Chapter 5: Production, Income and Employment

- We will take our first look at production and employment, focusing on two key variables: Gross Domestic Product and Unemployment Rate.
- The nation’s Gross Domestic Product
  - Total value of all final goods and services produced for the marketplace during a given period, within the nation’s borders.
Production and Gross Domestic Product, GDP: A Definition

- The total value
  - Approach of GDP is to add up dollar value of every good or service—the number of dollars each product is sold for
    - Advantages
    - Also creates a problem
      - If prices rise, then GDP will rise, even if we are not actually producing more
      - GDP must be adjusted to take away the effects of inflation

- ...of all final...
  - When measuring production, we do not count every good or service produced in the economy
    - Only those that are sold to their final users
    - Avoids over-counting intermediate products when measuring GDP
      - Value of all intermediate products is automatically included in value of final products they are used to create
Production and Gross Domestic Product, GDP: A Definition

- ...goods and services...
  - We all know a good when we see one
  - Final services count in GDP in the same way as final goods

- ...produced...
  - In order to contribute to GDP, something must be produced
    - Buying land or financial assets (stocks and bonds) are not counted in GDP
    - During the period being considered
Figure 1: Stages of Production

Lumber Mill

$1.00 (Wood Chips)

Paper Mill

$1.50 (Raw Paper)

Office Supplies Manufacturer

$2.25 (Notebook Paper)

Wholesaler

$3.50 (Notebook Paper)

Retailer

$5.00 (Notebook Paper)
Production and Gross Domestic Product, GDP: A Definition

- ...for the marketplace...
  - GDP does not include all final goods and services produced in the economy
    - Includes only the ones produced for the marketplace—that is, with the intention of being sold

- ...during a given period...
  - GDP measures production during some specific period of time
    - Only goods produced during that period are counted
    - GDP is actually measured for each quarter, and then reported as an annual rate for the quarter
    - Once the fourth-quarter figures are in, government also reports official GDP figure for the entire year
Production and Gross Domestic Product, GDP: A Definition

...within the nation’s borders

☐ U.S. GDP measures output produced within U.S. borders

☐ Regardless of whether it was produced by Americans
  ☐ Americans abroad are not counted
  ☐ However, foreigners producing goods or services within the country are
The Expenditure Approach to GDP

- Expenditure components of GDP
  - Consumption goods and services (C)—purchased by households; sum of expenditures on durable goods, nondurable goods, and services.
  - Private investment goods and services (I)—purchased by businesses
    - Business purchases of plant, equipment and software
    - New-home construction
    - Changes in business firms’ inventory stocks
  - Government goods and services (G)—purchased by government agencies; includes government consumption and government investment
  - Net exports (NX): spending on domestic goods by foreigners minus spending on foreign goods by domestic residents. Exports – Imports
The Expenditure Approach to GDP

- Purchases of four groups (U.S. GDP)
  - U.S. household
  - U.S. business
  - U.S. government agency (including state and local government)
  - else is part of the foreign sector

- Add up purchases
  - GDP = C + I + G + NX
Consumption Spending

- Consumption is the part of GDP purchased by households as final users
  - One exception is construction of new homes
    - Counted as private investment
  - Some inclusions to consumption although households don’t actually buy them
    - Total value of food products that are produced on farms and consumed by farm families themselves
    - Total value of the housing services provided by owner-occupied homes
Private Investment

- Private investment has three components
  - Business Purchases of Plant, Equipment, and Software
    - A firm’s plant, equipment, and software are intended to last for many years—only a small part of them is used up to make the current year’s output
  - New Home Construction
    - Residential housing: an important part of nation’s capital stock
  - Changes in Inventories
    - When goods are produced but not sold during the year
    - Part of the nation’s capital stock
    - Will provide services in the future, when they are finally sold and used
Private Investment and the Capital Stock: Some Provisos

- Changes in nation’s capital stock: more complicated than we are able to capture with private investment alone

- Private investment does not include
  - Government Investment
    - Federal, state, and local (schools, fire stations)
  - Consumer durables
    - Goods such as furniture, automobiles, washing machines, and personal computers for home use
  - Human capital
    - Knowledge (just like plant and equipment or new housing).

