Stabilization Policy and the AS/AD

— Week 10 —

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Summary

I – Monetary Policy Rules and Aggregate Demand

The short-run model: three basic equations

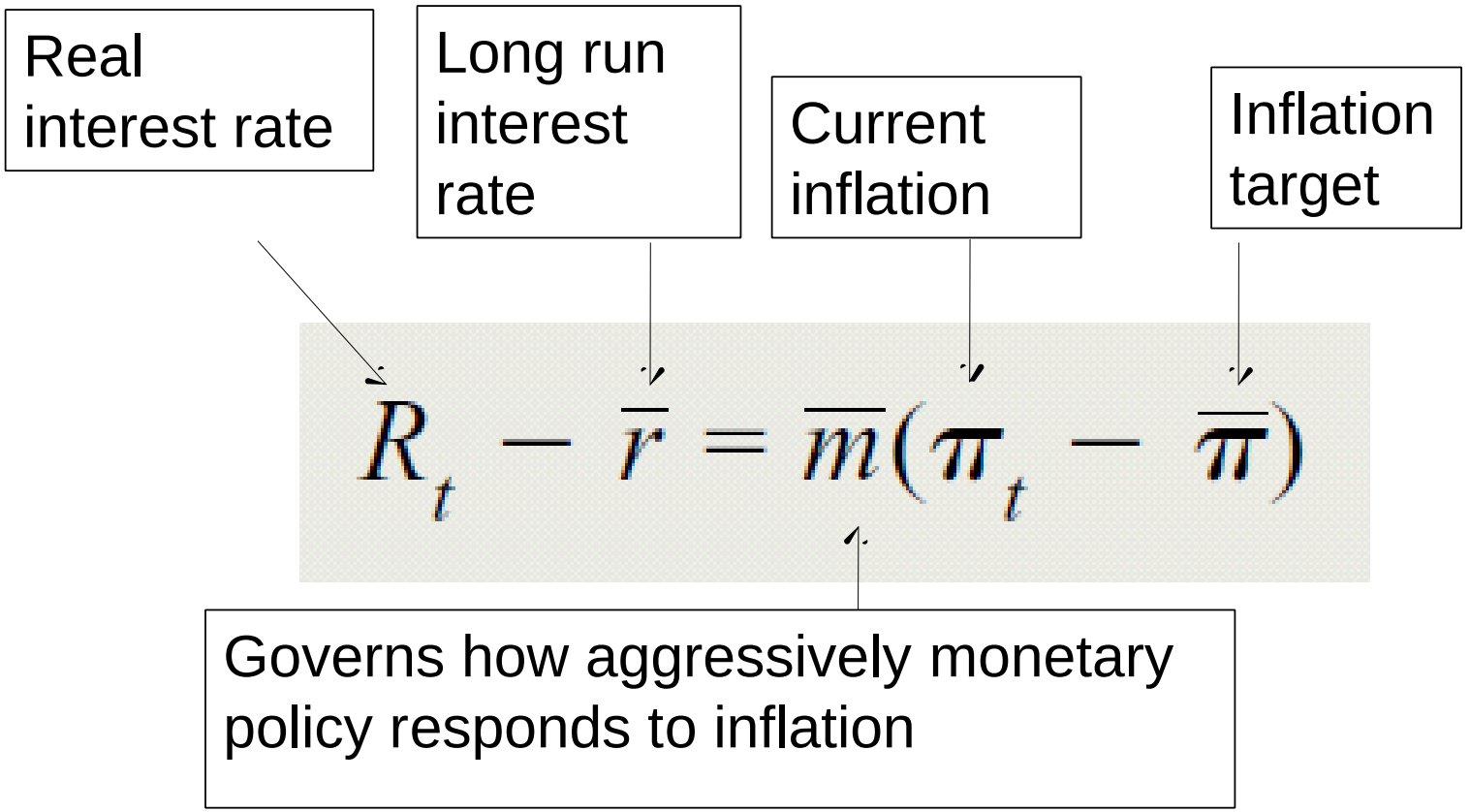
IS curve:	$\tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r})$.
MP curve:	The central bank chooses R_t.
Phillips curve:	$\Delta\pi_t = \bar{v}\tilde{Y}_t + \bar{o}$.

1. The model implies that high short-run output leads to an increase in inflation ... and vice versa
2. The central bank chooses how to make this trade-off by choosing the interest rate.
3. How does the CB set R_t? A monetary policy rule.

A monetary policy rule

1. A set of instructions that determines the stance of monetary policy for a given situation that might occur in the economy
2. The rule we consider is that the stance of monetary policy depends on: current inflation and the Inflation target
3. If inflation is above the target: the real interest rate should be high
4. If inflation is below the target: the real interest rate should be low

A monetary policy rule



The AD Curve

1. Substitute the monetary policy rule into the IS curve
2. The resulting equation is the aggregate demand (AD) curve

$$\left.\begin{array}{l} \text{IS curve: } \tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r}) \\ \text{policy rule: } R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi}) \end{array}\right\} \Rightarrow$$

$$\Rightarrow \text{AD curve: } \tilde{Y}_t = \bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi})$$

The AD curve

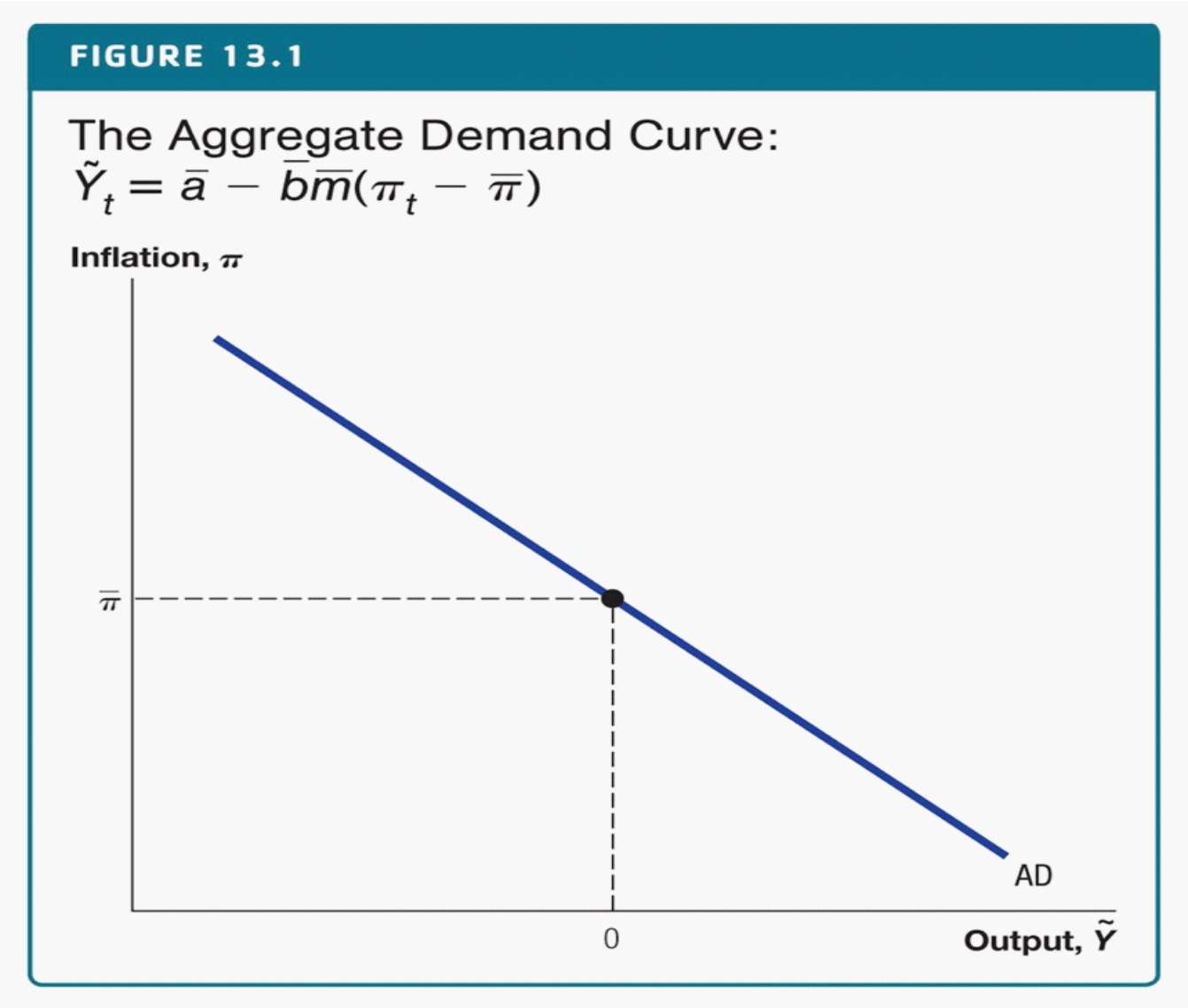
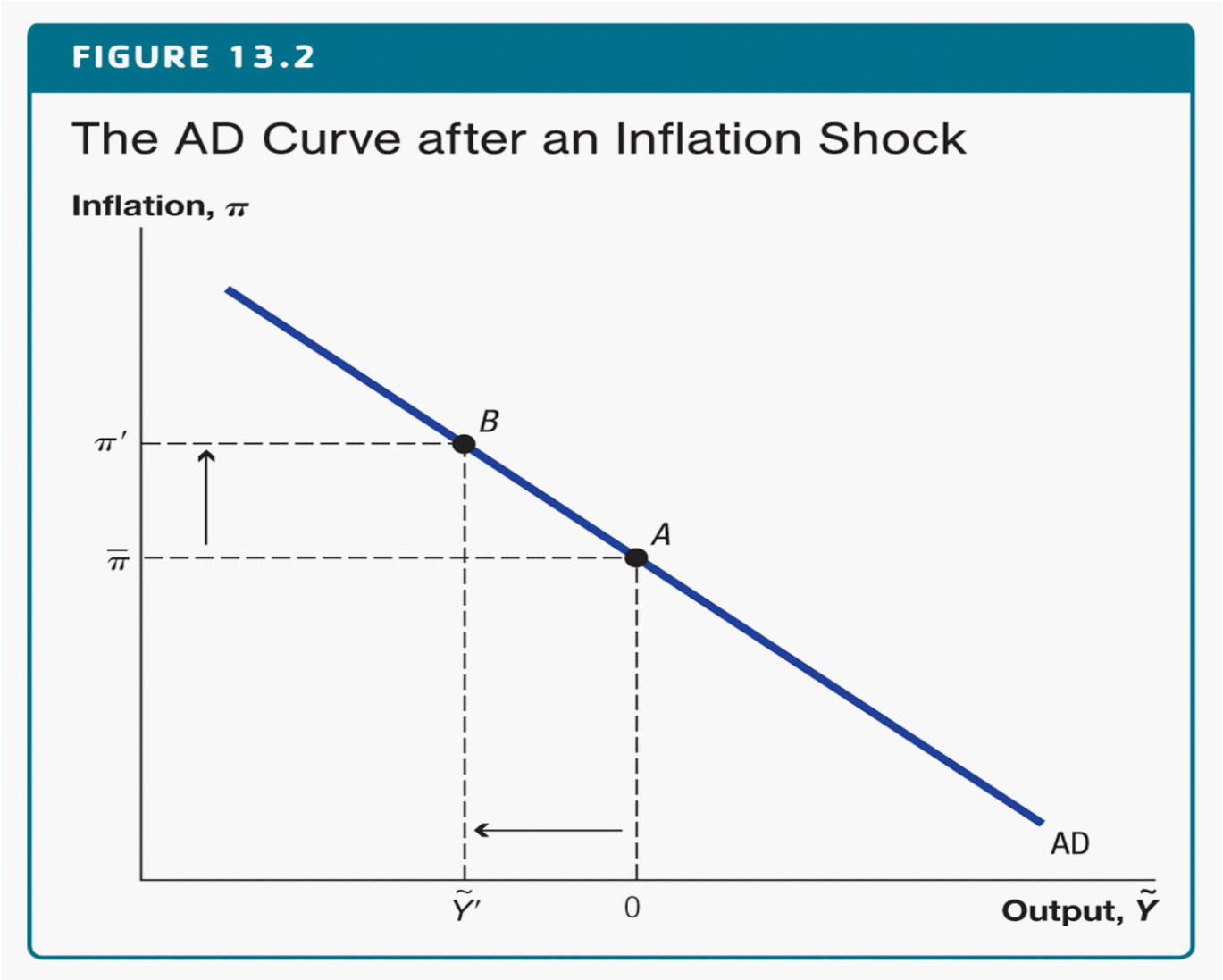


