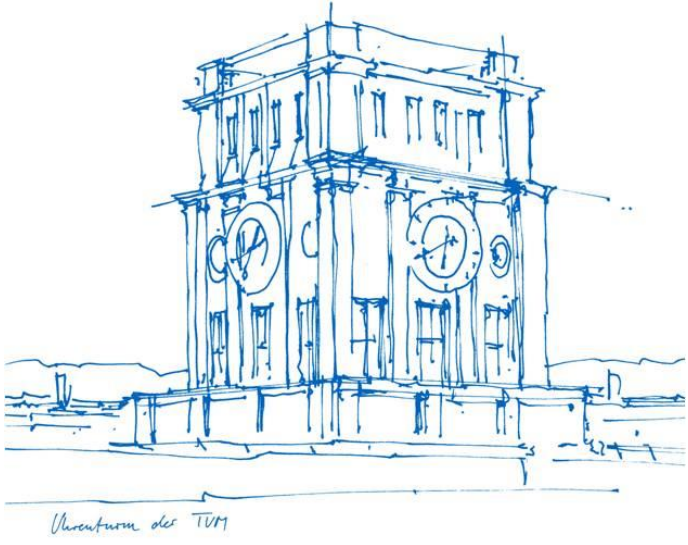
Economics II – Macroeconomics

VIII. Inflation and Monetary Policy



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Outline

I. Introduction to macroeconomics (chapter 1)
II. Technological change and economic growth (chapter 2)
III. The aggregate economy (chapter 13)
IV. Aggregate demand and fiscal policy (chapter 14)
V. The labour market (chapters 6 and 9)
VI. Aggregate demand and unemployment (chapter 14)
VII. Credit, banks and money (chapter 10)
VIII. Inflation and monetary policy (chapter 15)
IX. Technological progress, unemployment and living standards in the long run (chapter 16)
X. Economic and financial crises (chapter 17)

VIII. Inflation and Monetary Policy

The Economy Ch. 15

I. Inflation and the Phillips curve
II. Inflation, aggregate demand, and unemployment
III. Monetary policy

The context

Governments can use **fiscal policy** (e.g. spending, taxation) to stabilize the economy during recessions.

Besides unemployment, fluctuations in GDP also affect prices.

- What factors affect the price level in an economy?
- What is the ideal level of inflation and how do central banks achieve it?
- How do central banks respond differently to supply-side and demand-side shocks?

What we will learn:

- Inflation: causes and effects on the economy.
- How central banks can use **monetary policy** to respond to shocks in the economy.
- The importance of expectations and how central banks can manage them.

VIII. Inflation and Monetary Policy

The Economy Ch. 15

I. **Inflation and the Phillips curve**
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Inflation: key concepts

Zero inflation = a constant price level from year to year
Inflation = an increase in the general price level
Deflation = a decrease in the general price level
Disinflation = a decrease in the rate of inflation

Real interest rate = Nominal interest rate – Inflation rate
[The Fisher equation]

Example: *Julia borrows $50 from Marco*
→ repayment of $55 next year, nominal interest rate is 10%, but with inflation of 6%:
Marco could not buy with the repayment 10% more, but instead only 4%
→ The real interest rate is 4%

What's wrong with inflation?

- For people on fixed nominal income (e.g. pensioners), higher inflation means lower real value of income.
- Inflation reduces the real value of debt – good for borrowers, bad for creditors.
- High rate of inflation makes the economy work less well:
  - high inflation is often volatile → uncertainty
  - it is harder for producers to distinguish between changes in **relative prices** and inflation
  - **menu costs** as firms have to update their prices more frequently

What's wrong with deflation?

- Deflation could have even more dramatic consequences than high inflation.
- When prices are falling, households will postpone consumption (particularly of durables) because they expect goods will be cheaper in the future. This is similar to a negative shock to aggregate demand.
- Deflation increases the real debt burden, which may lead households to cut consumption to return to their target wealth.

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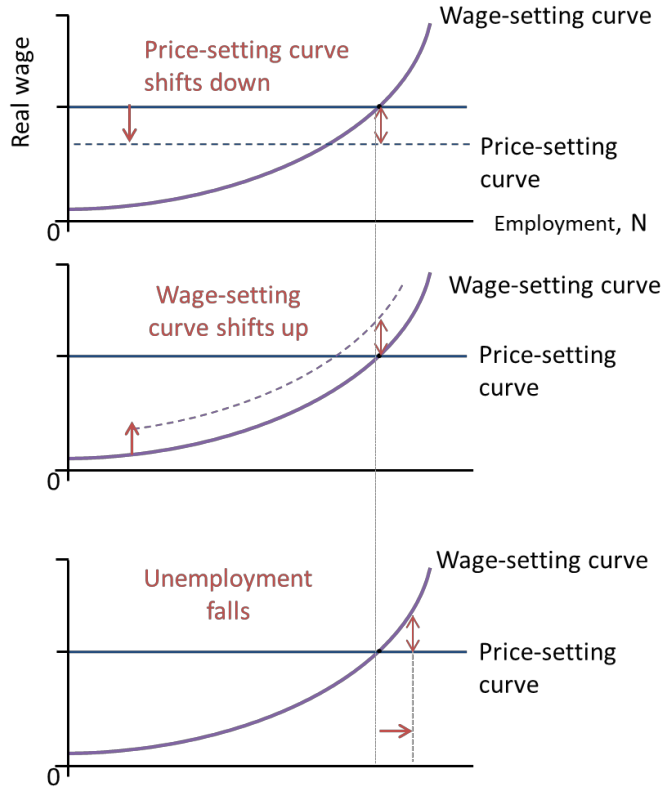
Causes of inflation

Recall: Wages and prices are determined by interactions between firms, consumers, and workers.

