

STUDY UNIT SIX

MACROECONOMICS

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This study unit is the second of three related to the economic environment of a business and its industry. **Macroeconomics** is the study of the **three interrelated aspects** of any economy taken as a whole: inflation, unemployment, and growth.

In the process of attempting to describe (and manage) these factors, macroeconomists require measurements of an economy's performance. **National income accounting** is the subdiscipline concerned with calculating these measures, such as gross domestic product and national income.

Over time, macroeconomists have noted that economic growth in capitalistic economies has not been constant but has been punctuated by distinct **cycles** of expansion and contraction.

Classical economic theory maintains that the free market contains **self-correcting mechanisms** that eventually rein in the forces of inflation and unemployment to reestablish aggregate equilibrium.

The worldwide **Great Depression** of the 1930s, however, brought that theory profoundly into question. Prices, employment, and output stayed bottomed out year after year. The supposed self-correcting mechanisms of the free market never seemed to kick in. Observing this situation, English economist **John Maynard Keynes** (1883–1946, pronounced “kaynz”) theorized that if **pessimism** were deep enough among businesspeople, they would never feel the sense of confidence about the future necessary to invest in the productive capacity that would get the economy booming again.

To Keynes, the answer lay in **government intervention**, the subject of Subunits 4 and 5. **Fiscal policy** refers to government purchasing goods and services in the marketplace (creating the demand that private business can then supply). **Monetary policy** refers to the setting of interest rates and managing the supply of money which businesses can deploy to purchase productive capacity. These practices are, to this day, termed **Keynesian economics**.

After the Second World War ended, the large numbers of discharged servicemen returning to the United States were expected to cause a disastrous spike in unemployment. In response, Congress passed the **Employment Act of 1946**, in which the federal government assumed responsibility for full employment, price stability, and economic growth. This was a triumph for Keynesian economics.

6.1 THREE PRINCIPAL ISSUES IN MACROECONOMICS

1. Inflation

- a. Inflation is a **sustained increase in the general level of prices**. The reported rate of inflation is therefore an **average** of the increase across all prices in the economy. This simple definition is not sufficient to fully understand inflation's impact, however.
 - 1) The **value of** any unit of **money** (e.g., the U.S. dollar) is measured by how many goods and services can be acquired in exchange for it. This is referred to as money's **purchasing power**.
 - 2) If the rate of inflation for all goods and services were the average, consumers would be able to buy less and less with each dollar -- their **purchasing power would steadily be eroded**. There are two main reasons why this is not the case, however:
 - a) The prices of individual goods and services rise and fall at different rates.
 - b) Wages generally rise in step with inflation.
 - 3) Thus, **mild, steady inflation does not usually erode purchasing power**. High or unpredictable inflation, on the other hand, can be very disruptive of economic activity.
- b. The **rate of inflation** is stated in **percentage terms**, calculated using a price index.
 - 1) A **price index** is a measure of the price of a market basket of goods and services in one year compared with the price in a designated base year. By definition, the **index for the base year is 100**.
 - a) The **rate of inflation** is calculated by comparing the change in the two years' indexes.

$$\frac{\text{Current-year price index} - \text{Prior-year price index}}{\text{Prior-year price index}}$$
 - b) For example, if the market basket in Year 3 was 10% higher than the base year and in Year 4 was 15% higher, the inflation rate for Year 4 is:

$$\frac{115 - 110}{110} = 4.55\%$$
 - c) The most commonly used index is the Consumer Price Index [see item 2.c.1) in Subunit 2].
- c. The distinction between nominal income and real income is crucial for understanding the effects of inflation.
 - 1) **Nominal income** is the **amount in money** received by a consumer as wages, interest, rent, and profits. For example, a systems analyst might have an annual salary, and therefore a nominal income, of \$64,000.
 - 2) **Real income** is the **purchasing power** of the income received, regardless of how it is denominated. Purchasing power relates directly to the consumer's standard of living.
 - 3) **Real income shrinks when nominal income does not keep pace with inflation**.
- d. **Macroeconomic Effects of Inflation**
 - 1) Inflation **arbitrarily redistributes wealth**. This redistribution reflects neither the workings of the free market nor the government's attempt to intervene.
 - 2) When inflation is **unexpected**, it can cause economic chaos.
 - 3) The **efficiency** of business relationships is **reduced**. Such efficiency relies on stable pricing.

- 4) **Usury laws** place arbitrary, nonmarket-determined caps on nominal interest rates, regardless of the real interest rate. A ceiling is placed on the price of money, choking off the available supply of lendable funds.

e. **Two Types of Inflation**

- 1) **Demand-pull inflation** is generated by **demand outpacing the supply of goods** to satisfy it.
 - a) Since the economy cannot produce enough to keep up with demand, the prices of existing goods are bid up. This kind of inflation is depicted by the phrase, **“Too many dollars chasing too few goods.”**
 - b) In a modern economy, demand-pull inflation arises when the economy approaches **full employment** and **demand continues to increase**.
- 2) **Cost-push inflation** is generated by **increased per-unit production costs**, which are passed on to consumers in the form of higher prices.
 - a) Increases in raw materials costs are the principal cause, particularly when they come about suddenly in the form of a **supply shock**.
 - i) The most prominent example is the first OPEC oil embargo of 1973–74, in response to the United States, Western Europe, and Japan taking the side of Israel in the “October War.”
 - b) Cost-push inflation tends to be **self-limiting**.
 - i) With input prices increasing, output is driven down and unemployment is driven up. As lower output and higher unemployment set in, the economy falls into recession and further price increases are no longer possible.

2. **Unemployment**

- a. The **unemployment rate** is stated in percentage terms. Controversies swirl around the derivation of both the numerator and denominator.

$$\frac{\text{Number of unemployed}}{\text{Size of labor force}} \times 100$$

- 1) The unemployment rate is published by the **U.S. Bureau of Labor Statistics**. The Bureau samples American households each month.
 - a) The first group **excluded from the denominator** consists of those who are (1) under the age of 16 or (2) incarcerated or institutionalized.
 - b) The second group **excluded from the denominator** consists of those classified as **not in the labor force**.
 - i) Among the people counted in this group are homemakers, full-time students, and retirees.
 - ii) Also included in this group are **discouraged workers**, a major bone of contention when discussing the official unemployment rate. These are the unemployed who are able to work but are **not actively seeking work**.
 - c) Among those who **remain in the denominator**, no distinction is made between **full- and part-time workers**. They are all considered equally employed.
 - d) The **numerator** consists of those who are willing and able to work and who are **seeking employment**.
- 2) The official statistics can be **distorted** by
 - a) Discouraged workers who falsely claim to be seeking work
 - b) Those employed in the underground economy

b. **Three Types of Unemployment**

- 1) **Frictional unemployment** is the amount of unemployment caused by the normal workings of the labor market.
 - a) This group can include those moving to another city, those ceasing work temporarily to pursue further education and training, and those who are simply between jobs.
 - b) This definition acknowledges that a “normal” amount of unemployment exists at any given time in a dynamic economy.
- 2) **Structural unemployment** results when the composition of the workforce doesn’t match the need. It is the result of changes in consumer demand, technology, and geographical location.
 - a) As consumers’ desires shift, certain skills become obsolete. As horse racing, once the biggest sport in the United States, lost popularity, jockeys and grooms became less employable.
 - b) The computer revolution has drastically changed the skills required for many jobs and completely eliminated others.
 - c) As automakers shifted production from the (unionized) Rust Belt to the (nonunionized) Sun Belt, workers in the old cities of the midwest were laid off.
- 3) **Cyclical unemployment** is directly related to the level of an economy’s output. For this reason, it is sometimes called **deficient-demand unemployment**.
 - a) As consumers slow their spending, firms cut back production and lay off workers.
 - b) The Great Depression was a period of low prices, low demand, and extremely low industrial output. During the worst of this period (ca. 1933), as much as 25% of the American labor force was out of work.

c. **“Full” Employment**

- 1) The **natural rate of unemployment** consists of frictional and structural unemployment combined.
 - a) Economists consider the economy to be at **full employment** when all unemployed workers fall into only these two categories.
 - b) The rate varies over time because of demographic and institutional changes in the economy.
- 2) The **economy’s potential output** is the real (i.e., inflation-adjusted) domestic output that could be achieved if the economy sustained full employment.
 - a) This concept illustrates the importance of providing all interested workers with productive jobs.