FIGURE 13.1
The Aggregate Demand Curve:
$\tilde{Y}_t = \bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi})$
Inflation, π
$\bar{\pi}$
AD
0
Output, $\tilde{Y}$

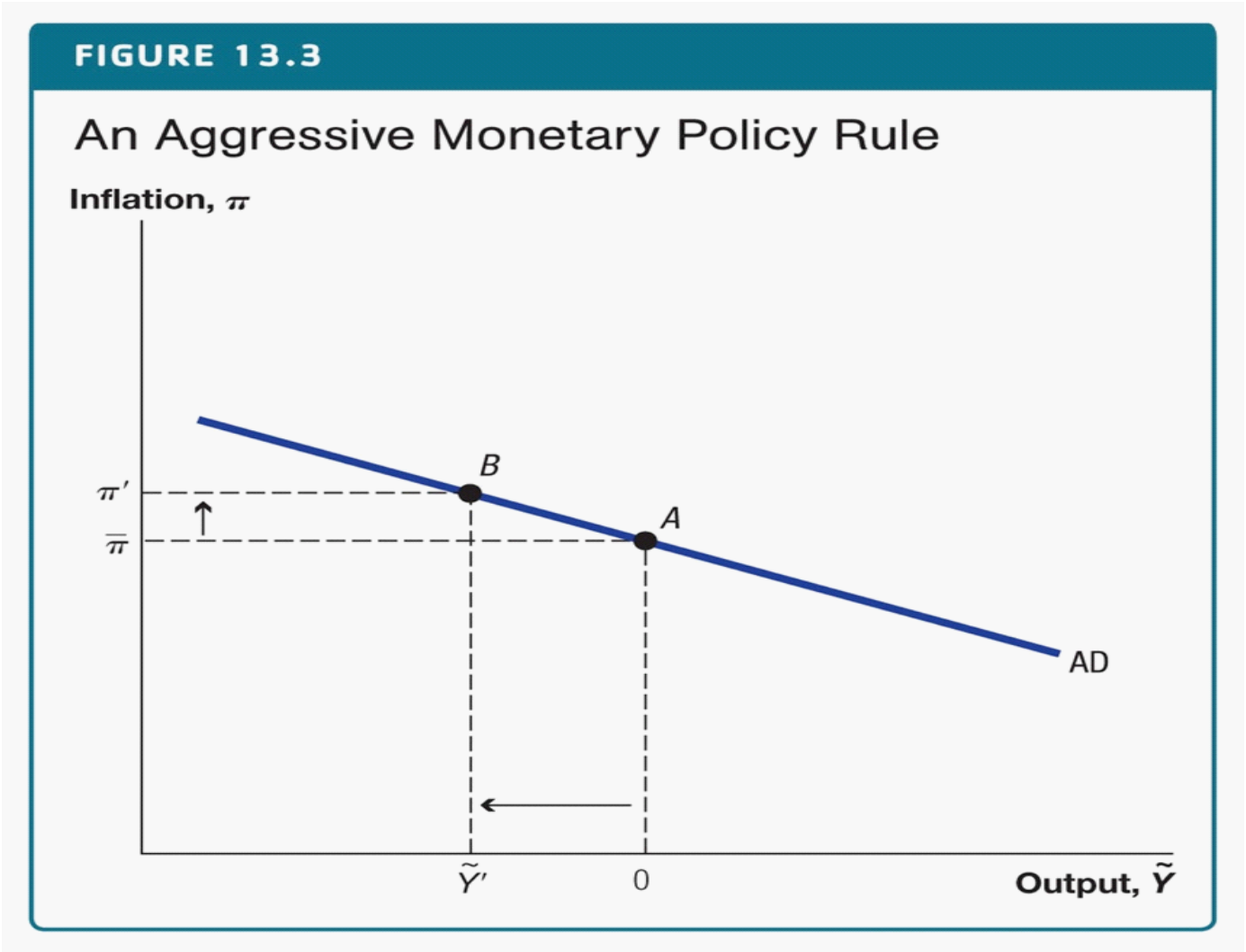
The AD curve: main points

1. Describes how the central bank chooses short-run output based on the rate of inflation.
2. If inflation is above target: the central bank raises the interest rate to lower output below potential.
3. If inflation is below target: the central bank lowers the interest rate to increase output above potential.

A change in inflation



A high value of m: aggressive monetary policy



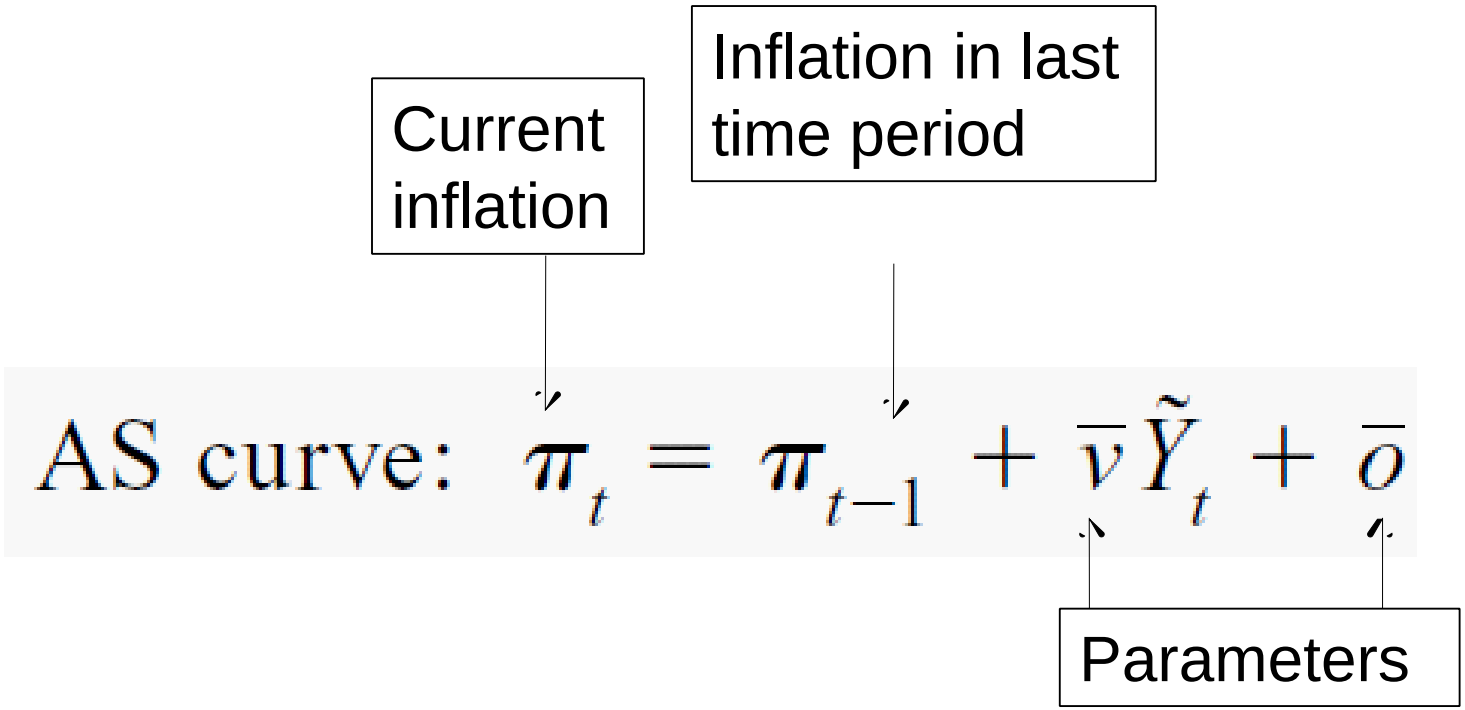
Shifts of the AD Curve

1. AD curve shifts to the right if:
    1. Parameter $\bar{a}$ increases
    2. The target rate of inflation $\bar{\pi}$ increases
2. Moves to the left if ...

