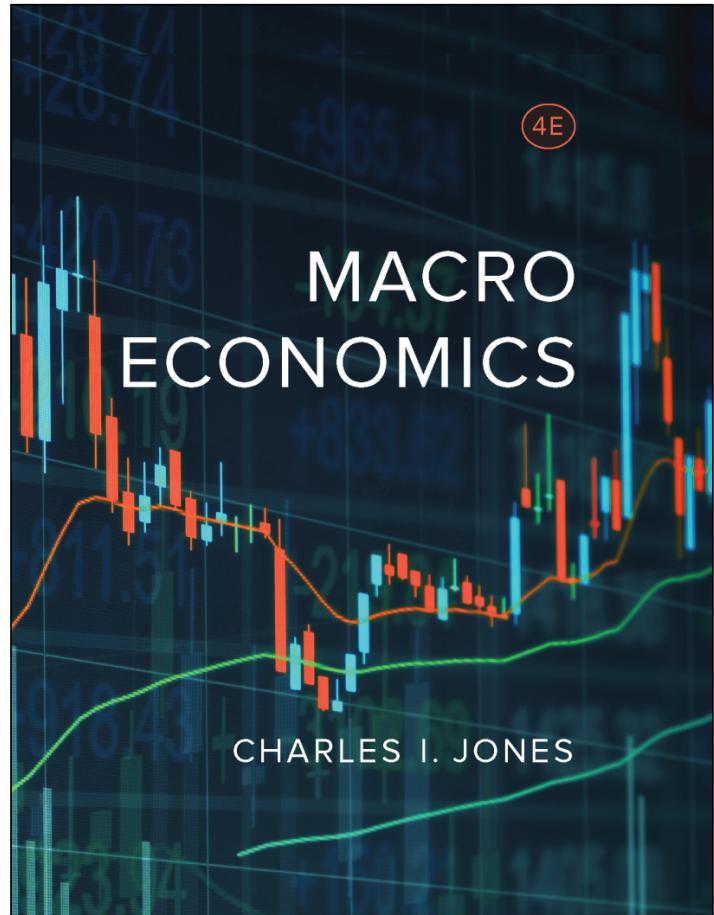


Chapter 13

Stabilization Policy and the AS/AD Framework

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13.1 Introduction

- In this chapter, we learn:
 - The IS and MP curves combine to get the AD curve
 - The Phillips curve can be shown as the AS curve
 - Movements in the economy can be shown in the AS/AD model
 - Modern monetary policy theories
 - The appropriate policy response to shocks

13.2 Monetary Policy Rules and Aggregate Demand

- The short-run model has three components:

IS curve

$$\tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r})$$

MP curve

The central bank chooses R_t

Phillips curve

$$\Delta\pi_t = \bar{v}\tilde{Y}_t + \bar{\sigma}$$

- High short-run output increases inflation
- The central bank faces this trade-off and chooses the interest rate

Simple Monetary Policy Rule

$$R_t - \bar{r} = \bar{m} (\pi_t - \bar{\pi})$$

↑
set real int.

↑
laissez faire interest rate
current inflation
in response to
govern how aggressively monetary policy responds to inflation.
inflation target.

The AD Curve—1

- Substitute the policy rule into the IS curve

$$\text{Policy rule: } R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi})$$

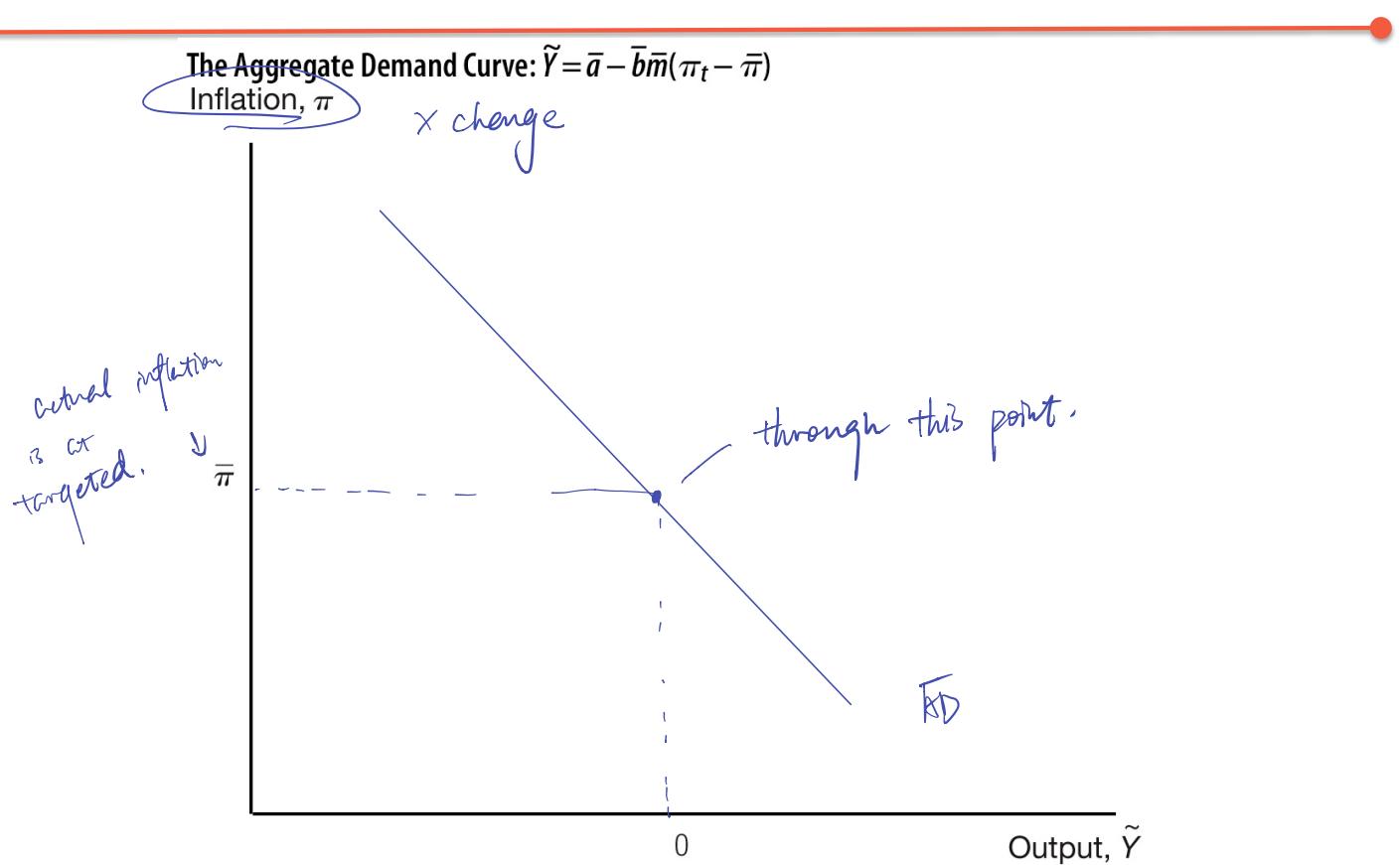
$$\text{IS curve: } \tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r})$$

