

# The Taylor rule

# Tactics: The Taylor rule

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

$$r = i - \pi$$

$$r = \bar{r} + (a - 1)(\pi - \bar{\pi}) + b\left(\frac{Y - \bar{Y}}{\bar{Y}}\right)$$

- **Taylor principle:** To stabilize inflation, central banks must raise nominal interest rates **by more than** any rise in expected inflation, so that  $r$  rises when inflation rises
- Otherwise:  $r$  would decrease, causing inflation to increase further

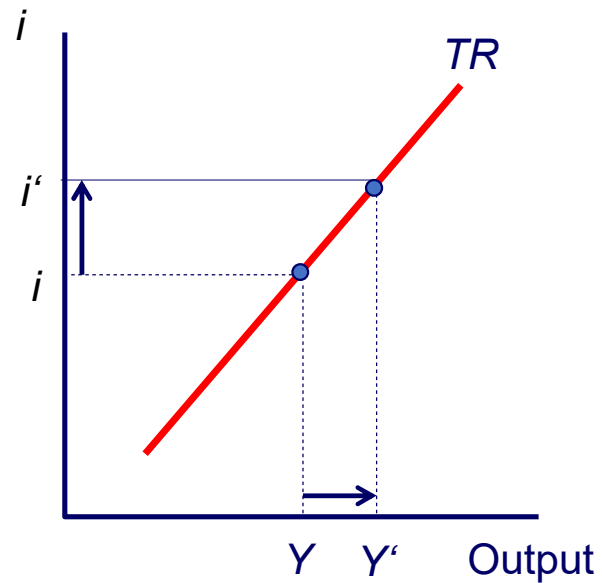
- An inflation gap and an output gap
  - Stabilizing real output is an important concern
  - **Output gap** is an indicator of future inflation as shown by Phillips curve

$\bar{i}$  = Anchor /neutral (long run)

$\bar{r} = \bar{i} - \bar{\pi}$  (natural)

