Imagine 3 identical firms, A, B, and C in an industry. What happens if A raises price?

B and C will not raise their prices.

Imagine 3 identical firms in an industry. A, B, C what happens if A lowers price?

B and C will lower their prices.

The Kinked Demand Curve Model:
Brand Multiplication:

Variations of essentially one good that a firm produces to increase its market share.

Firm’s Market Share = (Number of Brands) x (Brand’s Market Share)

Price Discrimination:

The practice of offering a specific good or service at different prices to different segments of the market.

Centralized Cartels:

\[
\text{Centralized Cartels:} \quad P = \frac{\sum MC}{Q}
\]

Chapter 19

Aggregate Demand and Aggregate Supply

Macro Issues:

- How do we measure a nation’s performance?
  By the value of aggregate output produced by the economy in a given year or by its GDP.

Formal Definition of GDP:

GDP stands for Gross Domestic Product. It represents the total value, measured in current prices, of all final goods and services, produced in the economy during a given year.

Macro Issues:

- How do we measure a nation’s performance?
- Why do nations grow (Economic Growth)?
- Why is there unemployment?
- Why is there inflation?
- Why does the economy perform well in some years and does very bad in others?
What is the Business Cycle?

Alternating periods of growth and decline in an economy’s output.

Stages of the Business Cycle?

- Recession
- Trough
- Recovery
- Prosperity
- Peak or Boom
- Downturn

Recession:

A phase in the business cycle in which the decline in the economy’s GDP persists for at least a half-year. A recession is marked by relatively high unemployment.

Depression:

A relatively long and deep recession is described as a depression.

Prosperity:

A phase in the business cycle marked by relatively high level of real GDP, near full employment and inflation.

What is Inflation?

An increase in the price level

Basic Macro Questions:

▲ Can we harness the disturbing swings in our business cycle?
This implies, can we moderate the inflationary pressures on the economy when it is on the upswing of the business cycle, pressing upon full employment? Can we moderate the inevitable unemployment that occurs when the economy after reaching its peak, begins its slide into recession?

▲ Can we learn how to engineer an attractive rate of economic growth?
GDP:

GDP or Gross Domestic Product is the total value, measured in current prices, of all final goods and services, produced in the economy, during a given year.

What is a Final Good?

A good that is not itself used to produce other goods.

Example:

= 100 bushels
Direct Consumption = 80 Bushels
20 Bushels
= 2000 pies

What does “produced in the economy” mean?

It is produced domestically or within the geographic boundary of the country.

What does “measured in current market prices” mean?

valued at a price that existed in the year in which the good was made.

What is Nominal GDP?

GDP measured in terms of current market prices - it is not adjusted for inflation.
What is Real GDP?

GDP adjusted for changes in the price level

Price Indexes:

The Consumer Price Index (CPI):

Base Year: Lets assume 1980 is our base year

CPI in the Base Year is = 100

Price of Consumer Basket in Base Year, \( P_{80} \) = $300

Price of the Consumer Basket in 1999, \( P_{99} \) = $450

\[
\text{CPI for 1999} = \frac{P_{99}}{P_{80}} \times 100 = \frac{450}{300} \times 100 = 150
\]

Suppose the Nominal GDP in 1999 was 800 billion $. What is the real GDP in 1980 prices?

\[
\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{CPI}} \times 100 = \frac{800}{150} \times 100 = 533.33 \text{ billion $}
\]

GDP Deflator:

Like the CPI it is also a price index. However the composition of the items in the consumption basket is different.

Instead of only including consumption items, the basket now also includes farm goods, producer goods, crude materials, services, capital equipment and export goods. The basket here is known as Market Basket.

From Nominal GDP to Real GDP

\[
\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP Deflator}} \times 100
\]
### Converting Nominal GDP to Real GDP

**Base Year 1992**

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal GDP</th>
<th>GDP Deflator</th>
<th>Real GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>5743.6</td>
<td>93.60</td>
<td>6136.3</td>
</tr>
<tr>
<td>1991</td>
<td>5916.5</td>
<td>97.32</td>
<td>6079.4</td>
</tr>
<tr>
<td>1992</td>
<td>6244.4</td>
<td>100.00</td>
<td>6244.4</td>
</tr>
<tr>
<td>1993</td>
<td>6558.3</td>
<td>102.64</td>
<td>6389.6</td>
</tr>
<tr>
<td>1994</td>
<td>6947.7</td>
<td>105.09</td>
<td>6610.7</td>
</tr>
<tr>
<td>1995</td>
<td>7265.3</td>
<td>107.76</td>
<td>6742.1</td>
</tr>
<tr>
<td>1996</td>
<td>7635.8</td>
<td>110.21</td>
<td>6928.4</td>
</tr>
</tbody>
</table>

### GDP Growth Rate:

It is the percentage change in GDP.

\[
\text{GDP Growth Rate} = \frac{\Delta \text{GDP}}{\text{GDP}} \times 100
\]

\[
= \frac{313.9}{6244.4} \times 100 = 5.03
\]

**Real GDP Growth Rate**

\[
\text{Real GDP Growth Rate} = \frac{145.2}{6244.4} \times 100 = 2.33
\]

### Aggregate Demand and Supply Model

#### Aggregate Supply:

It is the total quantity of goods and services that firms in the economy are willing to supply at varying price levels.

