Learning Objectives

1. Explain why an exogenous change in the price level shifts the AE curve and changes the equilibrium level of real GDP.
2. Derive the AD curve and explain why it shifts.
3. Explain the meaning of the AS curve and why it shifts when technology or factor prices change.
4. Define macroeconomic equilibrium.
5. Explain the effects of aggregate demand and aggregate supply shocks on real GDP and the price level.

1 The Demand Side of the Economy

Shifts in the AE Curve

Consider an exogenous change in the price level, **P**. What happens to equilibrium GDP?

An increase in **P** reduces the real value of money held by the private sector. A fall in **P** raises the real value of money holdings.

Changes in **P** also affect the wealth of bondholders and bond issuers, but because the changes offset each other, there is no change in the aggregate wealth.

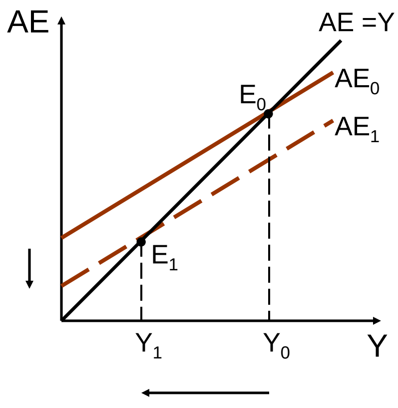
In summary, an increase in **P** reduces private-sector wealth and leads to a fall in desired consumption — this implies a downward shift in the **AE** curve.

Conversely, a fall in **P** increases private-sector wealth and leads to an increase in desired consumption — this implies an upward shift in the **AE** curve.

There is also an effect on net exports:

- A rise in **P** (with unchanged foreign prices) shifts the **NX** function downward — this causes a further downward shift in the **AE** curve. The reverse will occur after a fall in **P**.

Changes in Equilibrium GDP



An increase in **P** reduces private-sector wealth and therefore reduces desired aggregate expenditure.

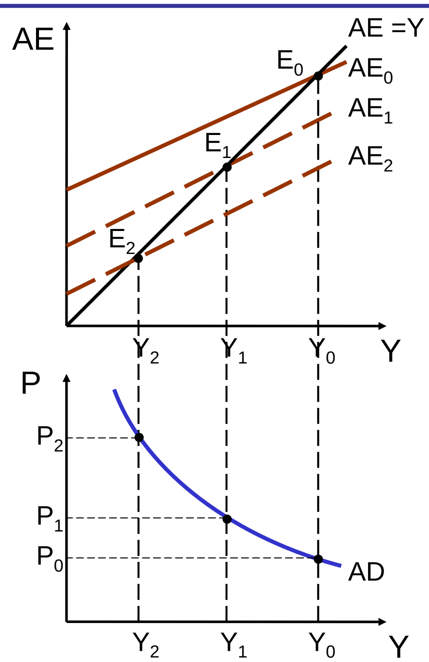
This causes the **AE** curve to shift down, reducing the equilibrium level of real GDP.

The Aggregate Demand Curve

The aggregate demand (**AD**) curve relates equilibrium real GDP to the price level.

For any given price level, the **AD** curve shows the level of real GDP for which desired aggregate expenditure equals actual GDP.

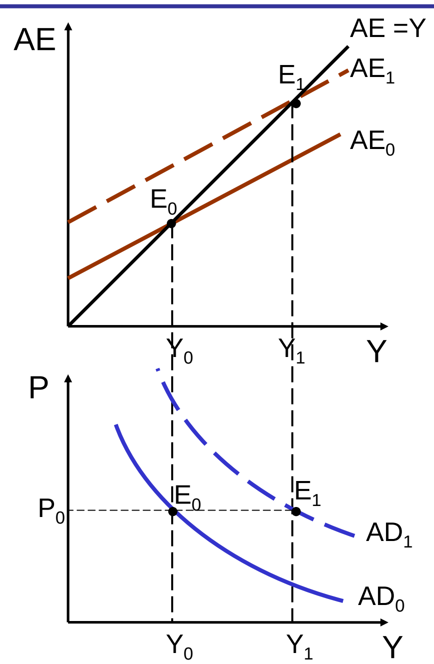
Changes in the price level that cause shifts in the **AE** curve cause movements along the **AD** curve.