Taylor principle:  $a > 1$

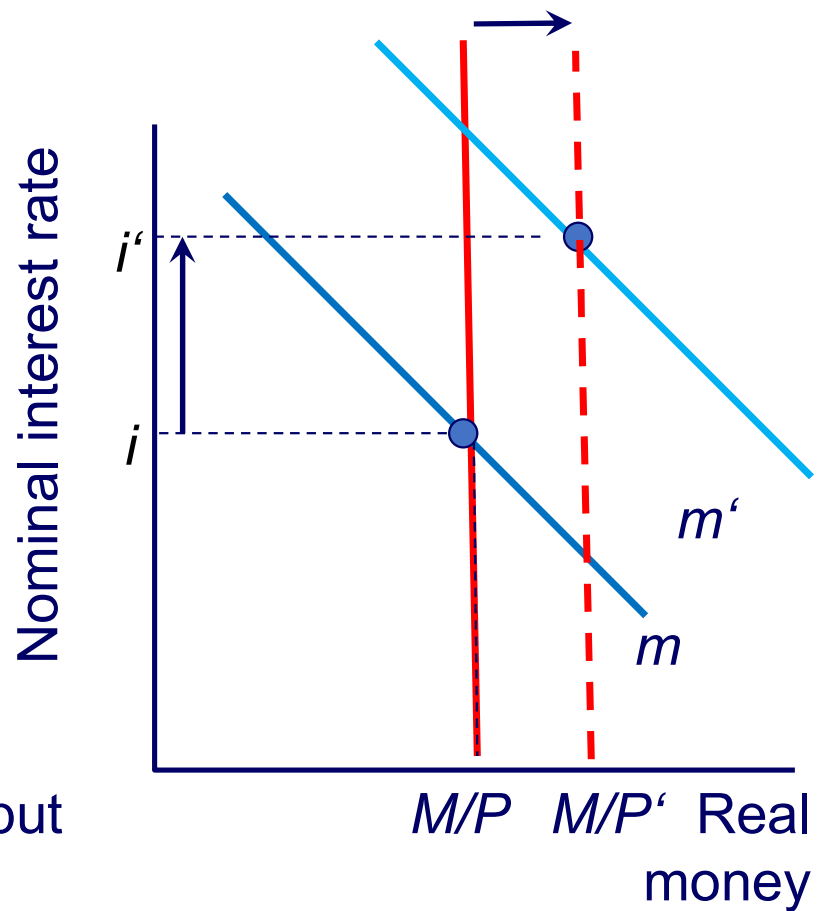
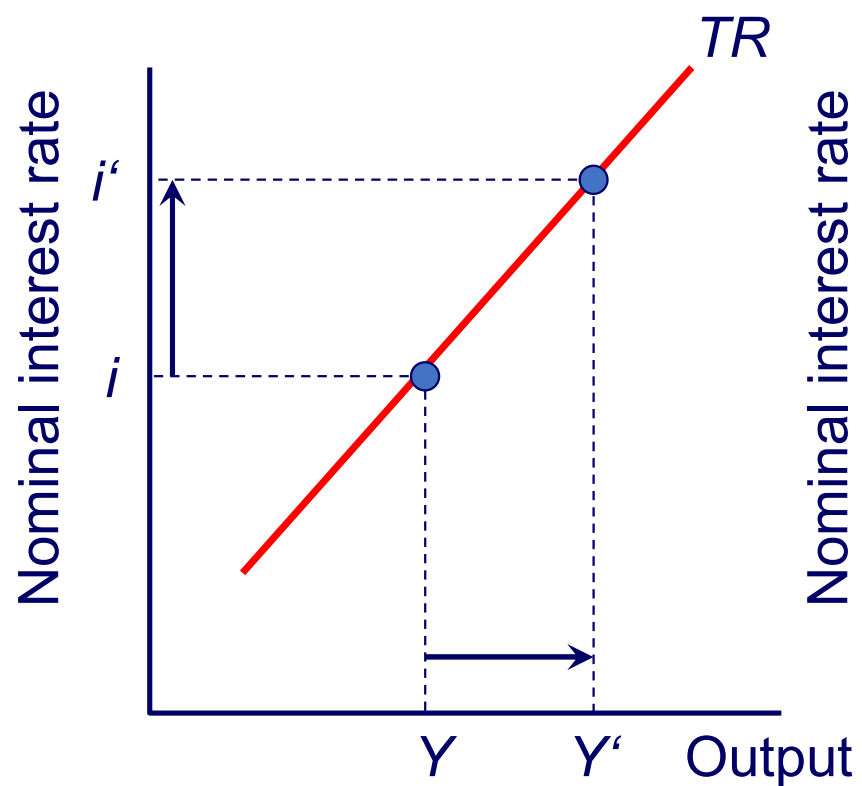
## The TR Curve



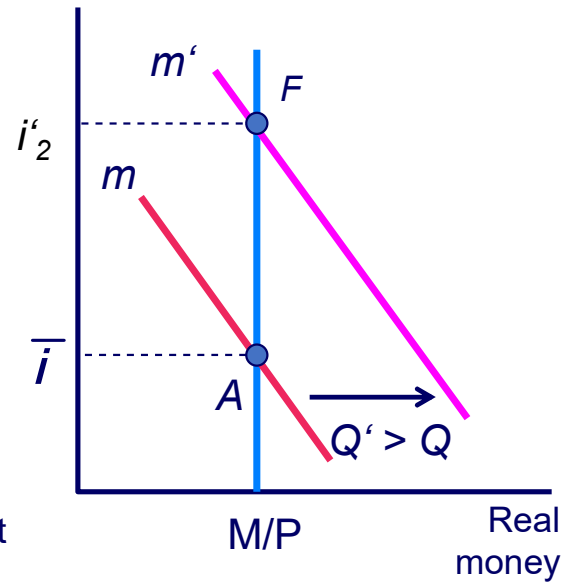
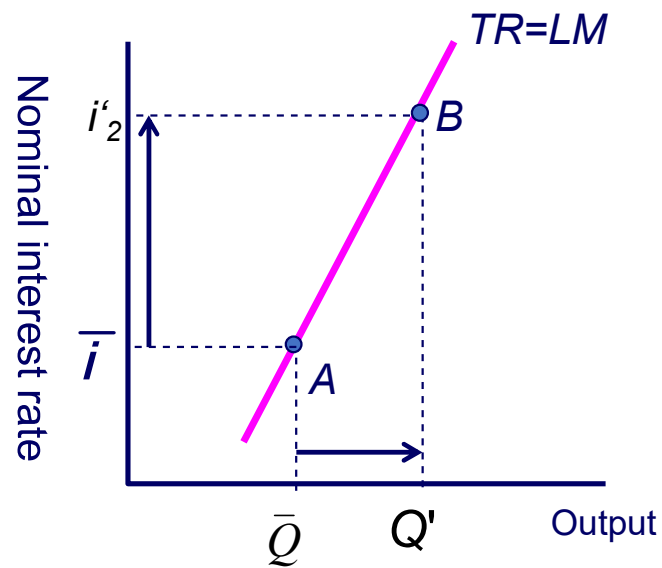
$$i = \bar{i} + a(\pi - \bar{\pi}) + b\left(\frac{Y - \bar{Y}}{\bar{Y}}\right)$$