- Private investment
  - Ignores depreciation—the capital that is used up during the year
Government Purchases

- Government investment and government consumption
- Purchases by state, local governments and federal government are included
- Government purchases include
  - Goods
    - Fighter jets, police cars, school buildings, spy satellites, etc.
  - Services
    - Such as those performed by police, legislators, and military personnel
- Government is considered to be a purchaser even if it actually produces the goods or services itself
Government Purchases

- Important to distinguish between
  - Government purchases
    - counted in GDP
  - Government outlays
    - Government agencies also disburse money for transfer payments

- Transfer payments: money redistributed from one group of citizens (taxpayers) to another (poor, unemployed, elderly)
  - Not included in government purchases or in GDP
  - Example? – Social Security payments by Fed, unemployment insurance and welfare payments by state gov., money disbursed to homeless shelters by city gov. etc
Net Exports

- Recognize dealings with the rest of the world
- To properly account for output sold to, and bought from, foreigners
  - Must include net exports—difference between total exports and total imports—as part of expenditure in GDP
Other Approaches to GDP: The Value-Added Approach

- **Value added**
  - Firm’s contribution to a product as it is produced or
  - Revenue it receives for its output minus cost of all the intermediate goods that it buys
  - The value of the final goods already includes the value of the intermediate goods, so including intermediate goods in GDP would be double-counting.

- GDP is sum of values added by all firms in economy
Other Approaches to GDP: The Value-Added Approach

Example

- A farmer grows a bushel of wheat and sells it to a miller for $1.00
- The miller turns the wheat into flour and sells it to a baker for $3.00
- The baker uses the flour to make bread and sells it to you for $6.00

- VA at each stage of production?
- GDP for this economy?
Other Approaches to GDP: The Factor Payments Approach

- Factor payments: payments to the owners of resources that are used in production.
- GDP equals sum of all firms’ value added
  - Each firm’s value added is equal to its factor payments
  - GDP = Total factor payments made by all firms in the economy
    - these factor payments are received by households in the form of wages and salaries, rent, interest or profit
Measuring GDP: A Summary

Different ways to calculate GDP

- Expenditure Approach
  - $GDP = C + I + G + NX$

- Value-Added Approach
  - $GDP = \text{Sum of value added by all firms}$

- Factor Payments Approach
  - $GDP = \text{Sum of factor payments made by all firms}$
  - $GDP = \text{Wages and Salaries + interest + rent + profit}$
  - $GDP = \text{Total household income}$
Example: Finding GDP from value added approach & factor payments approach

- Consider an economy consisting of two firms: Firm A and Firm B
  - Firm A extracts gasoline from crude oil and sells gasoline by the gallon to the public. Firm B manufactures crude oil by the barrel. Assume Firm B sells all its crude oil production to Firm A. Consider sales and wage data:

<table>
<thead>
<tr>
<th></th>
<th>Firm A</th>
<th>Firm B</th>
<th>Total Factor Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Revenue</td>
<td>$1,000,000</td>
<td>$420,000</td>
<td></td>
</tr>
<tr>
<td>Intermediate Goods</td>
<td>$420,000</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Wages</td>
<td>$400,000</td>
<td>$370,000</td>
<td>$770,000</td>
</tr>
<tr>
<td>Interest Payments</td>
<td>$25,000</td>
<td>$0</td>
<td>$25,000</td>
</tr>
<tr>
<td>Rent</td>
<td>$75,000</td>
<td>$40,000</td>
<td>$115,000</td>
</tr>
<tr>
<td>Profit</td>
<td>$80,000</td>
<td>$10,000</td>
<td>$90,000</td>
</tr>
</tbody>
</table>
Real vs Nominal GDP

- GDP: value of all final goods and services produced
- Nominal GDP: measures these values by using current prices
- Real GDP: measures these values using the prices of a chosen base year
- Changes in nominal GDP can be due to:
  - Changes in prices
  - Changes in quantities of goods produced
- Changes in real GDP can be due to:
  - Changes in quantities of goods produced
## Example

- Calculate Nominal GDP and Real GDP (in 2000 dollars) for each year.

