Lesson 5 - Unemployment, Inflation, and Business Cycles

Of all of the measures of the health of an economy, the two that seem to get the most attention are the unemployment rate and the inflation rate. In this lesson, we will look at both measures, show how they are defined and calculated, and explain their importance. Throughout the remainder of the course, the impact on the unemployment rate and the inflation rate will be key considerations in evaluating the wisdom of particular economic policies. The fundamental understanding that you gain of these two variables in this lesson, therefore, must be retained for the rest of the course.

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Section 1: Unemployment

Unemployment and Employment Definitions

Before giving the exact formula for the unemployment rate and letting you calculate it, let's define a few useful terms:

Civilian non-institutional population (working age populations): Persons 16 years of age and older residing in the 50 states and the District of Columbia, who are not inmates of institutions (e.g., penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces. (244,995,000 in March 2013.)

Civilian labor force: All persons in the civilian non-institutional population classified as either employed or unemployed. (155,028,000 in March 2013.)

Employed persons: These persons are in the labor force. A person who is employed is defined someone who has, during the reference week (the week including the twelfth day of the month), (a) did any work as paid employees, worked in their own business or profession or on their own farm, or worked 15 hours or more as unpaid workers in an enterprise operated by a member of their family, or (b) were not working but who had jobs from which they were temporarily absent. Each employed person is counted only once, even if he or she holds more than one job. (143,286,000 in March 2013.)

Underemployed persons for economic reasons: These are persons who are in the labor force and who are considered employed. However, they are persons who desire a full-time job, but have settled for a part-time job.

Unemployed persons: These persons are in the labor force. Someone who is unemployed is defined as had no employment during the reference week, were available for work, except for temporary illness, and had made specific efforts to find employment some time during the 4 week-period ending with the reference week. Persons waiting to be recalled to jobs from which they were laid off are still counted as unemployed; one needn't be looking for work to be classified as unemployed. (11,742,000 in March 2013.)

Notice that by these definitions, the Labor Force includes both the employed and the unemployed. To be considered unemployed you must be looking for work or about to return to a job. Otherwise, you are **NOT IN THE LABOR FORCE**. In March 2013, 89,967,000 persons in the United States were not in the labor force. Of those, according to the Current Population Survey, 6,722,000 wanted a job but had quit looking because they became discouraged by not being able to find one. These are sometimes referred to as **discouraged "workers,"** but are not counted as being part of the labor force, because they do not have a job and are no longer looking.

The Bureau of Labor Statistics compiles monthly employment and unemployment data. This data can be found at www.bls.gov.

The Unemployment Rate

The unemployment rate is equal to the number of people unemployed divided by the number of people in the civilian labor force times 100. We multiply times 100 so that the rate can be expressed as a percent:

$$\text{Unemployment Rate} = \frac{\text{Unemployed}}{\text{Civilian Labor Force}} \times 100$$

With the above data for March 2013, let me demonstrate calculating the unemployment rate:

$$\text{Unemployment Rate} = \frac{11,742,000}{155,028,000} \times 100 = 7.6\%$$

The unemployment rate in March 2013 in the United States was approximately 7.6%.

Labor Force Participation Rate

The labor force participation rate (LFPR) measures how many people that are of working age and eligible to work (civilian non-institutionalized population) are participating in the labor force. The LFPR is equal to the number of people in the labor force divided by the number of people in the civilian non-institutionalized population times 100. We multiply times 100 so that the rate can be expressed as a percent:

$$\text{Labor Force Participation Rate} = \frac{\text{Civilian Labor Force}}{\text{Civilian non}-\text{instutionalized population}} \times 100$$

With the above data for March 2013, let me demonstrate calculating the labor force participation rate:

$$\text{Labor Force Participation Rate} = \frac{155,028,000}{244,995,000} \times 100 = 63.3\%$$

The labor force participation rate in March 2013 in the United States was approximately 63.3%.

Employment-Population Ratio

The employment-population ratio measures how many people that are of working age and eligible to work (civilian non-institutionalized population) are employed. The employment-population ratio is equal to the number of people who are employed divided by the number of people in the civilian non-institutionalized population times 100. We multiply times 100 so that the rate can be expressed as a percent:

$$\text{Employment-Population Ratio} = \frac{\text{Employed}}{\text{Civilian non}-\text{instutionalized population}} \times 100$$

With the above data for March 2013, let me demonstrate calculating the labor force participation rate:

$$\text{Employment-Population Ratio} = \frac{143,286,000}{244,995,000} \times 100 = 58.5\%$$

The labor force participation rate in March 2013 in the United States was approximately 58.5%.