- Output increases from  $Y$  to  $Y'$
- Central Bank reacts by raising the interest rate from  $i$  to  $i'$ .
- Interest rate targeting: the CB must expand the quantity of money as demanded by agents at the desired interest rate

## The $TR$ Curve and Money Market Equilibrium



## The Slope of the $TR$ Curve

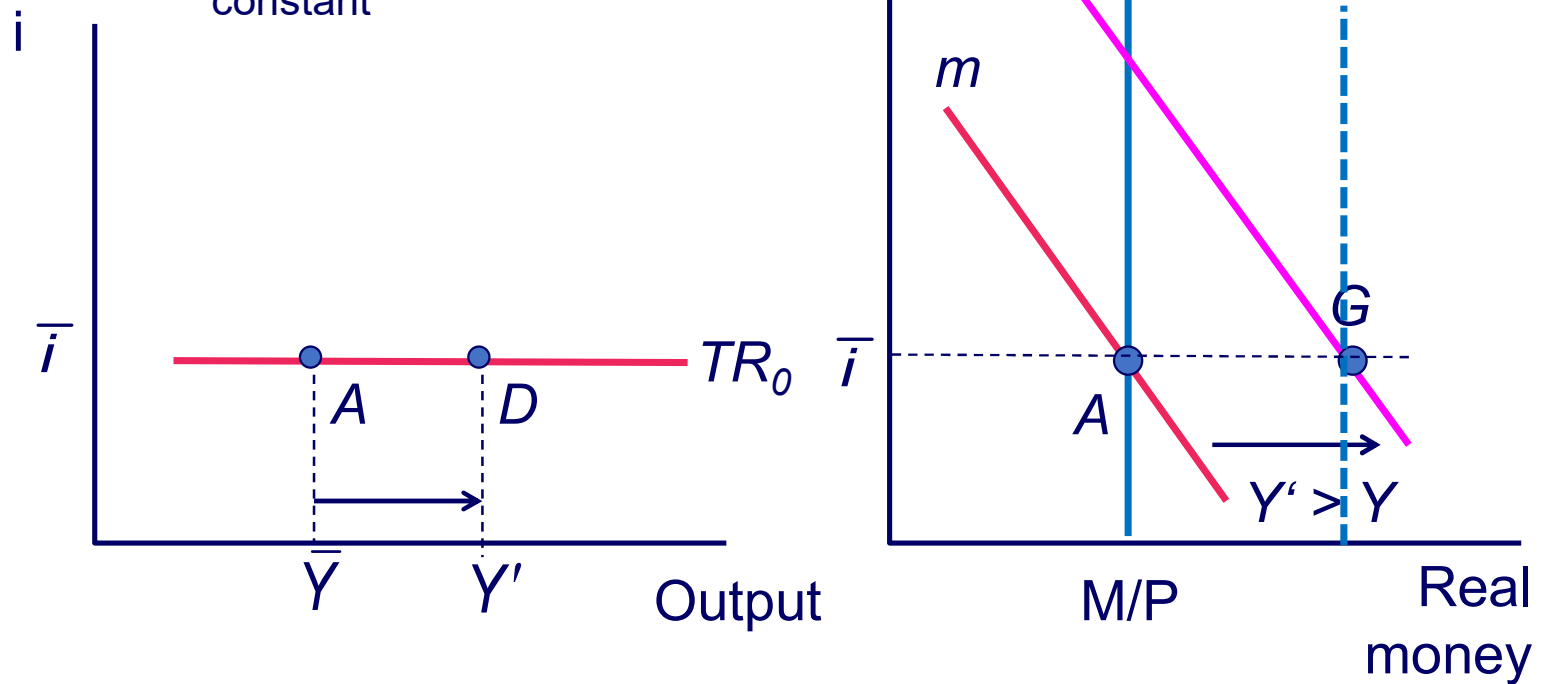


