# R11 Understanding Business Cycles



Version 1.0

# 1. Introduction

The focus of our previous reading was GDP, the goods and services produced in an economy, and the factors that affect it in the long run. In this reading, we look at the factors causing short-term movements in the economy, such as money, inflation, population, technology, and capital.

This reading is organized into the following sections:

- What is a business cycle; what are the different phases in a business cycle?
- Credit cycles and their relationship to business cycles
- Introduction to business cycle theory, and the different economic schools of thought.
- Unemployment and inflation, and how they affect economic policy.
- Economic indicators that are useful in predicting the future of an economy.

# 2. Overview of the Business Cycle

The curriculum defines business cycle as: "Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in **business enterprises**: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of events is **recurrent but not periodic**; in duration, business cycles vary from more than one year to 10 or 12 years."

Some important points to be noted from the definition:

- Business cycles occur in economies where there are a large number of private companies, and not just agriculture economies.
- The economic activity shows a cyclical behavior between expansion and recession.
- They are pervasive, i.e., the cycle includes many economic activities and not just one sector. And the phases of expansion or contraction occur at the same time throughout the economy. For example, banking and real estate both may be in an expansion stage.
- They are recurrent but not periodic, i.e., the cycles repeat. To say they are not periodic means that the intensity and the duration differs. For instance, if an economic boom lasted for five years from 2002-07, it does not mean that the expansion phase will last for five years in the next cycle. Each cycle lasts about 1 to 12 years.

## 2.1. Phases of the Business Cycle

### Types of Cycles

'Classical cycle' refers to fluctuations in the level of economic activity when measured by GDP in volume terms. It is rarely used in practice, because it does not easily allow us to distinguish between short-term fluctuations and long-term trends.

'Growth cycle' refers to fluctuations in economic activity around the long-term potential trend growth level. The focus is on how much actual economic activity is below or above trend growth in economic activity. The advantage of this method is that it divides economic activity into a part reflecting long-term trends and a part reflecting short-term fluctuations.

'Growth rate cycle' refers to fluctuations in the growth rate of economic activity. A growth rate above potential growth rate reflects upswings, while a growth rate below potential growth rate reflects downswings. The advantage of this definition is that there is no need to estimate a long-run growth path first. Also, peaks and troughs can be recognized earlier than when using the other two definitions.

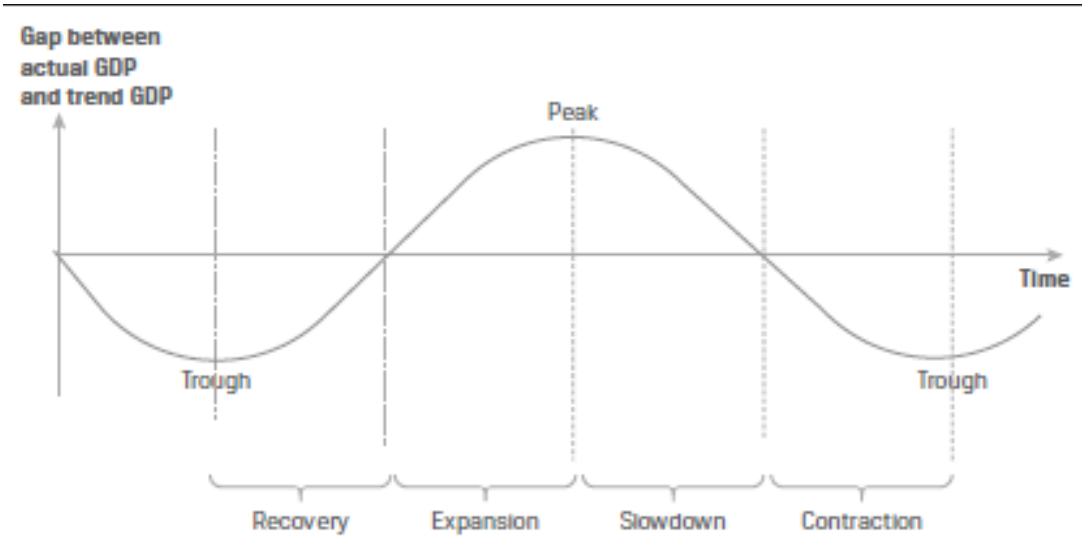
**Four Phases of the Cycle**

There are four phases of a business cycle:

1. Recovery: The economy is going through the trough of the cycle. Economic activity (which includes consumer and business spending) is below potential but is starting to increase.
2. Expansion: The recovery gathers momentum and economic activity rises above potential. The economy enters the so-called 'boom' phase.
3. Slowdown: The economy is going through the peak of the cycle. Economic activity is above potential but is starting to decrease.
4. Contraction: Economic activity falls below potential. The economy may experience a recession.

The four stages are illustrated below (this exhibit is reproduced from the curriculum):

**Schematic of Business Cycle Phases**




This connection between aggregate demand and phases of a business cycle is not explicitly given in the curriculum. But, let us tie the concepts we covered in the previous reading to this one:

- Aggregate demand plots price level (y-axis) vs real GDP (x-axis).
- When the business cycle is at its peak after expansion, the intersection of AD and SRAS curves occurs to the right of the LRAS curve. The GDP is greater than potential GDP, and it results in expansionary gap.
- When the business cycle is at its trough after contraction, the intersection of AD and SRAS curves occurs to the left of the LRAS curve. The GDP is below the potential GDP, and the gap is known as recessionary gap.

Some of the important characteristics of each phase in a business cycle are presented in Exhibit 5 from the curriculum.

**Characteristics:**

| Phase | Recovery | Expansion | Slowdown | Contraction |
|---|---|---|---|---|
| **Description** | Economy going through a trough. Negative output gap starts to narrow. | Economy enjoying an upswing. Positive output gap opens. | Economy going through a peak. Positive output gap starts to narrow. | Economy weakens and may go into a recession. Negative output gap opens. |
| **Activity levels – consumers and businesses** | Activity levels are below potential but start to increase. | Activity measures show above-average growth rates. | Activity measures are above average but decelerating. Moving to below-average rates of growth. | Activity measures are below potential. Growth is lower than normal. |
| **Employment** | Layoffs slow. Businesses rely on overtime before moving to hiring. Unemployment remains higher than average. | Businesses move from using overtime and temporary employees to hiring. Unemployment rate stabilizes and starts falling. | Businesses continue hiring but at a slower pace. Unemployment rate continues to fall but at decreasing rates. | Businesses first cut hours, eliminate overtime, and freeze hiring, followed by outright layoffs. Unemployment rate starts to rise. |
| **Inflation** | Inflation remains moderate. | Inflation picks up modestly | Inflation further accelerates. | Inflation decelerates but with a lag. |

### 2.2 Leads and Lags in Business and Consumer Decision Making

The behavior of businesses and households often leads or lags the turning points of the business cycle. For example, at the start of an expansion phase, businesses rely on overtime and wait to hire new employees until they are certain that the economy is truly growing.

