

# Unit 15

## Inflation, Unemployment and Monetary Policy

Hui-Jun Chen

The Ohio State University

March 19, 2023

# Introduction



# Introduction

Textbook

Age of Easy Money

- **Stable** economy is desirable, and the stabilizing **price level** is the key
- **Inflation** as the result of price level rises
- **Phillips curve**: the trade-off between inflation and unemployment
- Central bank use **monetary policy** in response to inflation
- Yet, there's some **consequences** regarding Quantitative Easing:
  - 2008 Great Recession → QE policy → Money goes to financial mkt
  - Moral Hazard: profit goes to my pocket, loss bailed out by Fed
  - ⇒ Too much money facilitates speculation: fragile financial system
  - ⇒ crypto hype & crash (FTX); Silicon Valley Bank bank run

# Inflation

# Key Concepts

- **Inflation:** an increase in the general price level
- **Zero inflation:** A constant price level from year to year
- **Deflation:** A decrease in the general price level
- **Disinflation:** A decrease in the rate of inflation

$$r = i - \pi, \quad (\text{The Fisher Equation})$$

where  $r$  is real interest rate,  $i$  is nominal interest rate, and  $\pi$  is inflation rate

# What's wrong with inflation?

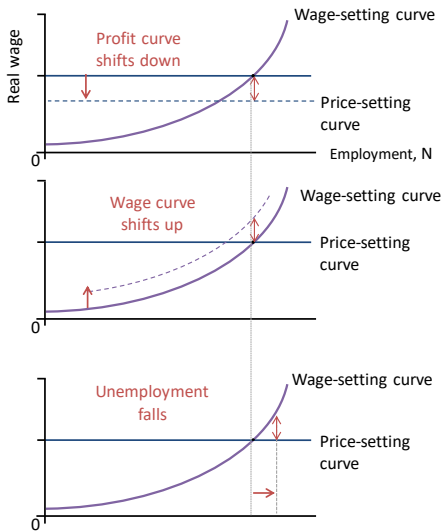
- Workers paid with fixed nominal income,  $\pi \uparrow \Rightarrow$  real income  $\downarrow$ .
- Inflation **reduces the real** value of debt: borrowers 😊 yet creditors ☹️.
- High rate of inflation makes the economy work less well:
  - High inflation is often volatile  $\rightarrow$  uncertainty
  - Harder for producers: changes in **relative prices** or inflation?
  - **menu costs** as firms have to update their prices more frequently

# What's wrong with deflation?

- Deflation could cause worse consequences than high inflation.
- When price  $\downarrow$ , HH postpone consumption
  - $\therefore$  **expect** goods to be cheaper in the future
  - **Increase** real debt burden, cut consumption for target wealth
- $\Rightarrow$  negative shock to aggregate demand

# Causes of inflation

Figure 15.2. Three causes of inflation.



1. Owners' power rises relative to consumers (e.g. lower competition) – medium to long run

2. Employees' power rises relative to owners (e.g. stronger unions) – medium to long run

3. Employees' power rises relative to owners in a business cycle upswing – short to medium run





# Phillips Curve



# Inflation and unemployment

Unemployment  $\uparrow \approx$  inflation  $\downarrow$

- increases workers' bargaining position  $\rightarrow$  higher wages  $\rightarrow$  higher cost of production  $\rightarrow$  higher prices



# Inflation and Aggregate Demand

upswing in business cycle is often associated with rising inflation.

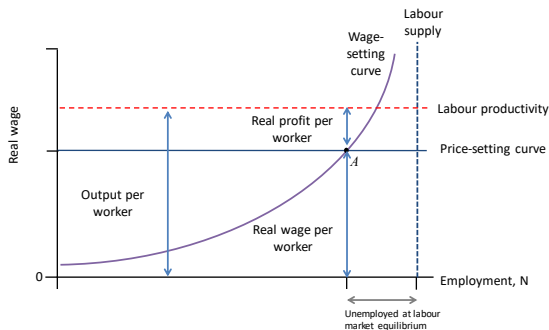
- higher aggregate demand → higher employment → higher wages → higher cost of production → higher prices
- the economy experiences (nominal) price and wage inflation, but the *real wage* ( $W/P$ ) has not increased
- constant real wage means that employment stays high
- ... and the wage-price spiral continues

## Stable price level

Prices are stable ( $\pi = 0$ ) when the labor market is in equilibrium.