II – The Aggregate Supply Curve

The aggregate supply (AS) curve is:

The price-setting equation used by firmsThe Phillips curve with a new name



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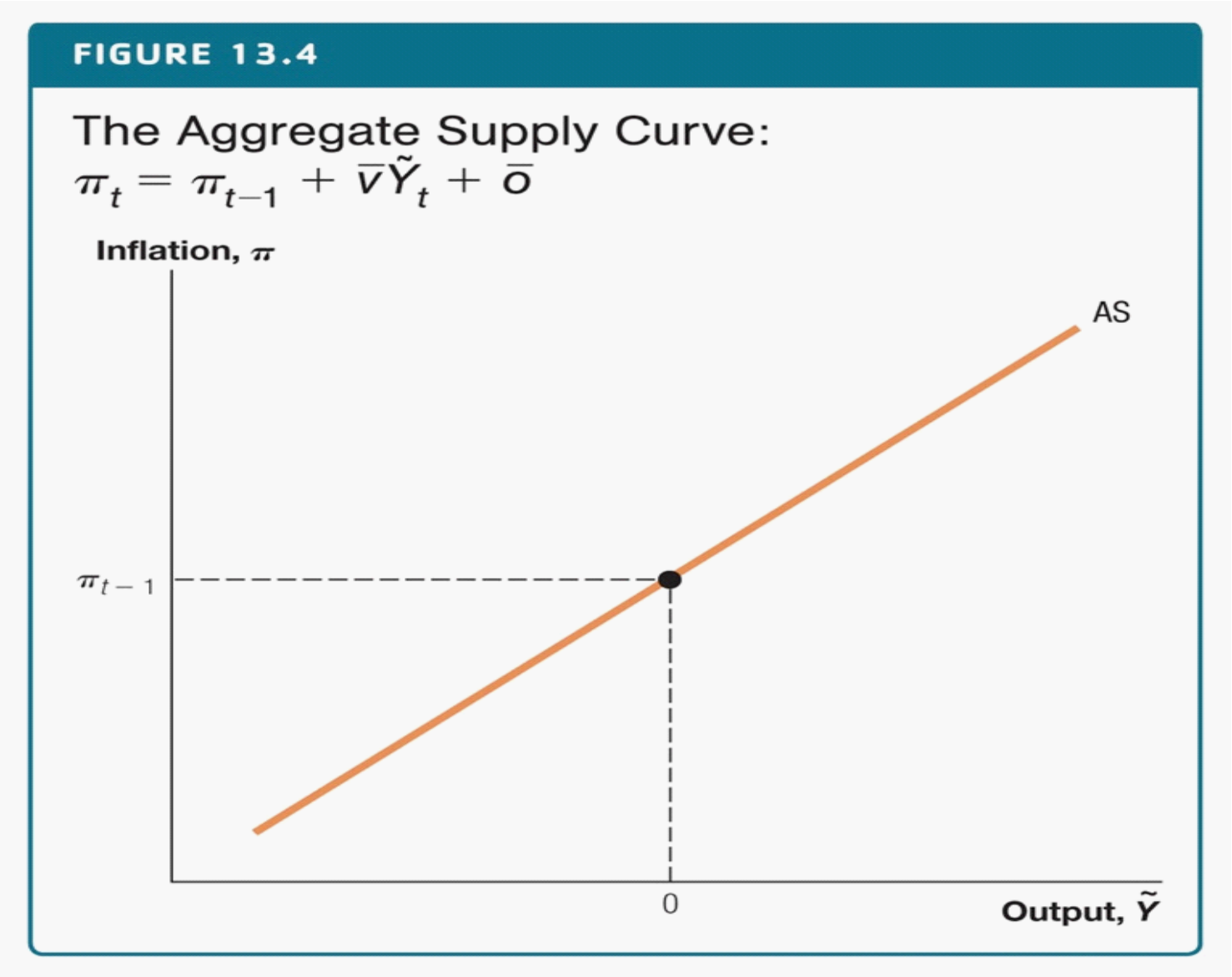
The aggregate supply curve



III – The AS/AD Framework

Combining the AS and AD curve

1. Two equations
2. Two unknowns

$$\text{AD curve: } \tilde{Y}_t = \bar{a} - \bar{b}\bar{m}(\pi_t - \bar{\pi})$$

$$\text{AS curve: } \pi_t = \pi_{t-1} + \bar{\nu}\tilde{Y}_t + \bar{o}$$

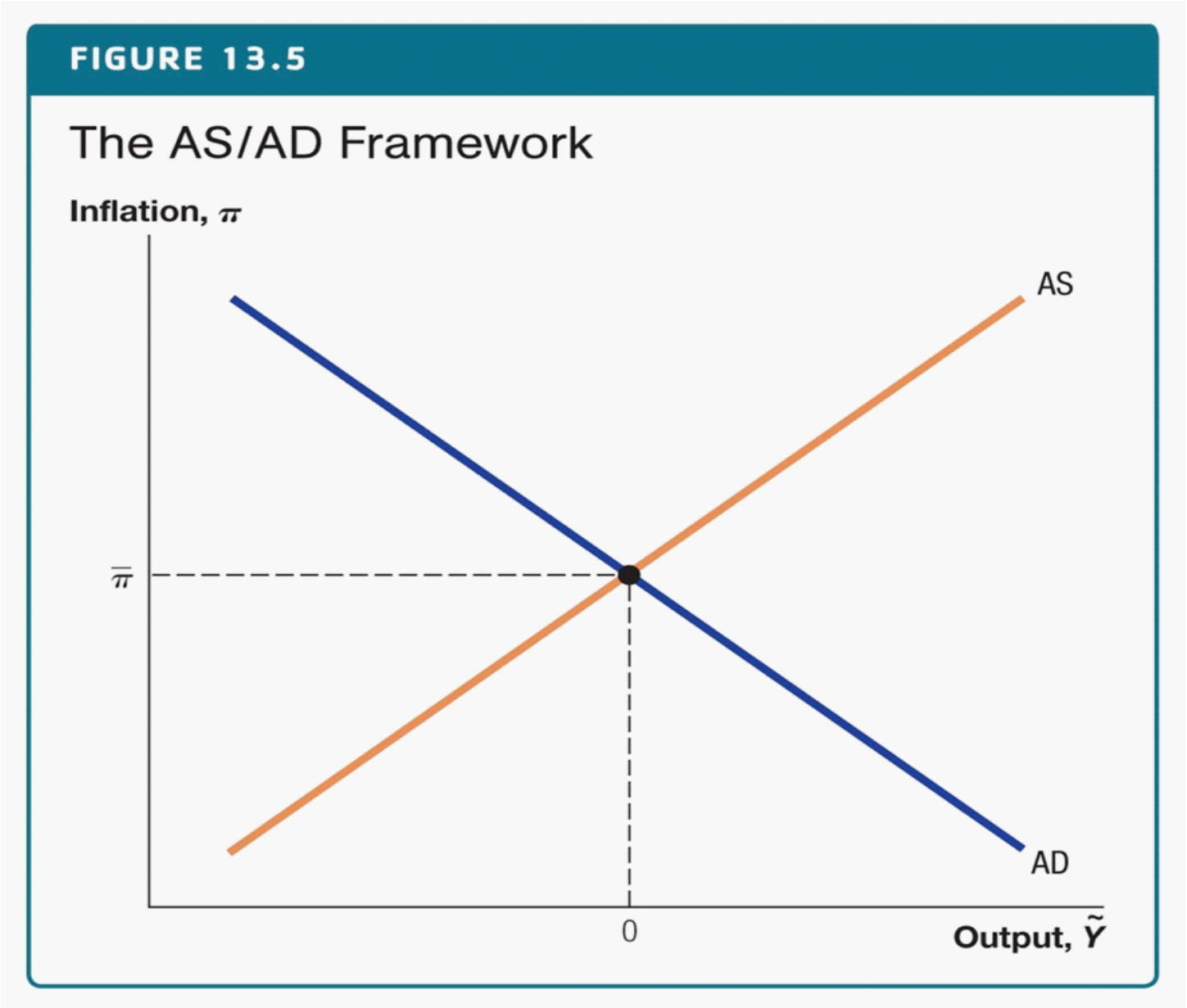
The Steady State

1. In the steady state:
   1. the endogenous variables are constant over time
   2. no shocks to the economy.
   3. the inflation rate must be constant and short-run output is equal to zero
2. Steady state implies:

$$\pi_t = \pi_{t-1} = \pi^*$$

$$\tilde{Y}^* = 0$$

The Steady State: graphically

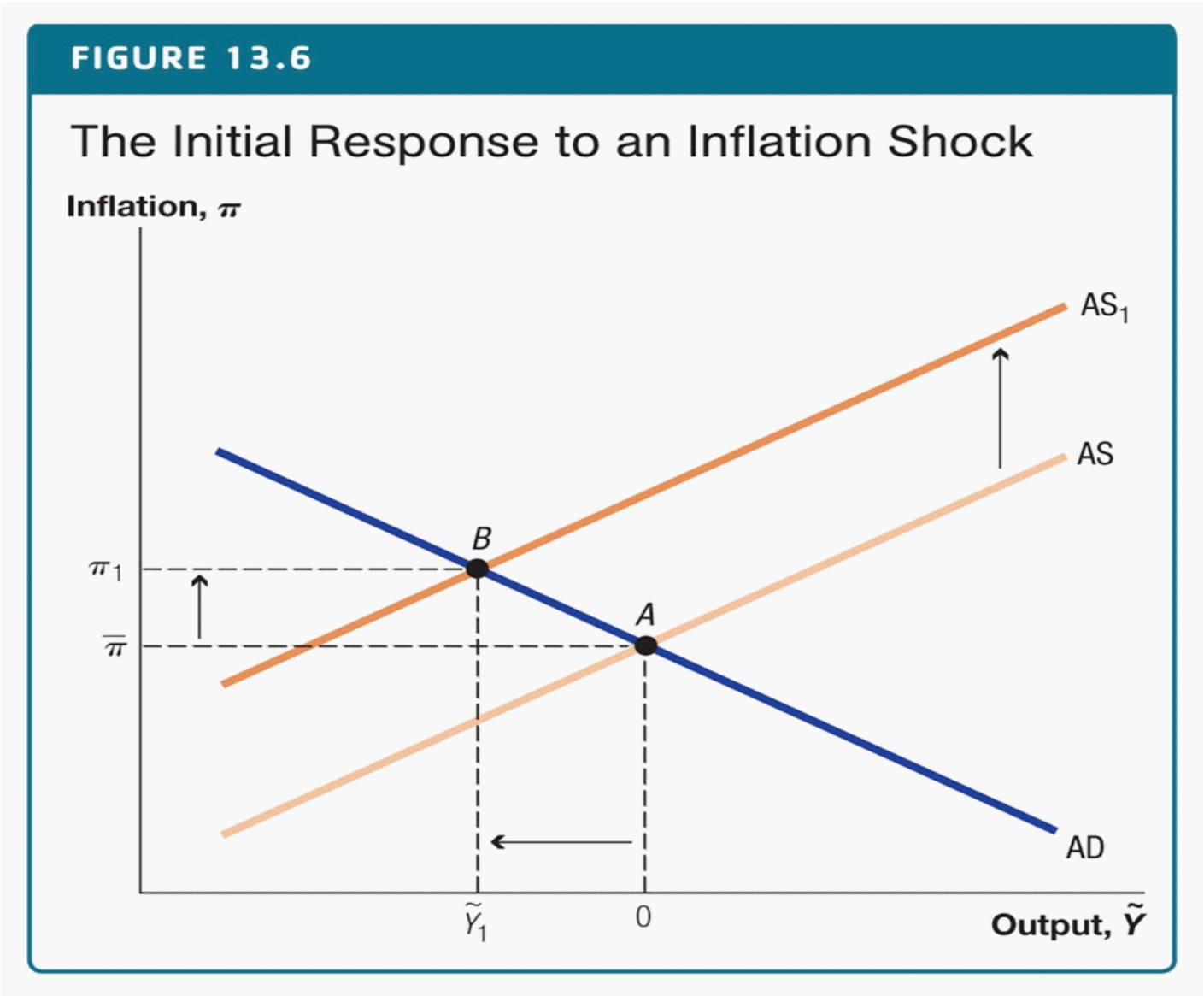


IV – Macroeconomic Events in the AS/AD Framework

Event #1: An Inflation Shock

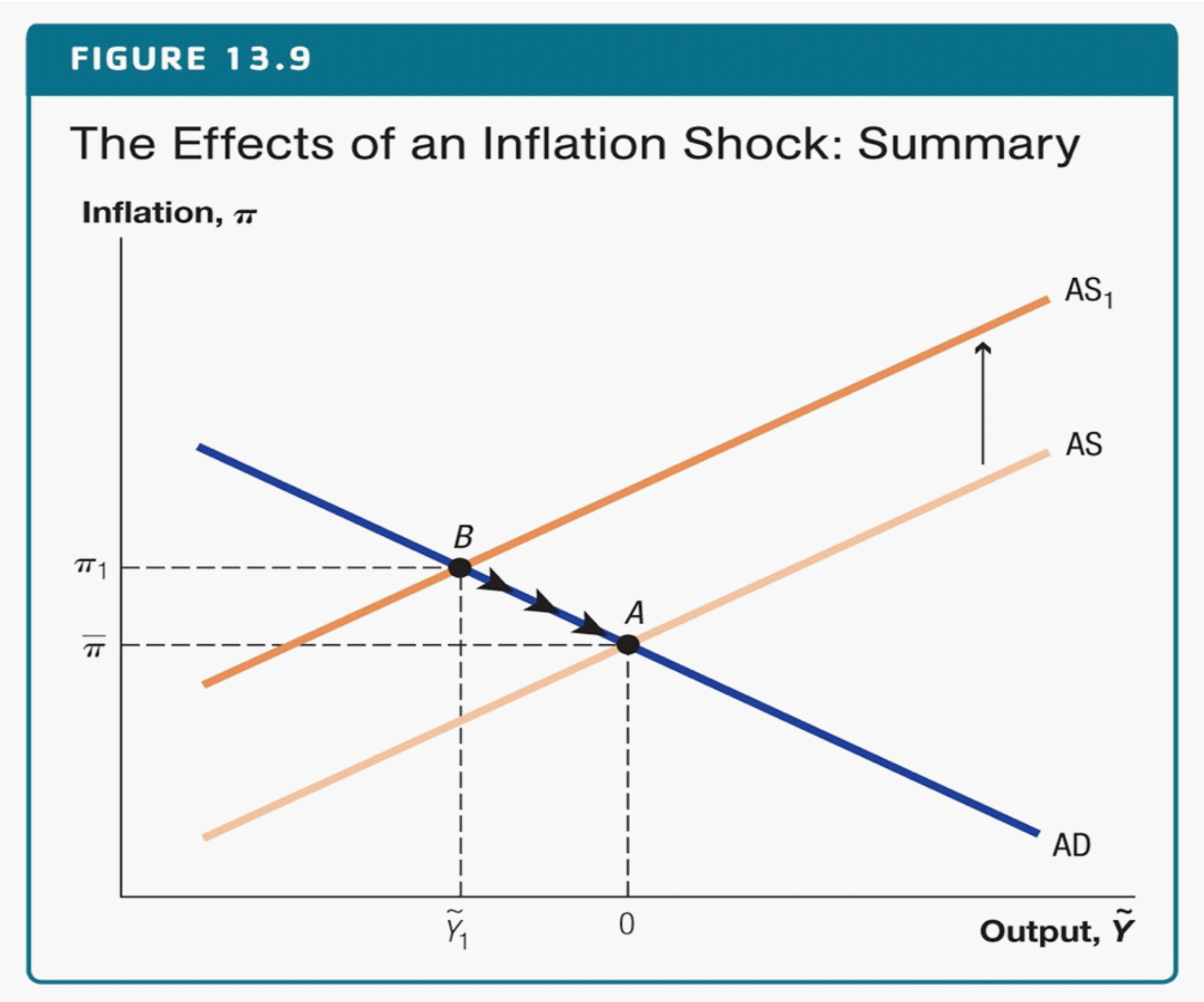
1. The economy begins in steady state and is hit with a lasting increase in the price of oil.
2. Thus, the parameter $\bar{o}$ is positive for one period
3. The AS curve will shift up as a result.
4. Stagflation: stagnation of economic activity accompanied by inflation.
5. How? Let's see.