### 2.3 Market Conditions and Investor Behavior

**Recovery phase**: When markets expect the end of a recession and the start of an expansion phase, risky assets are repriced upwards. Investors start incorporating higher profit expectations into the prices of stocks and bonds. Equity markets typically hit a trough about 3-6 months before the economy hits the trough.

**Expansion phase**: The boom phase tests the limits of the economy. For example, companies may expand so much that they have difficulty finding qualified labor and will compete with other companies by raising wages. Companies may also borrow a lot to fund capacity expansions. The government may have to step in to prevent the economy from overheating.

**Slowdown phase**: During the boom, the riskiest assets will usually have significant price increases. Whereas, safe assets such as government bonds may have lower prices and thus higher yields.

**Contraction phase**: During contraction, investors prefer safer assets such as government securities and defensive companies with stable positive cash flows.

## 3. Credit Cycles and Their Relationship to Business Cycles

Credit cycles describe the changing availability—and pricing—of credit. When the economy is strong the willingness of lenders to extend credit on favorable terms is high. Whereas, when the economy is weak lenders make credit less available and more expensive. This can result in decline of asset values and cause further economic weakness and higher defaults.

### 3.1 Applications of Credit Cycles

Credit cycles should be studied due to the importance of credit in the financing of construction and the purchase of property. The duration of recessions and recoveries are often shaped by linkages between business and credit cycles. Recessions accompanied by rapid fall in credit tend to be longer and deeper. Such situations can also lead to housing and equity price busts. Recoveries accompanied by rapid growth in credit tend to be stronger. They can also lead to a revival in house and equity prices.

Credit cycles are not always synchronized with the business cycle. They tend to be longer, deeper, and sharper than the business cycle.

### 3.2 Consequences for Policy

Investors pay attention to the stage in the credit cycle because:

- it helps them understand developments in the housing and construction markets
- it helps them assess the extent of business cycle phases

- it helps them better anticipate policy makers' actions

## 4. Business Cycle Fluctuations from A Firm's Perspective

### 4.1 The Workforce and Company Costs

Exhibit 7 from the curriculum depicts the pattern of hiring and employment through different phases of the business cycle.

| Phase | Recovery | Expansion | Slowdown | Contraction |
|---|---|---|---|---|
| Description of activity levels | Economy starts at trough and output below potential. Activity picks up, and gap starts to close. | Economy enjoying an upswing, with activity measures showing above-average growth rates. | Economy at peak. Activity above average but decelerating. The economy may experience shortages of factors of production as demand may exceed supply. | Economy goes into a contraction, (recession, if severe). Activity measures are below potential. Growth is lower than normal. |
| Employment | Layoffs slow. Businesses rely on overtime before moving to hiring. Unemployment remains higher than average. | Businesses move from using overtime and temporary employees to hiring. Unemployment rate stabilizes and starts falling. | Businesses continue hiring but at a slower pace. Unemployment rate continues to fall but at slowly decreasing rates. | Businesses first cut hours, eliminate overtime, and freeze hiring, followed by outright layoffs. Unemployment rate starts to rise. |
| | Levels of employment lag the cycle | | | |

### 4.2 Fluctuations in Capital Spending

Exhibit 8 from the curriculum depicts the fluctuations in capital spending through different phases of the business cycle.

| Phase | Recovery | Expansion | Slowdown | Contraction |
|---|---|---|---|---|
| Business conditions and expectations | Excess capacity during trough, low utilization, little need for capacity expansion.<br>Interest rates tend to be low—supporting investment. | Companies enjoy favorable conditions.<br>Capacity utilization increases from low levels. Over time, productive capacity may begin to limit ability to respond to demand.<br>Growth in earnings and cash flow gives businesses the financial ability to increase investment spending. | Business conditions at peak, with healthy cash flow.<br>Interest rates tend to be higher—aimed at reducing overheating and encouraging investment slowdown. | Companies experience fall in demand, profits, and cash flows. |

| | | | | |
|---|---|---|---|---|
| Capital spending | Low but increasing as companies start to enjoy better conditions. Capex focus on efficiency rather than capacity.<br>Upturn most pronounced in orders for light producer equipment.<br>Typically, the orders initially reinstated are for equipment with a high rate of obsolescence, such as software, systems, and technological hardware. | Customer orders and capacity utilization increase. Companies start to focus on capacity expansion.<br>The composition of the economy's capacity may not be optimal for the current structure of demand, necessitating spending on new types of equipment.<br>Orders precede actual shipments, so orders for capital equipment are a widely watched indicator of the future direction of capital spending. | New orders intended to increase capacity may be an early indicator of the late stage of the expansion phase.<br>Companies continue to place new orders as they operate at or near capacity. | New orders halted, and some existing orders canceled (no need to expand).<br>Initial cutbacks may be sharp and exaggerate the economy's downturn. As the general cyclical bust matures, cutbacks in spending on heavy equipment further intensify the contraction.<br>Maintenance scaled back. |
| **Examples** | Software, systems, and hardware (high rates of obsolescence) orders placed or re-instated first. | Heavy and complex equipment, warehouses, and factories.<br>A company may need warehouse space in locations different from where existing facilities are. | Fiber-optic overinvestment in late 1990s that peaked with the "technology, media, telecoms bubble." | Technology and light equipment with short lead times get cut first.<br>Cuts in construction and heavy equipment follow. |

## 4.3 Fluctuations in Inventory Levels

Increase and decrease in inventory happens very rapidly, and has a major effect on economic growth despite the small size. $\frac{\text{Inventory}}{\text{Sales}}$ (I/S) ratio is an important indicator. Final sales numbers better reveal the reality of the economic situation than inventory numbers because the inventory may accumulate or companies may want to dispose obsolete inventory before starting production; it depends on the stage of the business cycle. Inventories tend to rise when the I/S ratio is low. During recovery, inventory will be less than sales and companies start production to increase inventory.

