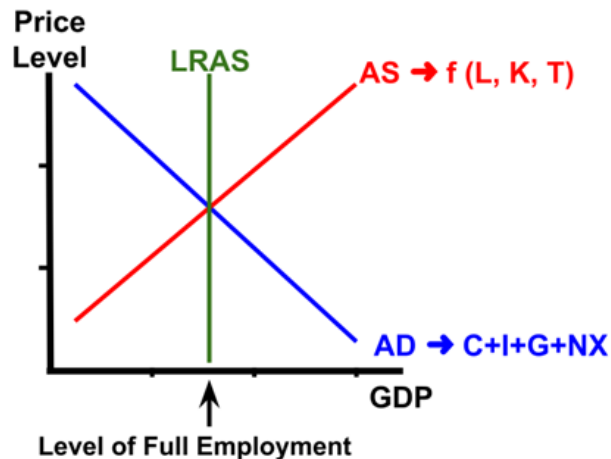


Economics: Introducing the Aggregate Supply – Aggregate Demand Model

The Aggregate Supply – Aggregate Demand Model (AS-AD) is a basic model of the macroeconomy that can be used to explain many macroeconomic events and how macroeconomic policy works. The term “aggregate” in the title means “total”. This reading will cover the workings of the AS-AD Model and the next reading will look at how policy works in the AS-AD Model.

The Aggregate Demand – Aggregate Supply Model is a simple but powerful tool that organizes the economy into two parts that describe how GDP is produced and consumed in the economy and tracks how the interaction of production and consumption affects economic growth, inflation and unemployment. This model contains all of the parts of the economy studied in macroeconomics.



The model organizes the important statistics in macroeconomics – GDP, unemployment & inflation – into the two axes of the diagram. The vertical axis tracks the price level (inflation) and the horizontal axis tracks GDP (the amount of economic output) and unemployment (which is implied by the concept of potential GDP being the level of full employment). This layout makes it easy to track how changes in the model can cause changes in GDP, unemployment and inflation.

The Aggregate Supply (AS) side of the model represents the productive side of the economy and can be described as a function of labor, capital and technology - $Q_P = f(L, K, T)$. The Aggregate Supply side of the economy is represented by two curves. The Long Run Aggregate Supply Curve (LRAS) represents how much the economy can produce at full employment or the level of potential GDP. The Aggregate Supply curve (AS) represents the productive side of the economy in the short run and shows how economic output can vary depending on changes in the price level in the short run. The reason for the two supply curves is that the equilibrium in the model can be different from the level of potential GDP in the short run, but will tend back to potential GDP in the long run.

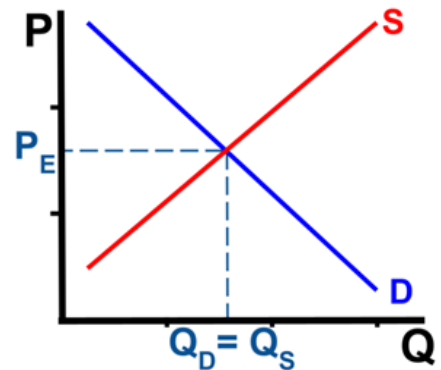
The Aggregate Demand (AD) side of the model represents how finished goods or GDP are consumed in the economy. Aggregate Demand is the summary of the collective demand in the economy organized into the four main parts of the economy: consumption, investment, government spending and net exports - $C + I + G + NX$. The Aggregate Demand curve (AD) shows how the amount of economic output in the economy can vary depending on changes in the price level.

The Aggregate Supply curve (AS) and Aggregate Demand curve are the two moveable parts of the model. Working with the model involves thinking about how a macroeconomic event affects the productive or consumption side of the economy. If this move shifts the intersection of the Aggregate Supply and Aggregate Demand curves away from Long Run Aggregate Supply then the result will affect the amount of inflation and unemployment in the economy. The model is based on the idea that the intersection of the Aggregate Supply and Aggregate Demand curves will move back to the level of Long Run Aggregate Supply. The place where Long Run Aggregate Supply, Aggregate Supply and Aggregate Demand curves intersect is called “General Equilibrium”.