#### Aggregate Demand:

It is the total quantity of goods and services demanded by households, firms, foreigners and government at varying price levels.
What factors explain Aggregate Demand?

- Real wealth affect
- Interest rate effect
- International trade effect

What factors cause a shift in Aggregate Demand? A change in ...

- government spending
- taxes
- income abroad
- expectations

What factors cause a shift in Aggregate Supply? A change in ...

- resource availability
- wages
- interest rates
- rents
Macroeconomic Equilibrium:

Real GDP vs. Price Level

Excess Supply

AS

Real GDP

Price Level

0

4.5

7.1

110

0

Macroeconomic Equilibrium:

Real GDP vs. Price Level

Excess Demand

AS

Real GDP

Price Level

0

4.6

7.1

90

0

The Depression of the 30s:

Real GDP vs. Price Level

AS

Real GDP

Price Level

0

6.3

0

102

0

The Vietnam War:

Real GDP vs. Price Level

AS

Real GDP

Price Level

0

0

Demand-Pull Inflation

Inflation caused primarily by an increase in aggregate demand
Cost-Push Inflation: The OPEC Legacy

In October 1973, the price of Arabian light crude oil was $2.10 per barrel. By Nov 74, OPEC had cut oil production substantially and raised the price to $10.46. By Jan 79, the price had drifted upward to $13.34 and by April 1980, OPEC had raised the price to $28 and by Jan 1982 to $34.

Cost-push Inflation:
Inflation caused primarily by a rise in the cost of resources which leads to a decrease in aggregate supply.

Stagflation:
A period of stagnating real GDP, inflation and relatively high levels of unemployment.

Chapter 20:
Gross Domestic Product Accounting

GDP:
GDP or Gross Domestic Product is the total value, measured in current prices, of all final goods and services, produced in the economy, during a given year.
What Approaches are used to measure GDP?

- Expenditure
- Income

Why Expenditure and Income?

- Because when someone spends money that money is income to someone else

The Circular Flow Model:

Resource Market
- Labor, Land, Capital, Entrepreneurship.

Product Market
- Goods and Services

Expenditure Approach:

Wages, Rent, Interest & Profit

Income Approach:

Total Income Generated = $.30 + $.08 + $.12 + $.50 = $1.00

Market Value & Value Added of Goods Produced

<table>
<thead>
<tr>
<th>Firm</th>
<th>Good</th>
<th>Market Value</th>
<th>Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep Ranch</td>
<td>Wool on Sheep</td>
<td>$4</td>
<td>$4</td>
</tr>
<tr>
<td>Shearing</td>
<td>Bulk Wool</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Knitting Mill</td>
<td>Wool Fabric</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Sweater</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>Store</td>
<td>Sweater</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$94</strong></td>
<td><strong>$50</strong></td>
</tr>
</tbody>
</table>
Final Goods:
Goods purchased for final use, not for resale.

Intermediate Goods:
Goods used to produce other goods.

Value Added:
The difference between the value of a good that a firm produces & the value of the goods the firm uses to produce it.

What is the Expenditure Approach?
- A method of calculating GDP that adds all expenditures made for final goods and services by households, firms, & government

Expenditure Approach
\[ GDP = C + I + G + (X - M) \]

Consumption

What is the largest component of GDP?
Consumption

What do Consumers spend their money on?
- Durable Goods
- Nondurable Goods
- Services

What is Gross Private Domestic Investment?
Businesses purchase such things as plants & equipment, houses & apartment buildings, and changes in inventory
What are Government Purchases?
- military hardware
- computers
- military food & clothing
- highways & education

Why do we include Exports in GDP?
- Because they are produced domestically

Why are Imports not added to U.S. GDP?
- Because they are produced abroad

Expenditure Approach to 1996 GDP ($ Billions)

- **C** = Personal Consumption Expenditure: 5,207.6
  - Durable Goods: 634.5
  - Nondurable Goods: 1,534.7
  - Services: 3,038.4
- **I** = Gross Private Domestic Investment: 1,116.5
  - Nonresidential: 781.4
  - Residential: 309.2
  - Change in Business Inventory: 25.9
- **G** = Government Purchases: 1,406.7
  - Federal: 520.0
  - Defense: 352.8
  - Nondefense: 167.3
  - State and Local: 886.7
- **X-M** = Net Exports of Goods & Services: -94.8
  - Exports: 870.9
  - Imports: (965.7)

**GDP** = Gross Domestic Product: 7,636.0

Tell me where it belongs:
- Produced in Kansas City
  - Should the toaster be considered as a part of U.S. GDP? Yes
  - Which component of U.S. GDP accounts for it? Consumption Expenditure
  - Sold to a Kansas City Household

Tell me where it belongs:
- Produced in Kansas City
  - Should the toaster be considered as a part of U.S. GDP? Yes
  - Which component of U.S. GDP accounts for it? Investment Expenditure
  - Sold to a Kansas City Restaurant
Income Approach:

A method of calculating GDP that adds all the incomes earned in the production of final goods and services.