Exhibit 9 from the curriculum shows how production, sales, and inventories typically move through different phases of the business cycle.

| **Phase** | **Recovery** | **Expansion** | **Slowdown** | **Contraction** |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Sales and production | Sales decline slows. Sales subsequently recover. Production upturn follows but lags behind sales growth.<br>Over time, production approaches normal levels as excess inventories from the downturn are cleared. | Sales increase. Production rises fast to keep up with sales growth and to replenish inventories of finished products. This increases the demand for intermediate products. "Inventory rebuilding or restocking stage." | Sales slow faster than production; inventories increase.<br>Economic slowdown leads to production cutbacks and order cancellations. | Businesses produce at rates below the sales volumes necessary to dispose of unwanted inventories. |
| Inventory–sales ratio | Begins to fall as sales recovery outpaces production. | Ratio stable. | Ratio increases. Signals weakening economy. | Ratio begins to fall back to normal. |

## 5. Consumer Behavior

Households represent the largest single sector of most economies. Therefore, patterns of household consumption determine the overall economic direction more than any other sector.

### 5.1 Consumer Confidence

Consumer confidence reflects expectations of future incomes and employment prospects. Consumer confidence is usually gauged through surveys.

### 5.2 Measures of Consumption

Consumer spending into three parts:

1. Durable goods – Most cyclical part
2. Non-durable goods – Least cyclical part
3. Services – Can include both more and less cyclical components

Exhibit 10 from the curriculum shows how consumer spending typically changes through different phases of the business cycle.

| **Phase** | **Recovery** | **Expansion** | **Slowdown** | **Contraction** |
|---|---|---|---|---|
| Incomes, employment, and confidence | Unemployment remains above average. Layoffs slow. Businesses rely on overtime before moving to hiring. Consumer confidence starts improving. | Hiring restarts. Unemployment rate stabilizes and starts falling. Consumers experience rising incomes, healthy employment prospects, and greater confidence. | Businesses continue hiring but at a slower pace. Unemployment rate continues to fall. Incomes are still growing. Consumers remain confident. | Businesses first cut hours of overtime prior to freezing hiring and starting layoffs. Employment levels decline, and consumer confidence weakens. |

| | | | | |
|---|---|---|---|---|
| Spending on consumer durables (autos, motorcycles, appliances, furniture) | Spending limited as households postpone spending. | Spending increases. | Spending above average. | Purchases postponed; spending decreasing. |
| Consumer non-durables (i.e., medicines, food, household products) | Spending shows little change through the cycle. | | | |
| Services (entertainment, outdoor eating, communications, personal services) | Spending below average. | Spending increases. | Spending above average. | Spending declines. |

Durable goods usually consist of big ticket items with a long life span. Their life span can be extended with repairs without incurring high replacement costs. When the economy is weak consumers tend to delay replacement. So, a decrease in durables spending may signal economic weakness. Whereas, an increase in durable spending may signal economic recovery.

### 5.3 Income Growth

Growth in income provides an indication of consumption prospects. It is a better indicator than surveys. Particularly relevant is after-tax income known as disposable income.

Overall income can be divided into temporary and permanent income. Temporary income is gains from sources such as stocks that are not sustainable. Permanent income is reliable income. Some analysts focus on permanent income than overall income to determine spending behavior. Increases in permanent income is a good indicator of basic consumption spending.

### 5.4 Saving Rates

Consumer spending often diverges from trends in income. So, analysts use savings rate to judge the willingness of consumers to spend from current income in the short run. Savings rate varies with country and reflects income uncertainties as perceived by households. Greater savings rate indicates that consumers anticipate more uncertainty.

## 6. Housing Sector Behavior

The housing sector is a smaller part of the overall economy compared to consumer spending, but it can move up and down quickly; hence can count more in overall economic movements than the sector's relatively small size might suggest.

### 6.1 Available Statistics

Generally, statistics on housing such as the inventory of unsold homes and the average or median price of homes are easily available in developed countries.

### 6.2 Sensitivity to Interest Rates and Relationship to Credit Cycle

The sector is particularly sensitive to interest rates. Lower mortgage rates can lead to expansion in housing activity.

The housing sector might follow its own internal cycle. When housing prices are low relative to average incomes and the mortgage rates are low, the demand for housing increases and vice versa.

People may also buy real estate for speculative purposes if prices have risen rapidly in the past. This can result in overbuilding. The large inventory of unsold homes eventually puts downward pressure on real estate prices, leading to a more severe correction.

### 6.3 The Role of Demographics

The sector is sensitive to demographics such as: are many new people moving into a region (influx of people into the IT sector in the San Francisco area over the past decade), how quickly new families are formed, or if older people are vacating existing homes, etc. This buying is based on a need.

### 6.4 Impact on the Economic Cycle

The points discussed above offer a gauge to measure how quickly the housing market can correct and return to normal growth.

Due to increasing urbanization in fast growing developing economies, the demand for housing units is high. This demand can quickly reverse any cyclical weakness in such economies.

## 7. External Trade Sector Behavior

This sector varies in size and importance from one country to another. It is significant for countries like Japan, where most of domestic produce is exported, but is a small amount for U.S.

### 7.1 Cyclical Fluctuations of Imports and Exports

Imports rise with domestic GDP growth. They are a reflection of the domestic cycle.

Exports rise with growth in the rest of the world. They do not reflect domestic cycle and rise even if domestic economy is slowing down. Exports increase if foreign demands for domestic output increase.

Exhibit 11 from the curriculum provides a summary for external trade.

| **Phase of the Cycle** (domestic economy) | **Recovery** | **Expansion** | **Slowdown** | **Contraction** |
|---|---|---|---|---|
| Exports | Driven by external demand | | | |
| Imports (*assuming exchange rate remains unchanged) | Imports below average, start to increase. | Imports increase. | Imports peak and start to decline. | Imports in decline to below-average levels. |

### 7.2 The Role of the Exchange Rate

Currency exchange rate has a major impact on imports/exports:

- Stronger domestic currency → increase in imports, decline in exports.
- Weaker domestic currency → decrease in imports, increase in exports.

### 7.3 Overall Effect on Exports and Imports

Domestic GDP growth and global GDP growth have an immediate and straightforward impact on imports and exports respectively. In contrast, exchange rates have a more complex and gradual effect.