An Inflation Shock: initial response



An Inflation Shock: final result

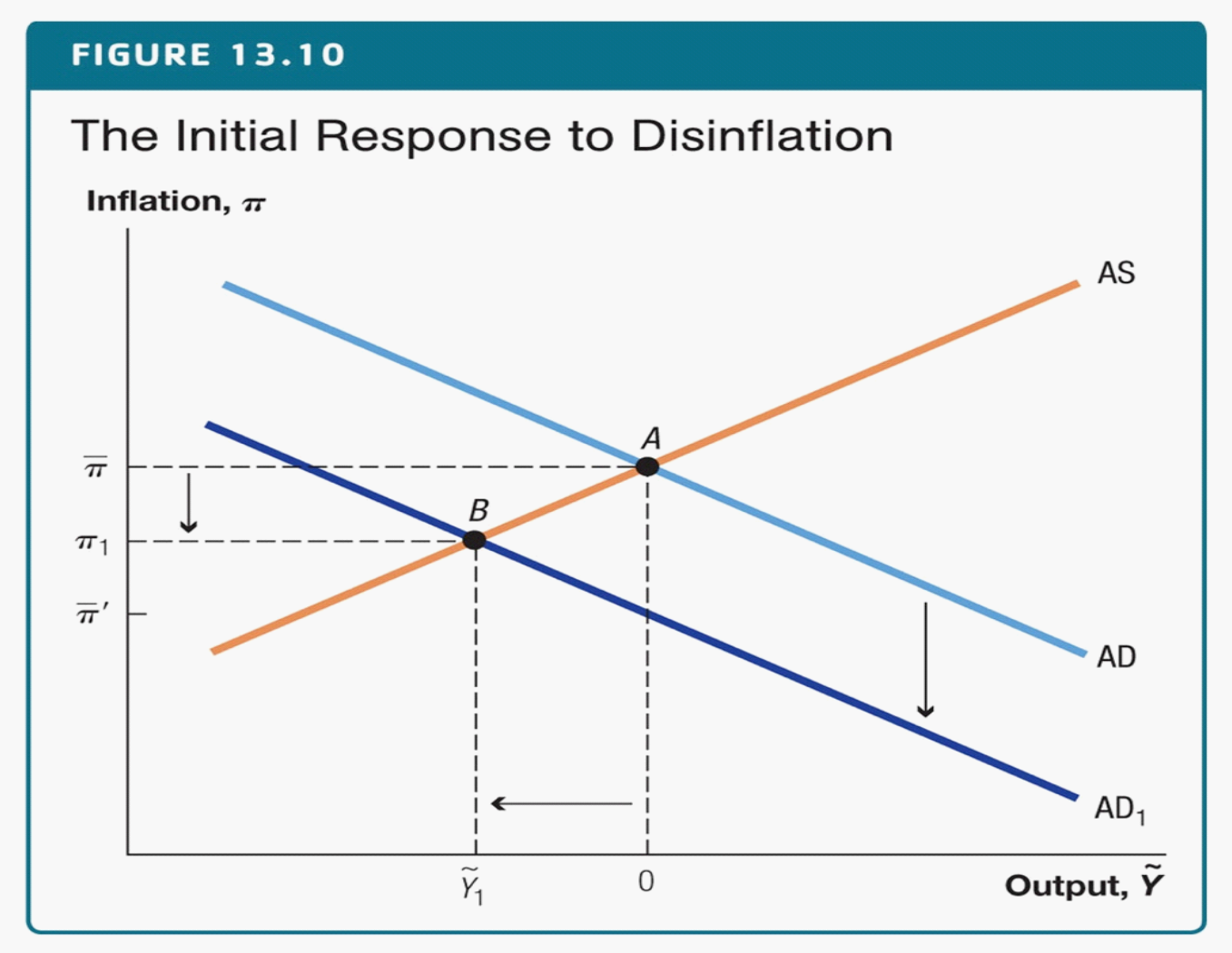
It takes time to get back to the original equilibrium: inflation is sticky



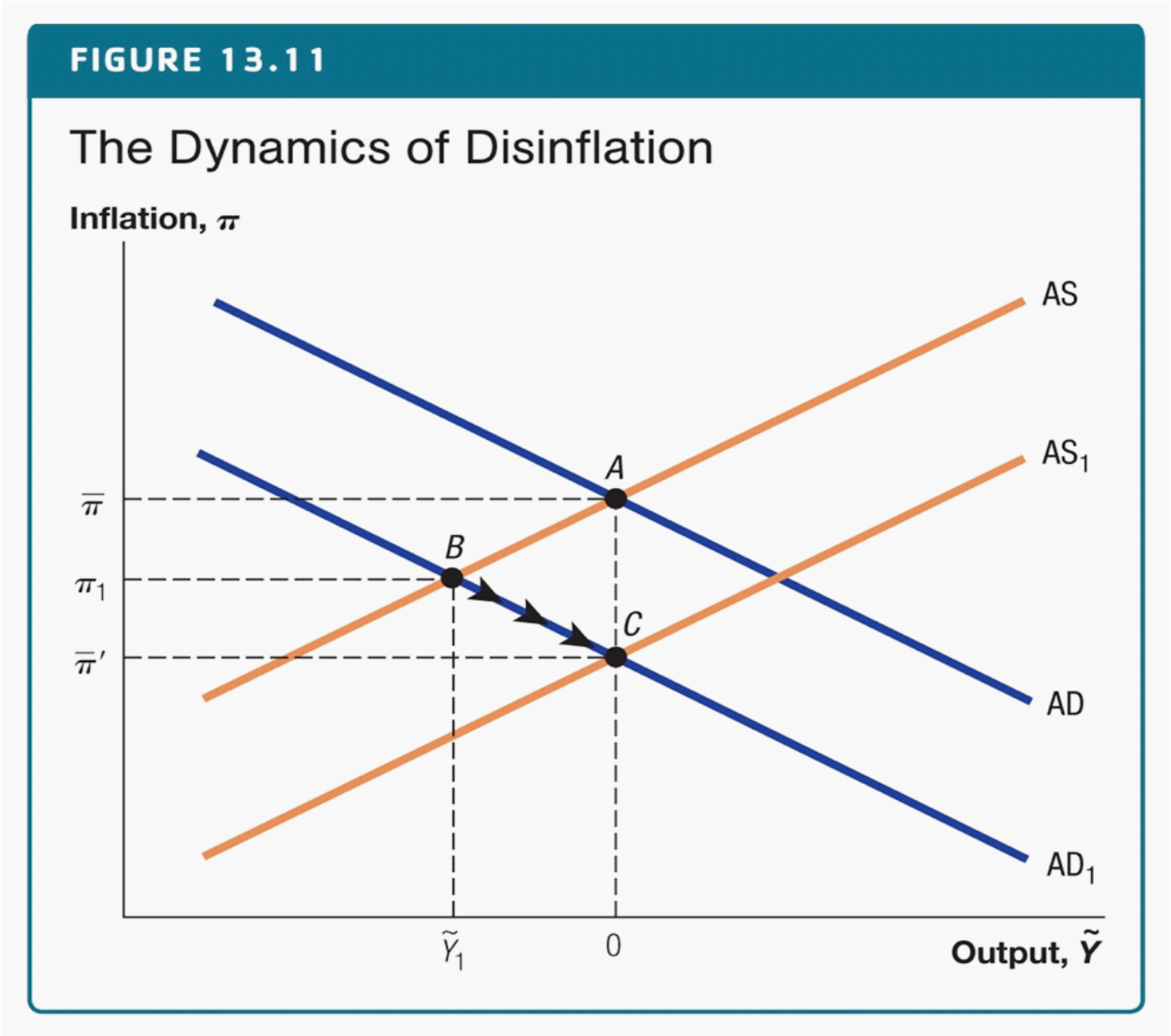
Event #2: Disinflation

1. Suppose the economy begins in steady state
2. Policymakers decide to lower the target rate of inflation.
3. The AD curve shifts down