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
<td>Quantity</td>
</tr>
<tr>
<td>Bread</td>
<td>$6.00</td>
<td>300</td>
</tr>
<tr>
<td>Butter</td>
<td>$3.00</td>
<td>192</td>
</tr>
</tbody>
</table>
Example

- Nominal GDP 2000 = $6*300 + $3*192 = $2376
- Nominal GDP 2002 = $7*400 + $4*200 = $3600
- Real GDP 2000 = $2376
- Real GDP 2002 = $6*400 + $3*200 = $3000
How GDP Is Used

- Government’s reports on GDP are used to steer the economy over both short-run and long-run
  - In short-run
    - sudden changes in real GDP can alert us to recessions/too-rapid expansion (stabilize the economy by taking proper policies)
  - In long-run
    - whether our economy is growing fast enough to raise output per capita and standard of living, and fast enough to generate sufficient jobs for a growing population
Figure 2: Real GDP Growth Rate, 1960–2003

Real GDP Growth Rate
(Percent Change from Previous Year)

Actual GDP growth rate

GDP growth needed for constant output per capita
Problems With GDP

- Quality changes
  - BEA does not have the resources to estimate quality changes for millions of different goods and services
  - Ignoring quality improvements causes GDP to understate the true growth in output

- Underground economy
  - Illegal
    - Drugs, prostitution, most gambling
  - Avoiding taxes
  - BEA estimates too low: GDP may understate the total output

- Non-market production
  - Goods & services that are produced but not sold in the marketplace
  - These can exaggerate the growth in GDP

- Other Aspects of economic well-being

- Interpreting long-run changes in GDP
  - Must exercise caution
  - Short-term changes in real GDP are fairly accurate
Types of Unemployment

- In United States, people are considered unemployed if they are (1) not working and (2) actively seeking a job.
  - Unemployment can arise for a variety of reasons, each arising from a different cause and with its own policy implications.
  - Classify unemployment into four different categories:
    - Frictional unemployment
    - Seasonal unemployment
    - Structural unemployment
    - Cyclical unemployment
      - Each arises from a different cause and has different consequences.
Frictional Unemployment

- Frictional unemployment
  - Short-term
  - Experienced by people who are
    - Between jobs
    - Just entering the labor market
    - Reentering the labor market
Seasonal unemployment

- Related to changes in weather, tourist patterns, or other seasonal factors
  - Short-term
  - To prevent any misunderstandings, government usually reports seasonally adjusted rate of unemployment
Structural Unemployment

- Joblessness arising from mismatches between workers’ skills and employers’ requirements
  - Or between workers’ locations and employers’ locations (geographic)
- Generally a stubborn, long-term problem
  - It can take considerable time to relocate or acquire new skills.
- In recent decades, it has been a much bigger problem in other countries (ex: continental Europe)
Unemployment

- Frictional, structural, and seasonal unemployment
  - arise largely from microeconomic causes
  - cannot be entirely eliminated since they are attributed to changes in specific industries and specific labor markets.
  - some amount of microeconomic unemployment is a sign of a dynamic economy
  - Government may be able to influence them
Cyclical Unemployment

- When the economy goes into a recession and total output falls, the unemployment rate rises.
- It arises from conditions in the overall economy, thus is a problem for macroeconomic policy.
- It is caused by the changes in production over the business cycle.
- Macroeconomists say we reached **full employment** when **cyclical unemployment is reduced to zero**.
  - But the overall unemployment rate at full employment is greater than zero.
    - Because there are still positive levels of frictional, seasonal, and structural unemployment.
- How do we tell how much of our unemployment is cyclical?
  - Normal amounts of frictional, seasonal, and structural unemployment account for an unemployment rate of between 4.5 and 5% in U.S.
U.S. Quarterly Unemployment Rate

Figure 3  U.S. Quarterly Unemployment Rate, 1960–2006
The Costs of Unemployment: Economic Costs

- Opportunity cost of lost output
  - Goods and services the jobless would produce if they were working
- The unemployed are often given government assistance
  - Costs are spread among citizens in general
  - However, when there is cyclical unemployment, nation produces less output
    - Some groups within society must consume less output
- Potential output
  - Level of output economy could produce if operating at full employment
Figure 4: Actual And Potential Real GDP, 1960–2003
The Costs of Unemployment: Broader Costs

- Unemployment—especially when it lasts for many months or years
  - Can have serious psychological and physical effects

- Also causes setbacks in achieving important social goals
  - Burden of unemployment is not shared equally among different groups in the population
  - Tends to fall most heavily on minorities, especially minority youth
How Unemployment is Measured?