- To get the aggregate demand (AD) curve

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

short-run output is a function of the inflation rate.

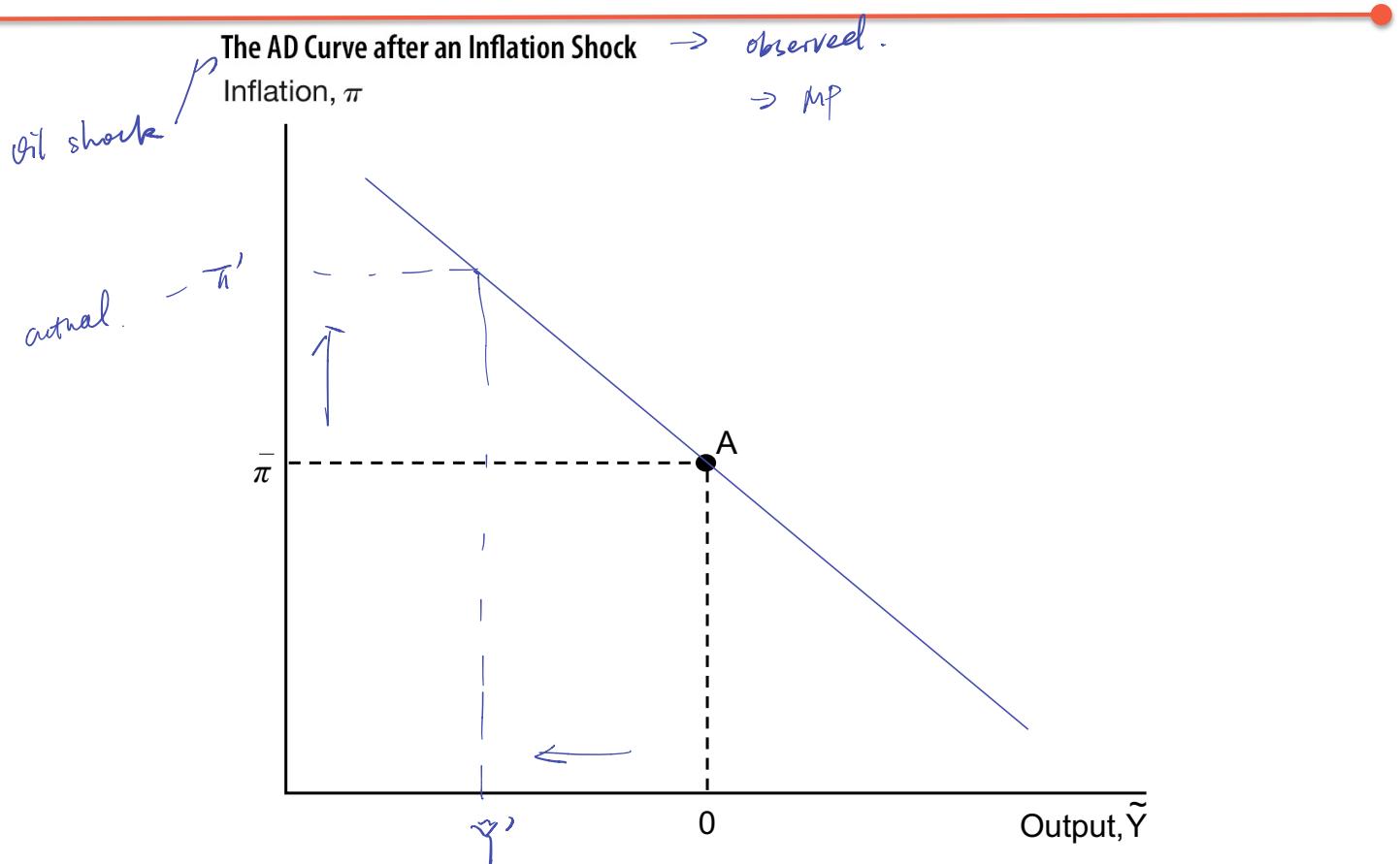
The AD Curve—2



The AD Curve—3

- The AD curve
 - is built from the demand side
 - describes how the central bank sets short-run output (via the nominal / real interest rate) for each rate of inflation.
- Change in inflation
 - = movement along the AD curve.
- Changes in \bar{m} (sensitivity of monetary policy rule) alter the slope of the AD curve.