Figure 15.4a. Inflation and conflict over the pie: Stable price level at labour market equilibrium.

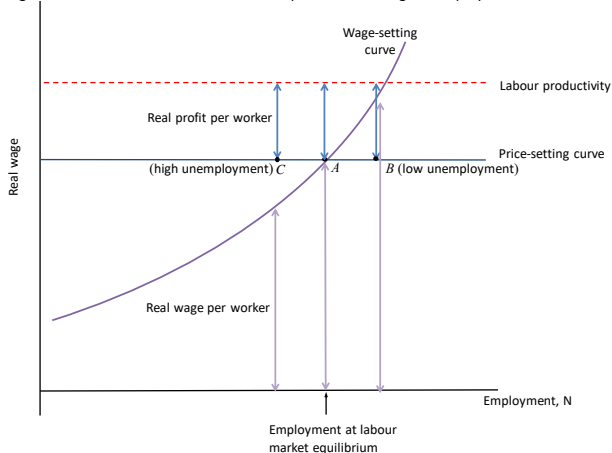
- Recall the labor productivity & share of pie between worker and firm
- Point  $A$  is labor market equilibrium



# Stable price level

Prices are stable ( $\pi = 0$ ) when the labor market is in equilibrium.

Figure 15.4b. Inflation and conflict over the pie at low and high unemployment.



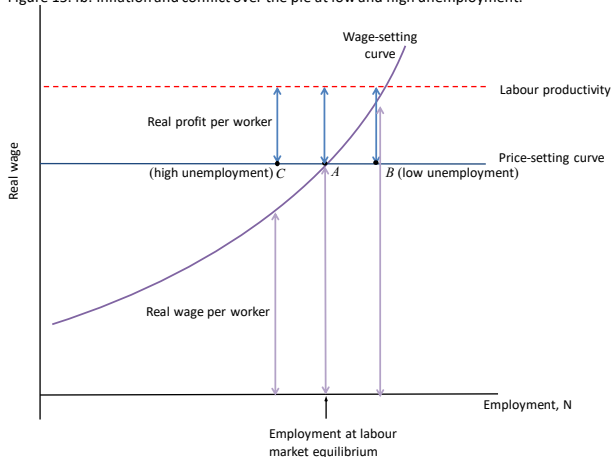
- Point  $B$  is unemployment too low  $\Rightarrow$  employment rent too low

- Point  $C$  is unemployment too high  $\Rightarrow$  firms hold too high bargaining power

# Stable price level

Prices are stable ( $\pi = 0$ ) when the labor market is in equilibrium.

Figure 15.4b. Inflation and conflict over the pie at low and high unemployment.



- Pt  $B$ : workers' claims to real wages + firms' claims to real profits  $>$  total productivity  $\rightarrow$  upward pressure on wages and prices

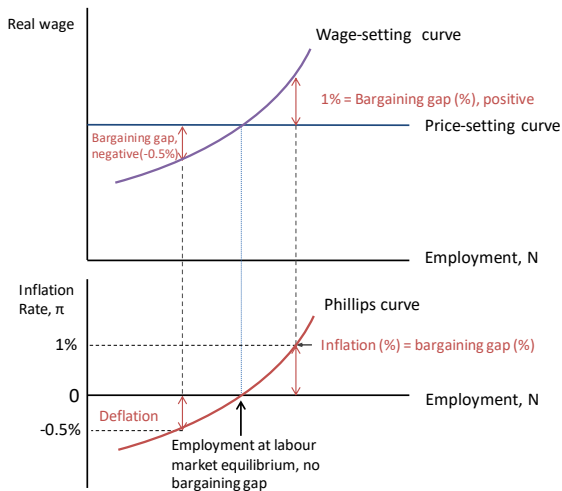


# The bargaining gap

- **Bargaining gap:** The difference between the real wage required to incentivize effort, and the real wage that gives firms enough profits to stay in business.
- Unemployment is below equilibrium: a positive bargaining gap and inflation.
- Unemployment is above equilibrium: a negative bargaining gap and deflation.
- Labour market equilibrium: the bargaining gap is zero and the price level is constant.