Alternate Measures of Unemployment (U-1 - U-6)

There are alternate measures of unemployment that economists use to understand the overall health of the labor market in the United States. These are called U-1 through U-6. According to the Bureau of Labor Statistics (BLS), the official unemployment rate defined earlier in the lesson is the U-3 measure. Below is a listing of alternate measures

of unemployment along with their definitions. All of these definitions come from www.bls.gov.

Definitions

U-1: "Persons unemployed 15 weeks or longer, as a percent of the civilian labor force."
U-2: "Job losers and person who completed temporary jobs, as a percent of the civilian labor force."
U-3: "Total unemployed, as a percent of the civilian labor force (official unemployment rate)."
U-4: "Total unemployed plus discouraged workers, as a percent of the civilian labor force plus discouraged workers."
U-5: "Total unemployed, plus discouraged workers, plus all other persons marginally attached to the labor force, as a percent of the civilian labor force plus all persons marginally attached to the labor force."
U-6: "Total unemployed, plus all persons marginally attached to the labor force, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all persons marginally attached to the labor force."

(Note: Persons marginally attached to the labor force are those who currently are neither working nor looking for work but indicate that they want and are available for a job and have looked for work sometime in the past 12 months. Discouraged workers, a subset of the marginally attached, have given a job-market related reason for not currently looking for work. Persons employed part time for economic reasons are those who want and are available for full-time work but have had to settle for a part-time schedule.)

Data (March 2013)

U-1:   4.1%
U-2:   4.1%
U-3:   7.6%
U-4:   8.1%
U-5:   8.9%
U-6:   13.8%

At times politicians will cite the U-6 measure of unemployment to highlight how labor is underutilized. These different measures help us as economists get a broader picture of the health of the labor market.

Types of Unemployment

Not everyone who is unemployed is unemployed for the same reasons. Generally economists classify unemployment into three different types: frictional, structural, and cyclical.

Frictional Unemployment

Frictional unemployment is a temporary, usually very short term, type of unemployment. It is sometimes referred to as the worker simply being "between jobs." Even in a very healthy economy, there will always be some unemployment of this type. A worker may get frustrated with a boss and quit his job, only to find a new one two weeks later. For that short duration, he is unemployed. A student may graduate from college in the spring and wait to begin looking for a job until after graduation. During his job search he is unemployed, but in a healthy economy he may find a job within a month. He is unemployed during that month, but that is fairly short. Because frictional unemployment is usually resolved quickly, it is not seen as a serious problem and generally does not elicit a government reaction.

Seasonal unemployment (unemployment during periods between agricultural seasons, tourist seasons, school breaks, etc.) is a form of frictional unemployment. At any given time, frictional unemployment makes up between 2 and 2.5 percent of the unemployment rate. Generally, because people begin looking for a new job at their own discretion, or decide to quit their current job on their own timetable, there is little that policy makers can do to improve frictional unemployment.

Structural Unemployment

Structural unemployment is unemployment due to a mismatch between the structure of the economy and the skills of the workers. Another way to look at it is unemployment caused by the institutional re-structuring of an economy—

that is, there are some jobs in the economy that are open, but there are not enough people in the labor force with the necessary skills required by such jobs. Let's say you had an economy with 1,000 workers who were unemployed and in which there were 1,000 jobs available. If the skills of the workers did not meet the needs of the employers, then those unemployed workers would remain unemployed even in the face of 1,000 available jobs. This is a much more serious form of unemployment than frictional unemployment, because its solution is not likely to be found without retraining or reeducating the unemployed workers. Structural unemployment, therefore, is likely to persist for much longer periods of time, and in extreme situations may not be resolved for an individual until he reaches the age of retirement.

At any given time, structural unemployment is thought to make up about 2-2.5 percent of the unemployment rate. Policy makers can help those that are structurally unemployed by providing public funding or loan programs for re-training, higher levels of education, or job-skill programs. Such programs tend to be longer-term efforts (i.e., one to three years for the training to be effective).

In the late 1970s and early 1980s the United States experienced a change in the structure of our economy as multi-ple steel mills shut down across the North-central and Northeast United States. The loss of jobs on the part of the steel workers during this time period was not a temporary phenomenon. Their jobs had permanently disappeared as the automobile industry, one of the largest consumers of steel, changed the way they produced cars. Large heavy cars were replaced by smaller, lighter-weight cars for fuel efficiency considerations. The United States faced a situation where a large number of men, some of whom were well into the second half of their working lives, lost their jobs in the only industry for which they had marketable skills. The fact that at this same time there were many jobs available in Silicon Valley California was not a comfort to these unemployed workers. Their skills did not match the needs of the high-tech employers in California and the geographical mismatch only added to the problem. Only an aggressive retraining program would have made these unemployed steel workers employable in another sector.