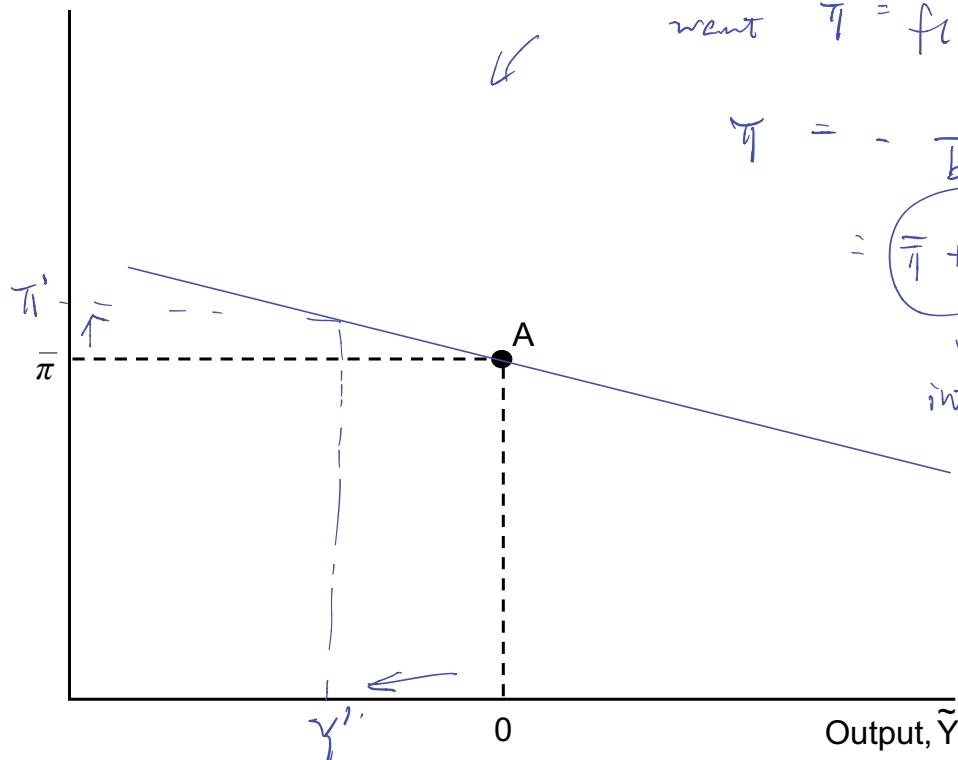
The AD Curve after an Inflation Shock



An Aggressive Monetary Policy Rule

$$R_t - \bar{r} = \frac{m}{\downarrow \text{big number}} (\bar{\pi} - \tilde{\pi}). \Rightarrow \text{flatter}$$

An Aggressive Monetary Policy Rule
Inflation, π



$$\tilde{\pi} = \bar{a} - \bar{b}\bar{m} (\bar{R}_t - \bar{\pi})$$

want $\bar{\pi} = f(\tilde{\pi})$

$$\bar{\pi} = -\frac{1}{\bar{b}\bar{m}} (\tilde{\pi} - \bar{a}) + \bar{\pi}$$

$$= \left(\bar{\pi} + \frac{\bar{a}}{\bar{b}\bar{m}} \right) - \frac{\bar{Y}}{\bar{b}\bar{m}}$$

\downarrow
intercept.

Shifts of the AD Curve

- AD curve shifts are caused by:
 - Changes in the parameter \bar{a}
 - Changes in the target rate of inflation $\bar{\pi}$

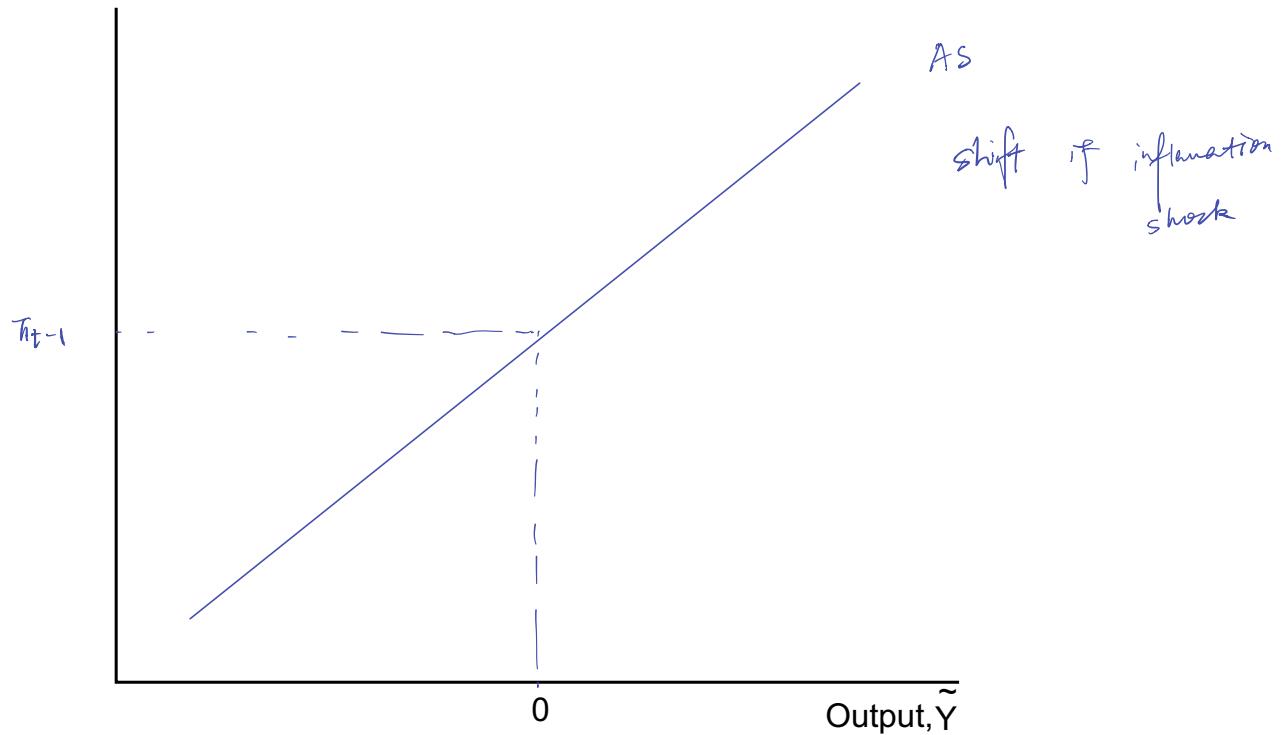
13.3 The Aggregate Supply Curve

- The aggregate supply (AS) curve is
 - the price-setting equation used by firms
 - the **Phillips curve** with a new name
- Equation:

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

The Aggregate Supply Curve—1

The Aggregate Supply Curve: $\pi_t = \pi_{t-1} + \bar{\nu} \tilde{Y}_t + \bar{o}$
Inflation, π



The Aggregate Supply Curve—2

- The AS curve will shift due to
 - The inflation rate changing over time
 - consider one - the inflation shock $\bar{\alpha} > 0$.
 - $\tilde{\gamma}_t = 0 \Rightarrow \tilde{\pi}_t = \tilde{\pi}_{t-1}$
 - Change in the inflation shock parameter

$$\tilde{\pi}_t = \tilde{\pi}_{t-1} + \bar{v}$$

$$= \tilde{\pi}_{t-1} + \bar{v} (\tilde{\gamma}_t)$$

\downarrow

$\underbrace{\bar{v}}_{<0} \quad \bar{v} > 0$

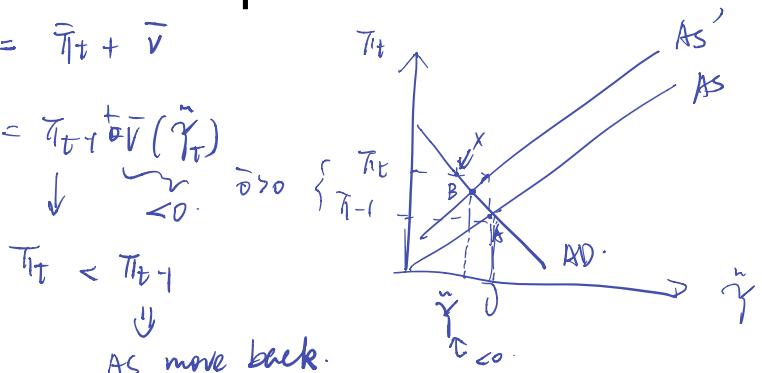
$$\tilde{\pi}_t < \tilde{\pi}_{t-1}$$

\downarrow

AS move back.

until to \textcircled{A} .

$$A \rightarrow B. \quad \tilde{\pi}_B > \tilde{\pi}^{\text{target}}$$



13.4 The AS/AD Framework

- Combining the AS and AD curve
 - Two equations
 - Two unknowns: inflation rate and short-run output

AD curve

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

AS curve

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

The Steady State—1

- In the steady state
 - the endogenous variables are constant over time
 - no shocks to the economy
- From the AS curve:

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

$$\pi^* = \pi^* + \bar{\nu} \tilde{Y}_t + o$$

$$\tilde{Y}_t = o.$$

The Steady State—2

- From the AD curve:

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

$$0 = \bar{a} - \bar{b} \bar{m} (\bar{\pi}_T - \bar{\pi})$$

$$\bar{\pi}_T = \bar{\pi} = \bar{\pi}^*$$

- So, in the steady state,

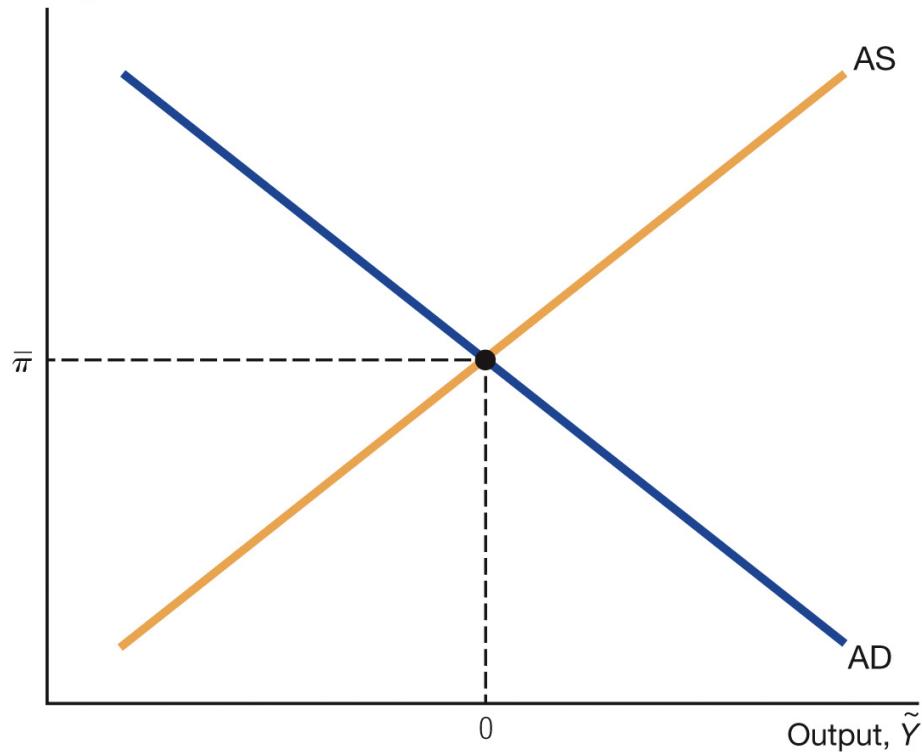
$$\pi_t = \bar{\pi} = \bar{\pi}^*$$

$$\gamma_t^n = 0.$$

The AS/AD Framework

The AS/AD Framework

Inflation, π



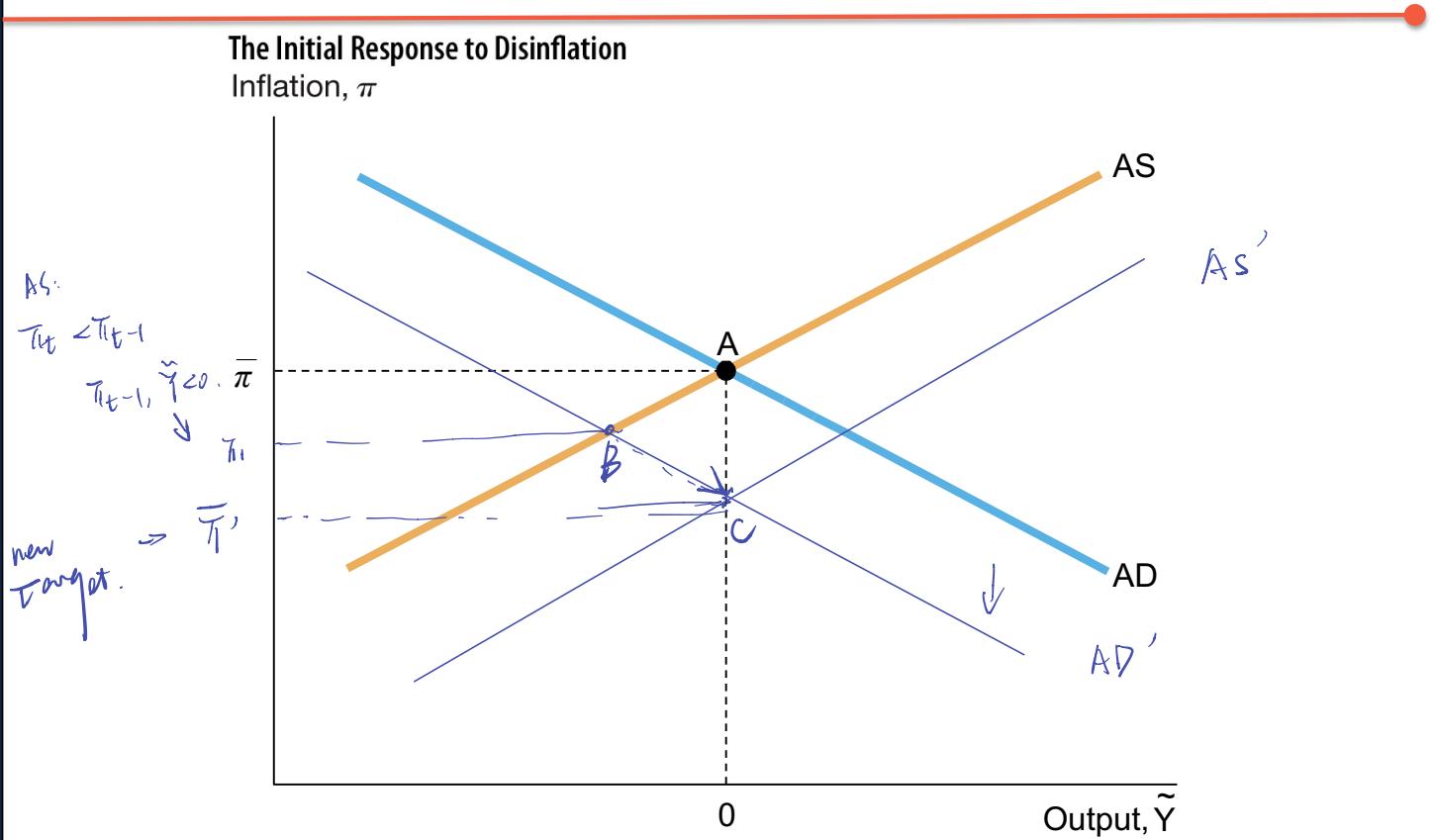
13.5 Macroeconomic Events:

- Review #1 and #3 in textbook independently
- The “stagflation” event (#1), in particular, is an important macroeconomic episode
- Event #2 (Disinflation) covered today

Event #2: Disinflation—1

- The economy begins in steady state.
- Suppose policymakers decide to lower the inflation target
 - the AD curve shifts down
 - the new rule calls for an increase in interest rate.

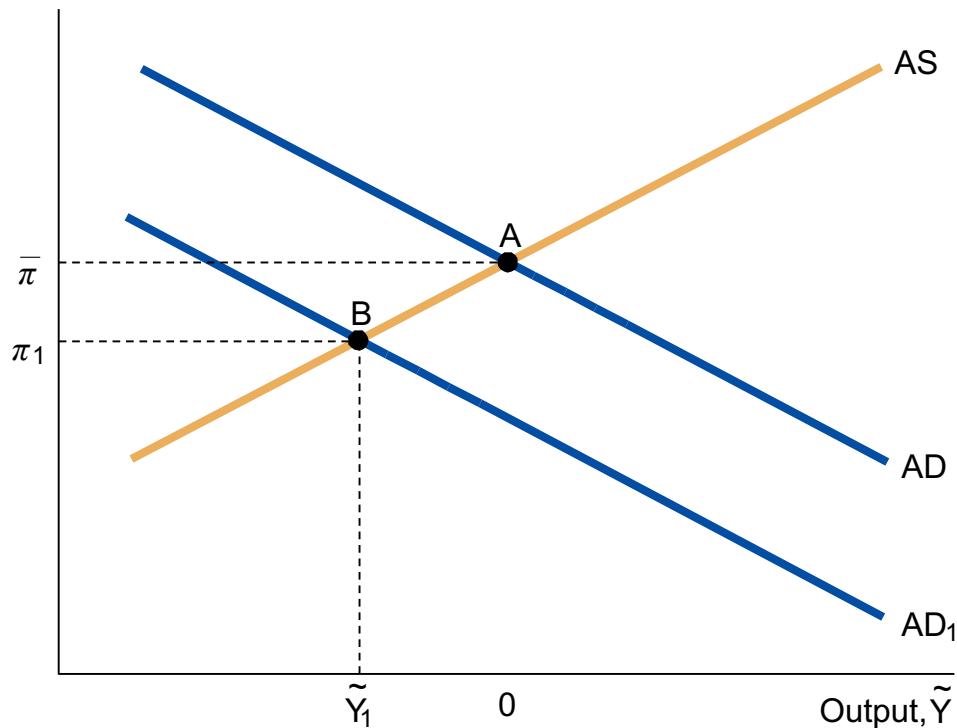
The Initial Response to Disinflation



The Dynamics of Disinflation

The Dynamics of Disinflation

Inflation, π



Event #2: Disinflation—2

change in the rate of inflation

firms adjust expectation of inflation
(lower).