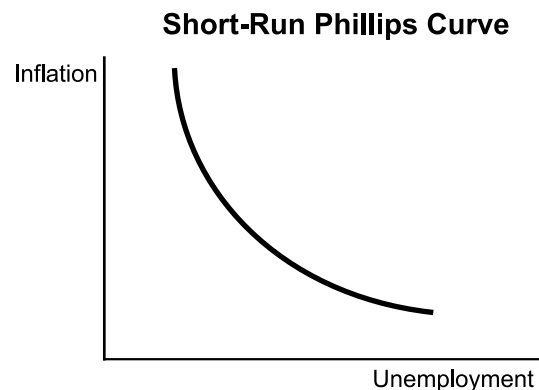
d. **Macroeconomic Effects of Unemployment**

- 1) **Lost value to the economy** is the primary economic cost of unemployment. The goods not produced and services not provided by idle workers can never be regained.
 - a) This loss is called the **GDP gap** (GDP, or gross domestic product, is a measure of national output; see item 1. in Subunit 2).
 - b) **Okun’s law**, proposed in the early 1960s by American economist Arthur Okun (1928–1980), states that for each **1% excess** of actual unemployment over the natural rate, a **2%–3% GDP gap** results.

- 2) The **burdens of unemployment are spread unequally** among groups of workers.
 - a) Blue-collar workers are more often impacted than white-collar workers. Similarly, lower-skilled workers experience higher rates of unemployment than those with larger skillsets.
 - b) The young and ethnic minorities tend to be unemployed more often. However, unemployment rates for men and women are roughly the same.
- 3) Unemployment has **social costs**, including loss of skills, personal and family stress, violence and other crime, and social upheaval.

e. **The Trade-Off Between Inflation and Unemployment**

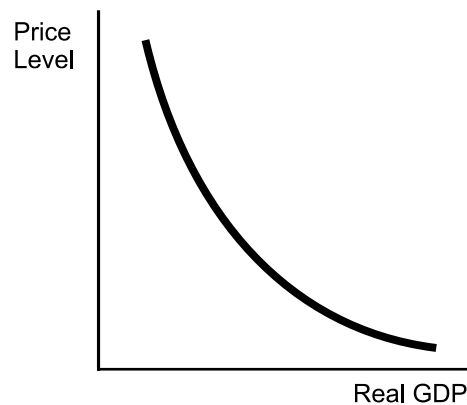
- 1) In the late 1960s, New Zealand economist A.W. Phillips (1914–1975) proposed a graph similar to the one presented below as depicting a predictable trade-off between wages and the unemployment rate.
 - a) The curve was later adapted by macroeconomists to depict a trade-off between inflation and unemployment and was named the **Phillips Curve**.



- 2) The Phillips Curve was held to be a sound description of macroeconomic reality until the petroleum supply shocks of 1973–74 and 1979–80.
 - a) Until that time, inflation had been **from the demand side**. With total output and prices increasing together, job creation kept pace with demand. The Phillips Curve appeared to supply a set of options from which macroeconomists could choose to “**fine-tune**” the economy.
 - b) The drastic jumps in the price of (and slashing in the supply of) oil experienced in the 70s, however, imposed inflation **from the supply side**. Stagflation, a general rise in prices accompanied by a fall in overall output, arose.
- 3) Thus, when an economy is experiencing **demand-side inflation**, high inflation is compensated for by an improvement in the unemployment rate. The Phillips Curve depicts this phenomenon in the **short-run**.
 - a) When an economy is experiencing **supply-side inflation**, by contrast, the problems of high inflation are compounded by an increase in unemployment.

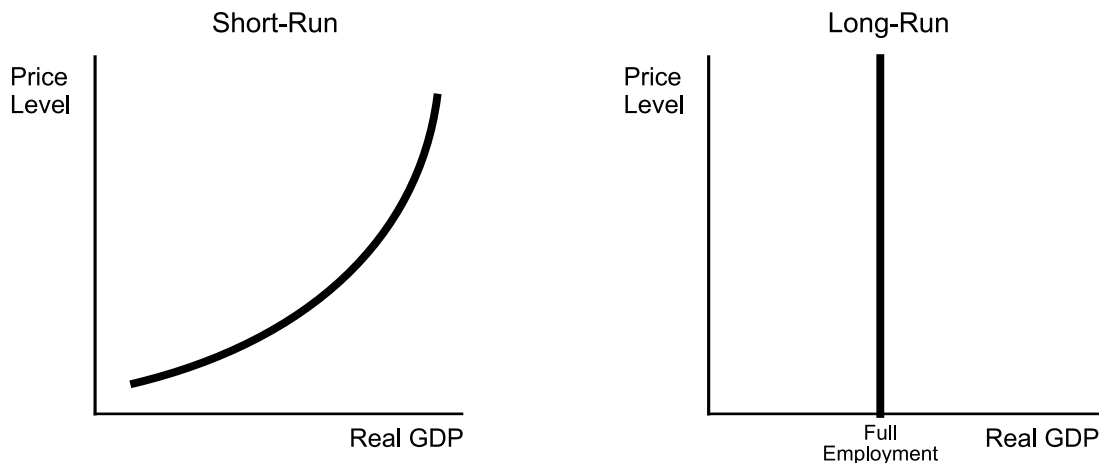
3. **Aggregate demand and supply.** Just as individual firms face supply and demand curves, an economy as a whole can be described by using the same graphical tools.
- a. **Aggregate demand** is a schedule reflecting all the goods and services that consumers are willing and able to buy at various price levels. The curve thus reflects the relationship between the **price level and real GDP**.

Aggregate Demand



- 1) Aggregate demand is **downward sloping**.
 - 2) **No distinction** is made between a **short-run and long-run** aggregate demand curve.
- b. **Aggregate supply** is a schedule reflecting all the goods and services an economy is willing and able to produce at various price levels.