## 8. Theoretical Considerations

### 8.1 Historical Context

Until the 1930s, economists believed that business cycles were a natural feature of the economy, and recessions were temporary. The Great Depression changed that view and gave rise to new schools of economic thought.

In the subsequent sections we discuss theories that try to explain causes of a business cycle, and what must/must not be done to restore equilibrium.

### 8.2 Neoclassical Economics

Neoclassical and Real Business Cycle (RBC) theories focus on fluctuations of aggregate supply (AS). The basic premise of the neo-classical school is: markets will reach equilibrium because of the invisible hand or free markets. No government intervention is needed for equilibrium.

- AS can shift to the left because of an input price increase or shift to the right because of a price decrease or technical progress. In both cases, the economy will gradually converge to its new equilibrium on its own.
- Government intervention is not required because it can amplify the fluctuation or delay the convergence to equilibrium.
- Neoclassical economists also argue that polices should not prevent "creative destruction" from taking place. Creative destruction refers to new innovations that introduce new products or a new, more efficient way to produce an existing good or service. Companies that adopt the innovation will survive, while companies that do not adopt the innovation may perish.

### 8.3 The Austrian School

The Austrian school believes that business cycles are the outcome of excessive credit growth due to an artificially low interest rate.

- During boom, low interest rates lead to excessive borrowing from banking system for funding projects with low returns. Low interest rates lead to widespread malinvestment.

- Subsequently, when interest rates increase, investments that were profitable at low rates now become unprofitable. As a result, the economy moves back into recession.

Since the business cycles are the result of government / central bank's expansionary monetary policies, the Austrian school believes that the government's interference should be minimal because markets are self-stabilizing.

### 8.4 Monetarism

What do the Monetarists say?

- Monetary and fiscal policy should be clear and consistent so that all economic agents can forecast government action.
- Minimal intervention from the government. They reject active management of aggregate demand (AD).
- In contrast to neoclassical economists, monetarists emphasize a steady money supply, i.e., money supply must grow at a steady rate.
- Business cycles occur because of exogenous shocks and government intervention.
- Let AD and AS find own equilibrium rather than risking further economic fluctuation.

The Monetarist school objected to Keynesian intervention (discussed in the next section) for three reasons:

- The Keynesian model does not recognize the importance of the money supply. If the supply is too fast, the boom will be unsustainable. If the supply is low, it will lead to recession.
- The Keynesian model fails to consider long-term costs of government intervention. Reducing taxes or increasing government spending can have a detrimental effect in the long run, which the Keynesian model does not consider.
- The timing of the government's economic policy response is uncertain and it can cause more harm than good.

### 8.5 Keynesianism

Key points related to the Keynesian school of thought are as follows:

- There is no quick adjustment mechanism for markets as advocated by neoclassicals.
- The focus is on AD fluctuations.
- If AD shifts left, the theory believes that it would be hard to restore equilibrium in the event of a crisis by wage and price reduction alone. Wages are downward sticky, but even if lower wages are accepted, consumption, and hence AD will be lower because workers would cut their spending.
- Simply lowering interest rates would not ignite growth because business confidence (or animal instincts) is low.
- The government's intervention is needed during a severe crisis. The government should use monetary and fiscal policy to keep capital and labor employed even if this means a large fiscal deficit.

- The fiscal policy tools are government spending and taxes. The government can either reduce taxes or increase spending to increase AD.
- Monetary policy tools are money supply and interest rates. The government can either increase money supply or lower interest rates to increase AD.
- Agreed with neoclassical and Austrian schools about the economy self-correcting in the long run, but states that by that point we will all be dead.

Why is the Keynesian policy criticized?

- Fiscal deficit leads to more government debt.
- It focuses on the short term. In the long run, the impact of low interest rates could be inflationary.
- Takes time to implement fiscal policy. By then the economy is already recovering.

### 8.6 Modern Approach to Business Cycles

Today's mainstream economists use an analytical framework that incorporates all three broad theories – Neoclassical, Keynesian, and monetarism.

**Summary of Business Cycle Schools:**

| **Economic Schools of Thought** | | |
|---|---|---|
| **School of Thought** | **Comment** | **Recommended Policy** |
| Neo-classical | Invisible hand. | Do nothing. |
| Austrian | Fluctuations caused by misguided government intervention. | Do nothing. |
| Keynesian | Focus on the AD curve.<br>Economy does not automatically correct in the short-run. | Use fiscal/monetary policy because in the "long run, we are all dead". |
| Monetarist | Monetary policy. | Steady, predictable growth of money supply. |

## 9. Economic Indicators

Economic indicators are variables that are used to assess the state of the overall economy and for providing insights into future economic activity.

### 9.1 Types of Indicators

Economic indicators can be classified based on whether they lag, lead, or coincide with changes in an economy's growth.

- **Leading indicators** have turning points that tend to precede those of the business cycle. They help in forecasting the economy in the near term.
  - Ex: Weekly hours in manufacturing, S&P 500 return, private building permits.
- **Coincident indicators** have turning points that tend to coincide with those of the business cycle and are used to indicate the current phase of the business cycle.

- Ex: Manufacturing activity, personal income, number of non-agricultural employees.

- **Lagging indicators** have turning points that tend to occur after those of the business cycle.
  - Ex: Bank prime lending rate, inventory-to-sales ratio, average duration of unemployment.

### 9.2 Composite Indicators

Composite indicators consist of a composite of different variables that all tend to move together. Different countries will have different composite indices. These indicators are based on empirical observations of an economy.

### 9.3 Leading Indicators

In the U.S., the composite leading indicator is called the Index of Leading Economic Indicators (LEI) that consists of 10 component parts. Exhibit 15 presents the 10 components used in the LEI.

1. Average weekly hours, manufacturing: Firms cut on overtime before a downturn and increase the overtime before hiring full-time workers during a recovery.
2. Average weekly initial claims for unemployment insurance.
3. Manufacturers' new orders for consumer goods and materials.
4. ISM new order index: The Institute of Supply Management (ISM)polls its members to build indexes of manufacturing orders, output, employment, pricing, and comparable gauges for services.
5. Manufacturers' new orders for non-defense capital goods excluding aircraft
6. Building permits for new private housing units.
7. S&P 500 stock index.
8. Leading credit index: Aggregates the information from six leading financial indicators, which reflect the strength of the financial system to endure stress.
9. Interest rate spread between 10-year Treasury yields and overnight borrowing rates: Spread is the difference between long-term yields and short-term yields. If the curve is upward sloping (a wider spread), then we expect short-term rates in the future to be high and more economic growth.
10. Average consumer expectations for business conditions

### 9.4 Using Economic Indicators

Leading indicators are particularly useful as they can help predict where the economy is likely to be in the near future. Coincident and lagging indicators can help confirm what the leading indicators are telling us.