Inflation may be due to:

- Increases in bargaining power of firms over their consumers, e.g. reduction in competition → higher markup
- Increases in the bargaining power of workers over firms, which could raise wages

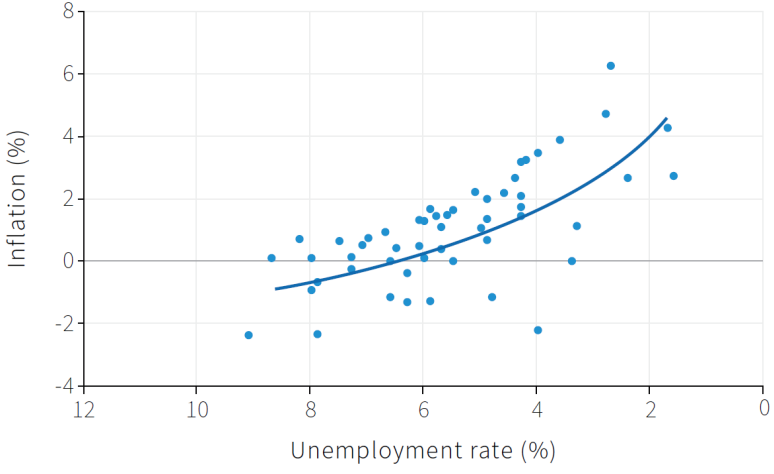


1. Owners' power rises relative to consumers (e.g. lower competition) – medium to long run

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

Inflation and (un)employment



Phillips's original curve: wage inflation and unemployment (1861-1913)

William Phillips (1914-1975): **trade-off between inflation and unemployment rate**

Mechanism:

- When unemployment is low, the HR department needs to set higher wages
- Higher wages mean higher costs for firms. As long as competitive conditions have not changed, the firm's markup will be unchanged.
- The price level will go up: Once all firms in the economy have set higher prices, the economy has experienced wage and price inflation.
- And real wages have not have increased: the percentage increase in W equals the percentage increase in P, so
  w = W/P is unchanged.

→ *wage-price spiral*

Inflation and aggregate demand

- An 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 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

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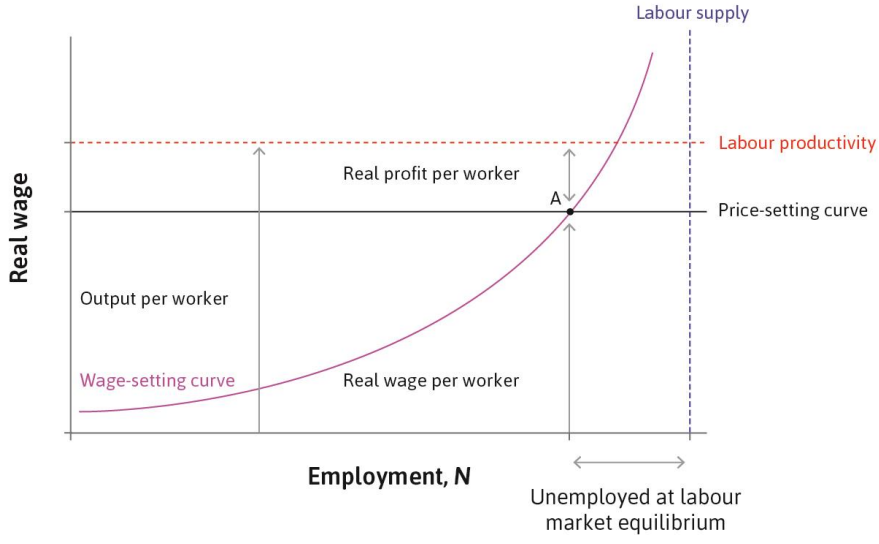
Stable price level

Prices are stable (inflation is 0) when the labour market is in equilibrium.



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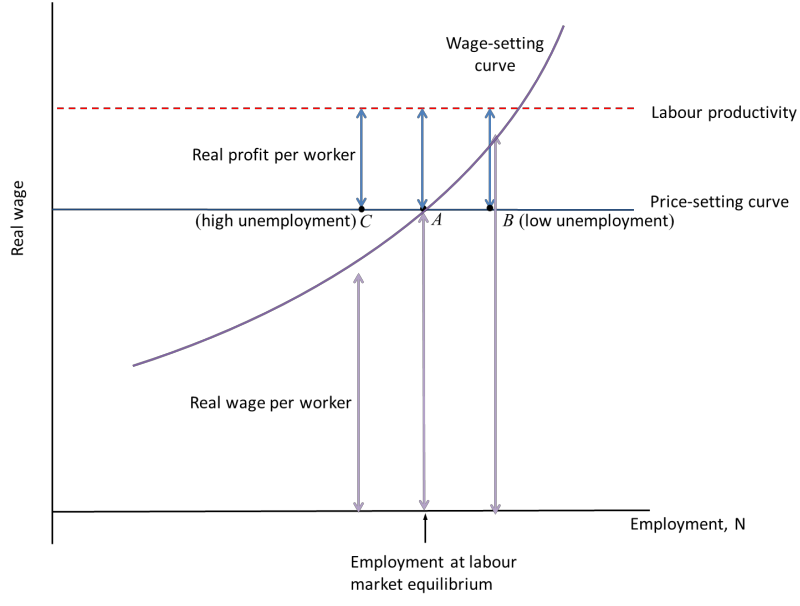
Upward and downward pressure

Unemployment below equilibrium:
→ **upward pressure on wages and prices**
Unemployment above equilibrium:
→ **downward pressure on wages and prices,**
i.e. declining wage-price spiral

Key insight: if employment is above or below the labour market equilibrium then the price level is either rising or falling.

→ When the real wage given by the wage-setting curve and that given by the price-setting curve are not equal, we say there is a **bargaining gap**



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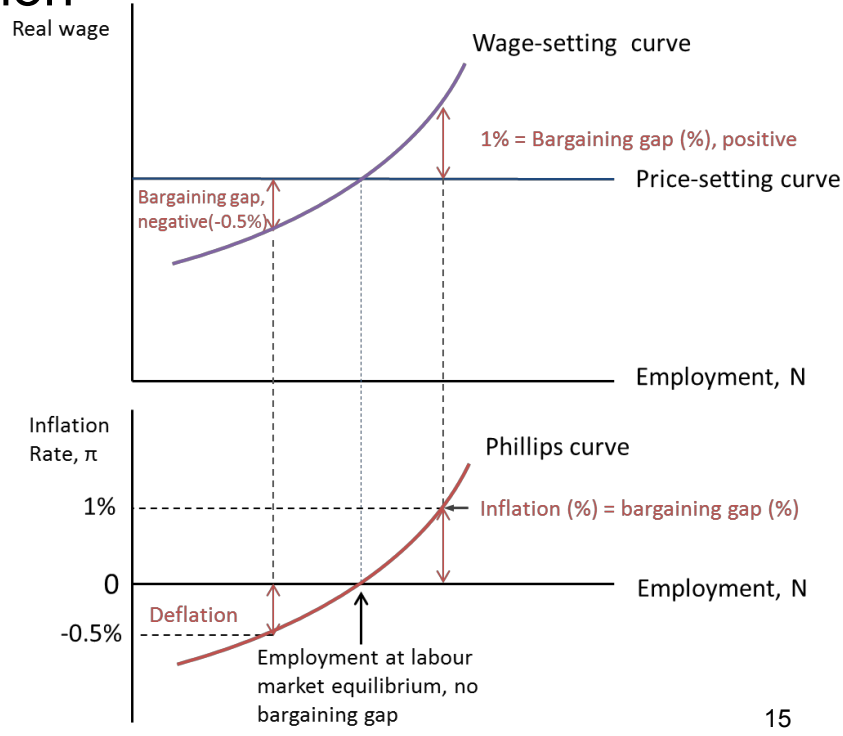
The bargaining gap and inflation

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.