Aggregate Supply

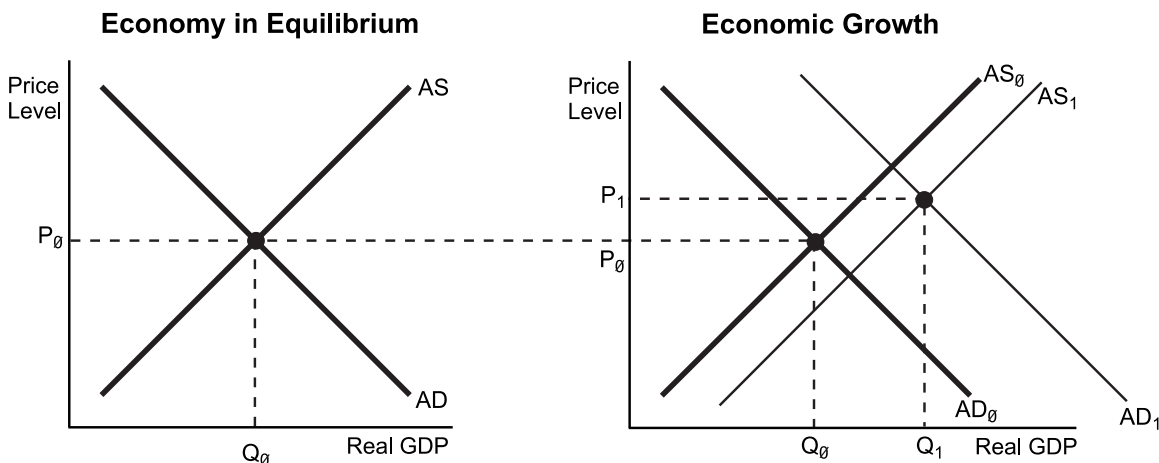


- 1) Over the short run, wages and other input prices may take quite some time to adjust to the changes in other price levels. The firm can produce more in the short term and earn excess profits.
 - a) Thus, the **short-run aggregate supply curve is upward sloping**.

- 2) In the long run, wages and other input prices adjust to match changes in other price levels, and excess profits earned in the short-term are squeezed out.
 - a) Thus, the **long-run aggregate supply curve is a vertical line** extending up from the point of full-employment GDP on the x axis.
- 3) The distinction between the short-run and long-run aggregate supply curves is captured in the aphorism “**All costs are variable in the long run.**”

4. Economic Growth

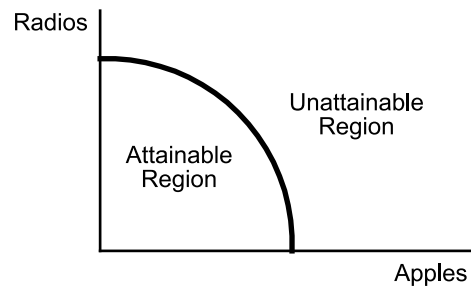
- a. An economy is in equilibrium where the aggregate demand and aggregate supply curves intersect. **Economic growth** takes place when both curves are driven to the right. Both the level of output and the price level increase.



- 1) Growth is a **major macroeconomic goal** because when an economy grows
 - a) Workers earn higher real wages and have access to a richer variety, and greater quantity, of goods and services are made available. This is the essence of a **rising standard of living**.
- 2) Growth can be achieved not only by increased resource inputs but also by **improved efficiency in the use** of those resources. This is termed productivity.
 - a) **Productivity** is usually measured by **worker productivity**, that is, the total real GDP produced during the year divided by the total number of hours worked in the economy. The more a worker can produce in an hour of work, the more productive (s)he is.
 - b) Productivity consists of **three factors**:
 - i) **Amount of capital.** The more an economy has invested in plant and machinery, the higher its productivity will be.
 - ii) **State of technology.** The more technologically advanced an economy's plant and machinery are, the higher its productivity will be.
 - iii) **Workforce competence.** The more educated and trained an economy's workers are, the higher its productivity will be.

- b. Another way to understand growth is with a **production possibilities curve (PPC)**.

Production Possibilities Curve



- 1) The PPC depicts **all possible combinations** of the output of two goods of which an economy is capable in the short run. In other words, the PPC depicts the **trade-off** between any two outputs.
 - a) The PPC **slopes downward** because of the principle of **opportunity cost**. To have more of one product, some units of another must be given up.
 - b) The PPC is **bowed outward** because **resources are specialized**. Inputs that are more suited to one product than the other produce less marginal output of the second product.
- 2) The shape and position of a PPC are determined by an economy's **current resources and state of technology**.
 - a) Production at a point **on the curve** indicates an economy that is **fully employing** all its resources.
 - i) All resources are in use and no additional output can be produced in the short run. An increase in aggregate demand will serve to drive inflation.
 - b) Production at a point **within the curve** indicates a failure to achieve full employment and full production.
 - c) Production at a point **outside the curve** is only possible by incurring a **trade deficit**, i.e., importing more than the country exports.
- 3) In the **long run**, the curve can be **shifted outward with economic growth**.

c. Policies for Economic Growth

- 1) **Demand-side policies.** In modern economies, actors in a free market are not the only parties to the determination of aggregate demand.
 - a) The **government** can deploy the tools of fiscal policy and monetary policy to either **stimulate or suppress demand** (depending on whether a recessionary or inflationary environment looms, respectively).
 - i) To **encourage economic growth**, stimulative policies are required.
- 2) **Supply-side policies.** The government can also implement policies to increase the country's **stock of investment capital**. Businesses use this capital to increase their productive capacity, thereby **stimulating aggregate supply**.

6.2 DOMESTIC OUTPUT, NATIONAL INCOME, AND PRICE LEVELS

1. Measuring an Economy's Output

- a. In the United States, the **Bureau of Economic Analysis** (BEA, an agency of the Department of Commerce) is responsible for compiling the National Income and Product Accounts (NIPA). These can be found at www.bea.gov.
- b. **Gross domestic product (GDP)** is the principal measure of national economic performance.
 - 1) GDP is
 - a) The **total market value**
 - b) Of **all final goods and services**
 - c) Produced **within the boundaries of the U.S.**
 - d) By **domestic- or foreign-owned sources**
 - e) During a **specified period of time** (usually a year)
 - 2) GDP is calculated **without regard to the ownership** of productive resources.
 - a) Thus, the value of the output of a U.S.-owned factory abroad is excluded, but the output of a foreign-owned factory in the U.S. is included.
 - b) This is in contrast to **gross national product (GNP)**, which is the total market value of all final goods and services produced by U.S.-owned sources, no matter where located.
 - i) In early 1992, the BEA changed the focus of its national income reporting from GNP to GDP to more closely parallel the reporting of other countries.
- c. There are **two approaches** to the measurement of GDP.
 - 1) The **expenditures approach** is the simpler of the two. It calculates GDP as the sum of all expenditures in the economy.

Expenditures Approach	
	In Billions
Consumption by households	\$6,000
Investment by businesses	1,200
Government purchases	2,020
Net exports	(400)
Gross domestic product	<u>\$8,820</u>

- 2) The **income approach** is much more complex because it measures each category of the economy's output. The income approach yields two important **intermediate measures**.
 - a) **National income (NI)** is all income **generated by American-owned resources**, no matter where located. By far the largest component is employee compensation.

Income Approach	
	In Billions
Wages	\$5,000
Rents	100
Interest	500
Profits:	
Proprietors' income	\$500
Corporate income taxes	100
Distributed corp. profits (dividends)	500
Undistributed corp. profits (retained earnings)	100
Total profits (retained earnings)	<u>1,200</u>
National income	<u>\$6,800</u>

- b) **Net domestic product (NDP)** measures income **generated in the U.S.**, no matter who owns the resources that generated it. Two components are added to national income to arrive at this figure:
- Indirect business taxes (sales taxes, excise taxes, etc.) that are collected by businesses and passed on to some level of government, and
 - Net foreign-factor income, which is the excess of income generated in the U.S. from foreign-owned resources over income generated in other countries from U.S.-owned resources.

	<u>In Billions</u>
National income	\$6,800
Indirect business taxes	500
Foreign-factor income:	
U.S. income from foreign-owned resources	\$30
Foreign income from U.S.-owned resources	<u>(10)</u>
Net foreign-factor income	20
Net domestic product	<u>\$7,320</u>

- c) **Gross domestic product (GDP)** is arrived at by adding back to net national product the **capital stock that was consumed** in the process of generating the income.
- Even though it is merely an accounting convention and not an exact engineering measurement, **depreciation** is considered to be the amount of **capital stock consumed** during a period.

