

## *The Business Cycle: Introduction to Macroeconomic Indicators*

### **Overview**

The 1930s were marked by periods of chronically high unemployment in the United States. After World War II, Congress passed the Employment Act of 1946, which stated that it was the policy and responsibility of the federal government to use all practical means to promote maximum employment, production, and purchasing power. The Employment Act of 1946 established three important goals for the economy:

1. *Full employment* exists when most individuals who are willing and able to work at the prevailing wages in the economy are employed. Even under conditions of full employment, there will be some temporary unemployment as workers change jobs and as new workers seek their first jobs.
2. *Price stability* exists when the average level of prices in the economy is neither increasing nor decreasing. The goal of price stability does not imply that prices of individual items should not change—only that the average level of prices should not change.
3. *Economic growth* exists when the economy produces increasing amounts of goods and services over the long term. If the increase is greater than the increase in population, the amount of goods and services available per person will rise, and thus the nation's standard of living will improve.

### **Measuring the Achievement of Economic Goals**

To determine how well we are achieving economic goals requires measuring the levels of employment, prices, and economic growth.

#### ***Measuring Employment***

The civilian *unemployment rate* measures how well we are achieving the goal of full employment. The unemployment rate is derived from a national survey of about 60,000 households. Each month the federal government asks the households about the employment status of household members aged 16 and older (the adult population). The survey puts each person in one of three categories: employed, unemployed, or not in the labor force. People who are at work (the employed) plus those who are not working but are willing and able to work and are actively looking for work (the unemployed) make up the *labor force*. The labor force is much smaller than the total adult population because many individuals are not willing or able to work.

#### ***Measuring Price Changes***

A *price index* measures price changes in the economy. By using a price index, you can combine the prices of a number of goods and/or services and express in one number the average change for all the prices. The consumer price index, or CPI, is the measure of price changes that is probably most familiar to people. It measures changes in the prices of goods and services commonly bought by consumers.

**Measuring Short-Run Economic Growth**

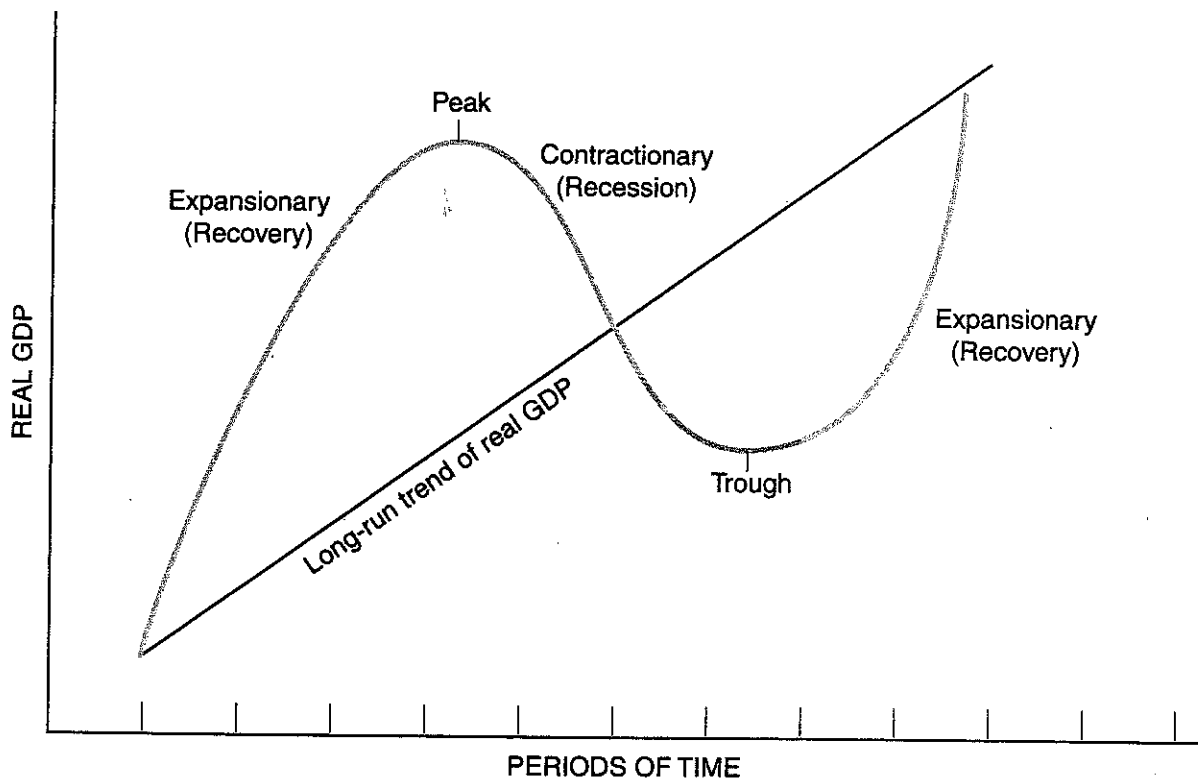
To measure fluctuations in output (short-run economic growth), we measure increases in the quantity of goods and services produced in the economy from quarter to quarter or year to year. The *gross domestic product*, or GDP, is commonly used to measure economic growth. The GDP is the dollar value at market prices of all final goods and services produced in the economy during a stated period. Real GDP is the GDP adjusted for changes in the price of goods.