As curves shifts to the right

Event #2: Disinflation—3

- **Note:**
If the classical dichotomy holds in the short run, the AD and AS curves would reach the new steady state **immediately**
- If there is **sticky** inflation, a recession is needed to **adjust expectations** down

13.6 Empirical Evidence: Predicting the Fed Funds Rate

Use the **Fisher equation** to write the monetary policy rule in terms of the nominal interest rate:

Policy rule: $R_t - \bar{r} = \bar{m}(\pi_t - \bar{\pi})$

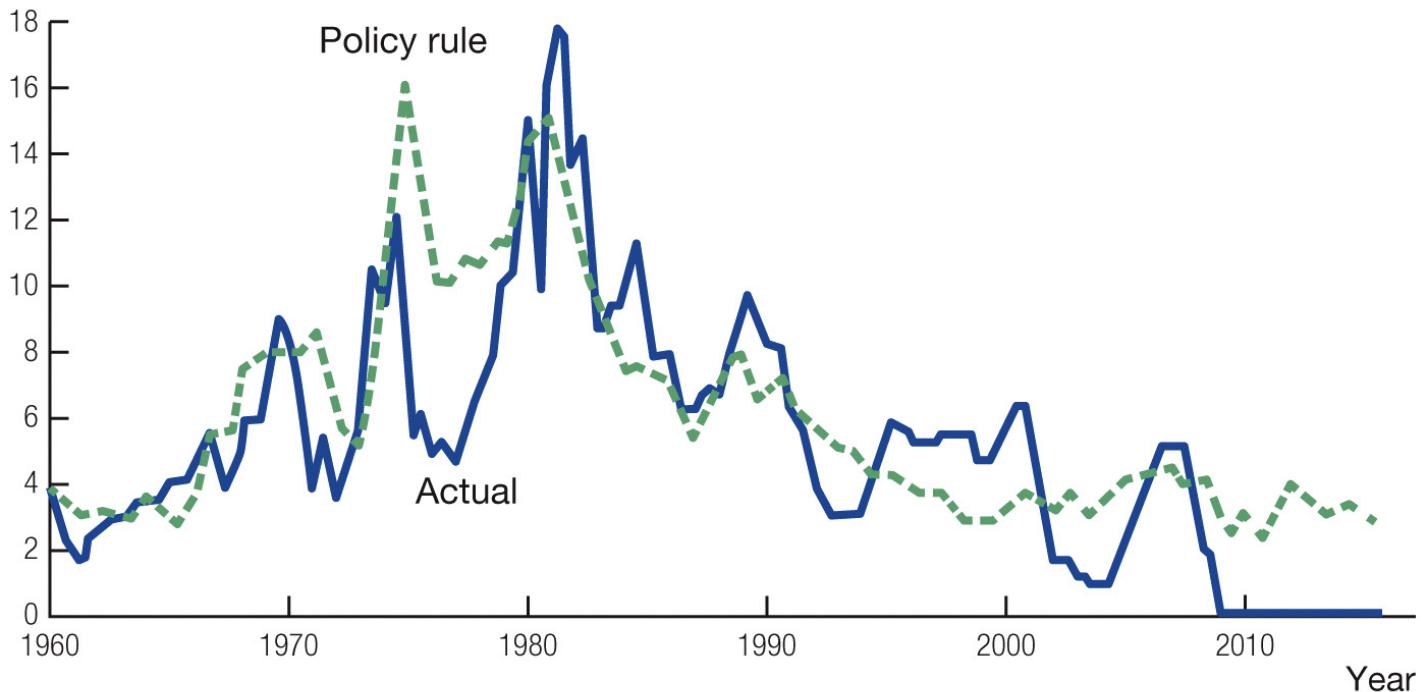
Fisher equation: $i_t = R_t + \pi_t$

$$i_t = \bar{r} + \pi_t + \underbrace{\bar{m}(\pi_t - \bar{\pi})}_{\text{MPK}}$$

The Fed Funds Rate, Actual and Predicted

The Fed Funds Rate, Actual and Predicted

Percent



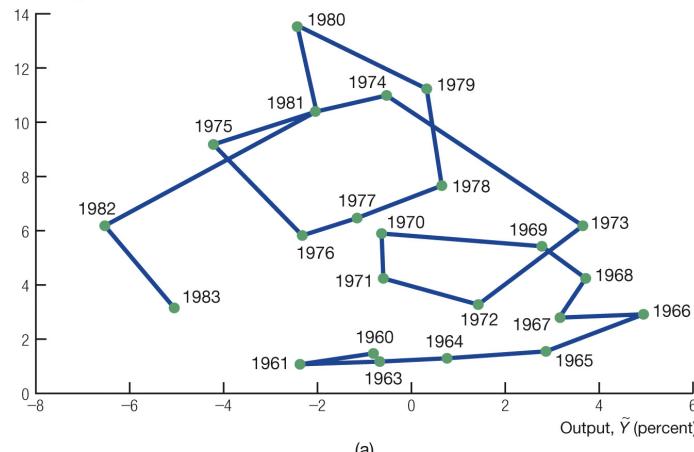
Inflation-Output Loops

- Vertical axis: inflation
- Horizontal axis: output
 - Following shocks
 - The economy moves in **counterclockwise** loops
 - Positive short-run output leads to rising inflation
 - A rise in inflation leads policymakers to reduce output