Cyclical Unemployment

The third type of unemployment that we experience in our economy is called **cyclical unemployment**. All economies experience what is called a business cycle. Business cycles will be explained in more detail further on in this lesson. Cyclical unemployment results from fluctuations in aggregate economic activity. When the economy goes through a business cycle, cyclical unemployment goes up during a recession and goes down during an expansion. For exam-ple, in October 2009 the U.S. unemployment rate was 10.1 percent. If about half of this was attributed to frictional and structural unemployment, it meant that cyclical unemployment that month was about 5.1 percent, and resulted from businesses cutting back on production and laying employees off.

Natural Rate of Unemployment

The Employment Act of 1946 assigns to the U.S. government the responsibility of creating full employment. Full employment exists when cyclical unemployment is near zero, and we are only left with frictional and structural. This full employment level is often referred to, as the **target rate of unemployment or the natural rate of unemploy-ment** and it is the lowest sustainable rate of unemployment that can be achieved with existing population demograph-ics and institutional structures, and without creating accelerating inflation. Most economists in the U.S. place this level currently between 4 and 5 percent. The measure of **Potential GDP** is the real output that is possible when the economy achieves the target rate of unemployment.

Okun's Law

Unemployment is related to economic output—the more people that are unemployed, the less output gets produced, or alternatively, when more people are employed they have more income to spend and more spending will spur greater production. **Okun's Law** states that for every 1 percent increase in the cyclical unemployment rate, the GDP will be approximately 2 percent lower than the potential GDP. For example, Okun's Law suggests that a 1 percent increase in the unemployment rate reduces real GDP by 2 percent. Since a one percent change in the unemploy-ment rate means about 1.5 million people either lose or get jobs, then you can see how output can change so much.

Because most laws in economics are based on economic theory and Okun's Law is based on Arthur Okun's empirical observations during the 1950s and 1960s, it might be suggested that Okun's Law is not a law at all, but more of a "rule of thumb."

While we normally report the unemployment rate for the economy as a whole, it is important to note that unemployment effects different demographic groups at different rates. So while US the unemployment rate in March 2013 was 7.6% overall, consider the differences in unemployment rates for the demographic groups listed below:

Demographic Differences in Unemployment Rates (March 2013)

Unemployment Rates: Educational Attainment

Workers with less than a High School diploma	11.1%
Workers with a High School diploma	7.6%
Workers with Some College Education	6.4%
Workers with a Bachelor's Degree	3.8%

Unemployment Rates: Adults v. Teenagers

Adults aged 20 and over	6.9%
Teenagers aged 16–19	24.2%

Unemployment Rates: Race

Asians	5.0%*
Blacks	13.3%
Hispanics	9.2%
Whites	6.7%

Unemployment Rates: Gender

Men	7.6%
Women	7.6%

* The "Asian" unemployment rate is not seasonally adjusted.

You can see that unemployment is not distributed uniformly across all segments of our population. We will come back to unemployment when we discuss business cycles in the last section of the lesson.

Section 2: Inflation

Inflation

Another important measure of economic well-being is the rate and direction at which prices are changing. If prices are going up faster than incomes, then the living standard in an economy is going down. Measurement and control of prices is a large part of macroeconomic policy making, and most often, policymakers will track changes in prices through the use of a **price index**.

Price indexes are calculated in order to measure the direction and speed at which prices are changing. If prices continue to go up, **inflation** is said to occur, and is defined as the continuing increase in the average level of prices of goods and services over time. Inflation is detrimental to the overall economy because people are uncertain about the value of their money. Inflation makes it difficult for business to plan and budget because of this uncertainty. Businesses are forced to shift resources from productive work and output into focusing on how to maintain real profit margins and loss of value in currency. Continuing levels of inflation reduce the purchasing power of people's

incomes, and makes saving and investing much more worrisome. Banks raise interest rates, which tends to discourage overall lending and borrowing. Currently, U.S. policymakers become concerned when inflation rises faster than 2 to 4 percent per year.

Inflation Rate

As stated earlier, besides the unemployment rate, another measure of the health of the economy is the inflation rate. While inflation is the rise in the average price level in the economy, the **inflation rate** is the rate of change in the price level. The inflation rate can be measured by the following formula:

$$\text{Inflation Rate} = \frac{P_1 - P_0}{P_0} \ X \ 100$$

Where P_1 is the price index value for the **current year** and P_0 is the price index value of the **previous year**. We will discuss different price indices shortly.