**The Business Cycle**

The *business cycle* refers to the ups and downs in an economy. In the short run, the economy alternates between upturns and downturns as measured by the three macroeconomic indicators. Figure 1-10.1 shows a graph of the business cycle.



Figure 1-10.1  
**The Business Cycle**

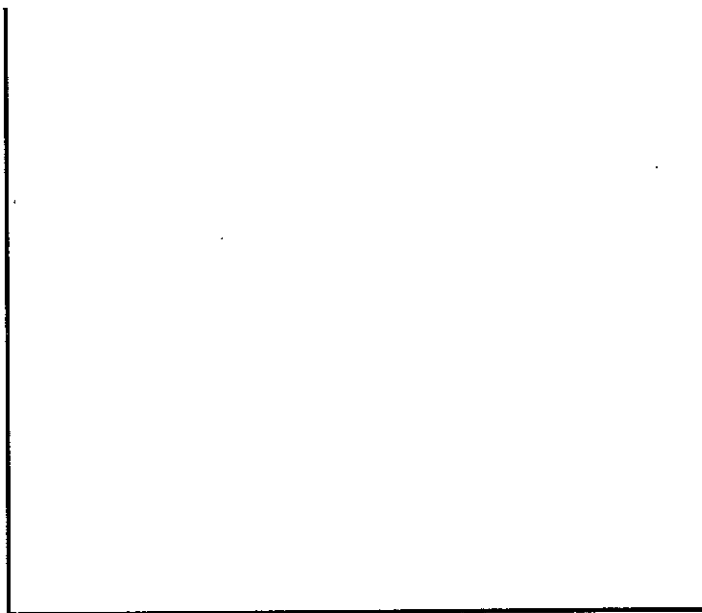


The curved line on Figure 1-10.1 shows a sample business cycle for an economy. The straight line represents the long-run trend of real GDP.

The business cycle can be divided into four phases:

1. *Expansionary*. Real output in the economy is increasing and the unemployment rate is declining. As the economic expansion continues, inflation may begin to accelerate. The early part of an expansionary phase is also called a recovery phase.
2. *Peak*. Real output, GDP, is at its highest point of the business cycle.
3. *Contractionary*. Real output in the economy is decreasing, and the unemployment rate is rising. As the contraction continues, inflationary pressures subside. The later stage of a contractionary phase is also called a recession.
4. *Trough*. The lowest point of real GDP reached during the business cycle is known as the trough. If the trough is particularly deep, it may be called a depression. A depression is an economic situation where the level of output falls to especially low levels and unemployment climbs to very high levels. There is no precise decline in output at which a serious recession becomes a depression. However, most business cycles do not end in a depression.

Draw a graph of a business cycle using unemployment as your measure of economic activity. That is, label the vertical axis with the unemployment rate. Make sure that you also label the horizontal axis. Label the phases of the business cycle on your graph. Remember that you are graphing the unemployment rate (rather than output) on your graph. Think about what happens to the unemployment rate during each phase of the business cycle!



On your graph, plot a point indicating where in the business cycle you think the economy is currently operating. Explain how you selected that location.

## Inflation

*Inflation* is an overall increase in the price level in an economy. *Deflation* is the opposite of inflation. Deflation is an overall decrease in the price level. A change in the price of just one or a few goods does not constitute inflation or deflation. After the price level increases, a dollar will buy less than it would before. When there is going to be inflation, people are better off buying now, before prices go up. After the price level falls, a dollar will buy more than it would before. When there is going to be deflation, people are better off waiting to buy later, when prices go down.

If people anticipate inflation, they will build that expectation into their decisions. For example, workers will demand higher wages to keep their purchasing power the same if prices are expected to rise. Then, when inflation leads to higher prices, workers are not hurt or helped because their higher wages allow them to purchase the same amount of goods and services. However, when inflation is *unanticipated*, people do not build it into their decisions, and some people are hurt while others are helped. For example, when there is unanticipated inflation, borrowers are helped while lenders are hurt. People who borrow money receive a loan before prices rise, when the money will buy more. However, they pay the money back later, after prices rise, when the money won't buy as much. With inflation, the borrower gains while the lender loses.