	<u>In Billions</u>
Net domestic product	\$7,320
Depreciation	1,500
Gross domestic product	<u>\$8,820</u>

- d) **Alternative calculations** can be derived by working backwards through the formulas:
- NDP** = GDP – depreciation
 - NI** = NDP – Net foreign-factor income – indirect business taxes
- 3) **Two Other Income Measures**
- Personal income (PI)** is all income **received by individuals**, whether earned or unearned.
 - Disposable income (DI)** is the income of **individuals after taxes** have been taken out.
 - Disposable income is divided between (a) consumption and interest payments and (b) savings.

	<u>In Billions</u>
National income	\$6,800
Social Security contributions	(600)
Corporate income taxes	(100)
Undistributed corporate profits	(100)
Transfer payments	1,400
Personal income	<u>\$7,400</u>
Personal taxes	(1,600)
Disposable income	<u>\$5,800</u>

d. **GDP as a Measure of a Country's Prosperity**

- 1) **Real per capita GDP** is the easiest way to measure the improvement in a country's **standard of living**.
 - a) If **real GDP** (i.e., adjusted for inflation) rises at a faster rate than the population, the country is experiencing a rising standard of living.

e. **Challenges Inherent in the Calculation of GDP**

- 1) Calculating GDP requires aggregating an **enormous amount of data**, some of which, from privately held companies for instance, may be difficult to acquire.
 - a) GDP includes both goods and services, and the **value placed on services** can sometimes be highly subjective.
- 2) GDP is a monetary measure; therefore, **comparing GDP over time** requires adjustment for changes in the price level (see "Nominal GDP" and "Real GDP" under item 2. below).

f. **Limitations of GDP**

- 1) GDP includes **only final goods and services**. Much economic activity involves the trading of **intermediate goods**, such as when a tire company buys rubber.
 - a) The exchange of intermediate goods is not captured in GDP since that would involve **double counting** some goods.
- 2) Increases in GDP often involve **environmental damage** such as noise, congestion, or pollution.
 - a) Also, some economic activity takes place as a result of **disasters**. Following a hurricane, home improvement stores experience a boom in sales. While this benefit is reflected in GDP, the devastating financial loss of the customers is not included in the calculation.
- 3) A huge amount of economic activity in **developing countries** takes place in the **underground economy**. None of this is captured in GDP.
 - a) This affects the calculation of GDP in developed nations as well, since such activities as **housework** and **cash-basis lawncare** are left out of the calculation.
- 4) GDP includes **only goods produced**; if the goods are **not sold** until a later period, GDP does not capture this.
- 5) The value placed by consumers on **leisure time** is not included in GDP.

2. **Price Level Accounting**

- a. **Nominal GDP.** The basic GDP calculation involves adding the total market value of all final goods and services in **current dollars**.
 - 1) This is clearly unsatisfactory when trying to compare the output of one year with that of another, since the general price level is constantly fluctuating.
- b. **Real GDP.** To facilitate year-to-year comparisons, nominal GDP is adjusted for changes in the general price level so it can be reported in **constant dollars**.

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price index}}$$

c. **Choice of Price Index**

- 1) The **consumer price index (CPI)** is the most common price index for adjusting nominal GDP.

- a) The CPI measures inflation by a **monthly pricing** of items on a **typical household shopping list**.

$$CPI = \frac{\text{Cost of market basket in current year}}{\text{Cost of market basket in base year}} \times 100$$

- 2) The **GDP deflator** is a far more comprehensive price index and is for that reason preferred by some economists.

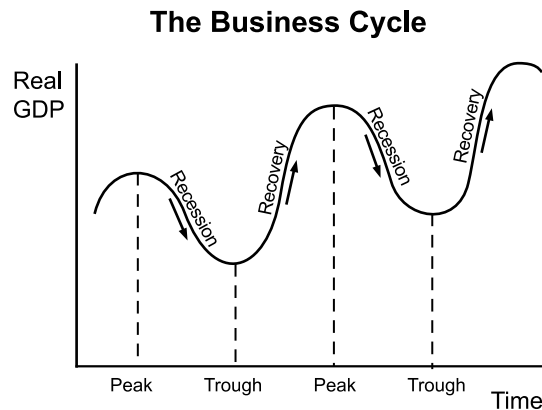
- a) Where the CPI focuses only on the goods consumed by typical households, the GDP deflator includes **every item produced in the economy**.

3. **Leading Economic Indicators**

- a. Economists use **leading indicators** to help them **forecast future economic trends** (by the same token, lagging indicators report past economic activity).
 - 1) The best-known set of leading indicators is that prepared by **The Conference Board**, a private research group with more than 2,700 corporate and other members worldwide.
 - 2) The Conference Board's **index of leading indicators** consists of 10 measures.
- b. A change in either of the following indicators suggests a future change in real GDP in the **same direction**:
 - 1) The average workweek for manufacturing workers
 - 2) New orders for consumer goods
 - 3) New orders for nondefense capital goods
 - 4) Building permits for houses
 - 5) Stock prices
 - 6) The money supply
 - 7) The spread between short- and long-term interest rates
 - 8) Consumer expectations
- c. A change in either of the following indicators suggests a future change in real GDP in the **opposite direction**:
 - 1) Initial claims for unemployment insurance (more people out of work indicates slowing business activity)
 - 2) Vendor performance (because vendors have more time on their hands and are carrying high levels of inventory)

6.3 BUSINESS CYCLES

1. Over the **very long run**, growth in capitalistic economies has not been steady. The overall trend of growth is periodically interrupted by **periods of instability**.
 - a. This tendency toward instability within the context of overall growth is termed the **business cycle** and can be depicted by the following graph:



- 1) At a **peak**, the economy is
 - a) At or near full employment, and
 - b) At or near maximum output for the current level of resources and technology.
 - i) In other words, the economy is **booming**.
 - 2) During a **recession**, income, output, and employment fall. This period must last **at least six months** to be recognized as such.
 - a) In an attempt by businesses to hold on to profits, **prices may not fall** even as wages do.
 - i) If the recession is severe enough, prices will fall and the phase will be considered a **depression**.
 - 3) In a **trough**, economic activity reaches its lowest ebb.
 - 4) During a **recovery**, output and employment rise. Eventually, the price level rises also.
- b. **Possible Causes**
- 1) When **consumer confidence declines**, i.e., when consumers become pessimistic about the future, they spend less. Unsold inventory starts to pile up. Businesses respond by cutting back production and laying off workers.
 - 2) The **introduction of major innovations**, such as railroads, airplanes, and computers, can have a destabilizing effect on an economy.
 - 3) A **miscalculation in fiscal or monetary policy** by the government may be sufficient to induce a recession or a boom.

6.4 FISCAL POLICY

1. Definition

- a. Even in capitalistic countries, **government** plays a very large role in the workings of the economy.
 - 1) The first major area in which government participates is called **fiscal policy**, that is, the government as one of the players in the marketplace, taking in revenues (taxes) and making purchases (the annual budget).
 - 2) The other major area is called monetary policy and is discussed in Subunit 5.
- b. Fiscal policies can be discretionary or nondiscretionary.
 - 1) **Discretionary** fiscal policy involves spending that is under the control of individuals within the government, such as contracting for new weapons systems.
 - 2) **Nondiscretionary** fiscal policy is that which is enacted in law. Certain outlays, e.g., Social Security, must be made regardless of their consequences or source of funding because the Congress has made them a legal requirement. No individual or group can choose to withhold (or increase) these expenditures.