Disinflation, Deflation, and Hyperinflation

It is useful to distinguish inflation from related terms of disinflation, deflation and hyperinflation. **Disinflation** occurs when there is a declining inflation rate. Note that prices are still increasing, but at a decreasing rate. If disinflation continues until the inflation rate is zero, and prices then continue to drop, the economy will enter a period of **deflation**, which is defined as the continuing decrease in the average level of prices of goods and services (negative inflation rate) over time. You still use the above formula to calculate the change in prices, but for inflation you would get a negative inflation rate. There was a small amount of deflation in 2009 when the inflation rate was -0.4%. The last time there was deflation prior to 2009 was 1955. Inflation can vary in its severity from low (low single digits) levels of inflation to hyperinflation (5 to 6 digit and more.). **Hyperinflation** occurs when very high levels of inflation are experienced in a relatively short period of time. Some economists have stated that hyperinflation occurs when inflation rates are at or above 40 percent per year though lower values of inflation rate could still be classified as hyperinflation. However, an exact definition of hyperinflation is not as important as its effect. In recent years hyperinflation has existed in various countries where the rate of inflation rose by 26 percent per year, or faster in some cases, at 50 percent per month. In 2008, the annual inflation rate in Zimbabwe was over 100,000 percent per year.

Consumer Price Index (CPI)

One common measure of inflation in the United States is called the consumer price index (CPI). The **CPI** is a measure of changes in the average price of a fixed basket of consumer goods, representing the average consumer's expenditures. The Bureau of Labor Statistics (BLS) calculates the CPI on a monthly basis. The Consumer Price Index has been on a fairly steady upward trend for the last 10 years, with significant spikes in mid-2006, mid-2008, and throughout 2011. Also note this particular index measures overall prices for the average city-dwellers in the United States. The BLS also calculates a number of different price indexes for various final goods and services, including housing, food, transportation, medical care, recreation, and education. It also provides regional CPI's, and some CPI's for large cities. If you hear the inflation rate reported in the media, you are generally hearing the latest estimate of the CPI. The CPI is calculated as follows:

$$\textbf{CPI} = \frac{\text{Price of } a \text{ market basket of goods in } a \text{ given year}}{\text{Price of the same goods in the base year}} \ X \ 100$$

The fixed basket of goods that they use to calculate the CPI is composed of 300 consumer goods and services purchased by a typical urban consumer. The prices of these goods are collected each month by the Bureau of Labor Statistics (BLS) by economic analysts from all over the country. Over 80,000 individual items are priced each month. Weights are applied to prices depending on the population of the area from which the price is collected. Therefore, the price of a tube of toothpaste in Los Angeles is given more weight than the price of the same tube of toothpaste in Idaho Falls. For additional information on how the CPI is calculated and what is contained in the "market basket of goods" used by the BLS to measure the CPI, see http://www.bls.gov/cpi/cpifaq.htm.

Calculating Inflation Rates Using CPI

On average, when the prices of goods goes up the CPI will indicate that inflation has occurred in the economy and on average when prices have fallen the CPI will indicate deflation. In looking at the formula for the CPI, you will note that it is an index that will be equal to 100 if the prices of goods and services have remained the same from one time period to the next. If the index is 100, it is the base period. If you calculate a CPI of 103 in the current period, then you could say that there has been 3% inflation since the base period. If the CPI is equal to 99 in the current period then you could say there has been 1% deflation since the base period. What if the CPI were 100 in 2002, 112.5 in 2006, and 121.5 in 2010? Let's see if we can calculate inflation rates between these various years. Between 2002 and 2006 is easy because 2002 is the base year and has a CPI of 100. Since the CPI was 112.5 in 2006 we would simply say that there was 12.5% inflation between 2002 and 2006. But how much inflation occurred between 2006 and 2010? To be able to express the inflation rate as a percent, we must use the formula for an inflation rate given above:

$$\frac{121.5 - 112.5}{112.5} \; X \; 100 = 8\%$$

Notice that the CPI changed by 9 index points (121.5–112.5 = 9), but only by 8 percentage points. Inflation is always measured by percentage changes in prices, not simply by changes in the index points.

Adjusting for Inflation Using CPI

One of the uses of the CPI and other price indices is to adjust for inflation. We talked in a previous lesson about adjusting nominal GDP to real GDP to remove the change in prices over time. Below are some ways to adjust for inflation.

Adjusting to Current Year Prices

If you want to convert a dollar amount from 1998 to 2012 dollars, then we use the formula below:

$$\text{Value in 2012 dollars} \; = \; \text{Value in 1998 dollars} \; X \; \frac{CPI \, 2012}{CPI \, 1998}$$

Example: If a hamburger cost $0.70 in 1998, and you want to know how much it would cost in 2012 dollars then you need to get the CPI from 2012 and 1998. In this case, the annual average CPI for 2012 was 229.594, and the annual average CPI for 1998 was 163.0. The problem is set up below:

$$\text{Value in 2012 dollars} \; = \; \$0.70 \; X \; \frac{229.594}{163.0}$$

When we do the math, the price of the hamburger of $0.70 in 1998 would have a value of $0.99 in 2012.