Disinflation: initial response



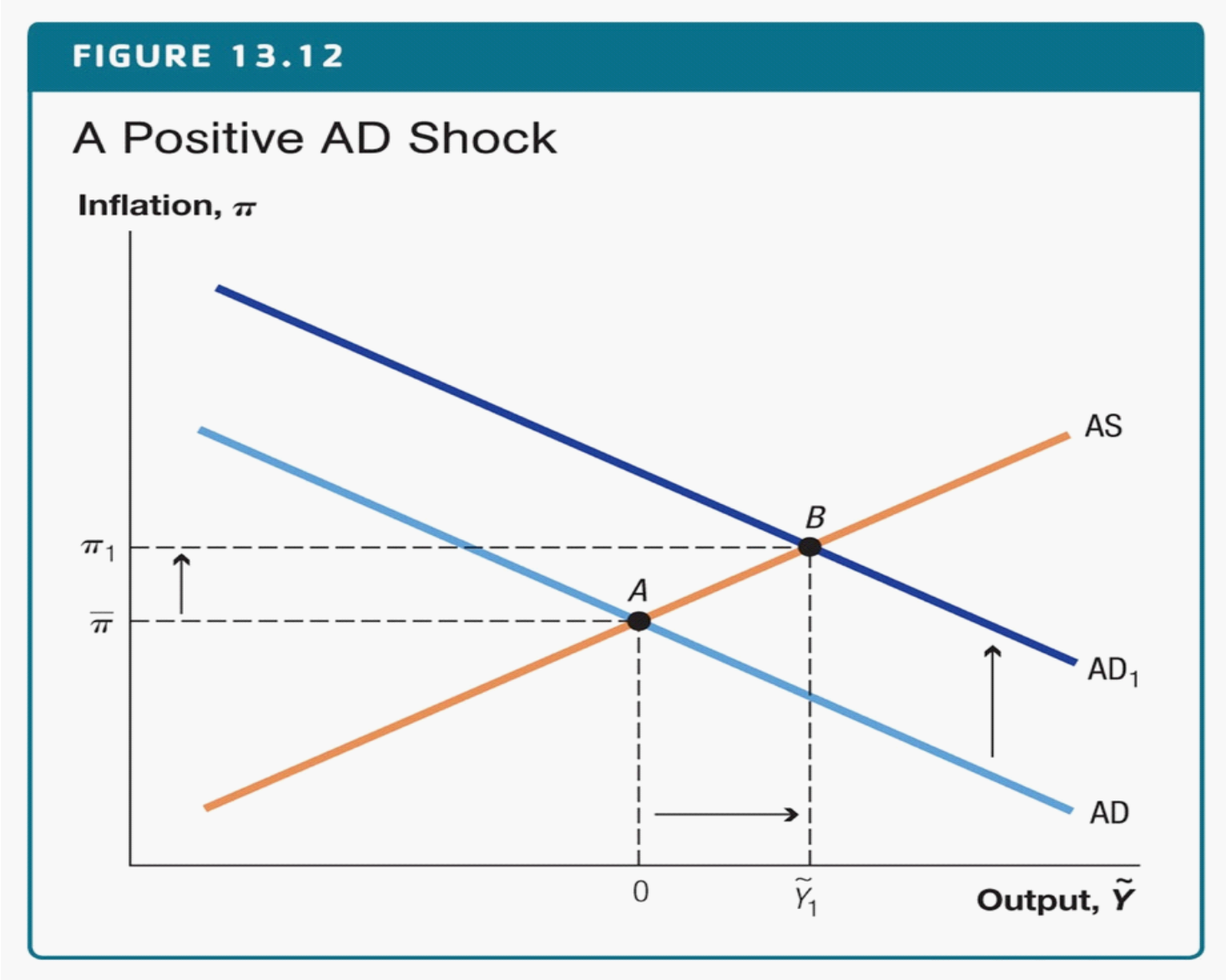
Disinflation: final result



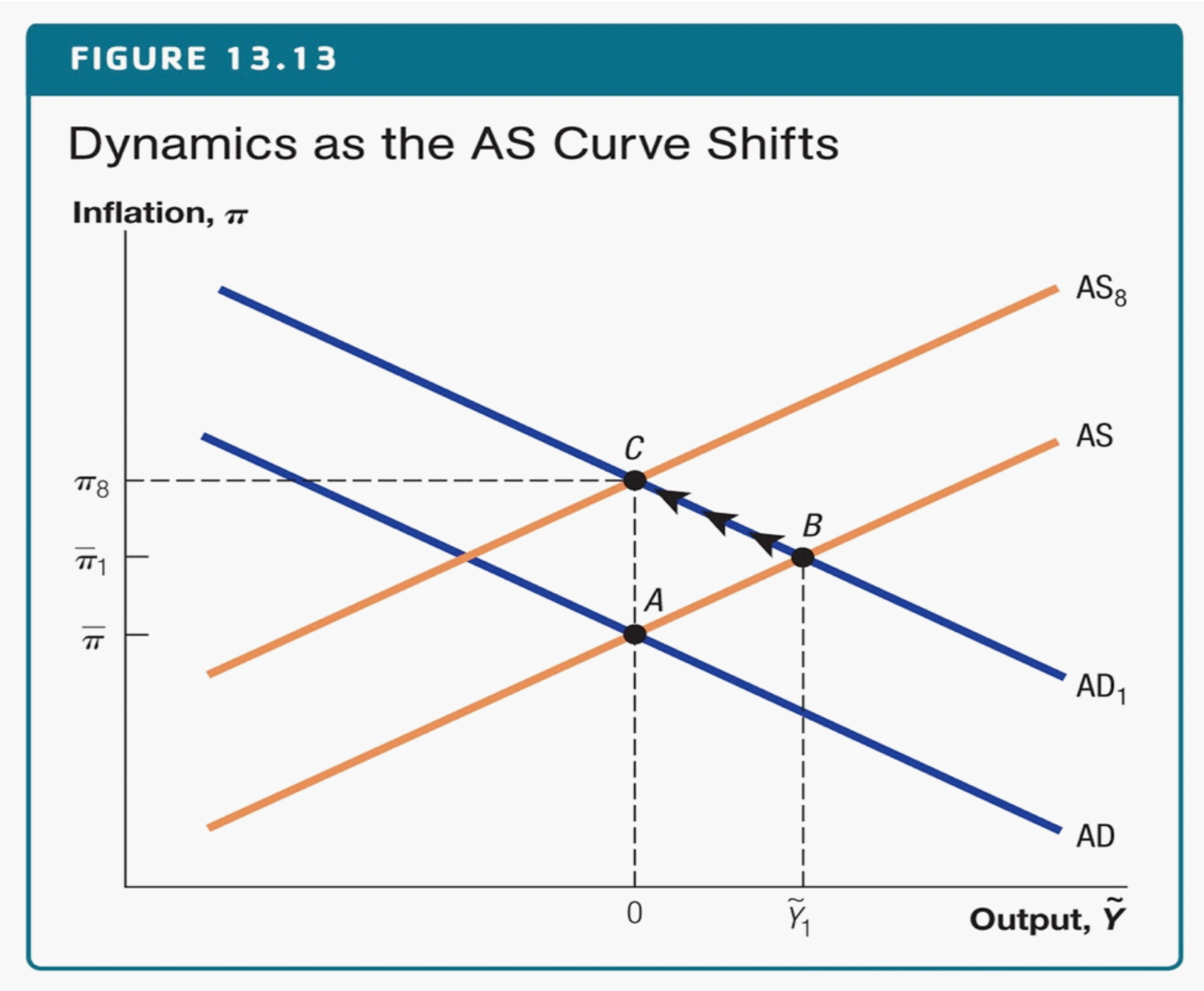
Event #3: A Positive AD Shock

1. Suppose there is a temporary increase in the aggregate demand parameter $\bar{a}$
2. The AD curve will shift out.
3. Prices increase.

