

Learning Objectives

1. Explain how wages change in response to both excess demand and inflationary expectations.
2. Show how constant inflation can be incorporated into the basic macroeconomic model.
3. Describe how aggregate demand and supply shocks affect inflation and real GDP.
4. Explain how the Bank of Canada may validate demand and supply shocks.
5. Explain the three phases of disinflation.
6. Describe how the cost of disinflation can be measured by the sacrifice ratio.

1 Adding Inflation to the Model

To add inflation to the basic model, we need to think about why wages change. We then go on to changing prices.

Why Wages Change

- 1. Excess Demand or Supply.** We know from Chapter 24 that excess demand for labour puts upward pressure on wages. Conversely, excess supply of labour puts downward pressure on wages.
- 2. Expected Inflation.** A second force that can influence wages is expectations of future inflation.

The expectation of some specific inflation rate creates pressure for nominal wages to rise by that rate (to keep real wages constant).

$$\text{Change in Money Wages} = \text{Excess Demand Effect} + \text{Expectational Effect}$$

How do people form their expectations?

Backward-looking expectations tend to change slowly because some time must pass before a change in the actual rate of inflation provides enough past experience to cause expectations to adjust.

Forward-looking expectations can adjust quickly to changes in events because they are based on expected economic conditions and government policy, not past inflation rates.

A strong version of forward-looking expectation is called rational expectation.

Rational expectations are not always correct — rather, the assumption is that people make the best possible decisions based on the information available to them.

One implication is that they will not make persistent or systematic mistakes — their expectations are, on average, correct.

From Wages to Prices

The overall effect on nominal (money) wages determines how the **AS** curve shifts. This determines the change in the price level.

We can decompose actual inflation into its three component parts:

$$\text{Actual Inflation} = \text{Excess Demand Inflation} + \text{Expected Inflation} + \text{Supply Shock Inflation}$$

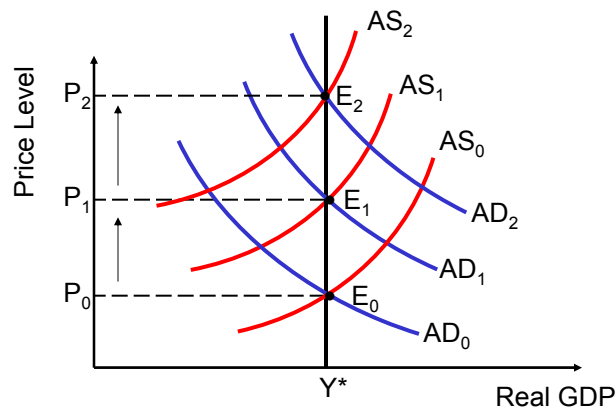
The last term captures any shifts in the **AS** curve caused by things other than wage changes.

Constant Inflation

If inflation has been constant for several years and there is no indication of a change in monetary policy, then the expected rate of inflation will equal the actual rate of inflation.

If expected inflation equals actual inflation, real GDP must be equal to potential GDP. This means there is no excess demand.

But if there is no excess demand, what would be causing the constant inflation?

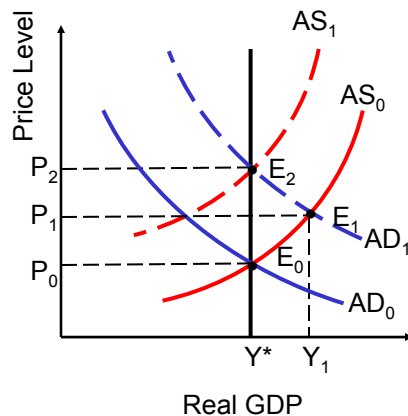


Constant inflation with $Y=Y^*$ occurs when the rate of monetary growth, the rate of wage increase, and the expected rate of inflation are all consistent with the actual inflation rate.

2 Shocks and Policy Responses

Demand Shocks

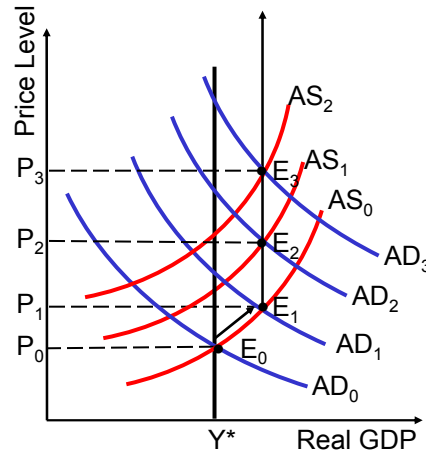
Inflation that is caused by a rightward shift in the **AD** curve is called demand inflation.