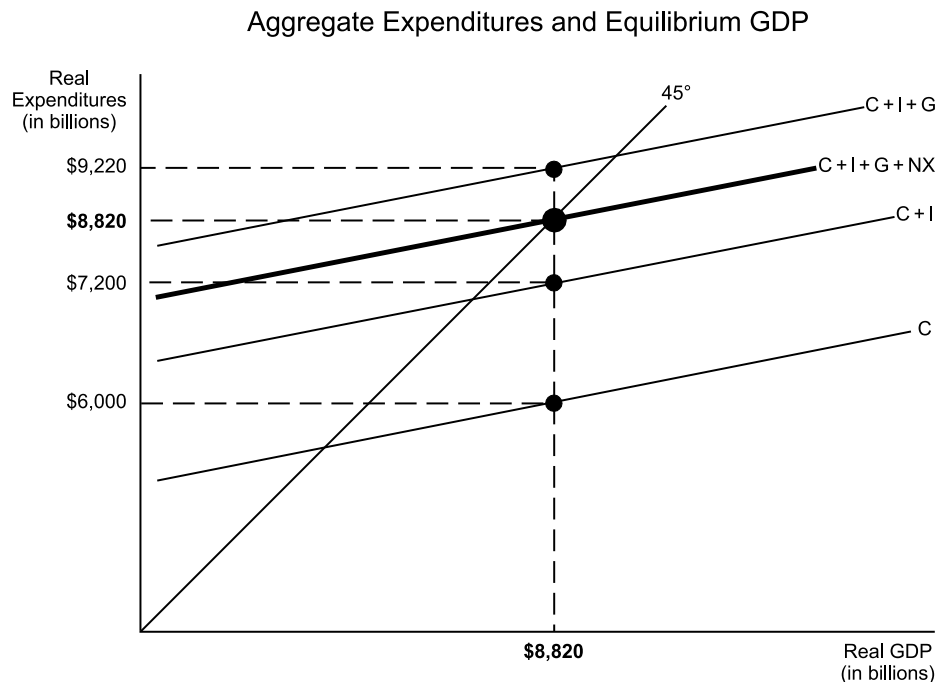
2. **Gross domestic product (GDP)** is a comprehensive measure of an economy's output during a given period of time.

- a. The simplest way to calculate GDP is simply as **the sum of all spending**, public and private, in the economy over the course of the year. This is known as the **expenditures approach**.
 - 1) The expenditures approach classifies spending into **four broad categories**.
- b. **Consumer spending (C)**. This is by far the largest component of GDP, and its most important determinant is **personal incomes**.
 - 1) Changes in incomes do not affect GDP dollar-for-dollar, however. For every additional dollar consumers receive in income, some portion is spent and the remainder is siphoned off into savings.
 - 2) These phenomena are known as the **marginal propensity to consume (MPC)** and the **marginal propensity to save (MPS)**.
 - a) For example, if, taken as a whole, consumers in an economy spend 80% of each new unit of income they receive, the MPC for that economy is .80, and the MPS is .20 ($1.0 - .80$).
- c. **Investment spending (I)**. While not as large a component of GDP as consumer spending, business investment is by far the most **volatile** component. This is because investment reflects the level of businesses' **optimism** about future demand, and business optimism is subject to wide and sudden variations.
- d. **Government spending (G)**. Government's component of total spending consists of
 - 1) Outlays for **goods and services** that are consumed by the government, and
 - 2) Outlays for long-lived **public infrastructure assets**, such as schools, bridges, and military bases.
 - a) Transfer payments are not included since they will be spent on final goods and services by consumers.
- e. **Net exports (NX)**. GDP attempts to capture all spending on American-made goods, no matter who purchases them.

- f. The following schedule is an example of the expenditures approach to calculating GDP:

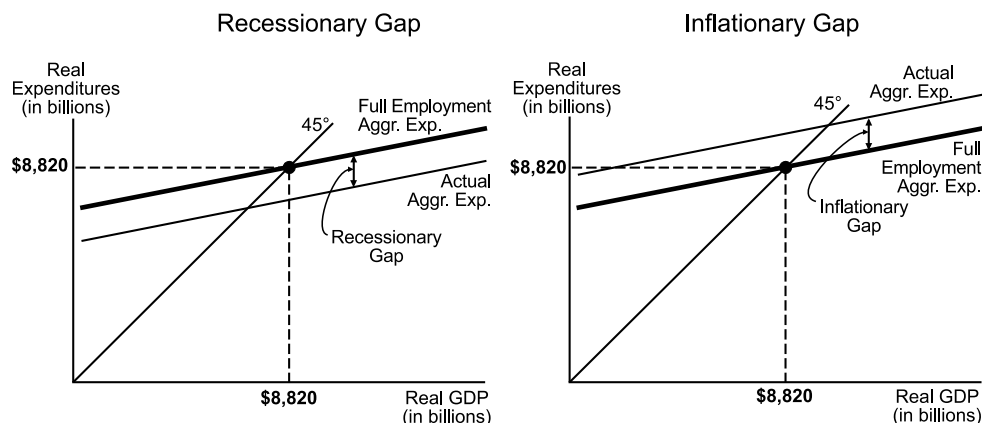
	In Billions	Legend
Consumption by households	\$6,000	C
Investment by businesses	1,200	I
Government purchases	2,020	G
Net exports	(400)	NX
Equilibrium GDP	\$8,820	C + I + G + NX

- 1) These functions can be depicted graphically as follows:



- 2) The **slope of the consumption function is the marginal propensity to consume** [see item 2.b.2) on the previous page].
3. By definition, **total expenditures equal real GDP**.
- Thus, **demand-side equilibrium** is at any point on the **45° line** (along which the values on the x and y axes are equal).
 - A **shift** in any of the four expenditure functions causes **equilibrium GDP to rise or fall**.
 - Consumer spending (C).** If consumers increase their spending, for example, because they expect incomes to rise or because taxes have been lowered, the consumption function shifts up, reflecting a rise in national output.
 - Investment spending (I).** If businesses increase their spending on productive facilities, for example, because a new generation of technology is available or because real interest rates have fallen, the investment function shifts up, reflecting a rise in national output.
 - Government spending (G).** If government increases its spending, for example, because of a military buildup, the government function shifts up, reflecting a rise in national output.
 - Net exports (NX).** If American firms sell more products overseas, the net exports function shifts up, reflecting a rise in national output. If exports eventually exceed imports, this will become a positive number.

- c. In the previous example, the economy is in equilibrium at an output-and-consumption level of \$8.82 trillion.
- 1) If the **current level** of output and spending is **less than** the amount of which the economy is capable at full employment of all its resources, the actual aggregate expenditures curve rests below the full-employment curve. The distance between the two is a **recessionary gap**.
 - 2) If the **current level** of output and spending **exceeds** the full-employment level, the actual aggregate expenditures curve rests above the full-employment curve. The distance between the two is an **inflationary gap**.



- d. The following **tools of fiscal policy** are deployed by the government to close these gaps:
- 1) Tax policy
 - 2) Government spending (highway maintenance, military buildup, etc.)
 - 3) Transfer payments (welfare, food stamps, unemployment compensation, etc.)
- e. If a **recessionary gap** exists, the government institutes **expansionary policies**, stimulating aggregate demand.
- 1) Taxes can be cut, putting more money in the hands of consumers.
 - 2) Government can increase its spending, generating demand for goods and services from the private sector.
 - 3) Transfer payments can be increased, putting more money in the hands of consumers.
- f. If an **inflationary gap** exists, the government institutes **contractionary policies**, suppressing aggregate demand.
- 1) Taxes can be increased, giving consumers less disposable income.
 - 2) Government can cut its spending, reducing demand for goods and services from the private sector.
 - 3) Transfer payments can be decreased, giving consumers less disposable income.
4. **Multiplier effect.** When the government increases its own spending or encourages business investment, the **effect** of each new dollar injected into the economy is **greater than one**.
- a. When a dollar enters the economy, it is one person's income. When that person spends it, it becomes another person's income, and so forth.
 - b. As money "ricochets" through the economy, then, it has a **cumulative effect** greater than the single amount. (Likewise, when a dollar is removed from the cycle, it has an impact greater than that of removing a single dollar.)