When the CB wants to keep  $M$  unchanged: central bank responds to output increase by strongly raising interest rates (old LM curve).

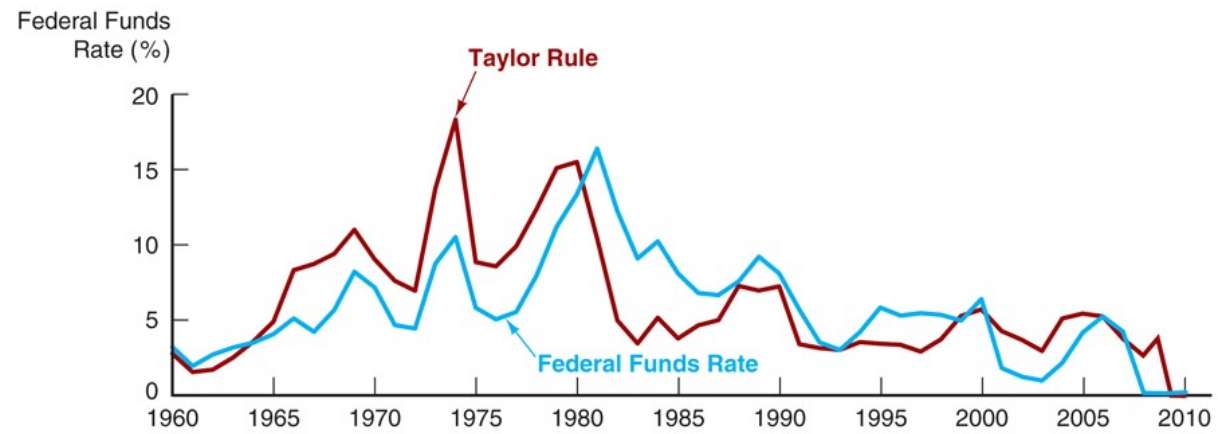
Figure 11.8 (a)

## The Slope of the $TR$ Curve

- When the CB is not concerned with the output gap at all
- It responds to output increase by holding interest rate constant



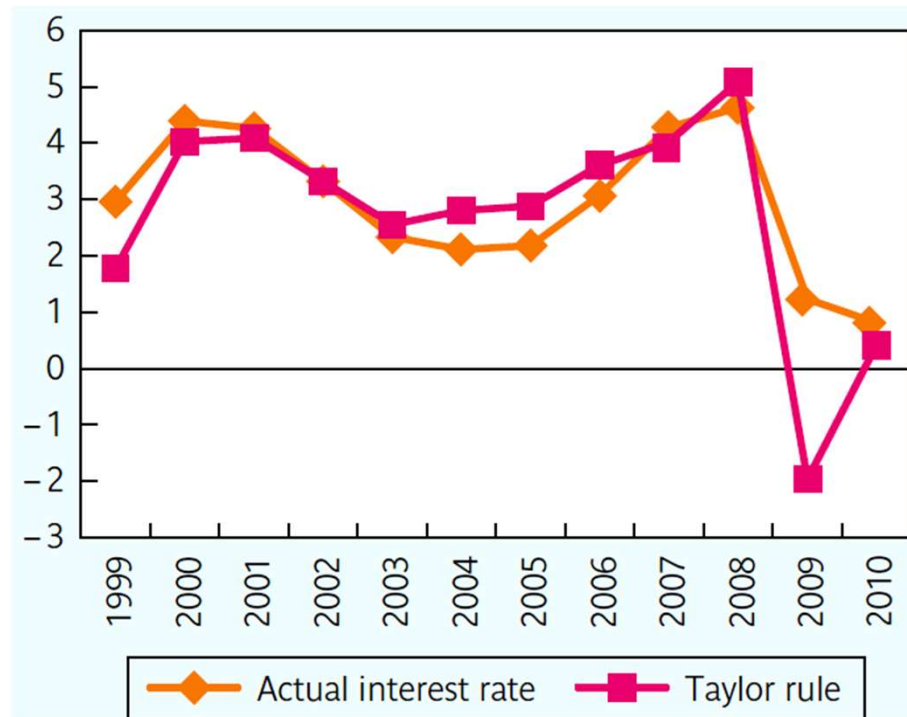
## The Taylor Rule for the Federal Funds Rate, 1970–2011