If unemployment is lower than at the equilibrium: positive bargaining gap → **inflation.**
If unemployment is higher than at the equilibrium: negative bargaining gap → **deflation.**

If there is labour market equilibrium: only situation in which the price level is constant.

Inflation = bargaining gap (%)



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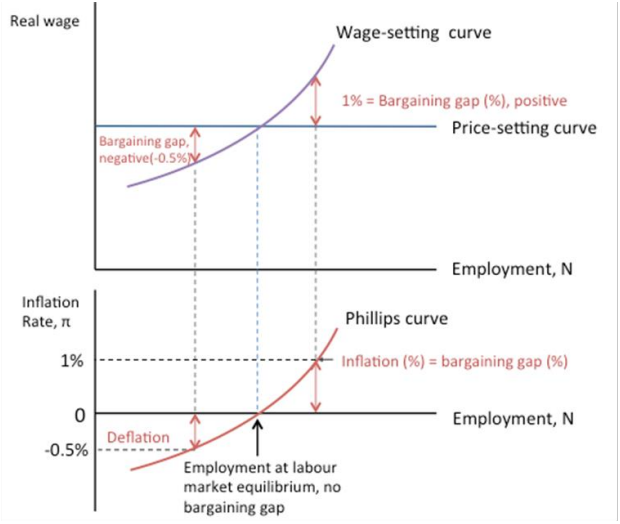
AD and inflation

Adding the multiplier model:

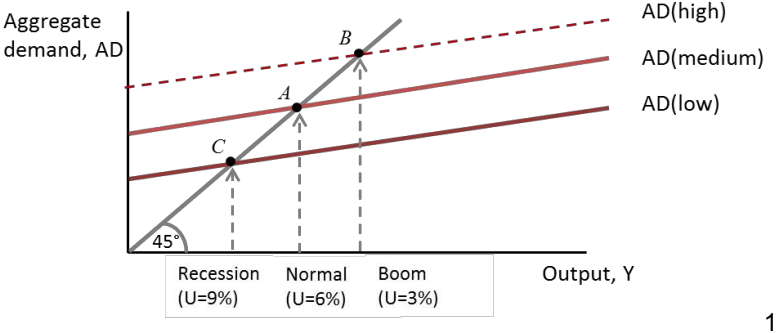
At a higher level of aggregate demand, i.e. during a *boom* – higher aggregate demand, lower unemployment, positive bargaining gap –> **Inflation**

At a lower level of aggregate demand, i.e. during a *recession* – lower aggregate demand, negative bargaining gap –> **Deflation**

Supply side (medium run)



Demand side (short run)



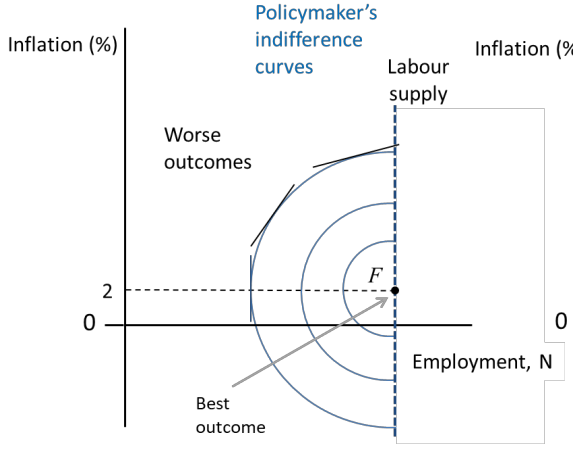
Choosing inflation rates

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

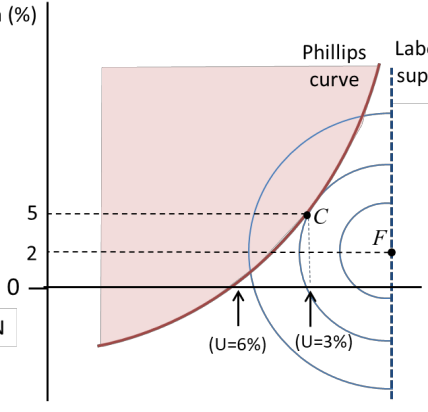
→ policymaker prefers the highest possible level of employment

Phillips Curve determines the feasible combinations of inflation and unemployment (MRT)

Optimal inflation rate where
MRS = MRT



a. The policymakers' preferences

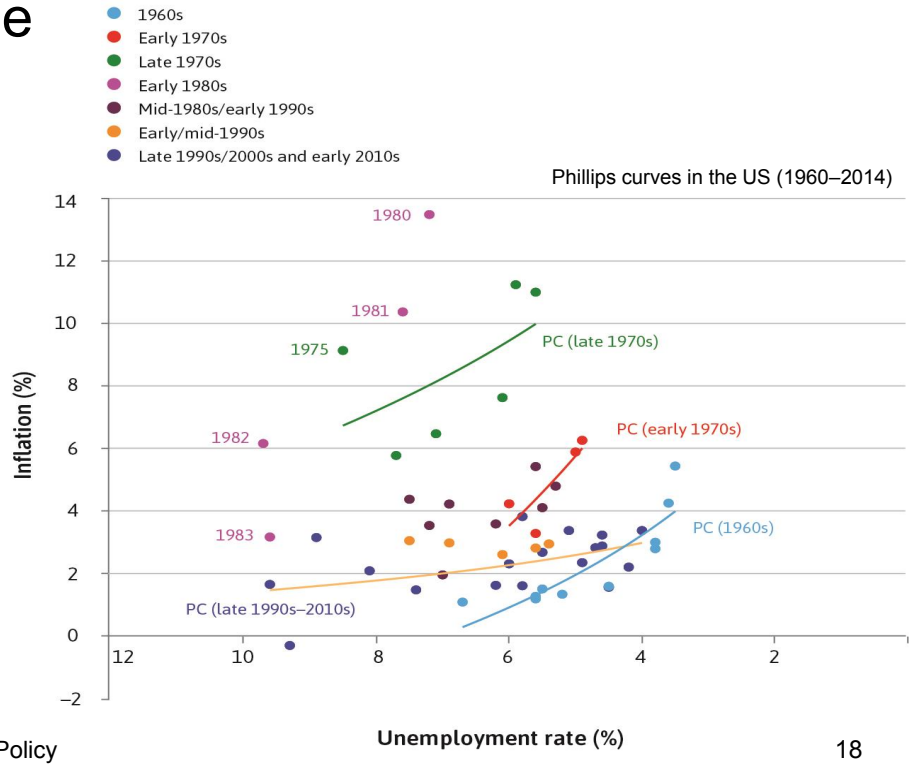


b. The policymakers' preferences and the Phillips curve tradeoff

The Phillips curve over time

Trade-off between inflation and unemployment is not stable:

Phillips Curve shifts over time!