- c. With **each round of earning and spending**, the effect of the dollar diminishes. This effect can be greatly simplified in algebraic form as follows:

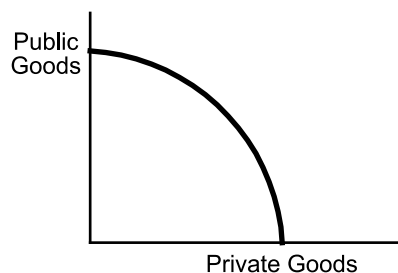
$$\text{Multiplier} = \frac{1}{MPS}$$

- 1) For example, if the MPC is .80 and expenditures increase by \$100 million, the increase in equilibrium GDP is \$500 million [$\$100,000,000 \times (1.0 \div .20)$].
- d. As stated on the previous page, the multiplier is only applicable to changes in the **investment (I) and government (G)** expenditure functions. These amounts are injected directly into the economy.

5. Effects of Public Expenditure

- a. **Public expenditure** is the **G** function in the aggregate expenditures model (see item 2. in this subunit). By purchasing (or curtailing purchase of) goods and services from the private sector, government can play a large role in managing aggregate demand.
- b. Public goods and private goods can be distinguished in two ways:
- 1) **Private goods** are characterized by **exclusivity of consumption**. One consumer's enjoyment of a strawberry milkshake means that no other consumer can have the benefit of the same shake.
 - 2) **Public goods**, on the other hand, are characterized by **indivisibility of consumption**. All citizens enjoy the benefits of nuclear submarine patrols and public parks, no matter the level of their contribution to these benefits.
- c. Governments are the major (often the only) purchasers of public goods. For example, the federal government is the only consumer of tanks and fighter planes. This has two implications:
- 1) **Income is redistributed** to defense contractors.
 - 2) Since a multi-player marketplace is not at work, **resources may not be allocated** as efficiently as possible.
 - 3) The relationship of government spending to consumer spending can be graphically illustrated with a production possibilities curve as shown below.

Private vs. Public Goods

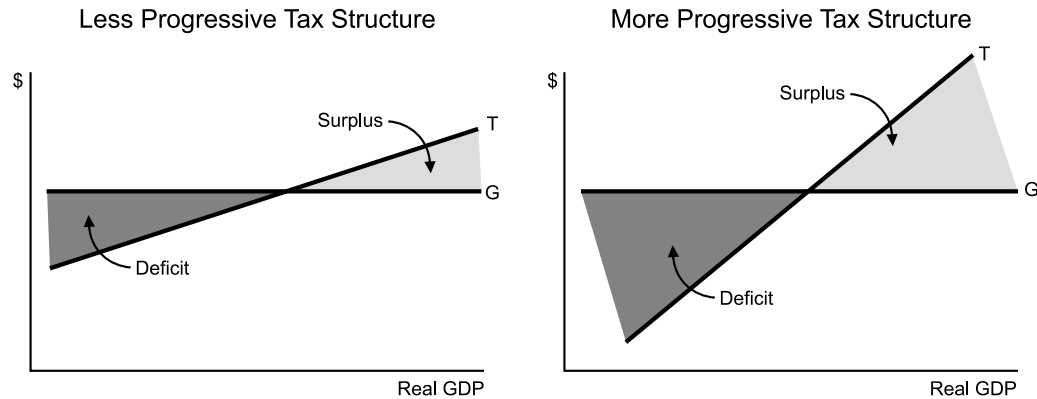


6. Budget Deficits and Surpluses

- a. Keynesian theory calls for expansionary fiscal policy during times of recession (to stimulate aggregate demand) and contractionary policy during boom times (to prevent inflation).
 - 1) **Expansionary policy**, involving increased spending, tax cuts, or both, causes government to incur a **budget deficit**, i.e., the government is spending more than it takes in.
 - 2) **Contractionary policy**, involving decreased spending, tax hikes, or both, causes government to incur a **budget surplus**, i.e., the government is taking in more than it spends.
- b. The government can avail itself of **two methods for financing a budget deficit**:
 - 1) **Borrowing**. The government can sell debt instruments such as Treasury bonds and notes to citizens and to foreigners.
 - 2) **Printing money**. The government can simply order that more paper currency be created.
- c. Both methods of financing a deficit carry **risks**.
 - 1) **Borrowing** can lead to the **crowding-out effect**. Government debt securities compete in the marketplace for investors. This puts upward pressure on interest rates, inevitably leading to the inability of some private sellers of debt to find financing for their ventures.
 - 2) **Printing money** tends to devalue the currency (“too many dollars chasing too few goods”), leading to **inflation**.

7. Progressive Taxation as a Built-in Stabilizer

- a. The progressive rate structure of the Federal tax code constitutes an automatic macroeconomic stabilizer.
 - 1) The amount of government spending for a period is enacted into law. Congress sets the tax rate structure to approximate the amount of revenue needed to cover the mandated level of spending.
 - 2) If the economy enters a recession and **GDP falls**, tax revenues also fall. Thus, government inevitably incurs a **deficit**, creating a **stimulus to aggregate demand**.
 - 3) If the economy enters a recovery and **GDP rises**, tax revenues also rise. Government incurs a **surplus**, and (as long as it isn’t spent) **inflation is prevented**.
- b. A **progressive tax structure** means that as income increases, the taxpayer is subject to higher tax rates. Government revenues thus respond in proportion to the desired effect.
 - 1) The more progressive the tax structure (i.e., the steeper the T function is with respect to the G function), the deeper the deficit is when GDP falls and the greater the government’s contribution to economic stimulus.



- 2) For example, in 1993, **Congress raised the highest bracket** on personal income taxes and increased the rate for corporate taxes.
 - a) This “stretching out” of tax rates on the high end made the tax system **more progressive**, reflected by an increase in the slope of the T function.
 - b) In the latter part of the decade, the U.S. economy entered a boom phase. The **increased progressivity** of the tax structure resulted in a budget surplus, allowing the boom to proceed **without sparking inflation**.
8. **Cyclical vs. structural deficits.** The budget deficit is the **sum** of the cyclical deficit and the structural deficit.
 - a. A **cyclical deficit** is one that results from **economic downturns** and not from government action.
 - 1) As illustrated above, when real GDP falls, tax revenues decrease because of the progressive tax system.
 - b. A **structural deficit** is the deficit that **would exist at full employment** if there was no downturn in the economy.
 - 1) In other words, a structural deficit results from government action, i.e., discretionary fiscal policy.
9. **Timing Issues**
 - a. **Recognition lag** is the time it takes for macroeconomists to recognize that a recession (or inflation) is occurring.
 - b. **Administrative lag** is the time it takes for the government to act on macroeconomic changes.
 - c. **Operational lag** is the time it takes for the changes implemented by the government to take effect; also called **response lag**.