Consider a rise in the price level, from P_0 to P_2:

A rise in **P** causes the **AE** curve to shift down. This is a movement upward along the **AD** curve.

(Conversely, a fall in **P** causes the **AE** curve to shift up. This is a movement downward along the **AD** curve.)



Shifts in the AD Curve

Any shock that increases equilibrium GDP at a given price level shifts the **AD** curve to the right.

Any shock that reduces equilibrium **Y** at a given price level shifts the **AD** curve to the left.

The simple multiplier measures the horizontal shift of the **AD** curve.

2 The Supply Side of the Economy

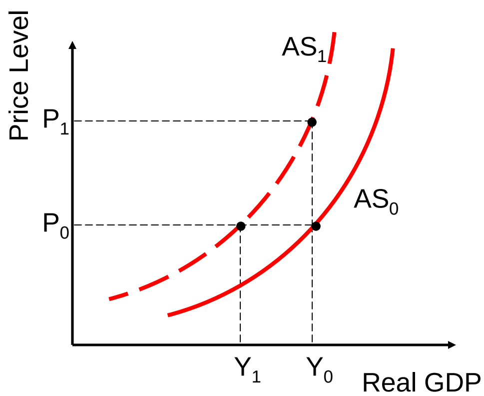
The Aggregate Supply Curve

The aggregate supply (**AS**) curve relates the price level to the quantity of output that firms would like to produce and sell.

The **AS** curve is drawn on the assumption that technology and factor prices remain constant.

Shifts in the Aggregate Supply Curve

Because unit costs rise with output, both price-taking and price-setting firms will produce more output only if prices increase. The **AS** curve is therefore upward sloping.



A change in either factor prices or productivity will change costs and shift the **AS** curve.

An increase in factor prices or a decrease in productivity shifts the **AS** curve up and to the left.

The Increasing Slope of the AS Curve

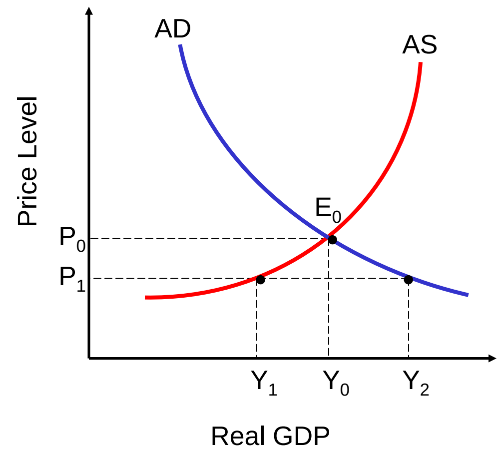
The slope of the **AS** curve is increasing because when output is low, firms typically have excess capacity. This means that output can be expanded without causing a large increase in unit costs. Therefore, only a small increase in price may be needed to induce them to expand production.

Once output gets closer to capacity, however, increases in output cause larger increases in unit costs. Therefore, larger price increases are needed to induce firms to expand output.

3 Macroeconomic Equilibrium

Demand behaviour is only consistent with supply behaviour at the interSec of the **AS** and **AD** curves.

At P_1 there is more output demanded (Y_2) than what firms want to produce (Y_1).



Changes in the Macroeconomic Equilibrium

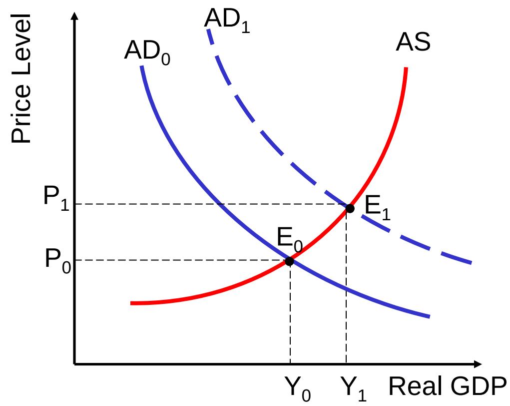
A demand shock can either be <u>expansionary</u> or <u>contractionary</u>. An expansionary demand shock shifts the **AD** curve to the right, increasing both **P** and **Y.**