### 9.5 Other Composite Leading Indicators

Apart from the LEI used in the US, there are several other composite leading indicators that

are used across different countries.

### 9.6 Surveys

Composite indicators often make use of economic surveys. These surveys are usually conducted by central banks, research institutes, statistical offices, and trade associations on a monthly or quarterly basis. The surveys are conducted among either businesses, consumers, or experts. For example, among the 10 components of the LEI, the following three components are survey based:

- ISM new order index
- Manufacturers' new orders for non-defense capital goods excluding aircraft
- Average consumer expectations for business conditions

### 9.7 The Use of Big Data in Economic Indicators

In recent years, due to the vast increase in the amount of information and the number of variables that go into composite indicators, statistical techniques such as 'principal component analysis' are frequently used while constructing indexes using economic indicators.

### 9.8 Nowcasting

Policy makers and market practitioners have started monitoring economic and financial variables such as internet searches and electronic payment data in real-time. This allows them to continuously assess current conditions and produce a nowcast.

Nowcasting produces an estimate of the current state of the economy. The advantage of this method is that it helps overcome delays associated with the release of actual measures. For example, measures such as GDP are only published with delay, after the end of the time period under consideration.

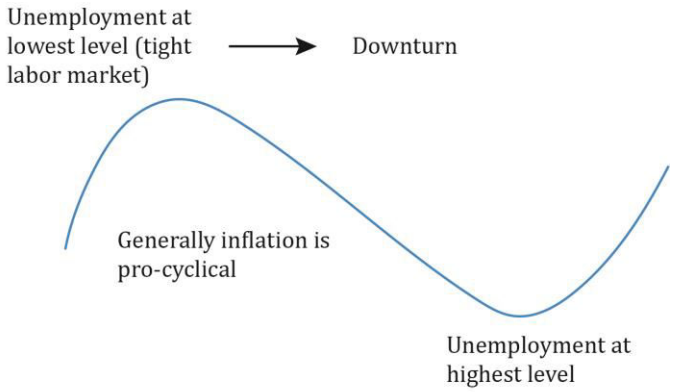
### 9.9 GDPNow

GDPNow is a nowcast published by the Federal Reserve Bank of Atlanta. According to the Atlanta Fed, "GDPNow" is "best viewed as a running estimate of real GDP growth based on available data for the current measured quarter."

## 10. Unemployment

Most governments try to limit unemployment and contain inflation because these conditions can lead to social and political unrest. The graph below shows the relationship between these variables and the business cycle:




Interpretation of the graph:

- Unemployment is at its lowest at the peak of the business cycle. This is also indicative of a tight labor market. This situation may also trigger a downturn in the economy, because the bargaining power of labor increases. Workers demand high wages as inflation is at its peak now and they expect prices of goods to further go up. Labor costs account for a significant part of a firm's costs. When wages are up, the SRAS shifts to the left, causing a decrease in real GDP.
- If central banks act to tame inflation, it may result in recession.
- Unemployment is at its highest level at the trough of the economic cycle. Unemployment numbers lag the cycle as we will see shortly, but they are closely related to the cycle.
- Inflation numbers move along with the business cycle. So, it is said to be pro-cyclical.

## 10.1 Unemployment

The table below lists some important terms related to unemployment:

| **Terms related to unemployment** | |
|---|---|
| Employed | Number of people with a job. Excludes informal workers such as illegal workers. |
| Working age | Those between 16 and 64 years of age. |
| Labor force | Includes unemployed and employed i.e. working age population who are either working or looking for work. Discouraged workers are not included here. |
| Unemployed | People who are actively seeking employment, but currently without a job. To be considered unemployed, one must have been looking for work in the past 4 weeks. |
| Long-term unemployed | People who have not been working for a long-time (3-4 months). |
| Frictionally unemployed | People who are between jobs. They are not working at the time of filling the survey. But they are not 100 percent unemployed. They have another job waiting and are yet to start. |

| | |
|---|---|
| Structurally unemployed | Unemployment that arises because the demand for certain skills has reduced while employers are looking for a different set of skills. Ex: need for typists decreased because of computers/public telephone operators decreased in developing countries because of mobile phones. It can also be due to changes in business, technology, etc. |
| Activity (participation) ratio | $\frac{\text{Labor force}}{\text{Total population of working age}}$ |
| Underemployed | A person who has a job that pays significantly less for the qualifications they possess. Ex: a person out of work with a CFA charter working in a grocery store. |
| Discouraged worker | A person who has stopped looking for a job probably because of a weak economy. They are not included in the unemployment rate. If they stop looking for work, then unemployment rate may decrease in a recession. |
| Voluntarily unemployed | Person voluntarily outside the labor force. Ex: early retirees, a 22-year old who is pursuing a Master's degree and hence not looking for work. |
| Unemployment rate | $\frac{\text{Unemployed}}{\text{Labor force}}$ |

**Unemployment rate:**

Unemployment rate = $\frac{\text{Unemployed}}{\text{Labor force}}$

- Most quoted measure of employment.
- Measured differently in different countries, which makes international comparisons difficult. Some countries may include even people of working age who are not willing to work, or underemployed.
- Unemployment rate is inaccurate in predicting the direction of an economy. It lags the economic cycle because it is the economic environment that forces people to look actively for jobs or drop out of it. The following two reasons elaborate on why it is an inaccurate indicator:
  - Businesses are reluctant to lay off people as it is more expensive to hire and train new workers.
  - In difficult economic times, discouraged workers stop looking for jobs (hence not counted as unemployed). So, the unemployed number becomes low. But, when the economy recovers, these people start looking for jobs again pushing the unemployed number up undermining recovery.

**Overall payroll employment and productivity indicators:**

- To get a sense of the employment cycle and address the issue of discouraged workers, analysts often look at payroll growth. Most companies publish their payroll data. If

payroll numbers are increasing, then unemployment is decreasing.