Who earns income?

- Labor - compensation to employees
- Capital - interest
- Land - rent
- Entrepreneurship - profit

**1996 National Income ($ Billions)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation of Employees</td>
<td>4,426.9</td>
</tr>
<tr>
<td>Wages and Salaries</td>
<td>3,633.6</td>
</tr>
<tr>
<td>Supplements</td>
<td>793.3</td>
</tr>
<tr>
<td>Rental Income</td>
<td>146.3</td>
</tr>
<tr>
<td>Corporate Profit</td>
<td>735.9</td>
</tr>
<tr>
<td>Net Interest</td>
<td>425.1</td>
</tr>
<tr>
<td>Proprietor's Income</td>
<td>520.3</td>
</tr>
<tr>
<td>Farm</td>
<td>37.2</td>
</tr>
<tr>
<td>Nonfarm</td>
<td>483.1</td>
</tr>
<tr>
<td>National Income</td>
<td>6,354.5</td>
</tr>
</tbody>
</table>
What is GNP or Gross National Product?

The market value of all final goods and services in an economy produced by resources owned by the people of that economy.

What is Depreciation?

◆ The value of capital stock used up during a year in producing GDP.

Bringing GDP & National Income into accord:

\[
\text{GNP} - \text{Depreciation} = \text{NNP} \\
\text{NNP} - \text{Indirect Business Taxes} = \text{National Income}
\]

Reconciliation between GNP and NI:

<table>
<thead>
<tr>
<th>Gross Domestic Product (GDP)</th>
<th>7,636.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minus Factor Payments to the rest of the world</td>
<td>-232.6</td>
</tr>
<tr>
<td>Plus Factor Payments from the rest of the world</td>
<td>234.3</td>
</tr>
<tr>
<td>Equals Gross National Product (GNP)</td>
<td>7,637.7</td>
</tr>
<tr>
<td>Minus Capital Depreciation</td>
<td>830.1</td>
</tr>
<tr>
<td>Equals Net National Product (NNP)</td>
<td>6,807.6</td>
</tr>
<tr>
<td>Minus Indirect Business Taxes</td>
<td>553.1</td>
</tr>
<tr>
<td>Equals National Income (NI)</td>
<td>6,254.5</td>
</tr>
</tbody>
</table>

National Income (NI) is what people earn.

Personal Income (PI) is what people receive.

\[
\text{PI} = \text{NI} + \text{income received but not earned} - \text{income earned but not received}
\]

Disposable Personal Income = PI – Direct Taxes
How Comprehensive is GDP?

- Value of Housework
- The Underground Economy
- Leisure
- Quality of Goods and Services
- Costs of Environmental Damage

Use the following data to compute GDP, GNP, NNP, NI, PI and Personal Disposable Income.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Consumption Expenditures</td>
<td>$800</td>
</tr>
<tr>
<td>Interest</td>
<td>80</td>
</tr>
<tr>
<td>Corporate Profit</td>
<td>120</td>
</tr>
<tr>
<td>Government Purchases</td>
<td>300</td>
</tr>
<tr>
<td>Depreciation</td>
<td>80</td>
</tr>
<tr>
<td>Rent</td>
<td>40</td>
</tr>
<tr>
<td>Gross Private Domestic Investment</td>
<td>100</td>
</tr>
<tr>
<td>Compensation of Employees</td>
<td>750</td>
</tr>
<tr>
<td>Exports</td>
<td>100</td>
</tr>
<tr>
<td>Imports</td>
<td>60</td>
</tr>
<tr>
<td>Indirect Business Taxes</td>
<td>70</td>
</tr>
<tr>
<td>Proprietor's Income</td>
<td>110</td>
</tr>
<tr>
<td>Income Tax</td>
<td>100</td>
</tr>
<tr>
<td>Income Earned but not Received</td>
<td>120</td>
</tr>
<tr>
<td>Income Received but not Earned</td>
<td>140</td>
</tr>
<tr>
<td>Factor Income from abroad</td>
<td>60</td>
</tr>
<tr>
<td>Factor Income to the world</td>
<td>50</td>
</tr>
</tbody>
</table>

Suppose next year, the following changes in economic activity occur in the country. What effect would these changes have on GDP?

<table>
<thead>
<tr>
<th>Economic Activity</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durable Goods</td>
<td>+30</td>
</tr>
<tr>
<td>Business Inventory</td>
<td>+10</td>
</tr>
<tr>
<td>Imports</td>
<td>+20</td>
</tr>
<tr>
<td>Income Tax</td>
<td>+10</td>
</tr>
</tbody>
</table>