Review – Microeconomic Equilibrium

Before getting into the details of macroeconomic General Equilibrium, it is first important to review the concept of equilibrium in how it pertains to markets. The reasons economists like both markets and the concept of market equilibrium are:

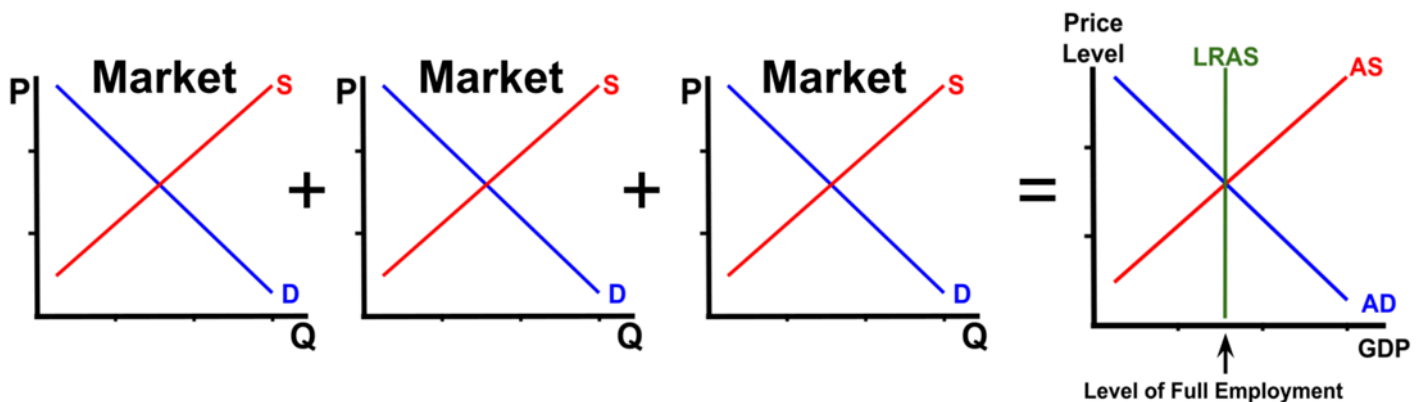
1. Markets are a self-correcting responsive system that uses prices to signal individual economic agents so they can coordinate their actions.
2. Market efficiency – No waste: the quantity produced equals the quantity consumed. Excesses or shortages will cause an adjustment in the equilibrium price.
3. Market shifts – changes in determinants of supply or of demand can affect market equilibrium price. In this way markets react quickly to changing conditions in the greater world.



In short, the reason that economists like markets is because it is a way for individuals to act for their economic betterment in a way that benefits others (larger society) and markets are responsive to changes in the wider world in a way that cannot be done better through other types of economic institutions (i.e. government action).

Aggregating “the Economy From Market Equilibrium to “General Equilibrium”

The concept of the macroeconomy can be a bit strange because there is no one place of general economic interaction that makes a single economy. The macroeconomy is really made up of many different markets that are interconnected with each other along with the economic actions by the government. For right now, ignore government economic activity and just think of the macroeconomy as being made up of lots of markets. The graph below shows the idea of the macroeconomy being the summation of the different individual markets that exist in the economy. This process is the “aggregation” described by the title of the model Aggregate Supply-Aggregate Demand. The concept of “General Equilibrium” in the macroeconomy is based on the idea that if all of the individual markets are in equilibrium then the whole economy would also be in equilibrium.



