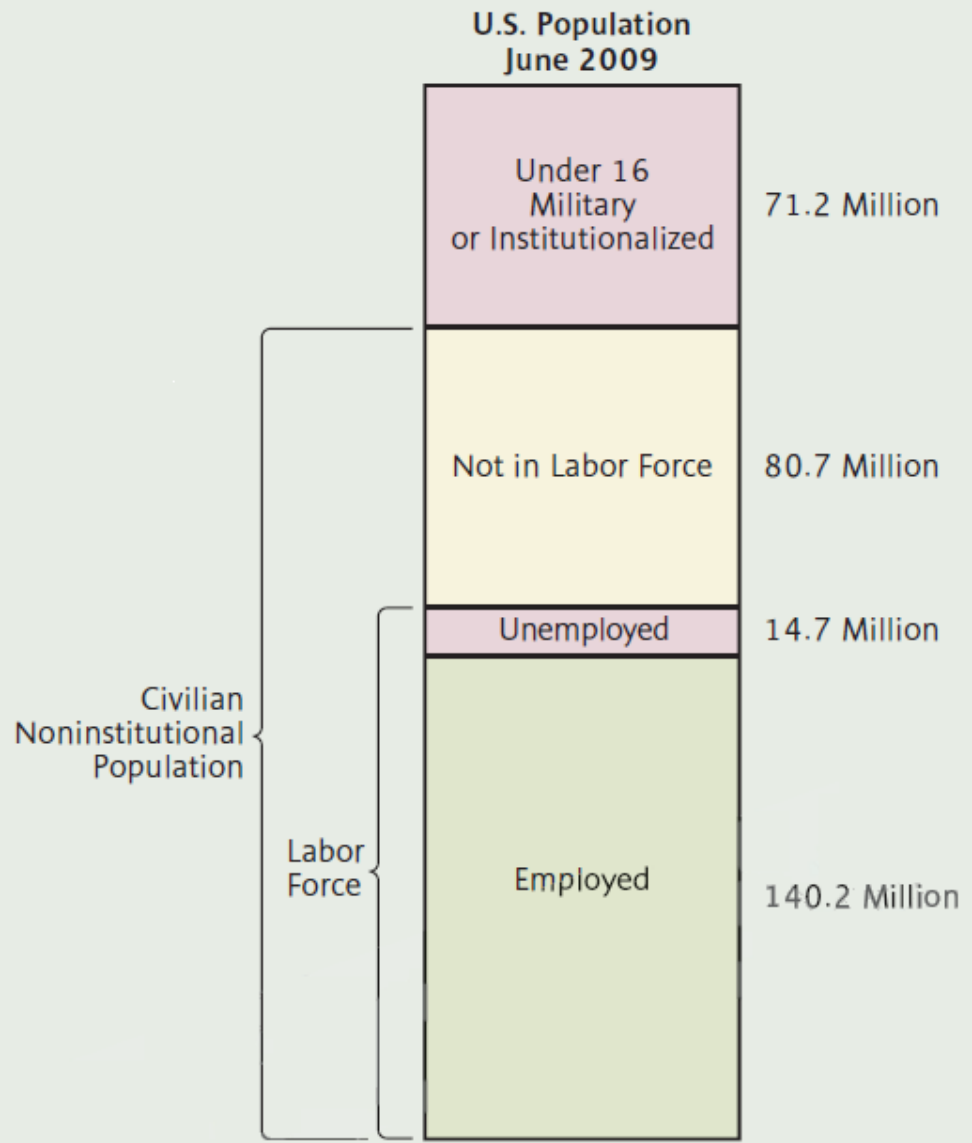
BLS interviewers ask a series of questions to determine whether an individual is employed, unemployed, or not in the labor force.