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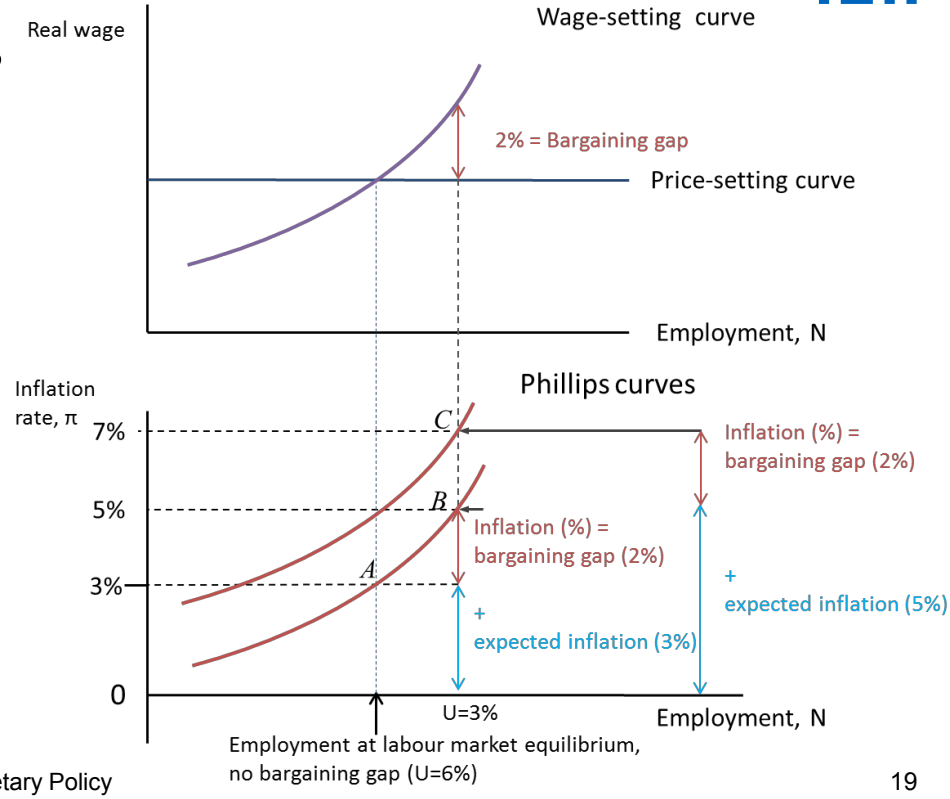
The role of expectations

Expectations of future prices can cause the Phillips curve to shift.

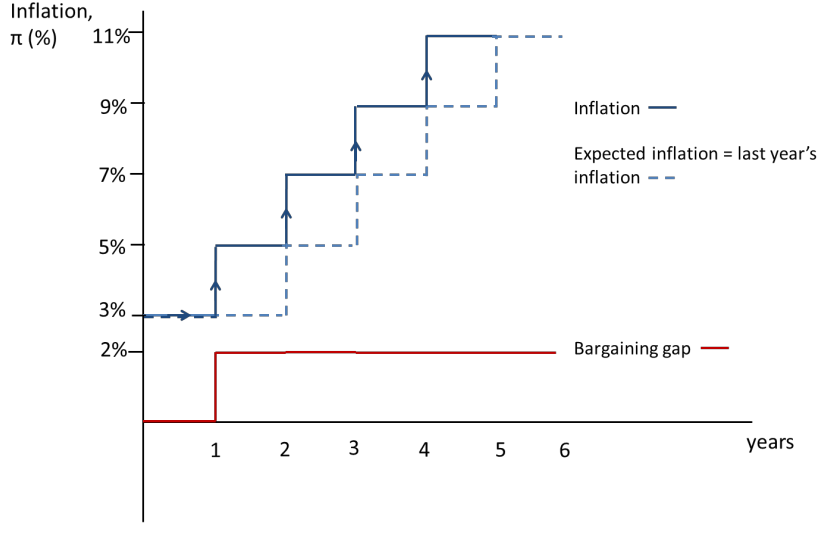
Inflation = expected inflation
+ bargaining gap

The **inflation-stabilizing rate** is the unemployment rate which keeps inflation constant.



The role of expectations

- A zero bargaining gap, inflation is as expected: 3%.
- In year 1 inflation is equal to the bargaining gap plus expected inflation.
- In year 2, with no change in the bargaining gap, inflation goes up by the bargaining gap plus expected inflation.
- As long as the bargaining gap remains unchanged, inflation rises each year.



→ **Expected inflation shifts the Phillips curve.**

➢ Policymakers were wrong to think of the Phillips curve as a feasible set from which they could simply select the most electorally popular combination of inflation and unemployment.

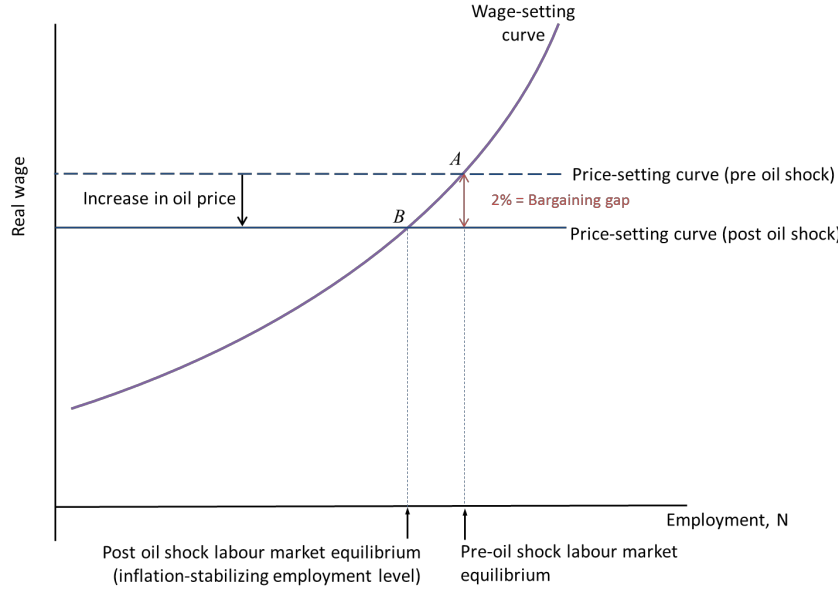
Supply shocks

Supply shocks = unexpected change on the supply-side of the economy, e.g. technological improvement, increase in oil price