Adjusting to Base Year Prices

Another adjustment that we can make, is to adjust to base year prices. The base year for the CPI is an average of 1982-1984. If you want to convert a dollar amount to the base year, then we use the formula below:

$$\text{Value in Base Year dollars} \; = \; \frac{\text{Value in 1998 dollars}}{CPI \, 1998} \; X \; 100$$

Example: If a hamburger cost $0.70 in 1998, and you want to know how much it would cost in the base years (1982-1984) dollars then we only need the CPI from 1998. The annual average CPI for 1998 was 163.0. The problem is set up below:

$$\text{Value in Base Year dollars} = \frac{\$0.70}{163.0} \, X \, 100$$

When we do the math, the price of the hamburger of $0.70 in 1998 would have a value of $0.43 in the base years.

Producer Price Index (PPI)

Another measure of inflation in the United States is called the producer price index (PPI). The **PPI** is a measure of changes in the average price of a basket of goods common to industrial production. The Bureau of Labor Statistics (BLS) also calculates the PPI, and it is calculated on a monthly basis and measures the prices received by producers for their goods as well as the prices of their raw materials and intermediate goods. As a result there are PPI's for many different inputs in the U.S. economy.

GDP Deflator

The broadest measure of inflation in the United States is called the GDP Deflator or GDP price index. The **GDP Deflator** is a measure of the changes in the average price of ALL goods and services. It is calculated by dividing nominal GDP by real GDP and does not use a fixed basket of goods and services, but rather adjusts to people's consumption and investment decisions. It is used mostly for empirical research. The GDP Deflator is also known as the Implicit Price Deflator for Gross Domestic Product, and is calculated quarterly by the Bureau of Economic Analysis.

Causes of Inflation: Cost-Push Inflation and Demand-Pull Inflation

There are various general causes of inflation. As a result, there are also different methods to combat it. For example, suppose the OPEC oil cartel decides that it should begin increasing the price of oil sold to Americans. Because oil is so pervasive in the American economy, the increasing cost of the raw material will put upward pressure on final product prices. Inflation that is caused by increases in raw materials, labor, equipment or other factors of production is known as **cost-push inflation**—that is, the costs of production go up, and those higher costs push up final product prices.

A second type of inflation is known as **demand-pull inflation**. It occurs when increases in the price level result from excessive aggregate demand, usually caused by excessive total spending and/or the issuance of too much money by the central bank. For example, if the Federal Reserve creates a lot of money in the economy, interest rates will generally fall. That will make it easier for more people to buy homes, who, in turn will start to bid up the price of homes creating higher levels of inflation.

Some Impacts of Inflation on the Economy

Inflation impacts the economy. There are two main effects of inflation in the economy: **1)** impact on purchasing power and **2)** redistribution of income and wealth.

1) Purchasing Power

First, an issue that is important to every worker in the United States is the impact of inflation on their income and ultimately their purchasing power. Let's say that you earn $100,000 a year in income and that you do not receive a pay raise from one year to the next. If there has been 4% inflation during that time period, then you have actually received a 4% pay cut! Why? Because, if your pay remains the same and prices go up by 4%, then your income will buy 4% less next year than it bought the year before. Your nominal income has stayed the same but your REAL income has fallen. We can generally say that, in terms of pay increases, your increase in real income is equal to the increase in your nominal income minus the inflation rate.

2) Redistribution of Income and Wealth

A second impact that inflation can have on the economy is to redistribute income and wealth, either from creditors to

debtors if the inflation is not correctly anticipated, or from one sector of the economy to another if the inflation is not balanced. Let's look at each of these cases individually.

Creditors and Debtors

If you were a banker and wanted to make a one-year loan to someone, from which you would earn 4% interest, what interest rate would you charge if you thought the inflation rate was going to be 2% next year? You would charge the borrower an interest rate of 6% (the nominal interest rate) so that you would earn 4% real interest. This is because the borrower would be paying you back with money that is worth 2% less than the money he or she borrowed (that's the impact of 2% inflation!). What if you do not anticipate inflation correctly? In this example, what is the impact on the creditor (the banker) if he thinks the inflation rate is going to be 2% and it actually turns out to be 5%? If he makes the loan at a 6% nominal interest rate and there is 5% inflation, then the real rate of interest that he will earn is only 1%, far below the 4% he wanted to earn.