Source: Federal Reserve; [www.federalreserve.gov/releases](http://www.federalreserve.gov/releases) and author's calculations.

Fig. 10.9 (a)

## Taylor Rule: Euro Area

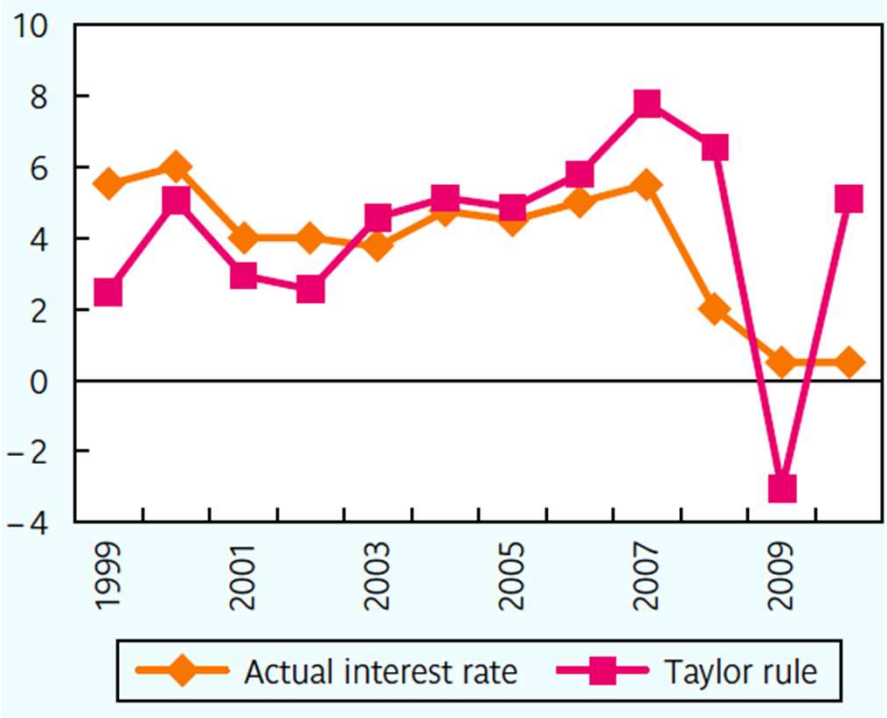


Sources: OECD, Econ. Outlook; IMF, Int. Fin. Statistics



Fig. 10.9 (b)