# How Unemployment is Measured

- Labor force
  - Have a job or looking for one
- Unemployment rate
  - Fraction of the labor force that is without a job

$$\text{Unemployment rate} = \frac{\text{Unemployed}}{\text{Labor force}} = \frac{\text{Unemployed}}{(\text{Unemployed} + \text{Employed})}$$

# Figure 7: Employment Status of the U.S. Population—June 2009



# Problems in Measuring Unemployment

- **Official measure of unemployment**
  - Underestimates the extent of unemployment
    - Treatment of involuntary part-time workers
    - Treatment of discouraged workers
- **Involuntary part-time workers**
  - Individuals who would like a full-time job
  - But who are working only part time
- **Discouraged workers**
  - Individuals who would like a job
  - But have given up searching for one

# The Unemployment Rate in Perspective

- **Alternative measures of the unemployment rate**
  - Include involuntarily part time workers
  - Include discouraged workers
  - Survey of business establishments - track the number of jobs that have been added and lost
- **Unemployment rate – relatively high**
  - Firms who want to expand
    - Hire unemployed
  - Little inflationary danger

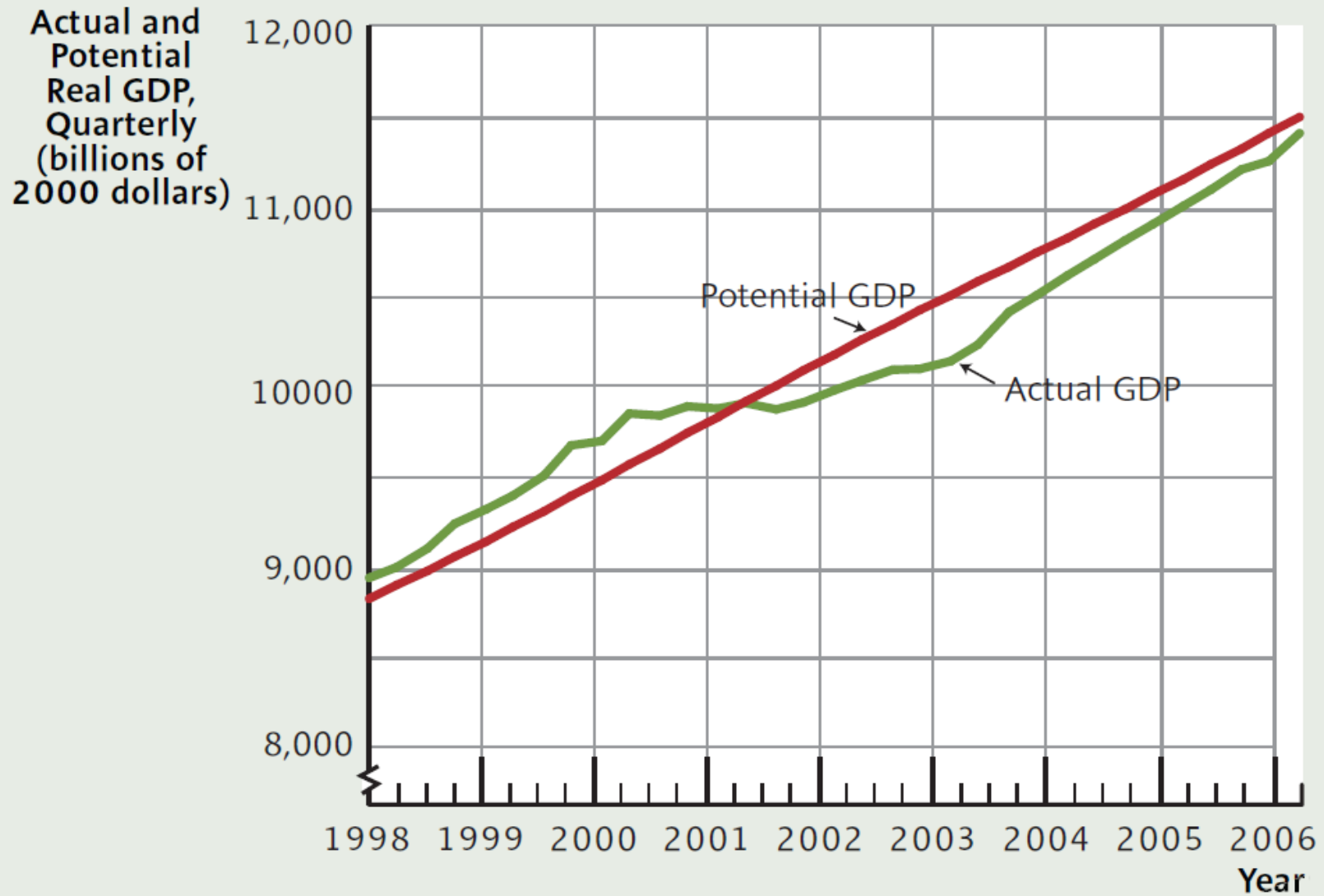
# The Unemployment Rate in Perspective

- Unemployment rate - relatively low
  - Few people are actively seeking work
  - Firms who want to expand
    - Lure workers from other firms
    - Higher wage rate
  - Can lead to future inflation

## Sudden disasters and GDP

- **Some horrific national disasters**
  - Man-made and natural
  - Have had relatively little impact on U.S. GDP
  - Two types of effects on real GDP
    - Direct impact of the event itself
    - Indirect effects that follow as economic decision makers respond to the event

# Figure 8: Quarterly GDP during Two Recent Disasters



# Hurricanes Katrina and Rita in 2005

- **Direct Effects: Destruction and Disruption**
  - Total loss: \$69 billion to \$130 billion
    - About 287,000 homes destroyed or damaged
    - Severe damage to oil and natural gas platforms and pipelines
  - Destroyed: part of the nation's capital stock
  - Impact on GDP