6.5 MONETARY POLICY

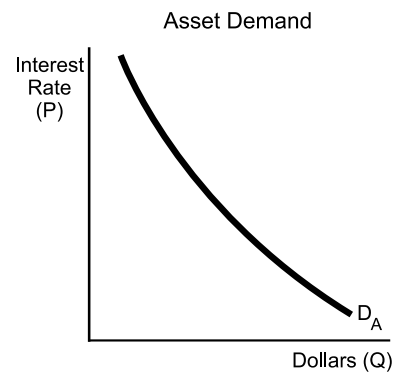
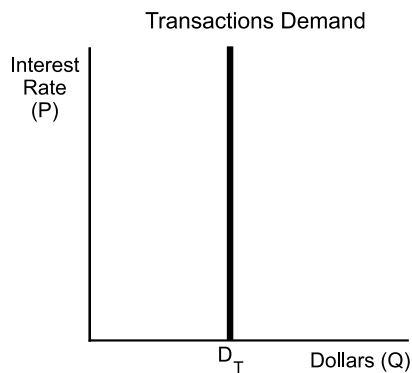
1. Three Uses of Money

- a. **Medium of exchange.** The existence of money greatly facilitates the free exchange of goods and services by providing a common “language” for valuation.
 - 1) In the words of English philosopher John Stuart Mill (1806–1873), money “is a machine for doing quickly and commodiously what would be done, though less quickly and commodiously, without it.” Without money, all goods and services would have to be **bartered**, creating extraordinary inefficiencies.
- b. **Unit of account.** The common “language” of money also provides a convenient basis for bookkeeping, since anything stated in terms of money can be easily compared.
- c. **Store of value.** Any society using the barter basis is subject to great inefficiencies, because many objects of great value, such as foodstuffs, spoil, making them worthless. The value of a unit of money is determined by the quantity of goods and services it can be exchanged for.

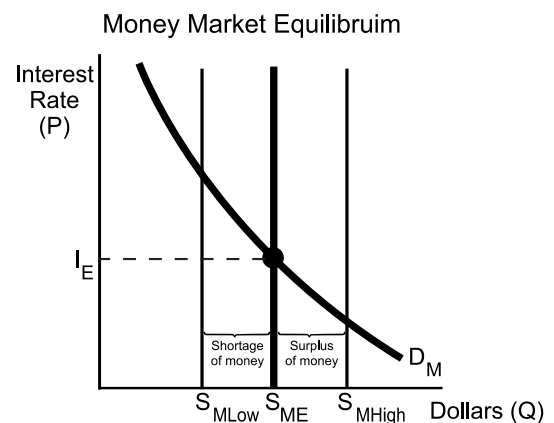
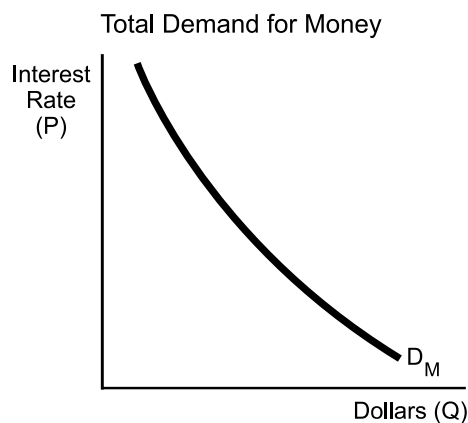
2. The Demand for Money

- a. When money is **borrowed**, the debtor pays the lender back an amount in addition to the sum that was borrowed.
 - 1) This amount is called “**interest**” and is, in effect, the “**price**” of the loan.
 - a) The rate of interest on a given loan is stated in terms of a **percentage** of the face amount of the loan.
 - 2) The two major **determinants of the interest rate** on a loan are
 - a) Overall economic conditions as reflected in the prime rate [see item 7.d.3) in this subunit], and
 - b) The creditworthiness of the borrower.
- b. The **total demand for money** has two components:
 - 1) **Transactions demand** reflects money’s role as a medium of exchange.
 - a) When economic activity increases, people need more money to carry out transactions. As **nominal GDP rises**, then, the transactions demand for money **rises**.
 - b) For simplicity, it is assumed that the transactions demand for money is determined **entirely** by GDP and not by the interest rate.
 - 2) **Asset demand** reflects money’s role as a store of value.
 - a) People have an incentive to hold money since it is the most liquid and least risky of assets.
 - b) However, holding money entails an opportunity cost. If money is held in a savings account, it earns less than it would if it were invested in a money-making venture. If it is held outside a financial institution altogether, it earns no return at all.

- c) When rates of return are high, people are more and more likely to place their money in venture projects rather than leave it in the bank. Thus, as **interest rates rise**, the asset demand for money **falls**.



- 3) **The total demand for money**, then, is simply the sum of the transactions demand curve and the asset demand curve.
- 4) **Money market equilibrium** is attained at the rate where the demand and supply curves intersect. When rates are too low, a surplus of money results; when rates are too high, a shortage results.



3. The Supply of Money

- a. The Federal Reserve System tracks and reports the **amount of money in circulation**.
- 1) The three most widely used metrics are **M1**, **M2**, and **M3**. M1 includes only the most liquid forms of money. Each successive category includes less and less liquid forms.
 - 2) The following is a hypothetical money supply calculation for an economy the approximate size of that of the U.S.:

	In Billions
Currency (paper money + coins)	\$600
Checking accounts	700
M1 money supply	\$1,300
Savings accounts, including money market accounts	2,900
Small time deposits (< \$100,000)	1,400
Money market mutual funds	800
M2 money supply	\$6,400
Large time deposits (\geq \$100,000)	2,200
M3 money supply	\$8,600

4. The Velocity of Money

- a. The **velocity** of money is the **number of times** the average dollar is **spent in a single year**.
- b. A corollary of this idea is the **equation of exchange**: the amount expended during a year must be equal to the money supply (M) times the velocity (V).

$$\text{Nominal GDP} = M \times V$$

- 1) To continue the previous example, if the M2 money supply is \$6.4 trillion and the velocity for M2 is 1.378, nominal GDP is \$8.82 trillion (\$6,400,000,000,000 × 1.378).

5. The Federal Reserve System (the Fed)

a. History of the Fed

- 1) From its founding, the United States tended to view a **central bank** as an anti-democratic institution. The **banking panics** of the late 1800s and early 1900s, however, convinced Congress that such an institution was needed for **stability**.
 - a) A bank panic, also called a “**run**,” occurs when depositors demand to withdraw more cash than the bank has on hand on a given day.
- 2) The result was the Federal Reserve System, established in **1913**.
 - a) Instead of a single central bank as in many other countries, the United States has **twelve regional** Federal Reserve Banks.
- 3) The Federal Reserve is **independent of the rest of the federal government**.
 - a) This independence, and the long terms of its members, insulate the Fed's decisions from political pressures.

b. Structure of the Fed

- 1) The **Board of Governors** is responsible for **overseeing the operations** of the Federal Reserve System.
 - a) The Board has **seven members** appointed by the president and confirmed by the Senate.
 - b) Governors serve **14-year terms**, and their appointments are staggered. The chair and vice-chair are appointed for 4-year terms by the president and confirmed by the Senate.
- 2) The **Federal Open Market Committee (FOMC)** is responsible for **administering monetary policy**.
 - a) The FOMC consists of **12 members**:
 - i) The seven members of the Board of Governors,
 - ii) The president of the Federal Reserve Bank of New York, and
 - iii) Four presidents from the 11 other Reserve Banks, selected on a rotating basis for a 1-year term.
 - b) The FOMC **meets eight times per year** at the Federal Reserve's headquarters in Washington, DC.
 - c) It is in the role of presiding officer over the FOMC that the chair of the Federal Reserve is the **most powerful central banker** in the world. The financial world hung on every word of every public pronouncement during the chairmanship of **Alan Greenspan** (served 1987–2006).