Important Note: In the previous paragraph, you have learned an important concept in economics—the difference between a nominal variable and a real variable. A real variable always takes into account the impact of inflation on the nominal variable. The word nominal comes from a Latin word meaning "named." So the **nominal interest rate** is the "named" interest rate, or the interest rate that is quoted by the bank. The **real interest rate**, on the other hand, is the actual interest rate that ends up being paid after the impact of inflation is taken into account. The   relationship is as follows:

Real Interest = Nominal Interest – Inflation Rate.

Thus, if inflation is unanticipated or anticipated incorrectly, wealth is transferred from the creditor to the debtor. In general, because inflation is difficult to anticipate, debtors like inflation and creditors do not.

Balance and Unbalanced Inflation

Next let's look at the issue of whether inflation is "balanced." If we say that inflation last year was 4%, you might imagine that the price of everything went up 4%. That would be balanced inflation. But the reality would be that the prices of some things went up 4%, the prices of other things went down, and the prices of some items might have gone up by far more than 4%. We only know that price went up on average by 4%. So let's say that the prices of food in grocery stores go up by 2% and the prices of meals at restaurants go up by 8%. Consumers might be led to buy relatively more food at the grocery store and eat at restaurants less often. This unbalanced inflation would redistribute wealth from restaurant owners to grocery store owners. If inflation is balanced, no such redistribution would take place.

Unanticipated and Anticipated Inflation

Lastly, inflation is detrimental to the overall economy because people are uncertain about the value of their money. We have discussed previously how unanticipated impacts creditors and debtors. In this paragraph we will focus on unanticipated inflation on businesses.

Inflation makes it difficult for business to plan and budget because of this uncertainty. When inflation rises faster than anticipated this called **unanticipated inflation**. This can harm businesses because they are forced to shift resources from productive work and output into focusing on how to maintain real profit margins and loss of value in currency. On the other hand, **anticipated inflation** is not as harmful to the economy. In planning for each year, businesses anticipate a certain level of inflation and work those numbers into their budgets and forecasts. If inflation grows according to projections then there are only minor costs incurred to firms. These costs include **menu costs**, which are costs associated with changing prices. Policy makers work to keep inflation around 2-3 percent. This allows firms to properly plan and work price changes into their budgets and forecasts.

Section 3: Business Cycles

Business Cycles

The business cycle is represented by the fluctuations in the growth rate of real GDP. **The National Bureau of Economic Research (NBER)** has an official **Business Cycle Dating Committee** that pinpoints the beginning and end of the different phases of the business cycle. This committee is made up of economists that analyze data and make decisions which months contractions and expansions begin and end.

 As indicated in the figure below, when real GDP is growing the economy is in economic expansion, and when real GDP is declining, the economy tends toward a slowdown or recession. Parts or phases of the business cycle are defined as:

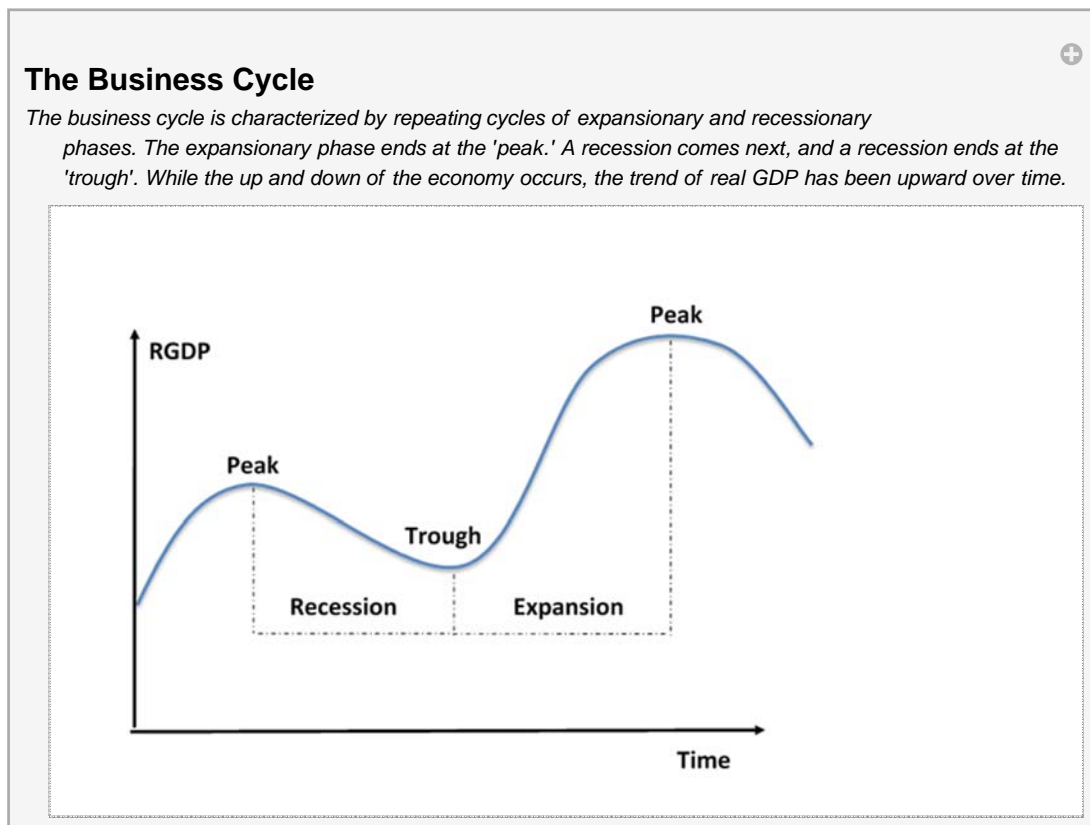**Peak**: the highest point before a recession;
Contractions (Recessions): "The NBER does not define a recession in terms of two consecutive quarters of decline in real GDP. Rather, a recession is a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales;"
Trough: the lowest point at the end of a recession and before an expansion;
Expansion: period between the end of a recession and the next peak;
Recovery: the beginning of the economic expansion;
Depression: very long and deep recession. (not officially defined by NBER)