    - Loss of output that the destroyed resources would otherwise have enabled us to produce

Table 6: Property Destruction from Hurricanes Katrina and Rita, 2005

<b>Type of Property</b>	<b>Estimated Loss</b>
Residential housing	\$17 billion to \$33 billion
Consumer durables (autos, furniture, appliances)	\$5 billion to \$9 billion
Energy infrastructure	\$18 billion to \$31 billion
Nonenergy business property	\$16 billion to \$32 billion
Public infrastructure	\$13 billion to \$25 billion
<b>Total</b>	<b>\$69 billion to \$130 billion</b>

Table 7: Estimated and Projected Effects of Hurricanes Katrina and Rita on GDP (billions of 2005 dollars at annual rates)

	Second Half, 2005	First Half, 2006	Second Half, 2006
<b>Direct effects</b>			
Energy production	-18 to -28	-8 to -10	-5 to -7
Housing services	-1 to -2	-2 to -4	-1 to -3
Agricultural production	-1 to -2	0	0
<b>Indirect effects</b>			
Reduced consumption spending (beyond direct effects)	-14 to -22	-7 to -11	-3 to -8
Replacement investment	+6 to +12	+16 to +34	+16 to +35
Increased government spending on goods and services	+6 to +10	+12 to +18	+14 to +20
<b>Total impact on real GDP</b>	<b>-22 to -32</b>	<b>+11 to +27</b>	<b>+21 to +37</b>

# Hurricanes Katrina and Rita in 2005

- **Indirect Effects: Government & Private Responses**
  - Potential to be more harmful and long-lasting
  - Any indirect decreases in production
    - Usually smaller than the direct decrease
  - Changes in macroeconomic policy - designed to counteract the decrease in production

# Hurricanes Katrina and Rita in 2005

- **Indirect Effects**
  - Some tend to decrease production
  - Others work to increase it
  - Three indirect effects
    - From decisions about spending by different sectors of the economy
      - Households, businesses, and government agencies
  - Negative: the decrease in consumption spending

# Hurricanes Katrina and Rita in 2005

- Two mistakes to avoid in analyzing the economic impacts of disasters:
  - To think that, because a disaster actually increases production, we end up economically better off for it
  - To extrapolate too broadly from past disasters to future ones