Motivation – The classical model we studied is designed to explain the behavior of “potential” or “full-employment” real GDP. That is, it is meant to explain the long-run or trend behavior of real GDP, abstracting from the ups and downs in economic activity associated with the business cycles.

Not only are there no business cycles in this model, but the model doesn’t have anything to say about the behavior of the inflation rate in the economy.

The AS-AD model provides a model of short-run fluctuations of real GDP and unemployment around their full-employment levels and it provides a model of inflation.
What is the AS-AD Model?

The AS-AD is a supply and demand model that explains how the equilibrium price and quantity of the economy’s output are determined in the economy’s goods market.

It is made up of a supply curve (AS curve) which relates the quantity of output supplied by the business sector to the price of output, all else equal and a demand curve (AD curve) which relates the quantity of output demanded by the various sectors of the economy (household, business, gov’t, foreign) to the price of output, all else equal.
The AS Curve

We actually identify two aggregate supply curves: the long-run aggregate supply curve (LAS) and the short-run aggregate supply curve (SAS).

The long-run aggregate supply curve is the aggregate supply curve that would be relevant if the economy is operating on its long-run, i.e., full-employment path.

The short-run aggregate supply curve is the aggregate supply curve that is relevant in the short-run, when the economy may or may or may not be operating at full-employment. In the short-run the LAS curve is only useful as a reference point.

The main operational distinction between deriving the LAS and SAS curves: Do we assume that the nominal wage rate is flexible (LAS) or fixed (SAS)?
Nominal Wage Rigidity

In the traditional aggregate supply and demand model, the distinction between the short-run and the long-run pertain to stickiness in the nominal wage rate – nominal wages are fixed in the short-run and flexible in the long-run.

Why are nominal wages sticky? Implicit and explicit contracts; worker resistance to nominal wage cuts;…

Note: Although we will focus on nominal wage rigidity the basic story doesn’t change if we assume other input or output price rigidity.
Aggregate Supply

Long-Run Aggregate Supply

The macroeconomic long run is a time frame that is sufficiently long for all adjustments to be made so that real GDP equals potential GDP and there is full employment.

The long-run aggregate supply curve (LAS) is the relationship between the quantity of real GDP supplied and the price level when real GDP equals potential GDP.

Put another way, the long-run aggregate supply curve (LAS) is the relationship between the quantity of real GDP supplied and the price level implied by the classical model of full employment.
Thinking back to our discussion of the classical full-employment economy, what role did the price level play in helping us determine the economy’s output level? (Hint: recall the “classical dichotomy”)

Answer: The price level was not relevant in that discussion. That is, the full-employment level of output was determined independent of the price level. The only price that matters is the real wage rate, W/P.
Aggregate Supply

So, if the economy operates along its full-employment path, the desired output of the business sector will depend (positively) on $K$, $A$, and $\text{Pop}$. It does not depend on $P$.

Consequently, if we graph the LAS curve, with $Y$ on the horizontal axis and $P$ on the vertical axis, the LAS curve will be vertical (perfectly inelastic) at the full-employment output level. It will shift to the right if $K$ or $A$ or $\text{Pop}$ increases.
Aggregate Supply

Figure 23.1 shows an LAS curve with potential GDP of $10 trillion.

The LAS curve is vertical because potential GDP is independent of the price level.

Along the LAS curve all prices and wage rates vary by the same percentage so that relative prices and the real wage rate remain constant.
Aggregate Supply

The LAS curve will shift to the right if:

- K increases
- A increases
- Pop increases

since any of these will increase potential real GDP.
Aggregate Supply

Short-Run Aggregate Supply

The **macroeconomic short run** is a period during which real GDP has fallen below or risen above potential GDP.

At the same time, the unemployment rate has risen above or fallen below the natural unemployment rate.

The **short-run aggregate supply curve** (SAS) is the relationship between the quantity of real GDP supplied and the price level in the short-run when the money wage rate and the prices of other resources remain constant. (Keynes; sticky wages)
Aggregate Supply

To determine short-run aggregate supply, we modify the classical full-employment model by assuming that

1) $W$ is fixed

and

2) $L$ is determined by labor demand

Now, **holding $K, A, and W$ fixed**, if $P$ increases:

- the real wage rate falls
- firms move along their labor demand curve and employ more labor, $L$
- with fixed $K$ and $A$ but more $L$, firms will supply more output, $Y$

Similarly, a decrease in $P$ leads to lower $L$ and $Y$. 
Aggregate Supply

Notice that in the short-run (i.e., while K, A, and W are fixed):

• Labor employment and aggregate output will vary directly with the economy’s price level
• The unemployment rate can rise above or fall below the natural rate of unemployment, depending upon whether the real wage rate is above or below the market-clearing level.
Aggregate Supply

Figure 23.2 shows a short-run aggregate supply curve.

Along the SAS curve, a rise in the price level with no change in the money wage rate and other input prices increases the quantity of real GDP supplied—the SAS curve is upward sloping.
Aggregate Supply

Along the SAS curve, real GDP might be above potential GDP…
… or below potential GDP.
Aggregate Supply

Movement along the LAS and SAS Curves

Figure 23.3 summarizes what you’ve just learned about the LAS and SAS curves.

A change in the price level with an equal percentage change in the money wage causes a movement along the LAS curve.
Aggregate Supply

Movement along the LAS and SAS Curves

Figure 23.3 summarizes what you’ve just learned about the LAS and SAS curves.

A change in the price level with no change in the money wage causes a movement along the SAS curve.
Aggregate Supply

Changes in Aggregate Supply

When potential GDP increases because of an increase in K or A, both the LAS and SAS curves shift rightward.

When potential GDP increases because of an increase in Pop, only the LAS shifts rightward.

An increase in the nominal wage rate, holding K and A fixed, shifts the SAS curve but does not affect the LAS curve.
Aggregate Supply

Figure 23.4 shows how these factors shift the LAS curve and have the same effect on the SAS curve.
Aggregate Supply

Figure 23.5 shows the effect of a change in the money wage rate on aggregate supply.

A rise in the money wage rate decreases short-run aggregate supply and shifts the SAS curve leftward.

But it has no effect on long-run aggregate supply.