The Business Cycle

The business cycle is characterized by repeating cycles of expansionary and recessionary phases. The expansionary phase ends at the 'peak.' A recession comes next, and a recession ends at the 'trough'. While the up and down of the economy occurs, the trend of real GDP has been upward over time.

GDP and Unemployment in the Business Cycle

Remember from the previous lesson on the Gross Domestic Product that we use the real GDP to measure growth in the economy. When an economy is experiencing a gain over a few months in the real GDP the economy is said to be

in an expansion. This period of expansion may eventually peak and be followed by a few months of broad decline in the real GDP and overall economy which is called a recession. During a recession, the falling output is generally accompanied by layoffs for employees. The resulting unemployment is called cyclical unemployment, because it is associated with the business cycle described above. Recessions vary in their length, but eventually the economy tends to hit bottom, called a trough, and then a recovery begins which is part of the expansion phase.

It is important to note that the long run trend in the economy may be upward even though there are short run recessions and booms. When the economy hits a trough and begins to go into another expansion phase, initially the upward movement can be thought of as a recovery until the economy gets back to the same level of output as the former peak. Once that level is achieved, any additional expansion may be thought of as economic growth until a new, higher peak is reached. To the extent that a expansion consists of both a recovery and additional growth, the trend of the economy is upward. During the boom cycles, unemployed workers are called back to work and the cyclical unemployment is eliminated as the economy heads towards its next peak.

When the economy is at its peak there will be no cyclical unemployment, though frictional and structural unemployment may still exist. The rate of unemployment in an economy when there is NO cyclical unemployment (in other words when the economy is very healthy and producing at its full capacity) is called the natural rate of unemployment, or sometimes the full-employment level of unemployment.

Because Cyclical unemployment occurs as a result of the business cycle, the government will often try to intervene by instituting policies to reduce the severity or duration of a recession, or to sustain an expansion. Cyclical unemployment can be severe in the case of prolonged recessions, but does not necessarily have to be accompanied by thoughts of retraining, additional education, or changing careers. At the end of most recessions, cyclically unemployed workers go back to their same or very similar jobs. The potential GDP of the economy is the amount we can produce when we are at full employment or at the natural rate of unemployment. It can be thought of as the output of the economy when we are at a peak. The difference between the potential GDP and the actual GDP is called the **GDP gap**. This gap represents the lost output that results from operating at less than full employment, and is sometimes used to measure a recession's impact on the economy. The relationship between cyclical unemployment and the GDP Gap is demonstrated by Okun's Law which was discussed in the unemployment section earlier.

## The Relationship between Inflation and Unemployment

Over some short periods of time, we may observe an inverse relationship between unemployment and inflation. That is to say that during periods of high unemployment (recessions or periods of low economic growth), inflation may be relatively low; during periods of high inflation (expansions or recovery), unemployment may be relatively low. This inverse relationship can be illustrated by what has come to be known as the **Phillips Curve**, shown below.

Named for New Zealand economist William Phillips, the Phillips Curve is no longer widely used because it is too simplistic. In fact, looking at US data, no single Phillips Curve can be distinguished over the time period from 1960 to 2010. Over shorter time periods, some groupings of data have a general downward slope, but at very different levels, suggesting that the Phillips Curve shifts at times and that the relationship suggested by Phillips does not hold over time.