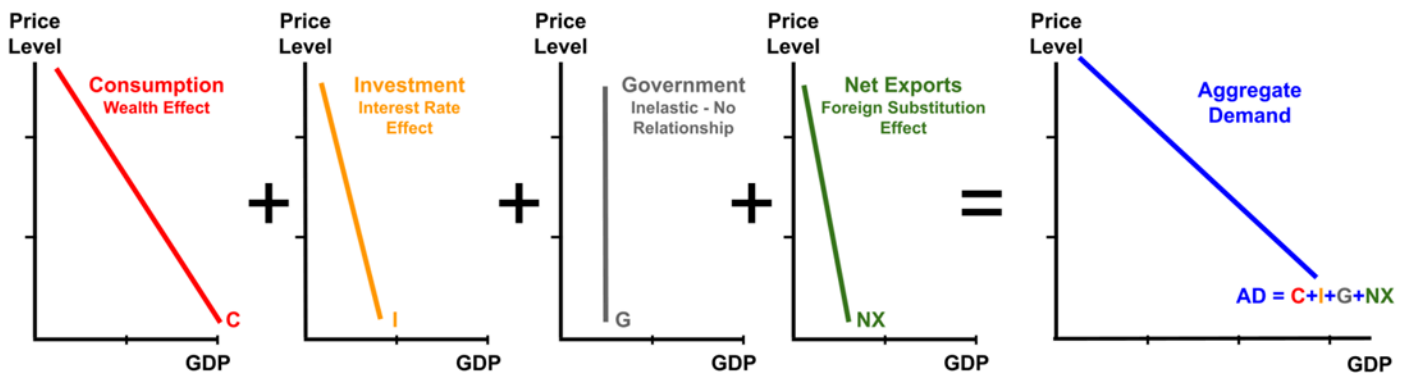
This view is that the macroeconomy is built on the economic choices of individuals and firms and sums up to affect the macroeconomy. This is what economists mean when they say that the macroeconomy is built on a “microeconomic foundation”. This conception of the economy makes it clear how a disturbance in one market could cause changes in other markets, changing the state of equilibrium in the macroeconomy.

The hard part in making a model of the macroeconomy is that it is impossible to simply sum up markets because the “price” and “quantity” measures in markets are not really compatible – there is no one “price” in the economy and idea of a single numerical “quantity” does not make sense for different types of goods. For example, how can the price and quantity of cars sold in the economy be combined with the price and quantities of frozen pizza sold in the economy?

The process of aggregating means eliminating any of the differences between the goods traded in different markets by harmonizing prices into a “price level” (which means “inflation”) and turning the total quantity of goods in the economy into the total value of goods in the economy (which means GDP).

Closer Look at Aggregate Demand

The Aggregate Demand curve shows how changes in the price level will affect the amount of finished goods used by consumption, investment, government and net exports. The reason for the negative slope of the Aggregate Demand curve is complicated by the fact that Aggregate Demand is made up of four parts and each part has its own reason for a negative relationship between price level and GDP, except for Government which is determined by the political process. This is the reason each part of the Aggregate Demand Curve has a negative slope:



- **Consumption** – The reason the amount of consumption increases as the price level goes down is the Wealth Effect. If the only change in an economy is a decline in the price level then people will be able to buy more with their current income – essentially, the decline in the price level has made people wealthier.
- **Investment** – The reason the amount of investment increases as the price level goes down is the Interest Rate Effect. A decline in the price level is usually accompanied with a decline in interest rates. This decline in interest rates encourages more investment because there are more profitable investments to be made at a lower interest rate.
- **Government** – There is no relationship between the price level and the amount of government spending. The amount of government spending and the level of taxation are a result of the political process and are not affected by the price level in the economy. This is the reason economists say that government spending and taxation are an exogenous factor in the macroeconomic model.
- **Net Exports** – The reason net exports increase as the price level goes down is the Foreign Substitution Effect. Net Exports is imports minus exports. A decline in the price level means that prices in this country are lower than in other countries, which makes goods in this country cheaper than other countries. The result is an increase in exports and a decline in imports – which means a higher level of net exports.