c. **Roles of the Fed**

- 1) **Open market operations.** The Federal Reserve's most important function is the management of the nation's money supply by trading government debt securities (see item 7.b. on the next page).
- 2) **Setting reserve requirements.** The Fed can also affect the money supply by changing the percentage of deposits that banks must keep on hand (see item 6.b. below).
- 3) **Serving as the bankers' bank.** The Fed serves the same purpose for the nation's banks that banks do for the general public; that is, the Fed loans funds to, and accepts deposits from, commercial financial institutions.
- 4) **Overseeing check collection.** The Fed coordinates the clearing of checks written against the nation's checking accounts.
- 5) **Issuing currency.** The paper money used in the U.S. (and, to a great extent, the world) economy is distributed by the twelve regional banks. Each bill is marked with a letter code indicating its Federal Reserve Bank of origin (A = Boston, E = Richmond, I = Minneapolis, etc.).
- 6) **Serving as fiscal agent for the U.S. government.** The enormous amounts of money collected and spent by the United States Treasury pass through the Federal Reserve System.
- 7) **Examining banks.** The Fed assesses individual banks as to profitability and conformity with laws and regulations.

6. **Banks and the Creation of Money**

- a. A review of the example M1 **money supply** calculation in item 3.a.2) on page 165 reminds us that **paper money and coins** (collectively referred to as currency) make up **less than half** the total.
 - 1) How can there be double the amount of money in the economy than there is currency to represent it?
 - a) The answer is that the U.S. Bureau of Engraving and Printing does not create all the money there is. In addition to the federal government, **banks create money.**
 - 2) For example, a bank customer deposits \$1,000 and the bank then loans out \$800 of it.
 - a) The depositor has a statement showing that (s)he has a claim on \$1,000 of cash and the borrower has \$800 of cash in his/her hand.
 - b) \$1,800 now exists where there was only \$1,000 previously. The **bank has just created \$800.**
- b. **Fractional reserve banking** is the practice of prohibiting banks from lending out all the money they receive on deposit.
 - 1) The **reserve ratio** is the percentage of each dollar deposited that a bank is required to either (a) keep on hand in its vault or (b) deposit with the Federal Reserve Bank in its district.
 - a) The bare minimum that must be held by law is called **required reserves.** As of October 2006, the Fed requires banks with checking account balances between \$8.5 million and \$45.8 million to keep 3% on hand.
 - i) Anything held by the bank above this amount (that is not loaned out) is termed **excess reserves.**

- b) Fractional reserves are obviously not sufficient to prevent a bank's collapse in the event of a run (that purpose is fulfilled by the Federal Deposit Insurance Corporation).
 - i) The **real purpose** of required reserves is to provide the Fed with another tool for **controlling the money supply** (see item 7.c. on the next page).
 - c. The amount of money banks potentially can create can be approximated by using the **monetary multiplier**.

$$\text{Monetary multiplier} = \frac{1}{\text{Required reserve ratio}}$$

- 1) For example, if the Fed required reserves of 4% on all deposits, a bank with \$10 million on deposit would be able to create \$250 million of new money [\$10,000,000 × (1.0 ÷ .04)].
 - 2) Because the multiplier is an inverse, it clearly shows that the **money supply will grow as required reserves are lowered**.

7. Goals and Tools of Monetary Policy

- a. The Fed attempts to balance the goals of gradual, steady **economic growth** and **price stability** (manageable inflation).
 - 1) The Fed has **three tools of monetary policy** at its disposal to achieve these goals:
 - a) Open-market operations,
 - b) The required reserve ratio, and
 - c) The discount rate.
- b. **Open-market operations** are the Fed's most valuable tool. The Fed can choose a range of potential impacts from large to small, and the effect is immediate.
 - 1) **U.S. Treasury securities** are traded on the open market. The Fed can either purchase them from, or sell them to, commercial banks.
 - a) When the Fed wishes to **loosen** the money supply, it **purchases** Treasury securities.
 - b) When the Fed wishes to **tighten** the money supply, it **sells** Treasury securities.
 - 2) The **Federal funds rate** is the rate **banks charge each other** for overnight loans.
 - a) Banks with excess reserves do not have to leave these funds idle. They can lend them on a short-term basis to banks that are in danger of dipping below the required reserve ratio.
 - b) When the Fed **buys** Treasury securities, the Federal funds rate **falls**. When the Fed **sells** Treasury securities, the Federal funds rate **rises**.
 - 3) This chain of cause and effect is summarized in the following table:

To Loosen Money Supply

1. FOMC sees **recession** looming
2. Fed **buys government securities** on the open market
3. Fed **credits cash to reserve accounts** of banks selling securities
4. Increase in supply of cash **creates excess reserves**; banks now willing to lend
5. Greater availability of cash for overnight loan causes **decline in Federal funds rate**

To Tighten Money Supply

1. FOMC fears **inflation** heating up
2. Fed **sells government securities** on the open market
3. Fed **decreases cash in reserve accounts** of banks buying securities
4. Decrease in supply of cash **reduces excess reserves**; banks unable to lend
5. Lower availability of cash for overnight loan causes **increase in Federal funds rate**

- c. **Changes in the required reserve ratio** are used less frequently. Requiring banks to leave more funds in (noninterest-bearing) reserve accounts has a dramatic effect on profits.
- 1) When the Fed wishes to **loosen** the money supply, it **lowers** the required reserve ratio.
 - a) If banks have to keep less money on hand, they have more available to lend out.
 - 2) When the Fed wishes to **tighten** the money supply, it **raises** the required reserve ratio.
 - a) If banks have to keep more money on hand, they have less available to lend out.
- d. The **discount rate** has come to **reflect, rather than enact, changes** the Fed wishes to make. The discount rate is the rate Federal Reserve banks charge to commercial banks that need loans.
- 1) After the Fed has **put money into the economy** by buying Treasury securities, the market reacts by lowering interest rates (since money is now easier to come by).
 - a) The Fed then **lowers** the discount rate to match the interest rate action of the market.
 - 2) After the Fed has **taken money out of the economy** by selling Treasury securities, the market reacts by raising interest rates (since money is now harder to come by).
 - a) The Fed then **raises** the discount rate to match the interest rate action of the market.
 - 3) The discount rate must be contrasted with the **prime rate**, which is determined by commercial banks with regard to their most creditworthy customers and is thus not under the direct control of the Fed.

8. **Weaknesses of Monetary Policy**

- a. The same **recognition lag** and **operational lag** (see item 9. in Subunit 4) that plague attempts to use fiscal policy also affect the use of monetary policy.
- 1) Recognition lag is the time it takes for macroeconomists to recognize that a recession (or inflation) is occurring, and operational lag (also called response lag) is the time it takes for the changes implemented by the government to take effect.

- 2) Administrative lag, on the other hand, is not the same obstacle to carrying out monetary policy that it is to the execution of fiscal policy. Whereas the changes necessary to enact fiscal policy must pass through an elaborate legislative process, the Fed can act immediately on open-market operations decided on by the FOMC.
- b. **Changes in velocity** may work counter to the Fed's intentions. If the money supply is loosened and interest rates fall, consumers are less willing to invest their cash and the rate of investment falls.
- c. The theory of **cyclical asymmetry** holds that a tight monetary policy is effective but a loose policy is less so.
 - 1) Reducing the money supply by locking up reserves and selling on the open market unquestionably takes cash out of the economy.
 - 2) On the other hand, simply loosening the money supply may not lead to increased spending. Other factors, such as banks' concerns about liquidity or high consumer debt loads, may forestall the intended round of anti-recessionary spending.