### Taylor Rule: United Kingdom



Sources: OECD, Econ. Outlook; IMF, Int. Fin. Statistics

Aggregate demand

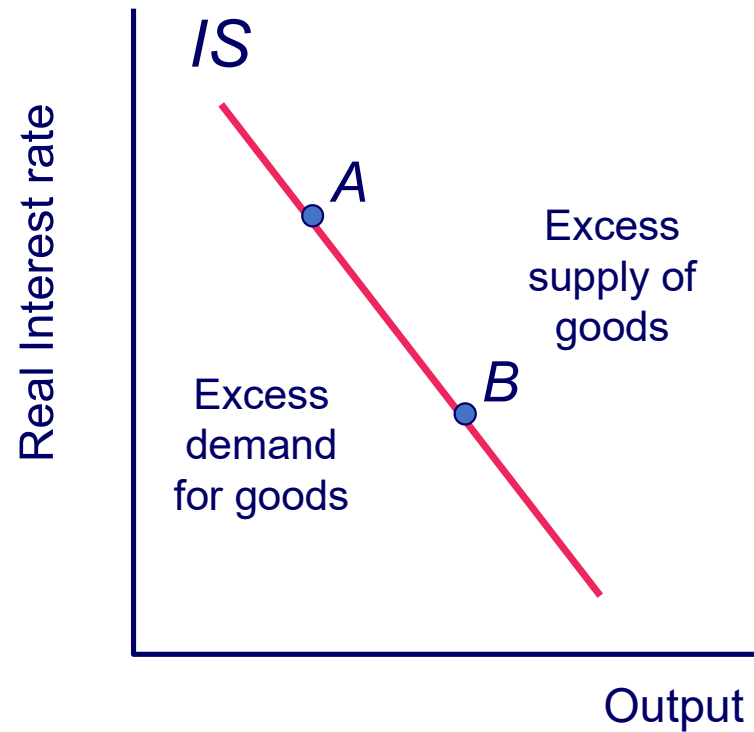
# Aggregate Demand

- Aggregate demand is made up of four component parts:
  - **consumption expenditure**, the total demand for consumer goods and services
  - **planned investment spending**, the total planned spending by business firms on new machines, factories, and other capital goods, plus planned spending on new homes
  - **government purchases** , spending by all levels of government (federal, state, and local) on goods and services
  - **net exports (TB)**, the net foreign spending on domestic goods and services

# The IS curve

$$Y=C(Y-T,r)+I(r)+G+TB(Y,Y^*,\theta)$$

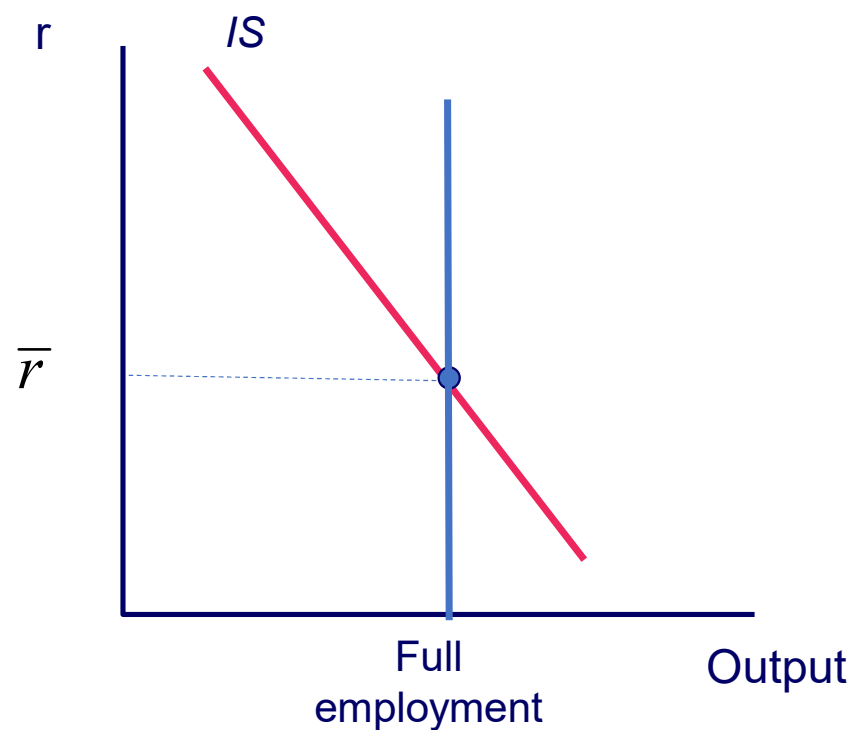
- To the left of the *IS* curve, demand for goods exceeds their supply
- The *IS* curve shifts whenever there is a change in autonomous factors (factors independent of aggregate output and the real interest rate)