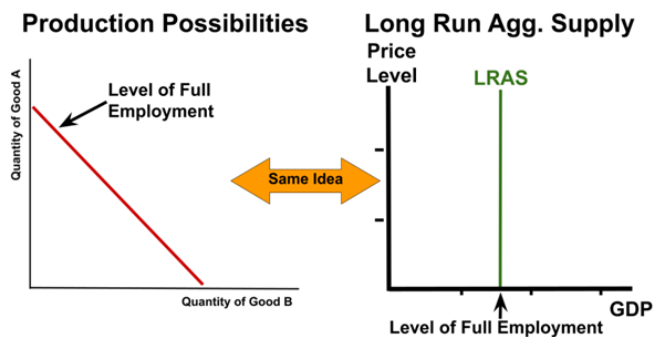
Closer Look at Aggregate Supply – Long Run and Short Run

The productive side of the economy is represented by two curves – the Long Run Aggregate Supply and Aggregate Supply (which covers the short run). The two curves represent how the productive side of the economy adjusts in the process of economic time.

The Long Run Aggregate Supply curve is an inelastic curve at the level of full employment for the economy or where the economy is at its long run potential GDP. It is inelastic because full employment is neutral toward the price level because the amount that the economy can produce when fully employing its productive potential not affected by the business cycle (it is determined by issues of economic growth) is considered the full employment supply curve. The concept of Long Run Aggregate Supply is similar to the production possibilities curve in that it represents the amount produced when the economy is fully employing all of its resources.



The Long Run Aggregate Supply curve represents a type of “center of gravity” for the macroeconomy since, in theory, the economy should return to full employment in the long run. The reason is that unemployed workers and unused capital will adjust the price it will work at (wages and rental rate) in order to be employed. This means, if there is unemployment, wages and the rental rate will go down until full employment is achieved, and likewise if there is inflation (over employment), wages and the rental rate will go up until the economy is back at full employment.



It is important to recognize the level of full employment does not mean the unemployment rate is zero. The reality of frictional unemployment means that unemployment will never reach zero. Instead, “full employment” means that cyclical unemployment is at zero.

The Aggregate Supply curve represents the productive side of the economy in the short run and is shown as a curve with a positive slope, where an increase in the price level causes an increase in the level of output produced. The short run describes the period of time when the economy is adjusting to some sort of change (the later parts of this reading will cover the types of “macroeconomic shocks” that can push the economy out of General Equilibrium). It is pretty easy to understand how Aggregate Supply can lower than full employment (typically during a recession). It is harder to understand how Aggregate Supply can be greater than full employment – after all, full employment describes a situation where the economy is at capacity. However, it is possible to run production in the economy beyond full employment for short periods of time by having workers put in longer hours and putting off maintenance on capital to keep it in service. A good example of this would be the United States economy in World War Two. The important point is that this is not sustainable in the long run because workers and capital become exhausted.

There are three ideas that explain the reason the Aggregate Supply curve is different from the Long Run Aggregate Supply and has a positive slope:

1. Misperception Theory – Companies do not see the full economy and tend to make decisions based on how they see the situation in their specific market. This means that companies cannot tell the difference between the price for the goods they sell and the inflation that is happening in the economy.

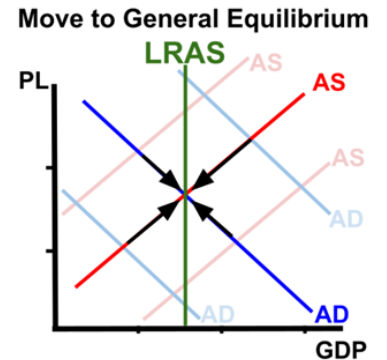
As a result, companies adjust the amount they produce in response to perceived price changes (produce more for higher prices and less for lower prices). Companies will reduce or increase employment to change the amount they produce. Only in time do they become aware of the impact of inflation – at that point they will adjust back to full employment.

2. Profit Expectations – Companies will adjust the amount they produce in anticipation of changes in profits. This idea is related to misperception theory. Higher prices signal higher profits, which encourages companies to increase production and vice versa for lower prices. In time, inflation reduces the profits and the companies return to full employment.