A Positive AD Shock: initial response



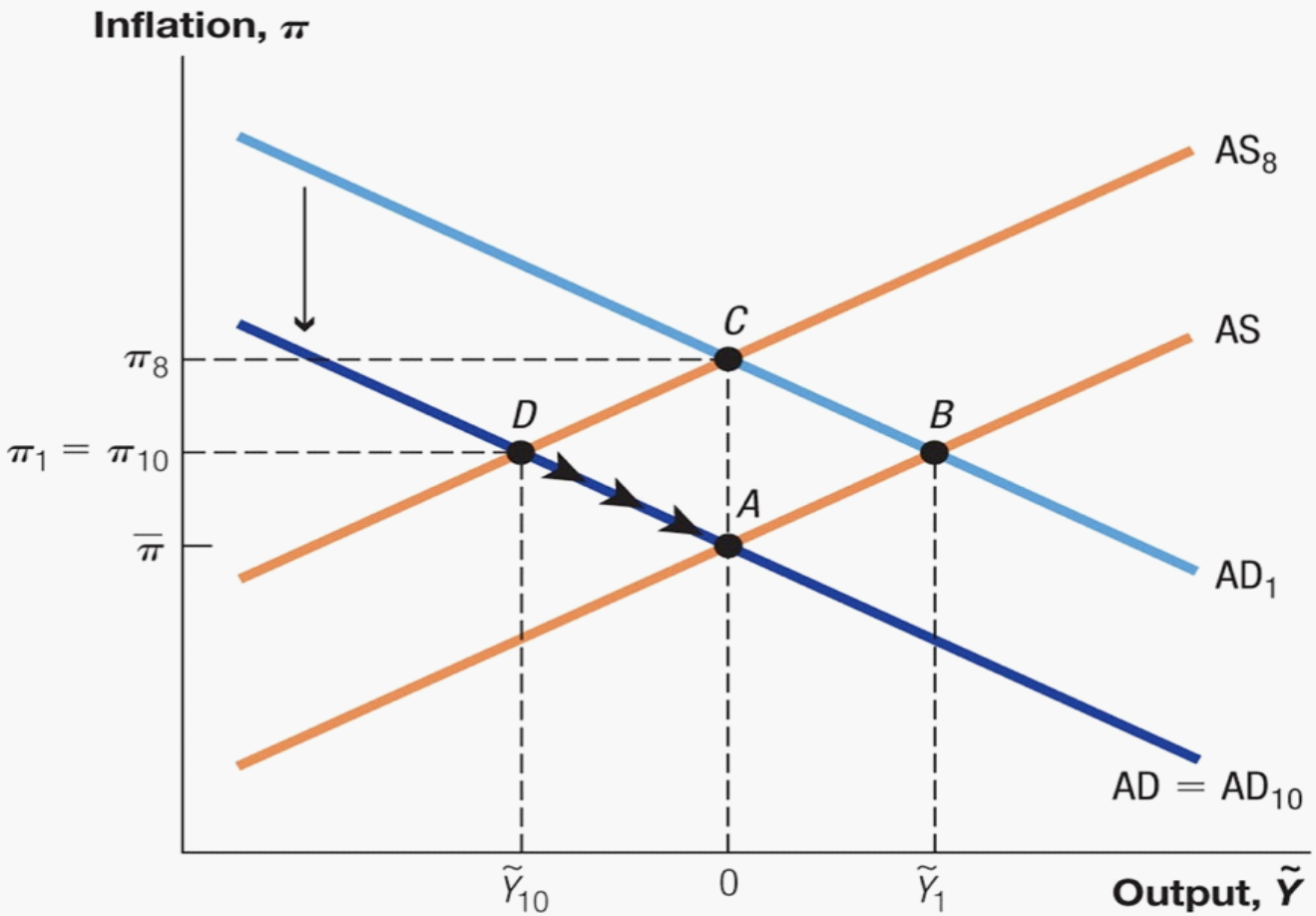
A Positive AD Shock: final result



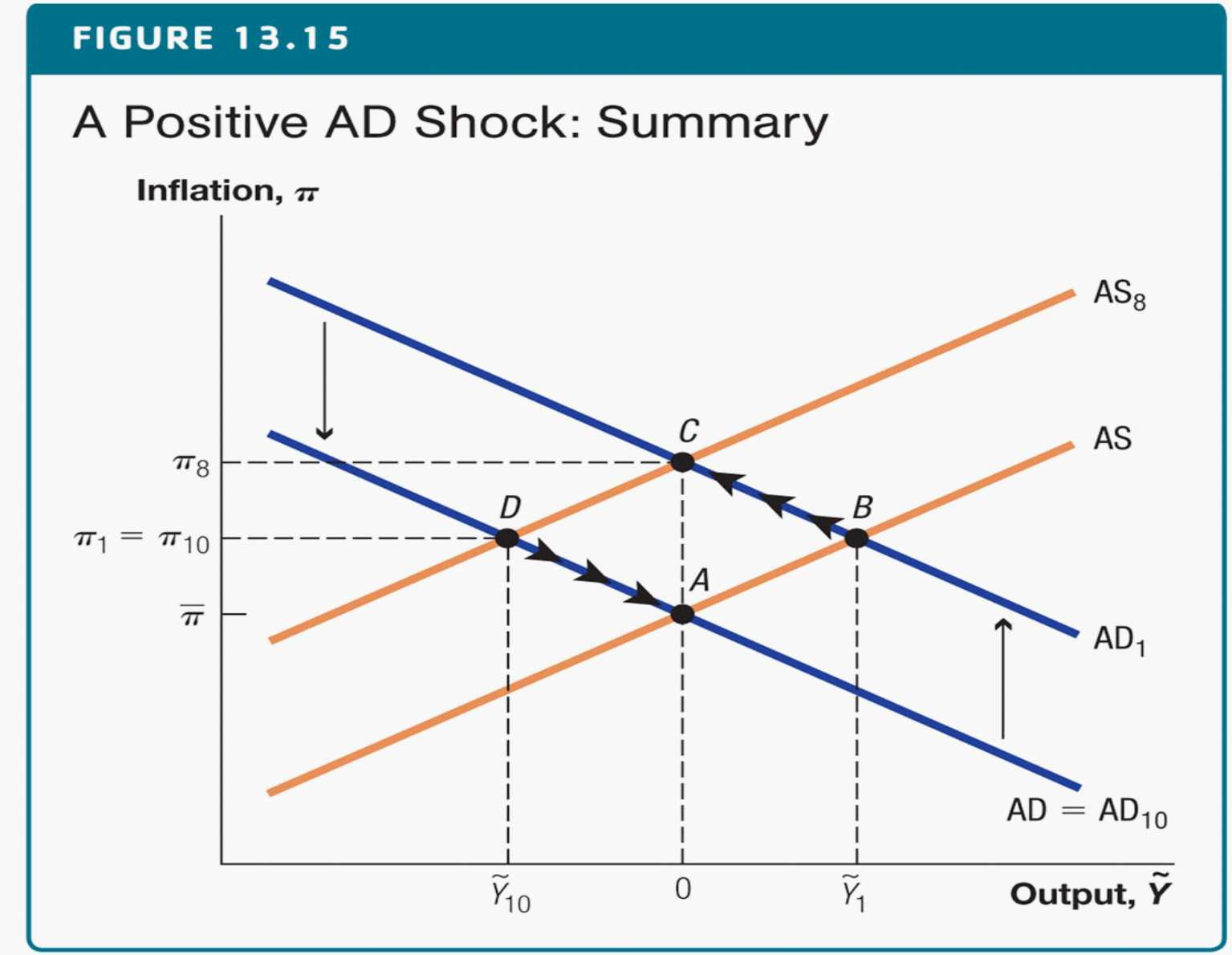
A Positive AD Shock: if the shock ends

FIGURE 13.14

The Unraveling after the AD Shock Ends



A Positive AD Shock: summary



V – Empirical Evidence

Predicting the Fed Funds Rate

1. The Fisher equation
2. Monetary policy rule in terms of the nominal interest rate

$$i_t = R_t + \pi_t = \overline{r} + \pi_t + \overline{m}(\pi_t - \overline{\pi}).$$

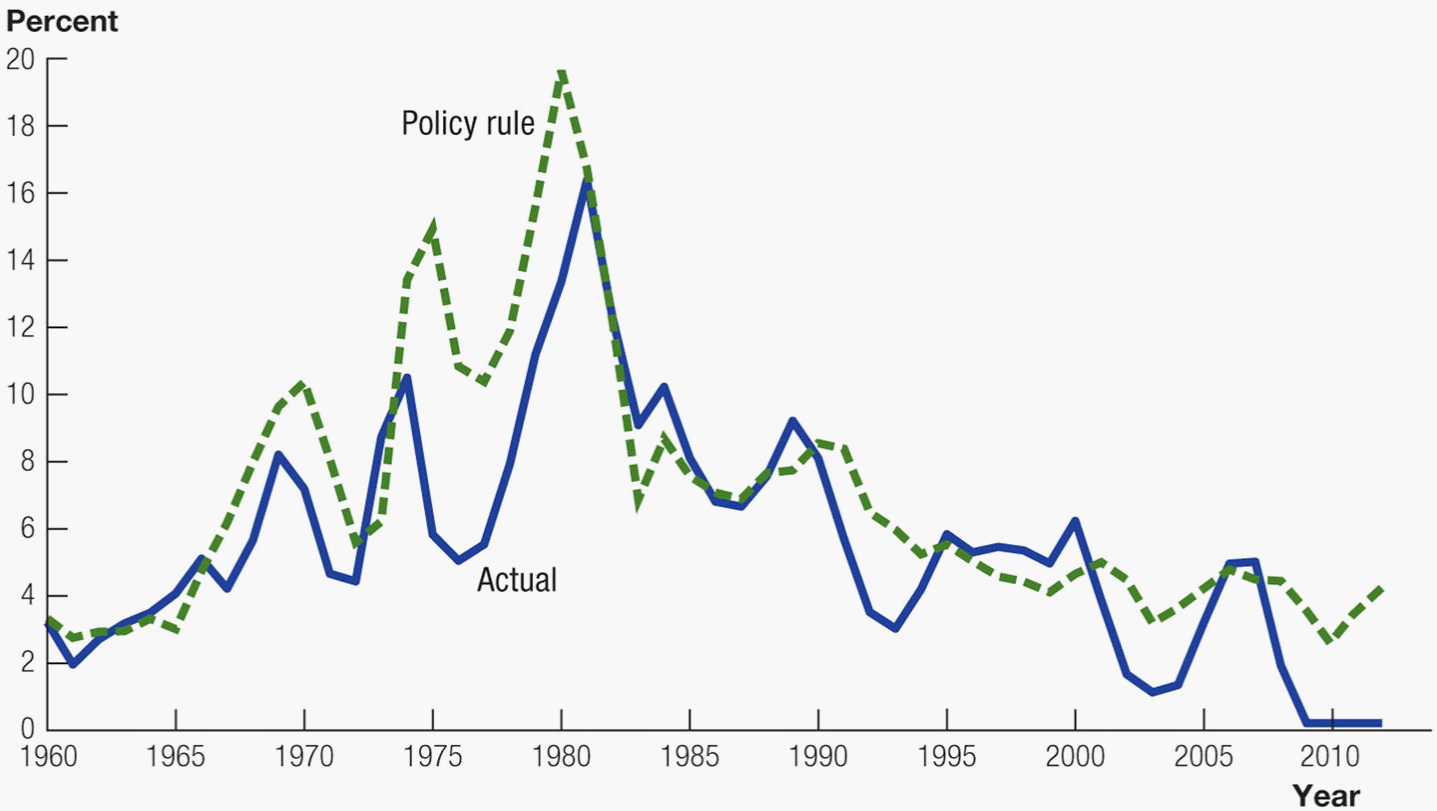
- Assume

$$\bar{m} = 1/2, \bar{r} = 2\%, \bar{\pi} = 2\%$$

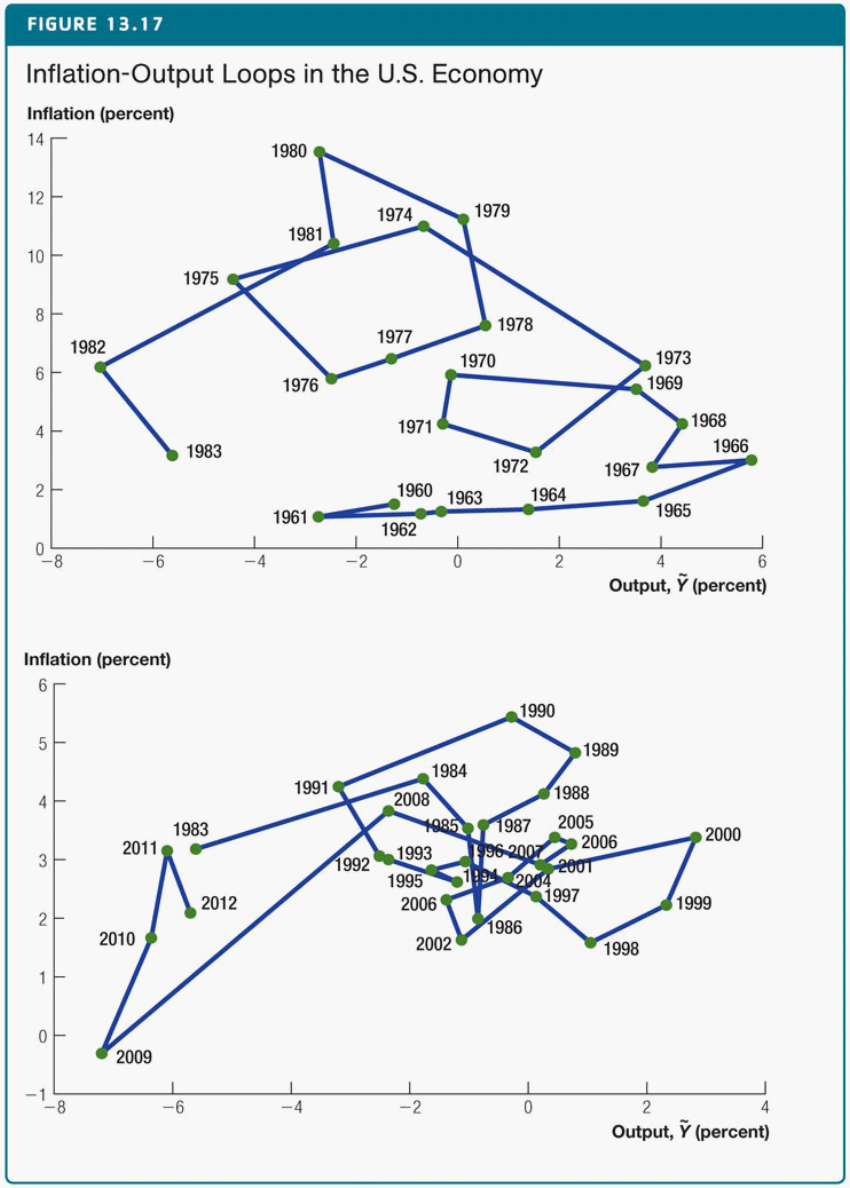
Actual and predicted level for the fed funds rate