**Student Alert:** Inflation is an increase in the price level in the economy. It does not necessarily mean that the price of every good is going up!

### Measuring Price Changes

A *price index* is used to measure price changes in the economy. Price indices combine the prices of a bundle of goods and services and track changes in the price of that bundle over time. The Consumer Price Index, or CPI, is the most familiar price index. It measures changes in the price of a bundle of goods and services commonly bought by consumers. The CPI is based on a market basket of more than 200 categories of goods and services weighted according to how much the average consumer spends on them. Two other price indices are the Producer Price Index (PPI) and the GDP deflator. The PPI measures the average change over time in the selling prices received by domestic producers for their output. The GDP price deflator is the most inclusive index because it takes into account the prices of all goods and services produced.

To construct any price index, economists select a year to serve as the base year (the year used for comparison). The prices of other periods are expressed as a percentage of the base period. The value of a price index in the base year is 100, because prices in the base year are 100 percent of prices in that year. Inflation will raise the price of the market basket, and the price index will rise. Deflation will decrease the price of the market basket, and the price index will fall.

For the CPI, the formula used to measure price change from the base period is

$$\text{CPI} = \frac{\text{cost of market basket in current-year prices}}{\text{cost of market basket in base-year prices}} \times 100.$$

### Who Is Hurt and Who Is Helped by Unanticipated Inflation?

Identify whether each of the following examples leads to a person or group being hurt or helped by unanticipated inflation. Circle your response, and explain your answer.

H - the person or group is *hurt* by unanticipated inflation

G - the person or group *gains* from unanticipated inflation

U - it is *uncertain* if the person or group is affected by unanticipated inflation

1. Banks extend many fixed-rate loans.

H                      G                      U

Explain:

2. A farmer buys machinery with a fixed-rate loan to be repaid over a ten-year period.

H                      G                      U

Explain:

3. Your family buys a new home with an adjustable-rate mortgage.

H                      G                      U

Explain:

4. Your savings from your summer job are in a savings account paying a fixed rate of interest.

H                      G                      U

Explain:

5. A widow lives entirely on income from fixed-rate corporate bonds.

H                      G                      U

Explain:

## Unemployment

The level of employment is an important measure of economic performance. The unemployment rate measures how well we are achieving the goal of full employment. It is found using a national survey of about 60,000 households. Each month the federal government asks these households about the employment status of household members aged 16 and older (the adult population). The survey puts each person in one of three categories: employed, unemployed, and not in the labor force. People who are at work (the employed) plus those who are not working but are actively looking for work (the unemployed) make up the *labor force*. People who are not working and are not seeking a job are not in the labor force. The category “not in the labor force” includes individuals who are unable to work or choose not to work.


### Measuring Unemployment

Only those people who are willing and able to work are considered part of the labor force. The size of the labor force as a percentage of the total population measures the labor resources available to produce in the economy. The *labor force participation rate* (LFPR) is defined as the percentage of the population that is considered part of the labor force.

$$\text{LFPR} = \frac{\text{labor force}}{\text{population}} \times 100.$$

The *unemployment rate* (UR) is defined as the number of people who are unemployed as a percentage of the labor force.

$$\text{UR} = \frac{\text{number of unemployed}}{\text{labor force}} \times 100.$$

 **Student Alert:** A person must be actively seeking a job to be considered unemployed. The LFPR is the labor force as a percentage of the *population*. The UR is the number of people unemployed as a percentage of the *labor force*. Make sure to use the right denominator!

1. Fill in the last three columns of Table 2-6.1. All of the population and labor-force data are in millions.



Table 2-6.1

**Civilian Employment**

Year	Civilian non-institutional population age 16 and over	Civilian labor force			UR	LFPR
		Employed	Unemployed	Total		
1970	117	66	4			
1980	137	79	4			
1990	168	99	8			
2000	188	117	7			
2010	209	135	6			

**Types of Unemployment**

The unemployment rate measures unemployment in the economy but it does not provide information about *why* people are unemployed. To better understand unemployment in the economy, unemployment is classified based on the reason people are willing and able to work but can't find a job. There are three types of unemployment:

- *Frictional unemployment* includes people who are temporarily between jobs. They may have quit one job to find another, or they could be trying to find the best opportunity after graduating from high school or college.
- *Cyclical unemployment* includes people who are not working because firms do not need their labor due to a lack of demand or a downturn in the economy. Cyclical unemployment is due to the business cycle.
- *Structural unemployment* involves mismatches between job seekers and job openings. Unemployed people who lack skills or do not have sufficient education for available jobs are structurally unemployed.