# Phillips Curve

Figure 15.4c. Bargaining gaps, inflation, and the Phillips curve.



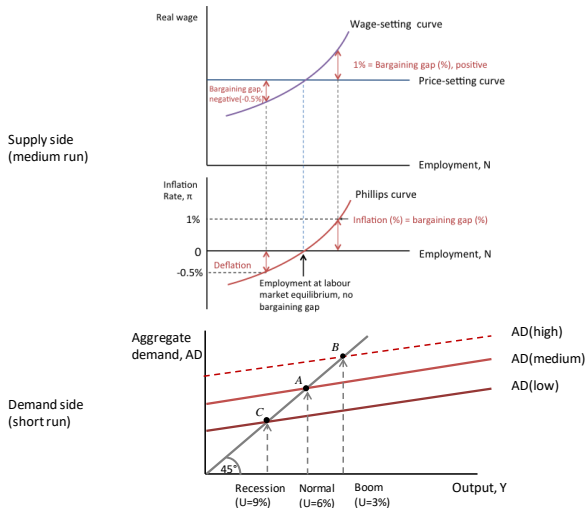




# Phillips Curve and the Business Cycle

A positive bargaining gap in boom  $\rightarrow$  inflation

Figure 15.4d. The short-and medium-run models: Aggregate demand, employment, and inflation

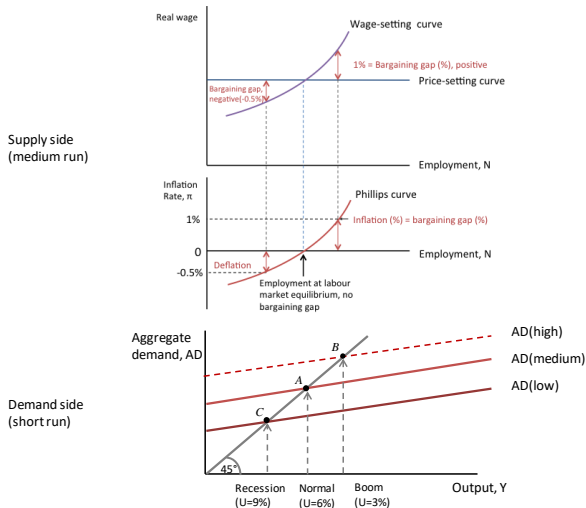




# Phillips Curve and the Business Cycle

A negative bargaining gap in recession  $\rightarrow$  deflation

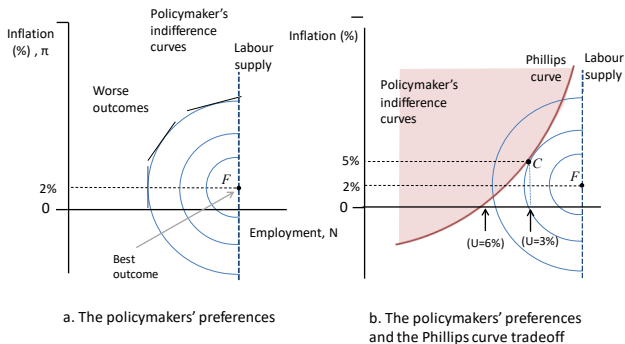
Figure 15.4d. The short-and medium-run models: Aggregate demand, employment, and inflation



# Central Bank's Decision

Figure 15.5. The Phillips curve and the policymaker's preferences.