Supply shocks affect the profit curve, which affects inflation, and can lead to rising inflation (via expectations)

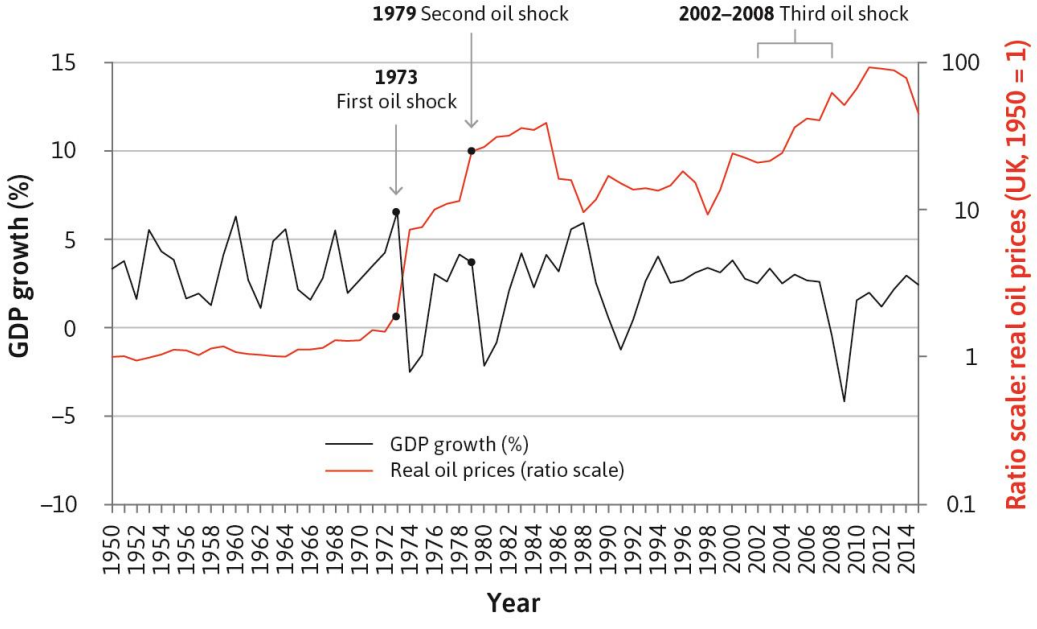
→ While a negative *demand shock* will increase unemployment and reduce inflation, **a negative *supply shock* can lead to increased unemployment and inflation at the same time.**

What can stop inflation from rising?
- Reduction in the bargaining gap
- Change in expectations



Oil price shocks in 1970s

Unexpected increases in oil prices in 1970s caused simultaneous increase in unemployment and prices.

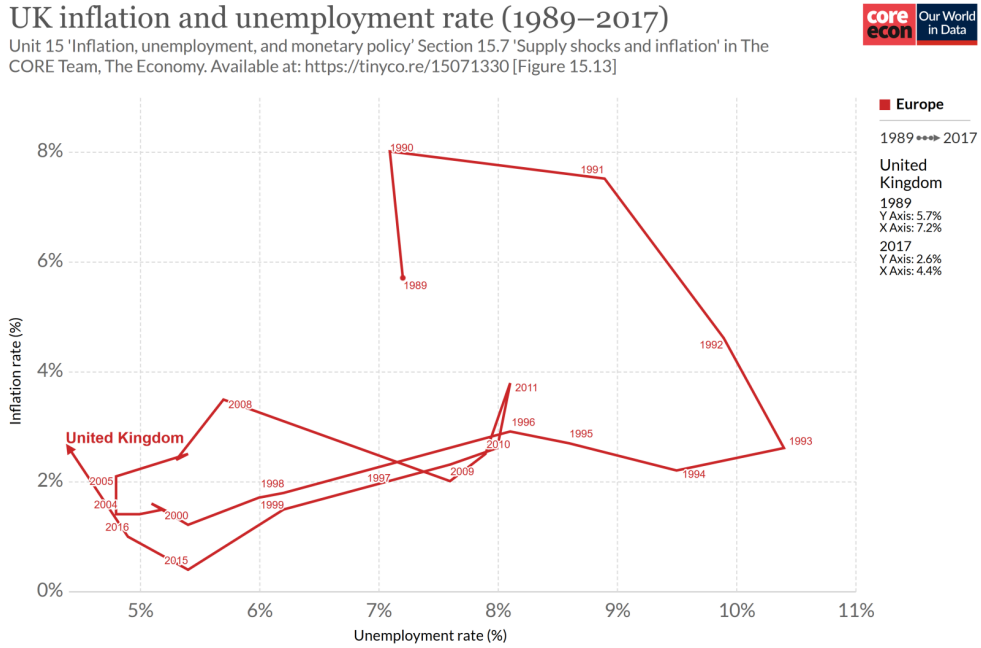


Adjustment processes

The model helps us to understand why

- the rise in the oil price led to rising inflation and high unemployment
- and it also helps to explain the role that high unemployment played in bringing inflation down again.

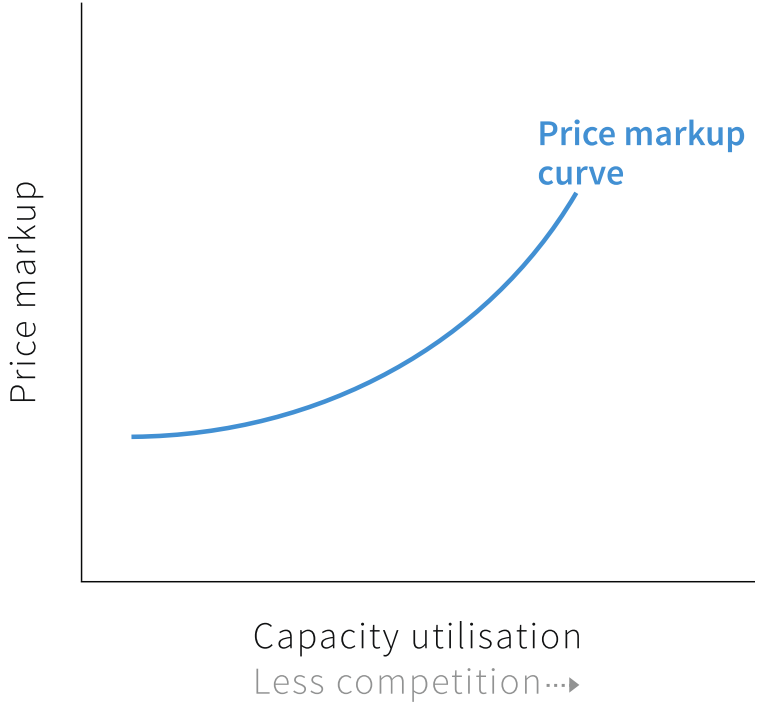
- But why is the 3rd oil price shock different?