- Two other measures used to understand the employment situation: overtime hours and the number of temporary workers. During a recovery, the first step taken by firms is to increase overtime hours instead of hiring new workers. Then, they increase the number of temporary workers. The opposite happens at the peak of a business cycle. Instead of laying off workers immediately, firms first reduce overtime hours, and then reduce temporary workers.
- Productivity is output/(hours worked). A drop in productivity (idling workers) precedes decrease in full-time payrolls. There is a decrease in full-time payrolls once the economy moves fully into recession.
- Conversely, an increase in productivity precedes an increase in full-time payrolls.

## 11. Inflation

Key points related to inflation are as follows:

- Generally, inflation is pro-cyclical (it goes up and down with the business cycle).
- Inflation is the sustained rise in the overall level of prices in an economy. Assume that the price of a good increases from 100 to 105, and stays constant. Is this inflation? No. It must be a steady rise in the price level. In simple terms, inflation means the same amount of money can purchase a lesser amount of goods and services in the future.
- Inflation rate is the percentage change in a price index.
- Inflation rates allow us to infer the state of the economy. High inflation is the sign of an overheated economy.
- Unexpected change in inflation may trigger a change in monetary policy that can impact asset prices.
- High inflation, fast economic growth, and low unemployment indicate the economy is overheating. This may trigger some policy movements to tame inflation. Equilibrium GDP is above potential GDP.
- High inflation, high unemployment, and slow economic growth results in a situation called stagflation (stagnation + inflation

### 11.1 Deflation, Hyperinflation, and Disinflation

- Deflation**:** A sustained decrease in aggregate price level. For example, price level comes down from 100 to 99 and then 98 and so on.
- Hyperinflation**:** An extremely fast increase in aggregate price level. Over a three-year time period if the price level doubles, then it is called hyperinflation.
  - Occurs when government spending is greater than real tax revenue and there is unlimited money supply.
  - Occurs usually after a war when the supply of goods and services is limited and there is too much money supply.
- Disinflation**:** A decline in the inflation rate, or a decelerating inflation. Prices are still going up over time, but at a slower rate than earlier. For example, two years ago, the

inflation rate was 15%, last year it was 12%, and this year it is 9%.

What's the difference between deflation and disinflation?

- With deflation, the price levels are going down, whereas with disinflation price levels are going up (positive inflation) but not at the same pace as before.
- The preferred inflation is 2% for developed economies. Otherwise, there is a risk of slipping into deflation. Value of money increases in deflation. Falling prices → lower revenues for the company → real debt borrowed by companies increases → cut in spending and investment → economy declines further. So, deflation is not good as was seen during the Great Depression.

## 11.2 Measuring Inflation: The Construction of Price Indexes

- Inflation rate is measured as the percentage change of a price index.
- A price index represents the average prices of a basket of goods and services. It determines the price change in one period relative to another.
- Base year/period is the period with which prices are being compared to for the current period.
- Laspeyres index is the most common type of index; it is created by holding the consumption basket constant. For instance, the consumption basket last year could have been 5 loaves of bread and 10 liters of milk. If it changes this year to 6 loaves of bread and 12 liters of milk, then when calculating the index, we take the initial quantities of the consumption basket and not the recent ones.
- Laspeyres index is a base-weighted index because the price increases are weighted using the quantities in the base period. This index number can then be used to calculate the inflation rate.

  $I_L = \frac{\sum(P_1 * Q)}{\sum(P_0 * Q)} * 100$

  where,

  $P_1$ = price in current year

  $P_0$ = price in base year

  Q = quantity in base year
- Many countries use the Laspeyres index where the consumption basket is updated once every 5 years.
- This strategy introduces a few biases (all the biases cause the index to be overstated):
  - Substitution bias: As price of a good increases, people substitute the good with a cheaper good.
  - Assume you have a consumption basket comprising 5 units of fruits and 5 units of vegetables. If fruits become expensive, then people will change their consumption basket to 2 units of fruits and 8 units of vegetables. But the index computes prices based on a fixed consumption basket of 5 units of fruits and 5 units of vegetables. Index weighted on these quantities or an inflation rate based on this price index will be biased upward or overstated.

- Quality bias: Quality of goods and services improves over time. Let us take the example of cars. Even though cars have become expensive, the improvement in quality is more than the price, which is not reflected in the index calculation.
- New product bias: New products entering the market are not included in the consumption basket as the basket is fixed.

- Paasche index allows for the composition of the basket to change. It uses the consumption in the current period. It measures the change in the price of consumption basket weighted by using the quantities in the current period.
- Limitation of Paasche Index: It is difficult to make comparisons on a periodic basis as different weights are used every time.

$I_P = \frac{\sum(P_1 * Q_1)}{\sum(P_0 * Q_1)} * 100$

where,

$P_1$ = price in current year

$P_0$ = price in base year

$Q_1$ = quantity in current year

- Fischer index uses the geometric mean of the Laspeyres index and Passche index.

$I_F = \sqrt{\text{Laspeyres Index} * \text{Paasche Index}}$

**Example**

| Date | January 2012 | | February 2012 | |
|---|---|---|---|---|
| **Goods** | **Quantity** | **Price** | **Quantity** | **Price** |
| Sugar | 7 Kg | 90 / Kg | 9 kg | 110 / kg |
| Milk | 10 liters | 100 / liter | 12 liters | 120 / liters |

Assume the base period is January 2012. The price level for the base period is set to 100. Calculate the February price index as a:

1. Laspeyres index
2. Paasche index
3. Fischer index

**Solution:**

1. Laspeyres index in February 2012 $= \frac{(7 * 110) + (10 * 120)}{(7 * 90) + (10 * 100)} * 100 = 120.8$

   Inflation rate $= \frac{120.8}{100} - 1 = 20.8\%$.

2. Paasche Index in February 2012 $= \frac{(9 * 110) + (12 * 120)}{(9 * 90) + (12 * 100)} * 100 = 120.89$.

3. Fischer Index $= \sqrt{121 * 121} = 121$.

## 11.3 Price Indexes and Their Usage

- Most countries use their own CPI to track inflation in the domestic economy.
- Weights of different categories vary across countries because the constituents of the

consumption basket differ from one country to another (Exhibit 21 in the curriculum lists consumption basket of different CPI). For instance, the weight for food and beverage in CPI for China and India are 30% and 47.1% respectively. But it is much lesser for the developed countries.