Inflation-Output Loops in the U.S. Economy

Inflation-Output Loops in the U.S. Economy

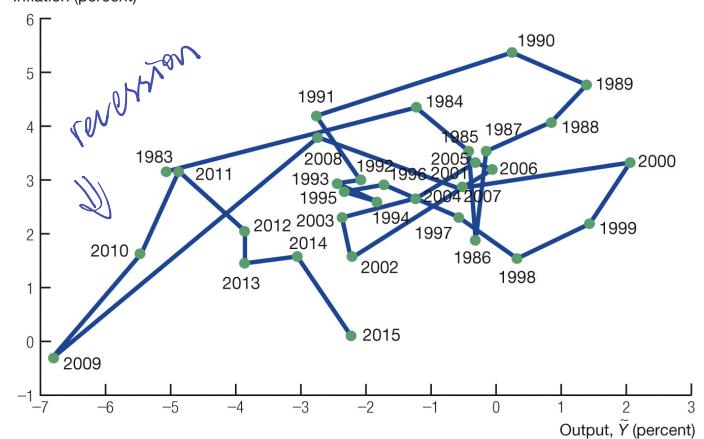
Inflation (percent)



(a)

Inflation-Output Loops in the U.S. Economy

Inflation (percent)



(b)

$\tilde{Y} \rightarrow$ potential inflation ↑
FR Policy inflat ↓

13.7 Modern Monetary Policy

FR: 透明化 MP \Rightarrow FR: transparency

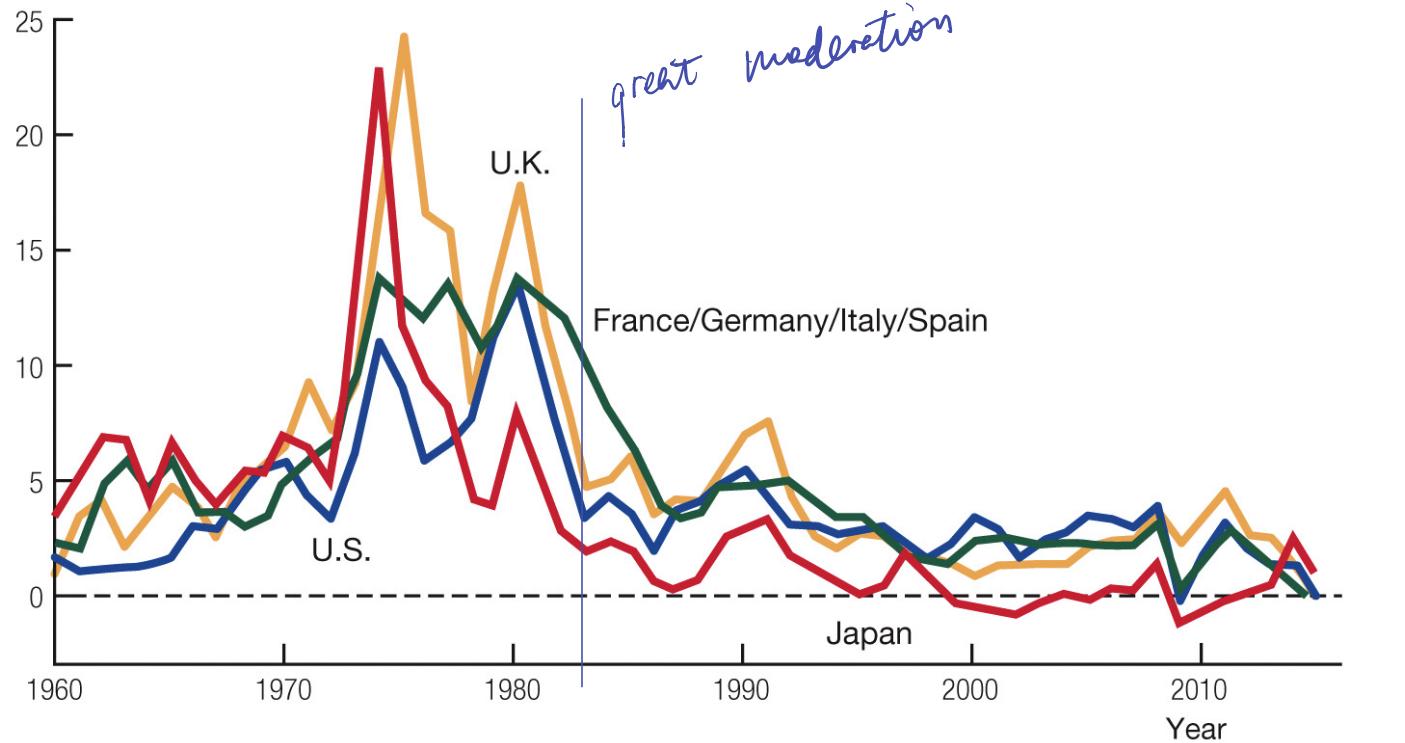
preview for future

- The short-run model captures many features of monetary policy
- Central banks are now more explicit about policies and targets (they used to be very secretive!)
- Inflation rates in industrialized countries have been well-behaved for the last 25 years

Inflation in the OECD

Inflation in the OECD

Percent



More Sophisticated Monetary Policy Rules

$$R_t - \bar{r} = \bar{\pi}(\bar{\pi}_T \cdot \bar{\gamma}) + \bar{n}(\bar{\gamma}_t)$$

- Richer monetary policy rules that use short-run output
 - Example: so-called “Taylor Rule(s)”
 - create results similar to the simpler model
- The simple policy rule we used implicitly weights short-run output
- Rules can mitigate **time consistency problem** (Kydland & Prescott)

*say do sth. today
and do different
Central Bank constraint.
want behavior according to rule.
could Taylor rule*

Rules versus Discretion

- The **time consistency** problem
 - Even though an agent supports a particular policy, once the future comes, they have incentives to renege on their promises
- Firms and workers form expectations about inflation
 - Expectations are built into prices and contracts
 - Central bankers pursue an expansionary policy
 - Firms and workers anticipate the policy and build it in
 - No benefit to output

The Paradox of Policy and Rational Expectations—1

- The goal of macroeconomic policy
 - Full employment
 - Output at potential
 - Low, stable inflation
- The presence of a policymaker willing to generate a large recession to fight inflation makes policy use less likely

The Paradox of Policy and Rational Expectations—2

given information

- Under adaptive expectations, we assume
- We assume the equation does not change with policy rule changes
 - Due to sticky inflation
 - And “pre-Lucas critique”-style expectations

** have expectation inconsistent with policy*

(MP by FR).