Capacity constraints

Another reason for the inflation-unemployment trade-off are capacity constraints.

- Firms respond to rising capacity utilization by increasing investment.
- **In the short run, firms are capacity constrained (unable to meet excess demand for output) so raise prices.**



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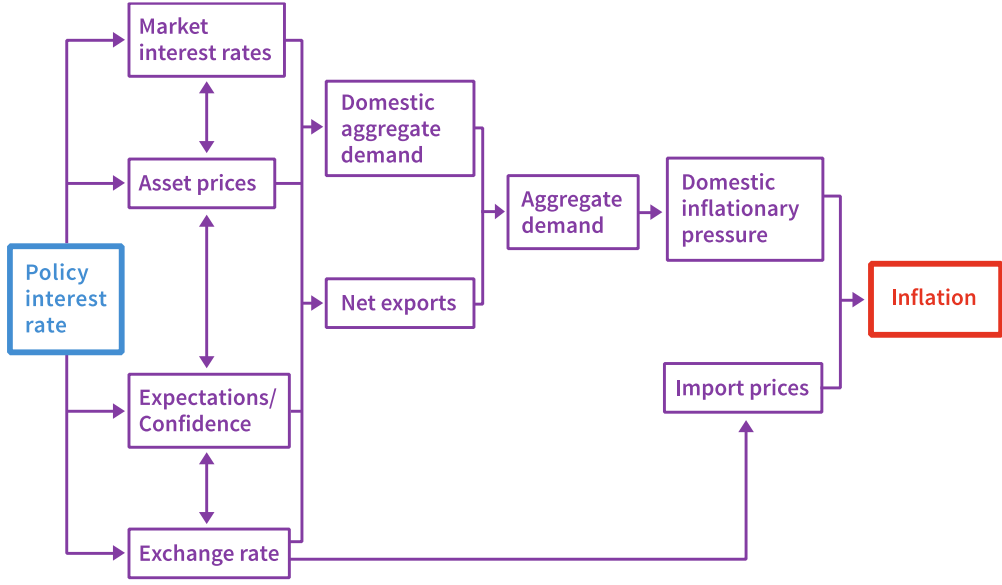
Transmission mechanisms

“Inflation targeting”
Central bank controls the **policy interest rate**, which affects:

- **Market interest rates** that banks charge on loans
- The value of financial assets (bonds, shares)
- Profit expectations and confidence
- The exchange rate (via investment and consumption)



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Market interest rates

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

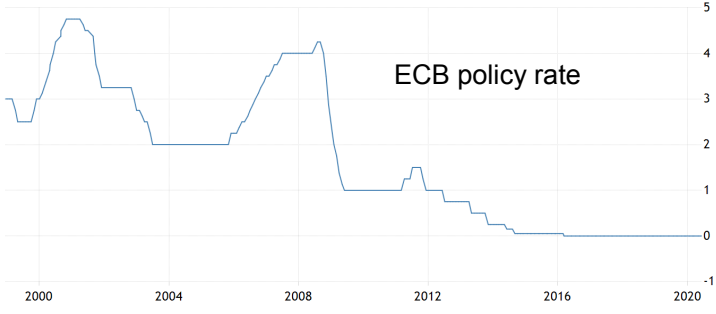
1. Choose the desired level of aggregate demand, based on the labour market equilibrium and the Phillips curve

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.



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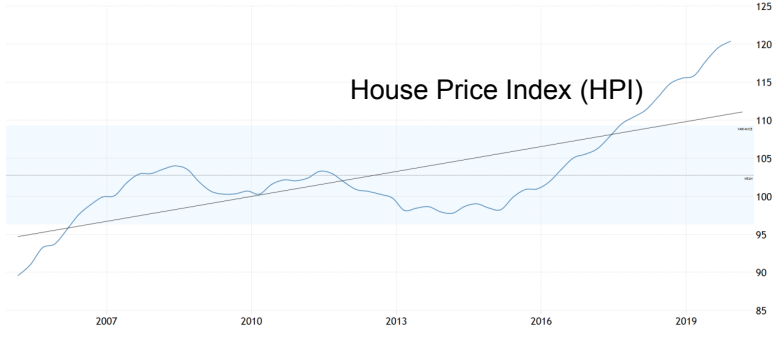


SOURCE: TRADINGECONOMICS.COM | EUROSTAT

Profit expectations

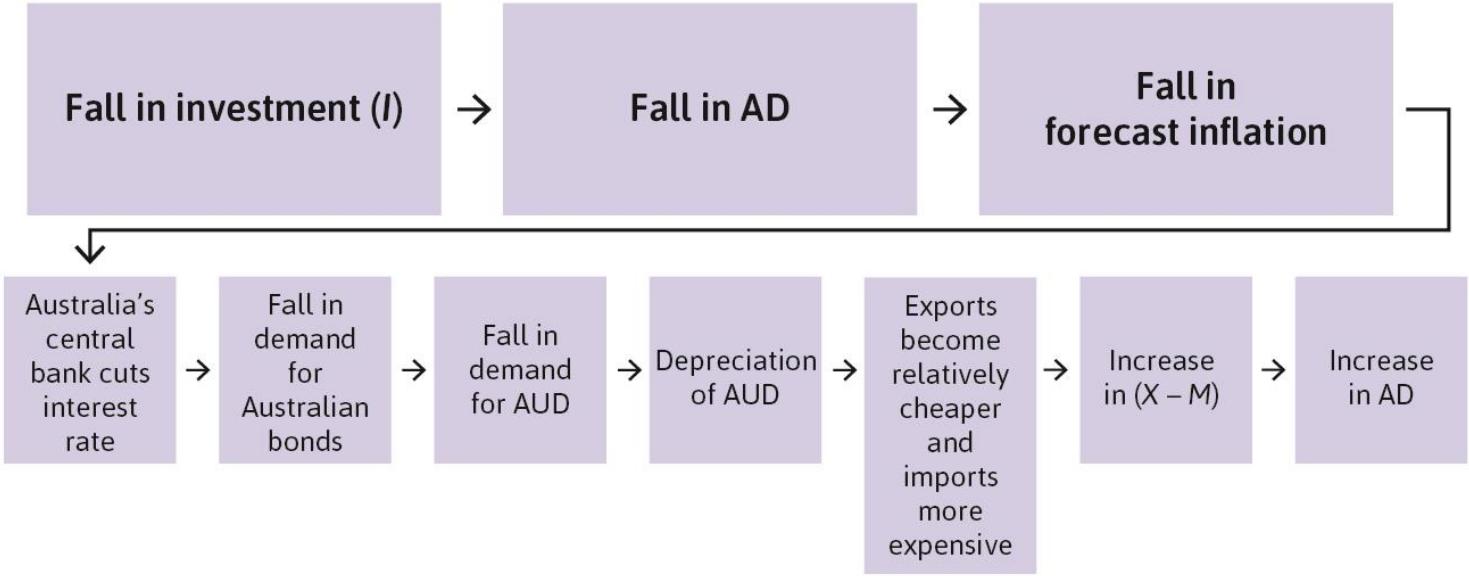
- Consistent policymaking and good communication with the public builds confidence in the Central Bank.
- This can lead firms to expect higher demand and therefore increase investment (or at least not lower it).
- Households may be confident that they will not lose their jobs, and they may increase their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

The exchange rate channel

- **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.