- Scope of each index is different.
  - CPI-U: This CPI for the United States covers only the urban consumers using a household survey.
  - PCE: Personal consumption expenditure covers all personal consumption in the United States using business surveys.
  - PPI: Producer price index measures the average change in selling prices experienced by domestic producers in the country. If PPI goes up, then CPI also goes up as the inputs for firms increases. PPI is also called the wholesale price index (WPI) in some countries.
- Many economic activities are indexed to a certain price index.
  - Treasury Inflation Protected Securities (TIPS) adjust the bond's par value based on CPI-U.
- Central banks use the CPI to monitor inflation.

Some important points based on examples from the curriculum:

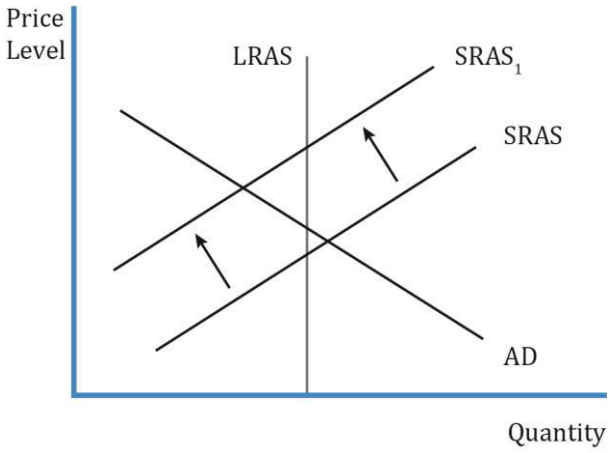
- Headline inflation is based on the price index of all goods and services in an economy. Headline inflation reflects the actual cost of living.
- Core inflation is based on the price index of all goods and services in an economy except food and energy. In the short-term, prices of food and energy fluctuate a lot, so policy makers focus on core inflation. But their long-term goal is to control headline inflation.
- Relative price is the price of a specific good or service in comparison with those of other goods and services.
- A sub-index is a price index for a specific category of goods and services. For example, a sub-index for food or energy.

### 11.4 Explaining Inflation

In this section, we look at the causes of inflation. Inflation can result from either an increase in aggregate demand or a decrease in aggregate supply.

Cost-push inflation: Inflation that results from a decrease in aggregate supply; it is caused by an increase in the real price of an important factor of production: wages or any raw material such as energy. Also known as wage-push inflation.




Interpretation of the graph:

- If there is an increase in the price of an input or wages, the SRAS curve will shift to the left.
- Real GDP decreases and the price level increases.
- This increase in cost creates a one-time rise in the price level.

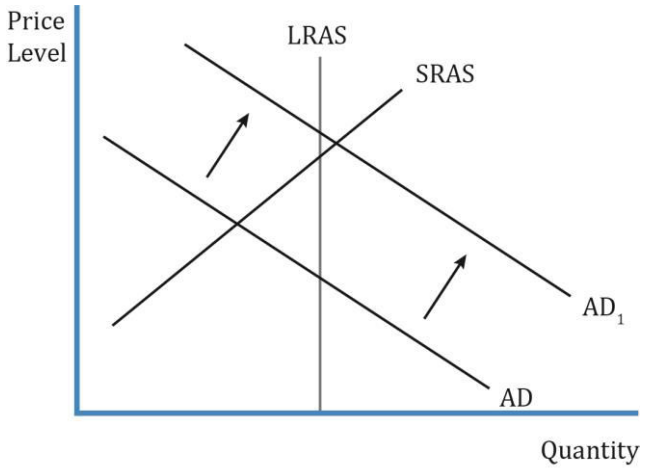
The signs that analysts look for include:

- Commodity prices because commodities are a key input to production.
- Unemployment rate: The lower the rate of unemployment, the greater the likelihood that shortages will drive up wages. The higher the rate of unemployment, the lesser the likelihood of labor shortage. But it does not represent the economy's full labor potential and participation rate is a better indicator.
- The two metrics that analysts look for include:
  - Non-accelerating inflation rate of unemployment (NAIRU): This is the level of unemployment where inflation does not rise or fall. If the unemployment rate falls below NAIRU, then there will be inflationary pressures.
  - Natural rate of unemployment (NARU): If the unemployment rate falls below NAIRU, then there will be upward pressures on wages.
  - Both these measures vary from one economy to another, and over time in a single economy.
  - These measures have limitations. One of them is that the appropriate level below which inflationary wage pressures emerge is not known. Another limitation is that these metrics do not consider bottlenecks in specific segments of the labor market. For example, if the demand for skilled analytics engineers is high but the supply is low, then the wages for these workers will increase. But it may not be represented well in the overall metrics.
  - NAIRU and NARU change over time with changes in technology and economic structure.
  - NAIRU of an economy can be high if a large number of workers in the labor force do not have the skills that employers need.

- Productivity and unit labor cost: Looking at wage increase independently is not sufficient to determine its impact on price levels. Analysts must also consider productivity as the unit labor cost is directly linked to productivity. As productivity goes up, unit labor cost comes down.
- ULC is the average cost of labor per unit of output. The greater each worker's output per hour, the lower the price businesses need to charge for each unit of output. Even if wages go up, since productivity is high, higher wages are less likely to put an upward pressure on wages.

Demand-pull inflation**:** Inflation that results from an increase in aggregate demand. Increase in aggregate demand increases the price level and temporarily increases economic output above its potential or full-employment level. It reflects the state of economic activity relative to potential.




Interpretation of the graph**:**

- Initially, assume real GDP was below the potential GDP. If actual GDP is close to potential, then it leads to shortages and bottlenecks, and prices rise.
- An increase in aggregate demand shifts the AD curve to the right.
- Real GDP increases, price level increases. Real GDP is above potential GDP. There is an inflationary gap.
- This increase in the price level is called demand-pull inflation.
- Recall what we saw in the previous reading. The wages rise in response to price rise and pushes the SRAS left. Real GDP is back on the LRAS curve equal to potential GDP, but price has increased even further.
- If the AD continues to increase, then the price increases too.
- An increase in aggregate demand may be due to any of the following:
  - Increase in money supply.
  - Increase in government spending.
  - Increase in exports.
- Monetarist perspective: Inflation is a monetary phenomenon, and they believe the money supply has a big role to play in determining inflation. If monetary authorities

increase the money supply at a rate higher than the rate of potential GDP, and the money supply is more than the amount of goods and services available, then the prices tend to rise.
- Analysts compare money growth with the growth of the nominal economy to determine if there is demand-pull inflation.