The Paradox of Policy and Rational Expectations—3

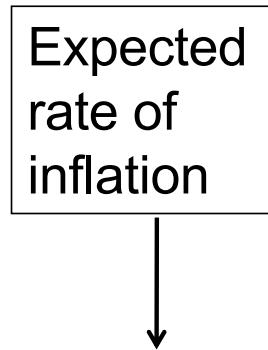
- **Rational expectations:**
People use **all information** at their disposal
to make their best forecast of the rate of
inflation

The Paradox of Policy and Rational Expectations—4

- This information may include the costs resulting in sticky inflation but may also add the target rate of inflation and the Fed's willingness to start a recession (captured by the parameter \bar{m})
- If firms know the bank will fight **aggressively** to keep inflation low, they are **less likely** to raise prices after an inflation shock

Managing Expectations in the AS/AD Model—1

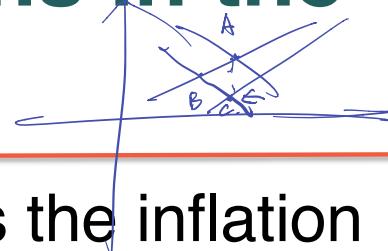
- We can drop the assumption of adaptive expectations and rewrite the AS curve in terms of the expected rate of inflation:



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

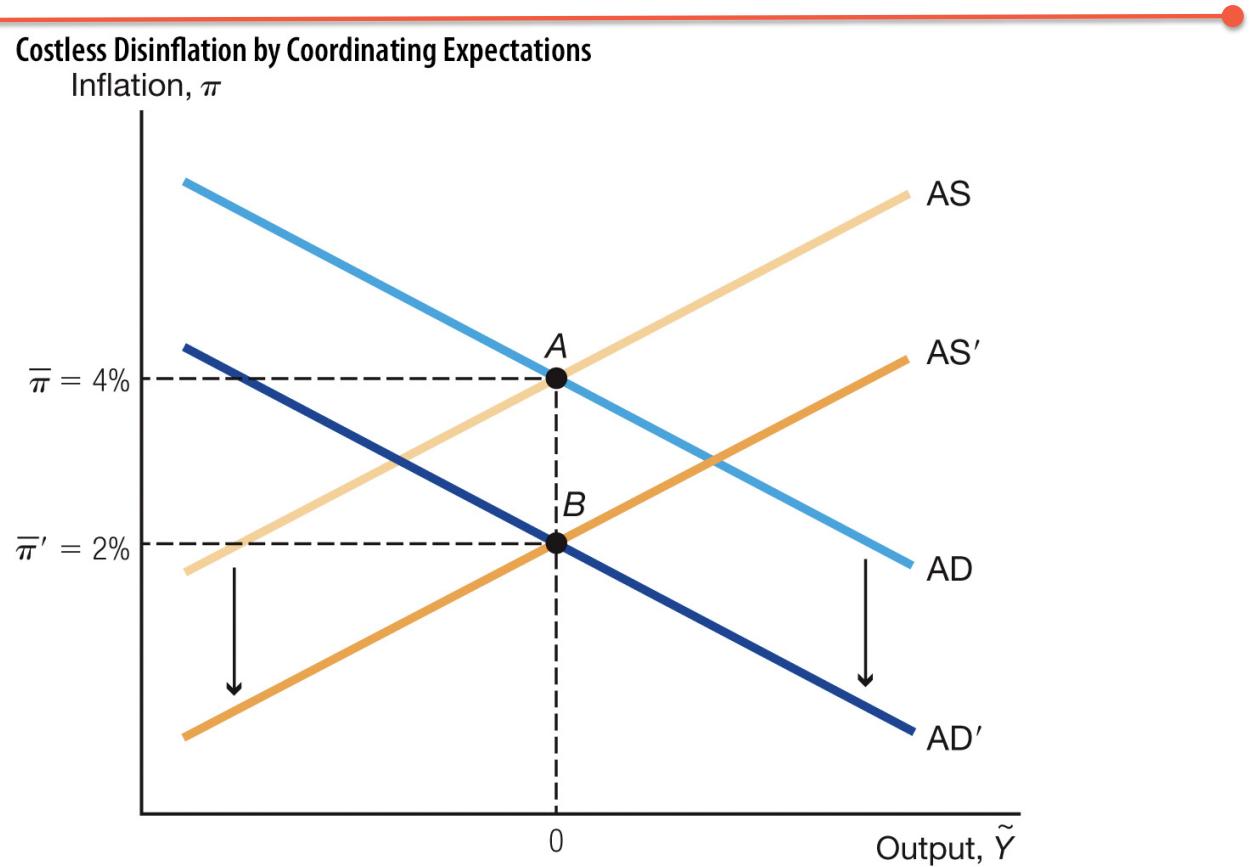
越接近， π_t 变更越少。

Managing Expectations in the AS/AD Model—2



- If the Federal Reserve lowers the inflation target:
 - AD shift down
 - if expectation adjust immediately and people use all info the AS shift down immediately to the new model.
- If the central bank can control expectations of inflation, then inflation can be kept low without recessions

Costless Disinflation by Coordinating Expectations



Case Study: Rational Expectations and the Lucas Critique

- The Lucas critique:

13.8 Conclusion

- A credible, transparent commitment to a low rate of inflation is one of the key factors in taming inflation
 - Anchors inflation expectations so that shocks are deflected quickly
 - Stabilizes economy
- The period after the 1980–82 recession
 - “The Great Moderation”
 - Relative stability of the macroeconomy