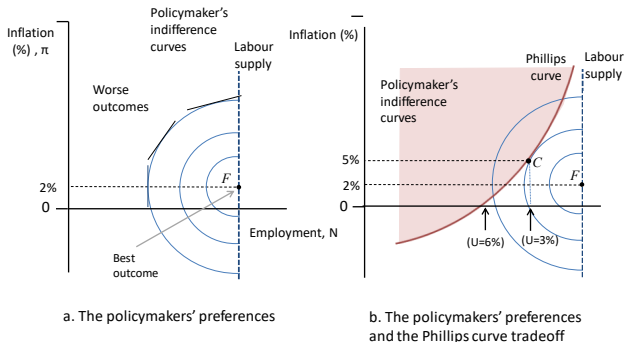
- Phillips Curve determines the **feasible trade-offs** between inflation and unemployment. (MRT)



# Central Bank's Decision

- Indifference curves show policymaker's preferred tradeoffs between inflation and unemployment. (MRS)

Figure 15.5. The Phillips curve and the policymaker's preferences.

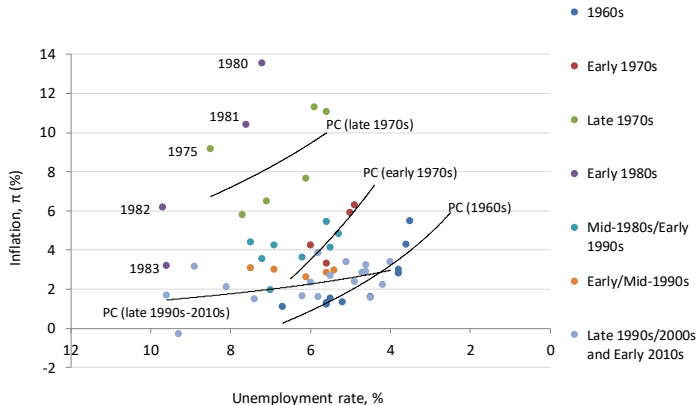


- Target at 0% unemployment ✓
- Target at 2% inflation rate???

What's So Special About 2% Inflation?

# Phillips Curve Over Time

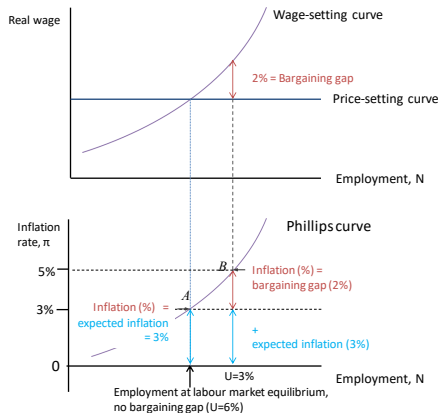
- Phillips Curve shifts over time
- Keeping unemployment “too low” leads to higher prices & rising inflation



# The role of expectations

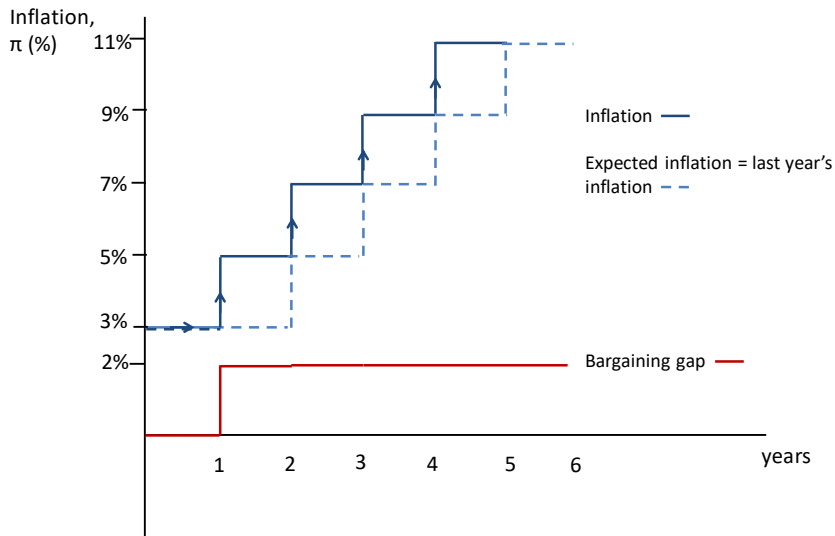
- Inflation =  
expected inflation  
+ bargaining gap
- If bargaining gap  
= 0, i.e., labor  
market in  
equilibrium, then  
inflation is  
constant

Figure 15.7. Bargaining gaps, expected inflation, and the Phillips curve.