**Inflation Expectations**

- Inflation expectations can be self-sustaining i.e. they persist even after the cause that triggered the price rise has disappeared.
- Some analysts gauge inflation expectations based on past trends.

## Summary

**LO.a: Describe the business cycle and its phases.**

There are four phases of a business cycle:

1. Recovery: The economy is going through the trough of the cycle. Economic activity (which includes consumer and business spending) is below potential but is starting to increase.
2. Expansion: The recovery gathers momentum and economic activity rises above potential. The economy enters the so-called 'boom' phase.
3. Slowdown: The economy is going through the peak of the cycle. Economic activity is above potential but is starting to decrease.
4. Contraction: Economic activity falls below potential. The economy may experience a recession.

**LO.b: Describe credit cycles.**

Credit cycles describe the changing availability—and pricing—of credit. When the economy is strong the willingness of lenders to extend credit on favorable terms is high. Whereas, when the economy is weak lenders make credit less available and more expensive. This can result in decline of asset values and cause further economic weakness and higher defaults.

**LO.c: Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle.**

Recovery:

- GDP growth rate changes from negative to positive.
- High unemployment rate and a moderate or declining inflation.
- Increasing production to meet the pickup in sales with more flexible methods like overtime or increasing utilization levels.
- Housing activity starts to pick up coupled with an increase in consumer spending.

Expansion:

- GDP growth rate increases.
- Reduction in unemployment rate as hiring rises.
- Inflation may begin to rise.
- Increasing production needs are met with investments and labor force additions.
- Housing activity demands leads to a rise in construction activity.
- Import increases as the domestic GDP increases.

Slowdown:

- GDP growth rate decreases.
- Unemployment rate decreases, but firms cut back on hiring.
- Business and consumer confidence declines, slowing the growth rates in investments

and consumer spending.
- Inflation rate increases.

Contraction:
- GDP growth rate is declining.
- Unemployment rate increases as firms cut back on production.
- Inflation decreases with a lag.
- Decline in consumer and business confidence lowers the investment and consumer spending.
- Housing activity starts to decline.
- Import decreases as the domestic GDP decreases.

**LO.d: Describe theories of the business cycle.**

| **Economic Schools of Thought** | | |
|---|---|---|
| **School of Thought** | **Comment** | **Recommended Policy** |
| Neo-classical | Invisible hand. | Do nothing. |
| Austrian | Fluctuations caused by misguided government intervention. | Do nothing. |
| Keynesian | Focus on the AD curve.<br>Economy does not automatically correct in the short-run. | Use fiscal/monetary policy because in the "long run, we are all dead". |
| Monetarist | Monetary policy. | Steady, predictable growth of money supply. |

**LO.e: Interpret a set of economic indicators, and describe their uses and limitations.**

The three types of indicators are:
- Leading indicators:
  - Indicators that change direction before the peaks and troughs of business cycles.
  - Examples: Stock prices, index of consumer expectations etc.
- Coincident indicators:
  - Indicators that change direction at roughly the same time as the peaks and troughs of business cycles.
  - Examples: Industrial production, manufacturing and trade sales etc.
- Lagging indicators:
  - Indicators that do not change direction until the expansions and contractions are already in progress.
  - Examples: inventory-sales ratio, unemployment rate, labor cost per unit of output, etc.

**LO.f: Describe types of unemployment, and compare measures of unemployment.**

Types of Unemployment:

- Frictional unemployment results from the time lag necessary to match employees seeking work with employers seeking their skills.
- Structural unemployment is caused by long-run changes in the economy that require workers to gain new skills to fill new jobs.
- Cyclical unemployment results from changes in the business cycle; = 0 at full employment.

Measures of unemployment:

- To be counted as unemployed, one must be actively seeking employment and must be available for work.
- Labor force consists of those that are employed and unemployed; unemployment rate = unemployed persons/ labor force.
- Participation ratio = Labor Force / working-age population ($16 < x < 64$).
- Discouraged workers are those who are available for work, but not employed or seeking employment – not considered in the labor force, not counted as unemployed.
- Underemployment refers to a person who is employed part time but would prefer to work full time, or is employed at a low-paying job despite being qualified for a significantly higher-paying one.

**LO.g: Explain inflation, hyperinflation, disinflation, and deflation.**

Inflation is the persistent increase in general price levels over time. The inflation rate refers to the percent increase in the price level over a period (usually one year).

Disinflation refers to the decrease in the inflation rate over time (e.g. from 9% to 7% annually).

Deflation is the persistent decrease in general price levels over time (not to be confused with disinflation).

Hyperinflation refers to out of control acceleration of inflation that can destroy a country's monetary system and bring about social and political upheavals.

**LO.h: Explain the construction of indexes used to measure inflation.**

- Price index serves as a proxy of price levels and is measured as the average price of a defined basket of goods and services.
- Inflation rate is calculated as the price change in percentage for a basket of goods and services from a base year.
- Consumer price index (CPI) uses a basket that is based on the purchasing patterns of a typical household.
    - The basket typically includes food, energy and other items.
    - The basket used for calculation varies significantly from country to country.
    - Inflation rate is calculated as the price change in the basket of goods and services from a base year.

    - Headline inflation is calculated for the entire basket.
    - Core inflation excludes food and energy as they are relatively volatile.
- Wholesale price index (WPI) or Producer price index (PPI) uses a basket of raw materials, intermediate goods, and finished goods to get an earlier indication of the price increase.

**LO.i: Compare inflation measures, including their uses and limitations.**

Laspeyres index is the most common type of index; it is created by holding the consumption basket constant. This strategy has substitution, quality, and new product biases (all the biases cause the index to be overstated).

Paasche index allows for the composition of the basket to change. It uses the consumption in the current period. It measures the change in the price of consumption basket weighted by using the quantities in the current period. Limitation of Paasche Index is that it is difficult to make comparisons on a periodic basis as different weights are used every time.

Fischer index uses the geometric mean of the Laspeyres index and Passche index.

**LO.j: Contrast cost-push and demand-pull inflation.**

Cost-push inflation results from a decrease in aggregate supply caused by an increase in the real price of an important factor of production, such as labor or energy.

Demand-pull inflation results from persistent increases in aggregate demand that increase the price level and temporarily increase economic output above its potential or full-employment level.