The Philips Curve

The Philips curve shows the tradeoff between inflation rate and unemployment.
If a government wants to reduce unemployment, the Philips curve shows that the inflation rate will
increase. If a government wants to lower the inflation rate, then it will result in higher unemployment.

Inflation Rate

Short run
Philips Curve
Unemployment
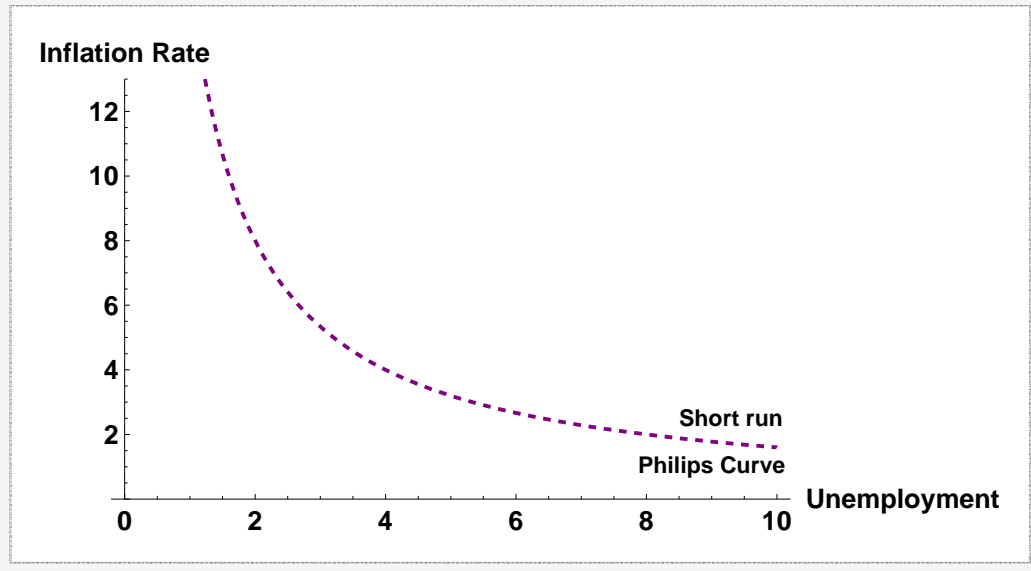
Impact of Business Cycles

In summary, during recessions we see unemployment increase, inflation rates get smaller (disinflation), and real GDP decrease. During expansions we see unemployment decrease, inflation rates get larger, and real GDP increase. Other impacts of recessions include declining incomes, decrease demand for durable goods, and a slow down in production.

Calculators

Unemployment and Employment Calculator

Unemployment and Employment Calculator

⊕

Put civilian non−institutionalized population, number of unemployed, and number of employed in the calculator.

Statistics	
Civ. non−instit. Population	0.
Employed	0.
Unemployed	0.

Calculate   Reset

"Results"

Price Level and Inflation Calculator

CPI Calculator

⊕

Put in the expenditures from current year and base year to calculate the CPI for the year.

Statistics	
Expenditures Base Year	0.
Expenditures Current Year	0.

Calculate   Reset

"Results"

Inflation Calculator

⊕

Put in the CPI from current year and previous year to calculate the inflation rate.

Statistics	
CPI Previous Year	*0.*
CPI Current Year	*0.*

Calculate   Reset

"Results"

Summary

Key Terms

Anticipated Inflation
Balanced Inflation
Business Cycles
Civilian Labor Force
Civilian Non-Institutional Population
Consumer Price Index
Contractions
Cost-Push Inflation
CPI
Cyclical Unemployment
Deflation
Demand-Pull Inflation
Depression
Discouraged Workers
Disinflation
Employed
Employment-Population Ratio
Expansion
Frictional Unemployment
GDP Deflator
GDP Gap
GDP Price Index
Hyperinflation
Inflation
Inflation Rate
Labor Force
Labor Force Participation Rate
National Bureau of Economic Research

Natural Rate of Unemployment
NBER
NBER Business Cycle Dating Committee
Nominal Interest Rate
Not in the Labor Force
Okun'*s* **Law**
Peak
Phillips Curve
Potential GDP
PPI
Price Index
Producer Price Index
Real Interest Rate
Recessions
Recovery
Seasonal Unemployment
Structural Unemployment
Target Rate of Unemployment
Trough
U-1
U-2
U-3
U-4
U-5
U-6
Unanticipated Inflation
Unbalanced Inflation
Underemployed
Unemployed
Unemployment Rate
Working-Age Population