There will always be some frictional and structural unemployment in the economy because people are always moving and changing jobs and because the structure of the economy is always changing, for example, as technology changes. Cyclical unemployment will exist or not, depending on the phase of the business cycle the economy is experiencing.

## Time Value of Money

A dollar you receive today is worth more than a dollar you may receive a year from today! Money has a time value because interest rates are positive. For example, if you earn 5 percent per year on your savings account, one dollar will grow to one dollar plus five cents after one year. Since the present value of \$1.05 to be received one year from now (if interest rates are 5%) is \$1.00, then the present value of \$1.00 to be received one year from now (again if interest rates are 5%) must be some value less than \$1.00. In fact, the present value can be calculated using the formula

$$PV = FV / (1 + r)^n$$

where

PV is present value

FV is future value

r is the rate of interest per period

n is the number of compounding periods (per year).

Using the formula for our example:

$$PV = \$1.00 / (1.05)^1$$

$$PV = \$0.95.$$

Today's value of \$1.00 to be received one year from now if the interest rate is 5 percent is \$0.95.

Business executives must consider the time value of money when making business investment spending decisions. They know that future profit projections must be converted to the present value in order to make a correct decision about whether a certain business project is profitable. Notice that the interest rate is in the denominator of the formula indicating the present value is inversely related to the interest rate. Thus, less business investment spending is worthwhile at higher interest rates.

For example, assume a business was considering the purchase of a new machine that costs \$2,000 now. The machine is expected to generate profits of \$1,000 at the end of year one and \$1,400 at the end of year two. For simplicity, assume the machine completely wears out and is worthless after the two years. Also assume the business must borrow the \$2,000 at 9 percent interest. Should the business borrow and purchase the machine?

Using the present value formula:

$$PV = \$1,000 / (1.09)^1 + \$1,400 / (1.09)^2 = \$917.43 + \$1,178.35 = \$2,095.78.$$

The business should invest in the machine since the present value of its future profits from the machine is greater than the cost of the machine:  $\$2,095.78 - \$2,000 = \$95.78$ .

Now, what if the rate the business had to pay to borrow increased to 15 percent?

Using the present value formula:

$$PV = \$1,000 / (1.15)^1 + \$1,400 / (1.15)^2 = \$869.57 + \$1,058.60 = \$1,928.17.$$



The business should not invest in the machine since the present value of its future profits from the machine is now less than the cost of the machine:  $\$1,928.17 - \$2,000 = (\$71.83)$ .

Understanding the time value of money also helps for understanding the relationship between bond prices and interest rates. A bond is a loan with a fixed interest rate called the coupon rate. Bonds are long-term fixed-rate loans of usually 20 or 30 years. The seller (borrower) of a bond agrees to pay the buyer (lender) the amount of interest specified each year plus the face value of the bond at the end of the specified period, again typically 20 or 30 years. Often the buyer of the bond (lender) incurs a liquidity problem and needs to sell the bond before it reaches its maturity. So, at what price can the owner of the bond sell the bond?

To answer that question, let's assume the original bond was a 20-year bond with a face value of \$1,000 and the coupon rate was 5 percent. That means the owner was receiving \$50 in interest payments each year and was planning on receiving the \$1,000 back at the end of year 20. But, let's further assume the owner needs some cash and wants to sell the bond after owning it for 18 years and that current interest rates for bonds with the same level of risk are now 7 percent. That means there are two more interest payments due (one next year and one two years from now) and the face value will be due at the date of maturity or 20th year (two years from now). What price can the owner sell the bond for now that current interest rates are higher?

Using the present value formula:

$$PV = \$50 / (1.07)^1 + \$1,050 / (1.07)^2 = \$46.73 + \$917.11 = \$963.84.$$

*Note:* Current interest rate is higher and the price of the bond is lower.

Now assume that current interest rates for bonds with the same level of risk are now 3 percent, which is lower than the 5 percent coupon rate. So, now what price can the owner sell the bond?

Using the present value formula:

$$PV = \$50 / (1.03)^1 + \$1,050 / (1.03)^2 = \$48.54 + \$1,019.42 = \$1,067.96.$$

*Note:* Current interest rate is lower and the price of the bond is higher. We can conclude that bond prices are inversely related to interest rates.

*Final note:* What would the same \$1,000 bond sell for if interest rates were still equal to the 5 percent coupon rate? Hopefully, you concluded that the price would be the same as the original price or \$1,000. To check this out using our formula:

$$PV = \$50 / (1.05)^1 + \$1,050 / (1.05)^2 = \$47.62 + \$952.38 = \$1,000.$$

1. What will \$3,000 deposited into a savings account be worth after one year if interest rates are 3 percent compounded yearly?