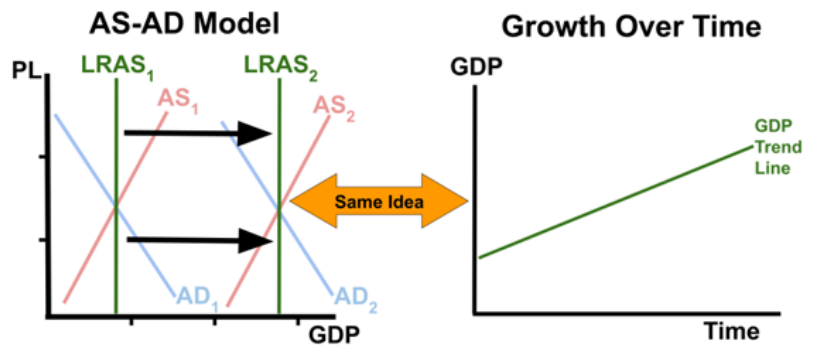
3. Intertemporal Substitution Theory – There are industries that are very cyclical (move with the business cycle) and go through periods of “boom” when there is lots of work and periods of “bust” when there is no work. A good example of this is building and construction. Companies that work in these industries are used to this cycle of employment and adjust the amount of work in order to smooth out their income in the long run. This means that during the “booms” they work larger amounts and increase output so they can save the extra income for “busts” when they will have to live off their savings. These companies and workers are substituting time for work in one period for time not working in another period.

Long Run Situation → General Equilibrium & Growth

In the long run, the macroeconomy should settle at the level of full employment and be in the condition of “General Equilibrium”. This is when the Aggregate Demand curve intersects the Aggregate Supply curve and the Long Run Aggregate Supply curve. However, it is important to recognize that General Equilibrium is not a permanent state and there are two forces constantly at work in the AS-AD Model.



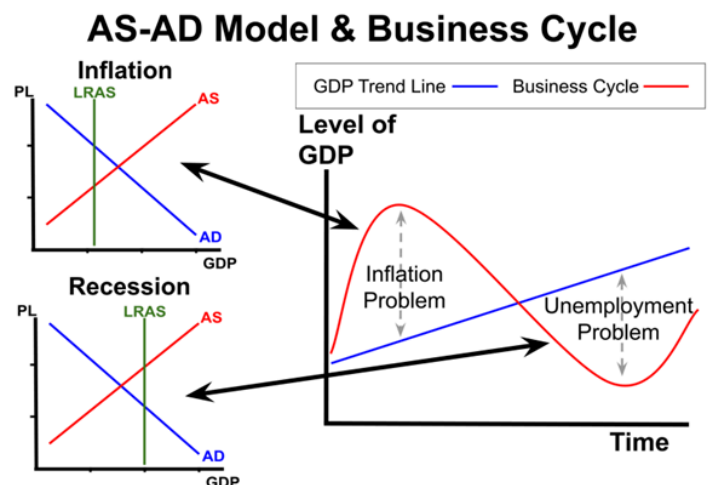
First, there are always changes in the economy that are moving the Aggregate Demand and Aggregate Supply curves out of General Equilibrium (these will be looked at shortly). It is better to think of the condition of General Equilibrium as a force that exerts its influence on the movement of the Aggregate Demand and Aggregate Supply curves – a sort of “gravitational center” for the economy.



Second, the Long Run Aggregate Supply curve is steadily moving outward because of the process of economic growth. This means that the “gravitational center” of the economy is moving both the Aggregate Demand and Aggregate Supply curves outwards.

Business Cycle Shown in AD-AS Model

Economic reality is that Real GDP fluctuates on either side of Potential GDP as it moves through the business cycle. This difference is often called an



“output gap”. The economy is in a recession and suffering unemployment when Real GDP is less than Potential GDP the economy. The economy is “booming” and is suffering inflation when Real GDP is greater than Potential GDP.

The diagram to the right shows how the AS-AD Model corresponds to different points in the business cycle. The AS-AD Model is basically a business cycle model that explains how the economy adjusts through the business cycle. In the AS-AD Model, the Long Run Aggregate Supply Curve shows the GDP Trend Line or Potential GDP. The intersection of the Aggregate Supply and Aggregate Demand curves show the current position of the economy in relation to Potential GDP – whether it is in recession or inflation.