- The unemployed are those willing and able to work, but who do not have jobs
- Others were able to work, but preferred not to
  - college students, homemakers, and retired people
- Others were in the military and are counted in the population
  - But not counted when calculating civilian employment statistics
- To be counted as unemployed, you must have recently searched for work
The Census Bureau’s Household Survey

- Every month, Bureau of Labor Statistics (BLS)—conduct a survey of 60,000 households across America
  - Household (HH) members who are under 16, in the military, or currently residing in an institution like a prison or hospital are excluded from survey
  - Remaining HH members activities during previous week
- Official unemployment rate
  - Percentage of the labor force that is unemployed

\[
\text{Unemployment rate} = \frac{\text{Unemployed}}{\text{Labor Force}} = \frac{\text{Unemployed}}{(\text{Unemployed} + \text{Employed})}
\]
Figure 5: How BLS Measures Employment Status

- Worked one or more hours for pay? (Yes → Employed)
- Temporary layoff? (Yes → Unemployed)
- Searched for work? (during previous 4 weeks) (Yes → Unemployed)
- Not in Labor Force (No → Not in Labor Force)
Figure 6: Employment Status of the U.S. Population—May 2006

U.S. Population May 2006

- Under 16 Military or Institutionalized: 71.4 Million
- Not in Labor Force: 77.4 Million
- Unemployed: 7.0 Million
- Employed: 144.0 Million

Civilian Noninstitutional Population

Labor Force
Problems in Measuring Unemployment

- Many economists believe that our official measure seriously underestimates extent of unemployment in our society due to
  - Treatment of involuntary part-time workers
  - Treatment of discouraged workers
    - Individuals who would like to work but, because they feel little hope of finding a job, have given up searching
- Still, the unemployment rate—as currently measured—tells us something important
  - Number of people who are searching for jobs, but have not yet found them
Sudden Disasters and GDP

Figure 7 Quarterly GDP During Two Recent Disasters
Sudden Disasters and GDP

- Terrorist attack of September 2001,
- Hurricanes Katrina and Rita, August and September 2005
- Why is GDP so stubbornly unmoved by such catastrophic events?
- Effects on real GDP
  - Direct impact of the event itself
  - Indirect effects that follow as economic decision makers respond to the event
Direct Effects on GDP

- Destruction and Disruption
  - Physical destruction
    - Hurricane Katrina and Rita caused a physical destruction of between $69 billion and $130 billion
    - About 270,000 homes destroyed or damaged
    - Severe damage to oil, natural gas platforms and pipelines
  - A disaster destroys part of the nation’s capital stock

- The impact on GDP
  - Loss of output that the destroyed resources would otherwise have enabled us to produce
    - Destroyed factory buildings, office buildings etc means less production of manufactured goods and services
    - Destroyed homes
Indirect Effects

- Result from decisions made afterward
  - These have the potential to be more harmful and long-lasting
- Usually smaller than the direct decrease in production
- Very short-lived
- Because
  - Changes in macroeconomic policy
  - Some effects - decrease production
    - Decrease in consumption
  - Others - increase production
    - Replacement investment, government assistance
  - The forces that increase production dominate
Drawing Conclusions

- Local disasters generally have relatively small effects on the nation’s GDP
  - Louisiana & Mississippi together produce only about 2% of nation’s GDP
  - Manhattan produces about 1.5% of nation’s GDP
- Much of the additional production (replacement investment, government assistance) after a disaster is used to bring capital stock back to where it was before
- Disasters can occur on a larger scale