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

- …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
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

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

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

- 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

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 = Sum of value added by all firms
  - Factor Payments Approach
    - GDP = Sum of factor payments made by all firms
    - GDP = Wages and Salaries + interest + rent + profit
    - GDP = 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>

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

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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

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

Figure 4: Actual And Potential Real GDP, 1960–2003
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
  - No → Temporary layoff?
    - Yes → Unemployed
    - No → Searched for work? (during previous 4 weeks)
      - Yes → Unemployed
      - No → Not in Labor Force

Figure 6: Employment Status of the U.S. Population—May 2006

- U.S. Population May 2006
  - Civilian Noninstitutional Population
    - Labor Force
      - Employed
        - Under 16 Military or Institutionalized: 71.4 Million
      - Not in Labor Force: 77.4 Million
    - Unemployed: 7.0 Million

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

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