# The Natural Interest rate

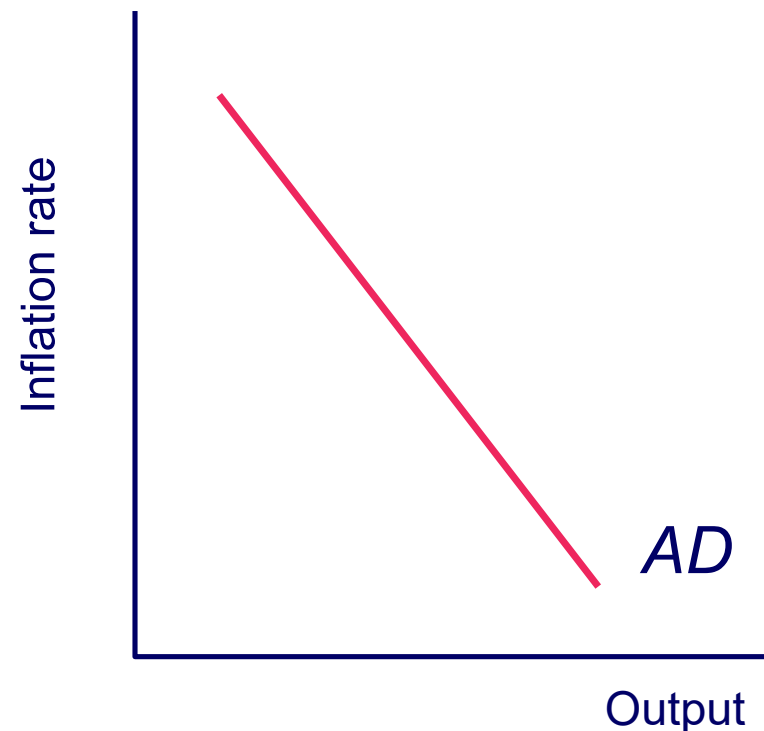
$$Y=C(Y-T,r)+I(r)+G+TB(Y,Y^*,\theta)$$

The real interest rate that would be consistent with full employment



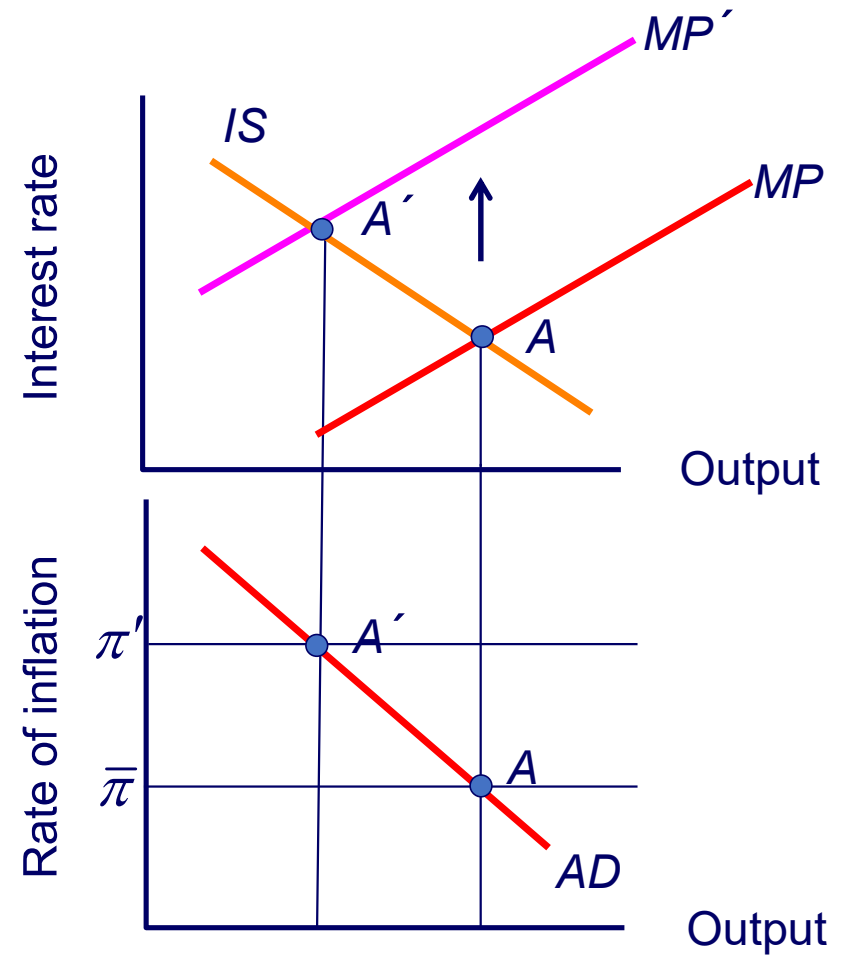
# The Aggregate Demand Curve

- The AD curve is central to AD-AS analysis, which allows us to explain short-run fluctuations in both aggregate **output** and **inflation**
- The aggregate demand curve represents the relationship between the inflation rate and aggregate demand when the goods market is in equilibrium
- The *AD* curve is derived from:
  - The *MP* curve
  - The *IS* curve
- The *AD* curve has a downward slope: As inflation rises, the real interest rate rises, so that spending and equilibrium aggregate output fall



# Deriving the Aggregate Demand

- Higher inflation triggers higher interest rate *via Taylor rule*:  $MP$  shifts up to  $MP'$ .