A demand shock that is not validated produces temporary inflation, but the economy's adjustment process eventually restores potential GDP and stable prices.

Monetary validation of a positive demand shock causes the **AD** curve to shift further to the right, thereby keeping open the inflationary gap.

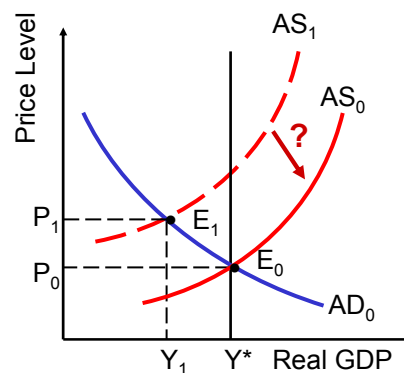
Continued validation of a demand shock turns what would have been transitory inflation into sustained inflation fueled by monetary expansion.



Supply Shocks

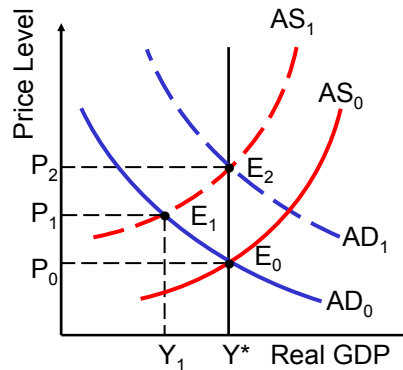
Inflation caused by shifts in the **AS** curve for reasons unrelated to excess demand is called supply inflation.

Important sources of supply inflation are increases in the world prices of raw materials.



But if wages fall only slowly in the face of excess supply, the return to Y^* after a non-validated negative supply shock will be slow and painful.

Monetary validation of a negative supply shock causes the initial rise in the price level to be followed by a further rise. But the recessionary gap may be closed faster than relying on factor prices to fall.



Some economists caution that supply shocks should never be validated, lest a wage-price spiral be created. Other economists advocate validation to avoid significant recessions.

Accelerating Inflation

Question: What happens to the rate of inflation if the central bank tries to maintain an inflationary gap through continued monetary validation?

Answer: When the central bank sets whatever rate of monetary expansion is needed to maintain any given inflationary gap, the actual inflation rate will accelerate.

This accelerationist hypothesis states that as long as an inflationary gap persists, expectations of inflation will be rising, which will lead to increases in the rate of inflation.

Inflation as a Monetary Phenomenon

The causes of inflation are:

- On the demand side, anything that shifts the **AD** curve to the right will cause the price level to rise.
- On the supply side, anything that increases factor prices will shift the **AS** curve to the left and cause the price level to rise.
- Unless continual monetary expansion occurs, such increases in the price level must eventually come to a halt.

The consequences of inflation are:

- In the short run, demand inflation tends to be accompanied by an increase in real GDP above potential.
- In the short run, supply inflation tends to be accompanied by a decrease in real GDP below potential.
- When costs and prices have fully adjusted, shifts in either **AD** or **AS** curves leave real GDP unchanged and affect only the price level.

Conclusions about inflation are:

- Without monetary validation, positive demand shocks cause temporary bursts of inflation that are accompanied by inflationary output gaps. The gaps are removed as rising factor prices push the **AS** curve to the left, returning output to Y^* .
- Without monetary validation, negative supply shocks cause temporary bursts of inflation that are accompanied by recessionary output gaps. The gaps are removed as factor prices fall, restoring output to Y^* and the price level to its initial level.
- Inflation initiated by either supply or demand shocks can only continue indefinitely with continuing monetary validation.

3 Reducing Inflation

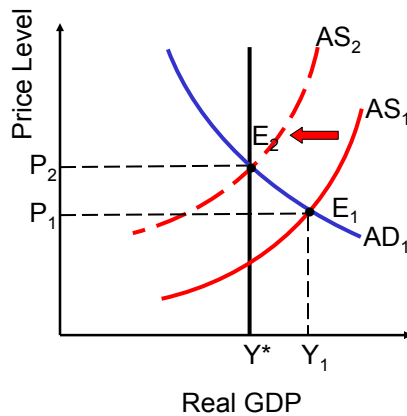
The Process of Disinflation

Reducing inflation quickly (referred to as “cold turkey”) incurs high costs for a short period of time; reducing it slowly (referred to as “gradualism”) incurs lower costs but for a longer period of time.