→ **interest rates affect aggregate demand**

The exchange rate channel

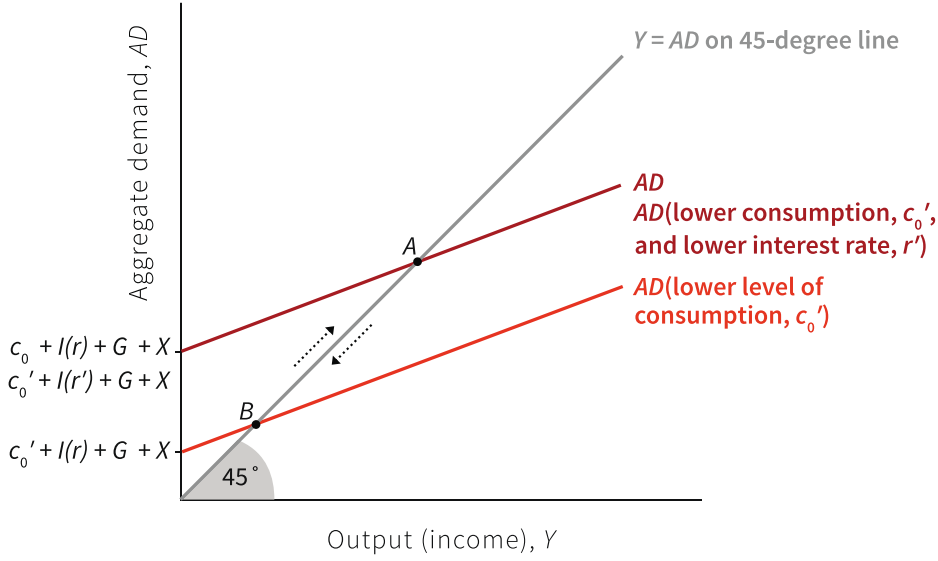


Monetary policy: uses

Monetary policy can be used to stabilize the economy.

In a recession, lowering real interest rates can shift aggregate demand (by stimulating investment and consumption) back to its starting point.

Popular because easier to adjust than fiscal policy!



Note: $AD = c_0 + c_1(1 - t)Y + I(r) + G + X - mY$

Monetary policy: limitations

- **Zero lower bound:** the lowest nominal interest rate set by the central bank is zero (otherwise holding cash is strictly better)

- Countries belonging to a common currency area have no national monetary policy, e.g. the Eurozone
  - Conflicting interests when for example unemployment is different in different regions

- Alternative monetary policy: **Quantitative Easing (QE)**
  Idea: Central bank purchases of financial assets → pushes up the prices → boosts spending

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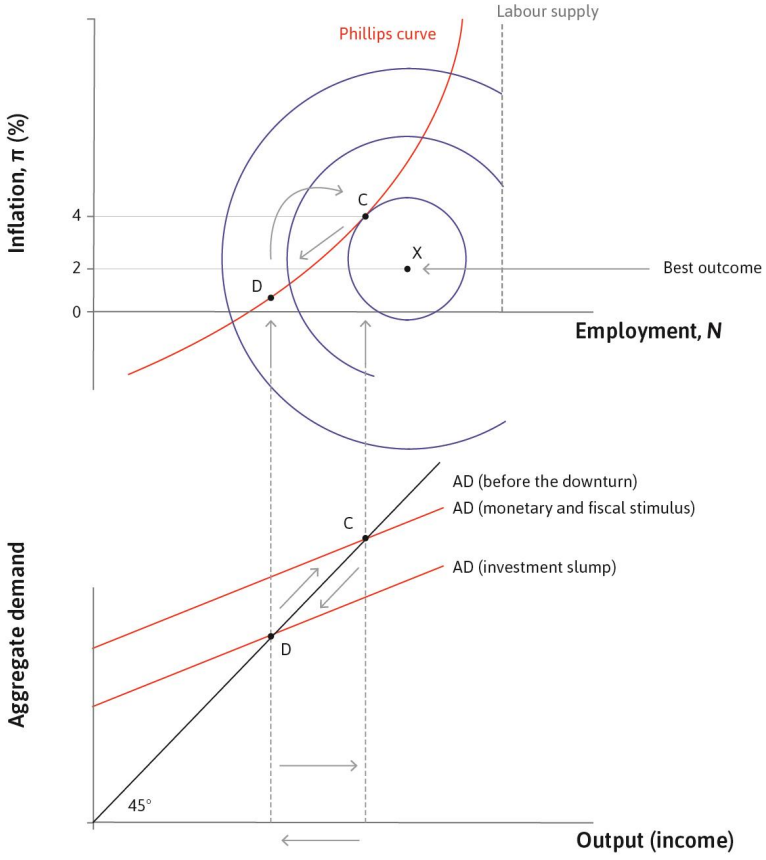
Demand shocks

Demand shock = An unexpected change in aggregate demand, e.g. Corona crisis

Governments can use both fiscal and monetary policy to stabilize the economy:

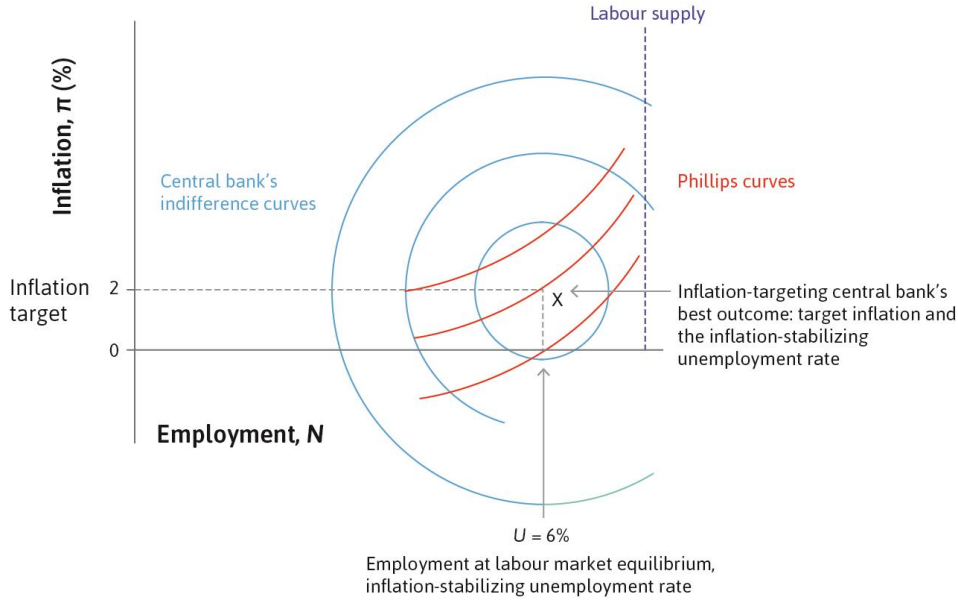
- Monetary policy – decreasing the nominal interest rate
- Fiscal policy – tax cuts and increased government spending



Inflation targeting

Inflation targeting = monetary policy regime where the central bank uses policy instruments to keep the economy close to an inflation target

Making the central bank independent from the government gives inflation targets credibility and prevents an inflation spiral by setting expectations.



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After the dotcom bubble…

		2000	2001	2002	2003
Real Gross Domestic Product (annual%change)		4.1	0.9	1.8	2.8
Contribution to % change in GDP	Change in nonresidential investment	1.15	-1.2	-0.66	0.69
	Change in residential investment	-0.07	0.09	0.39	0.66
	Change in government expenditure	0.10	0.88	0.74	0.36
	Change in other contributions	2.92	1.13	1.33	1.09
Federal Reserve nominal interest rate (annual average, %)		6.24	3.89	1.67	1.13
Unemployment rate (%)		4	4.7	5.8	6
Inflation rate (%)		3.4	2.8	1.6	2.3

negative demand shock:

1. rising unemployment
2. falling inflation

actions taken:

1. expansionary fiscal policy
2. decreasing the nominal interest rate

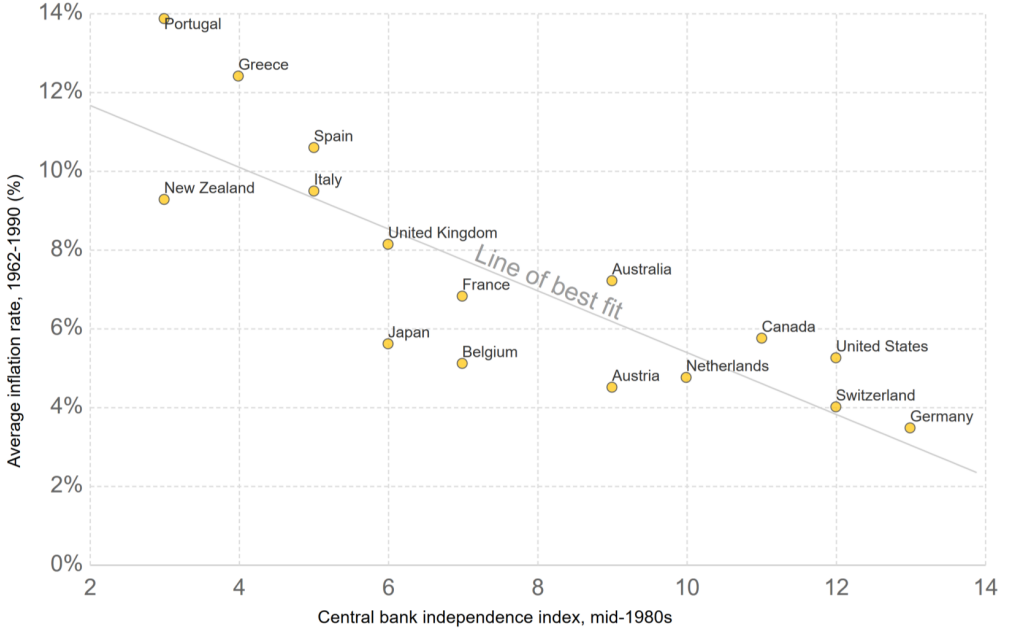
Central banks

Central banks independent of government control: Monetary policy was placed in the hands of these independent central banks in most advanced and many developing countries.

Inflation targeting: use their policy instruments to keep the economy close to a target rate of inflation. Usually with a band (range) of what was judged an acceptable level of inflation.

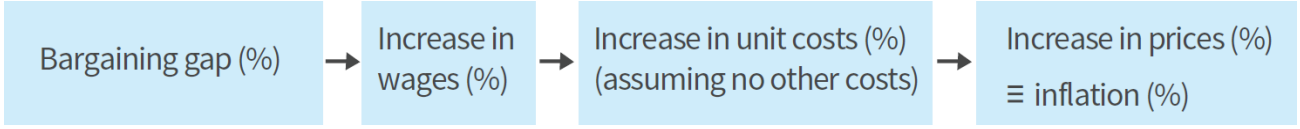
COUNTRY	INFLATION TARGETING ADOPTION DATE	INFLATION RATE AT ADOPTION DATE (%)	2010 END-OF-YEAR INFLATION (%)	TARGET INFLATION RATE (%)
NEW ZEALAND	1990	3.30	4.03	1 - 3
CANADA	1991	6.90	2.23	2 +/- 1
UNITED KINGDOM	1992	4.00	3.39	2
AUSTRALIA	1993	2.00	2.65	2 - 3

Central bank independence

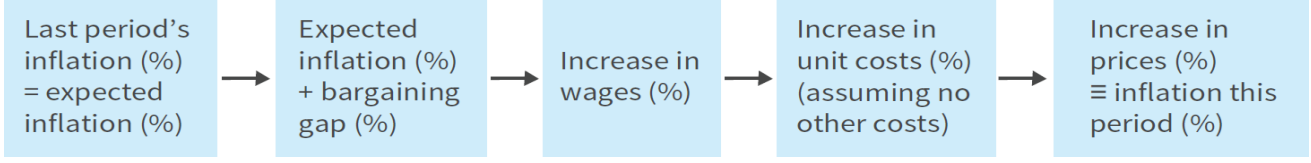


Summary

1. Inflation is caused by **bargaining gaps** and **capacity constraints**



   - **Phillips Curve**: tradeoff between inflation and unemployment
   - The trade-off isn't stable: **expectations** matter



2. **Central banks** can stabilize the economy by changing the policy rate
   - 4 channels of **monetary transmission mechanism**: interest rate, asset prices, profit expectations, exchange rates
   - **Zero lower bound** puts a limitation on monetary policy

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