# Expected Inflation Evolves with Positive Bargaining Gap

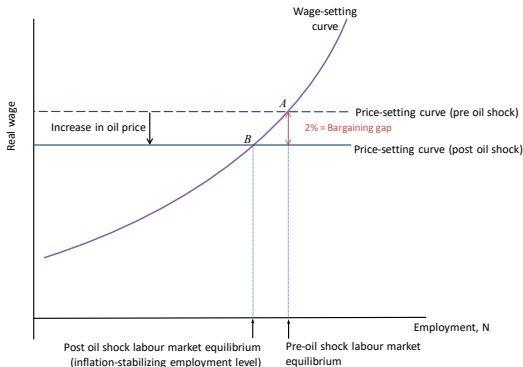
Figure 15.10. Inflation, expected inflation, and the bargaining gap.



# Supply Shock

- Def: unexpected change on the supply-side of the economy
  - e.g. oil price shock.
  
- price of oil  $\uparrow$
  
- $\rightarrow$  downward shift of price-setting curve
  
- $\rightarrow$  prices rise
  
- $\rightarrow$  real wages fall
  
- $\rightarrow$  positive bargaining gap

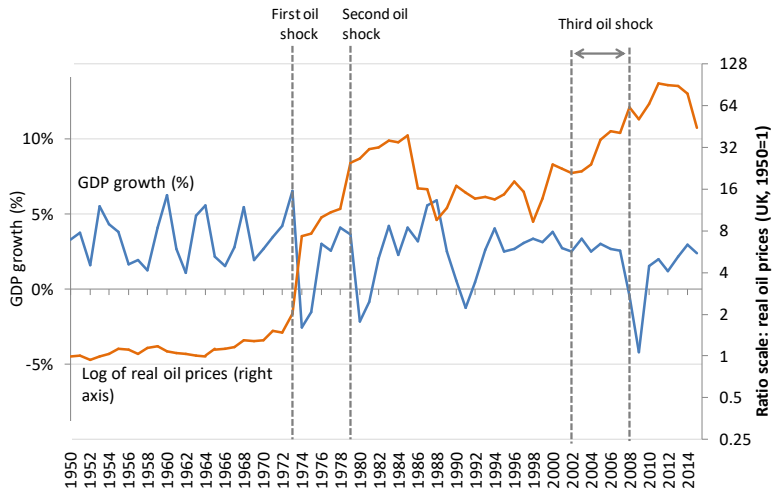
Figure 15.11. An oil shock and the price-setting curve.





# Oil Price Shock in 1970s

Figure 15.12. UK GDP growth and real oil prices (1950-2015).

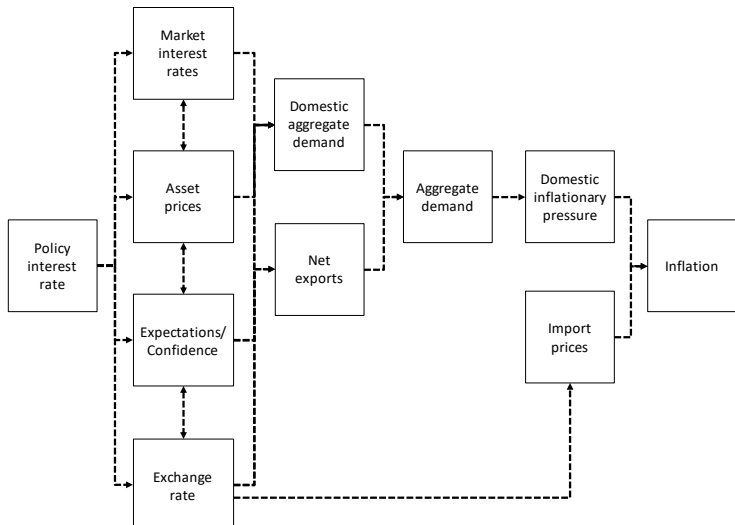




# Monetary Policy

# Transmission Mechanism

Figure 15.14. Monetary policy transmission mechanisms.