Expectations can cause inflation to persist even after its original causes have been removed.

How long inflation persists after the inflationary gap has been removed depends on how quickly expectations of continued inflation are revised downward.

Phase 1: Removing Monetary Validation

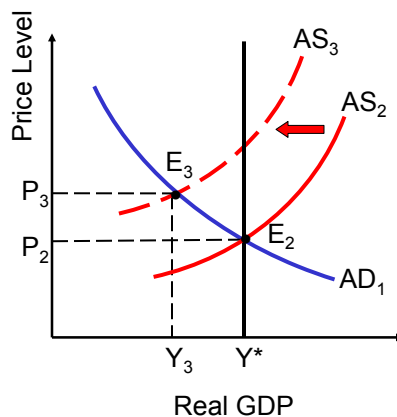


The elimination of a sustained inflation begins with a reduction in the rate of monetary expansion.

In this diagram, we suppose that once E_1 is reached, the central bank stops increasing the money supply.

The **AD** curve therefore stops shifting, but ongoing inflation expectations keep the **AS** curve shifting upwards.

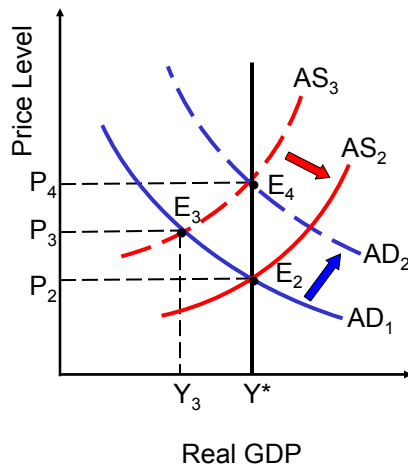
Phase 2: Stagflation



Slow-to-adjust inflationary expectations and wage momentum lead to further shifts in the **AS** curve.

This produces stagflation, with falling output and continuing inflation.

Phase 3: Recovery



After expectations are reversed, recovery takes output to Y^* , and the price level is stabilized by one of two means.

Either the recessionary gap causes wages to fall, bringing the **AS** curve back to **AS₂**.

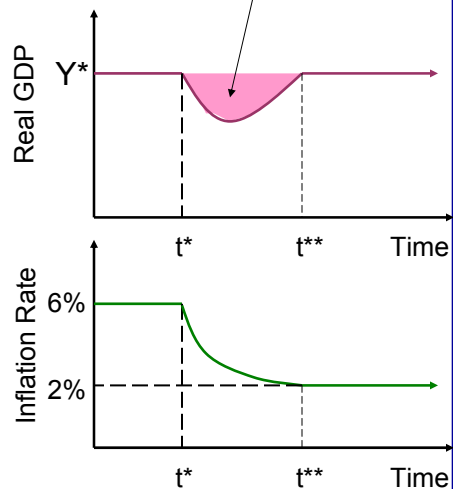
Or, the central bank increases the money supply sufficiently to shift the **AD** curve to **AD₂**.

The Cost of Disinflation

The cumulative loss in real GDP, expressed as a percentage of potential output, divided by the percentage-point reduction in the rate of inflation, is called the sacrifice ratio.

The larger the sacrifice ratio is, the deeper is the recession and the longer it takes real GDP to return to potential.

Suppose this cumulative loss is 10% of Y^* . Since inflation fell by 4 percentage points, the sacrifice ratio is $10/4 = 2.5$.



Conclusion

The Death of Inflation? Arguments have been made in defense of the view that inflation is no longer a threat, and they all involve the greater competition that comes from globalization.

Most economists reject this view. They argue that such an increase in competition is best thought of as a one-time rightward shift in the **AS** curve. Sustained inflation is ultimately a monetary phenomenon.

The Costs of Very Low Inflation. Some economists argue that there are dangers associated with very low rates of inflation. The central problem comes from the downward rigidity of nominal wages.

In an environment of moderate inflation (say 5%), most real wage declines can occur through inflation. But when inflation is very low, nominal wages must fall. If they won't fall, then unemployment will rise.