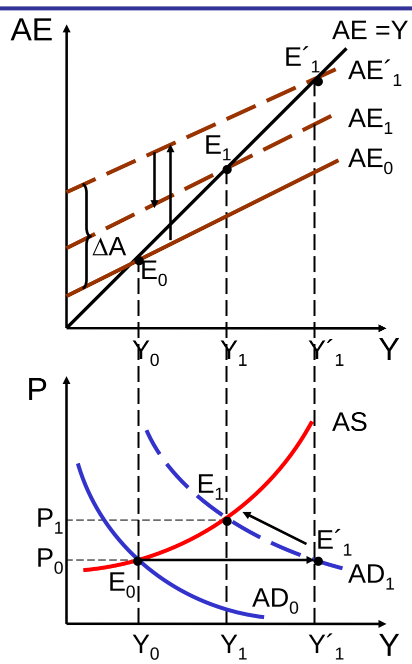
A supply shock can also be either <u>expansionary</u> or <u>contractionary</u>. An expansionary supply shock shifts the **AS** curve to the right, increasing **Y** but decreasing **P.**

Notice that we use the word “expansionary” or “contractionary” to refer to the effect of the shock on the equilibrium level of <u>output</u>.

Aggregate Demand Shocks

Demand shocks cause **P** and **Y** to change in the same direction; both rise with an increase in demand, and both fall with a decrease in demand.





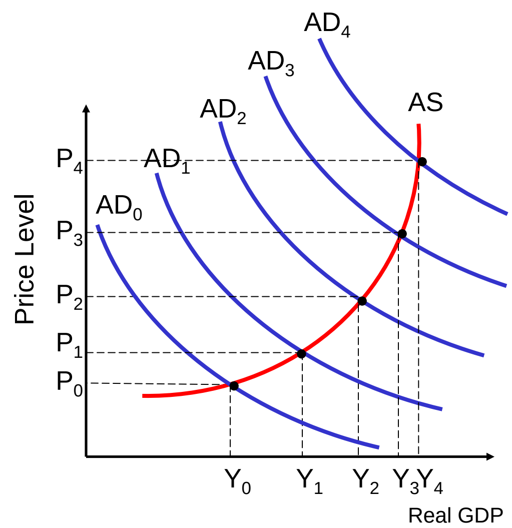
The Mechanics of an AD Shift

An increase in autonomous expenditure causes the **AE** curve to shift upward, but the rise in the price level causes it to shift part of the way down again.

Hence, when the **AS** curve is upward sloping, the multiplier is smaller than the simple multiplier.

The effect of any given shift of the **AD** curve will depend on the slope of the **AS** curve.

The steeper the **AS** curve, the greater the price effect and the smaller the output effect.



In the 45 degree model, it was shown that shifts in the **AE** curve always change real GDP. But now we see an extreme case — a vertical **AS** curve — in which there is no change in real GDP.

How can these seemingly contradictory statements be true?

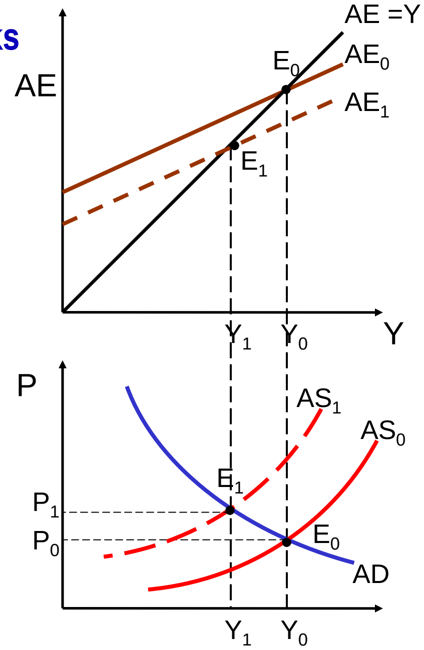
The answer is that each **AE** curve is drawn for a given price level. As the price level changes, the **AE** curve shifts.

Aggregate Supply Shocks

Aggregate supply shocks cause **P** and **Y** to change in opposite directions.

Consider the effects of a <u>negative</u> supply shock.

An example of a negative supply shock is an increase in the price of oil, as happened in the early and late 1970s.



A Word of Warning

Many economic events (especially changes in the world prices of raw materials) cause <u>both</u> aggregate demand and aggregate supply shocks.

The overall effect on the economy depends on the relative importance of the two separate effects.