# Market Interest Rates

To set the policy rate, the central bank will work backwards:

- 1 Choose the desired level of aggregate demand, based on the labour market equilibrium and the Phillips curve
- 2 Estimate the real interest rate, which will produce this level of aggregate demand (using the multiplier model)
- 3 Calculate the nominal policy rate that will produce the appropriate market interest rate.

# Asset prices

- A change in the policy rate has a ripple effect through all the interest rates in the economy.
- When the interest rate goes down, the price of assets goes up.
- Households who own assets will be wealthier, which will increase their consumption.



# Profit expectations

- Consistent policymaking and good communication with the public builds confidence in the Central Bank.
- This can lead firms to expect higher demand and therefore increase investment.
- Households may be confident that they will not lose their jobs, and they may increase their consumption.

# Exchange rate

- **Exchange rate:** number of units of home currency that can be exchanged for one unit of foreign currency.
- Interest rates affect demand for home currency in the foreign exchange market, so affects the exchange rate (**appreciation/depreciation**).
- The exchange rate affects relative demand for home-produced goods, so affects net exports.
- Therefore, interest rates affect aggregate demand through the market for financial assets.



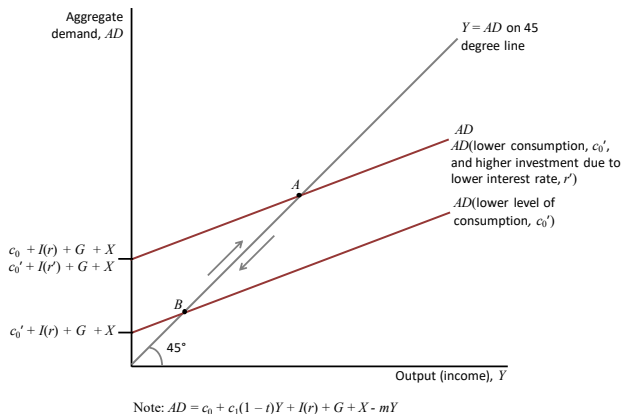
# Exchange rate as transmission mechanism

- Fall in investment ( $I$ )  $\Rightarrow$  Fall in AD  $\Rightarrow$  Fall in forecast inflation
- $\Rightarrow$  Fed cuts interest rate  $\Rightarrow$  Fall in demand for treasury bill
- $\Rightarrow$  Fall in demand for USD  $\Rightarrow$  Depreciation of USD
- $\Rightarrow$  Exports (Imports) become relatively cheaper (expensive)
- $\Rightarrow$  Increase net export ( $X - M$ )  $\Rightarrow$  increase AD



# Monetary policy in the multiplier model

Figure 15.15. The use of monetary policy to stabilise the economy in a recession.



To stabilize the economy, the central bank stimulates  $I$  by **lowering the real interest rate**. This shifts the aggregate demand curve upward.



# Monetary Policy: Limitations

- ① The short-term nominal interest rate (policy rate) cannot go below zero (“**zero lower bound**”)
  - when the economy is in a slump, a nominal interest rate of zero may not be low enough to stabilize the economy
  - **Quantitative easing** = Central bank **purchases** of financial assets aimed at **increasing investment by reducing yields of bond**.
- ② A country without its own currency does not have its own monetary policy
  - E.g. countries of the eurozone

# Demand shocks

- Def: unexpected change in AD
- Monetary policy: decreasing the nominal interest rate
- Fiscal policy: tax cuts and increased government spending

Figure 15.17. A policy intervention to restore employment and output after a fall in investment.