FIGURE 13.16

The Fed Funds Rate, Actual and Predicted



Inflation-Output Loops



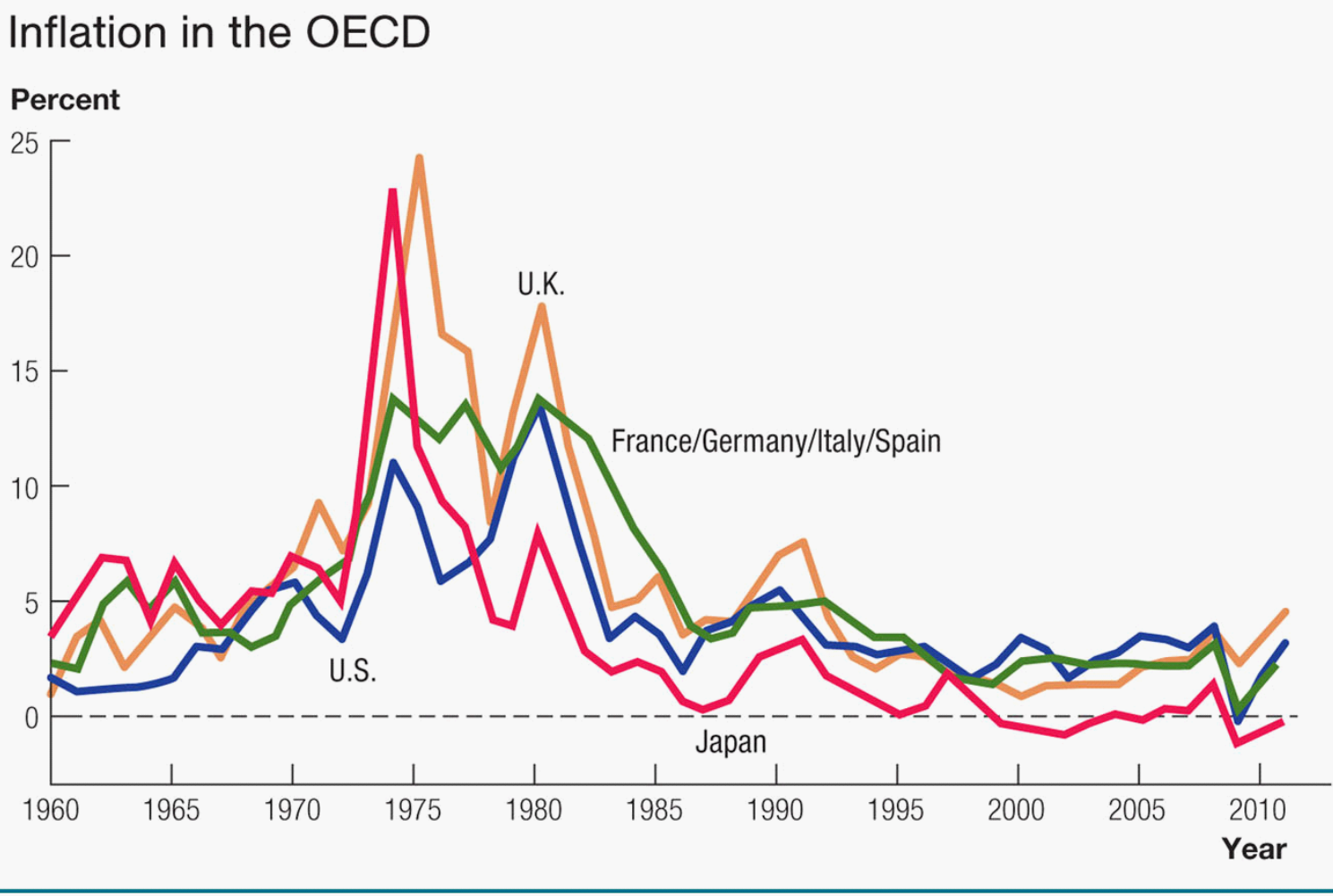
VII – Modern Monetary Policy

Modern Monetary Policy: the essence

1. Central banks are now more explicit about policies and targets.
2. They react very aggressively against inflation
3. Inflation rates in industrialized countries have been well behaved for the last 25 years.

Low inflation

FIGURE 13.19



More Sophisticated Monetary Policy Rules

1. The simple policy rule we used considers only a reaction to inflation.
2. Richer monetary policy rules that use also short-run output create results similar to the simpler model.
3. The Taylor Rule is such a rule
4. It considers also a reaction to the output gap

$$\begin{aligned} i_t &= \pi_t + R_t \\ &= \pi_t + \bar{r} + \bar{m}(\pi_t - \bar{\pi}) + \underbrace{\bar{n} \cdot \tilde{Y}_t}_{novelty} \end{aligned}$$

where $\bar{n}$ is a parameter.

The Paradox of Policy and Rational Expectations

1. The goal of macroeconomic policy:
   1. Full employment
   2. Output at potential
   3. Low, stable inflation
2. Remember adaptive expectations

$$\pi_t^e = \pi_{t-1}$$

3. Now ... Rational Expectations

$$\pi_t^e = \pi_t$$

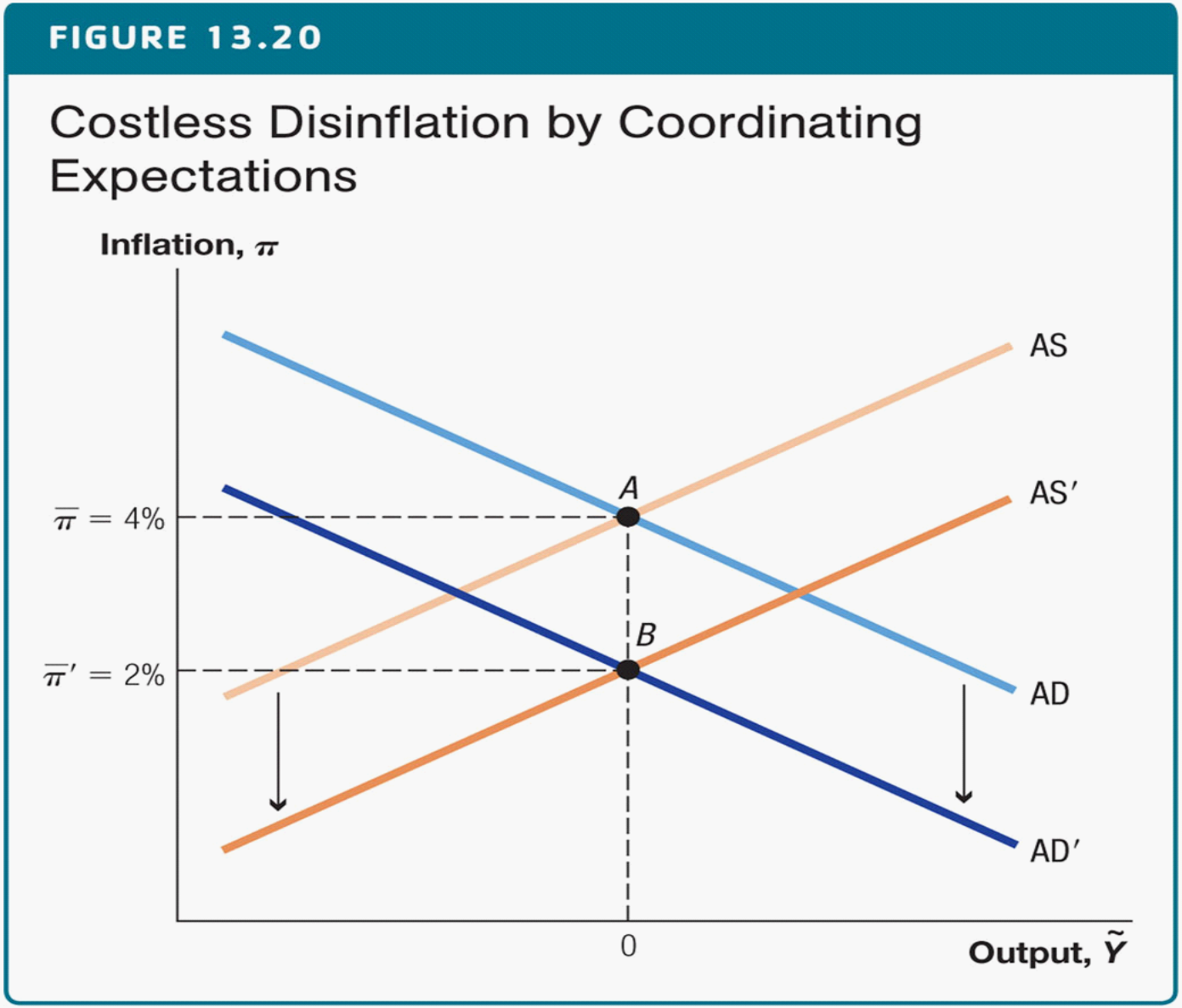
The AS/AD Model with Rational Expectations

- Remember that the AS curve is given by

$$\pi_t = \pi_t^e + \bar{v}\tilde{Y}_t + \bar{o}$$

- If the Federal Reserve lowers the inflation target:
  - The AD curve shifts down.
  - If expectations adjust immediately and people use all information, the AS curve shifts down immediately to the new target.
- Inflation can be kept low without recessions.

Rational Expectations and costless disinflation



VII – Required readings

Required reading

For this week you are required to read **Read Chapter 13** of our adopted textbook.

Charles I. Jones (2014). Macroeconomics, Third Edition, W. W. Norton & Company.