- Real interest rate increases, reducing demand (point  $A'$ ).

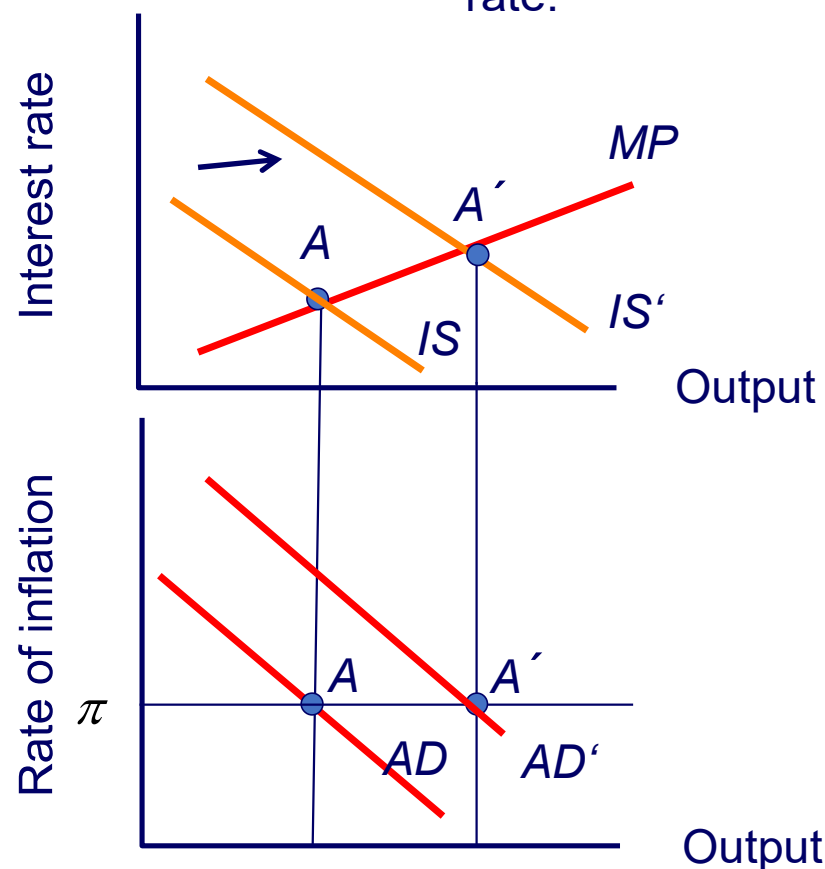


# Shifts in the AD curve

## Shifts in the *IS* curve

- Any factor that shifts the *IS* curve shifts the aggregate demand curve in the same direction
  - Autonomous consumption expenditure
  - Autonomous investment spending
  - Government purchases
  - Taxes
  - Autonomous net exports

- In response to output expansion, the central bank raises the interest rate.





# Shifts in the AD curve

## Shifts in the *MP* curve

- Autonomous shifts in monetary policy:
  - An autonomous tightening of monetary policy (a rise in real interest rate at any given inflation rate), shifts the aggregate demand curve to the left
  - Similarly, an autonomous easing of monetary policy shifts the aggregate demand curve to the right

$$r = \bar{r} + (a - 1)(\pi - \bar{\pi}) + b \left( \frac{Y - \bar{Y}}{\bar{Y}} \right)$$

