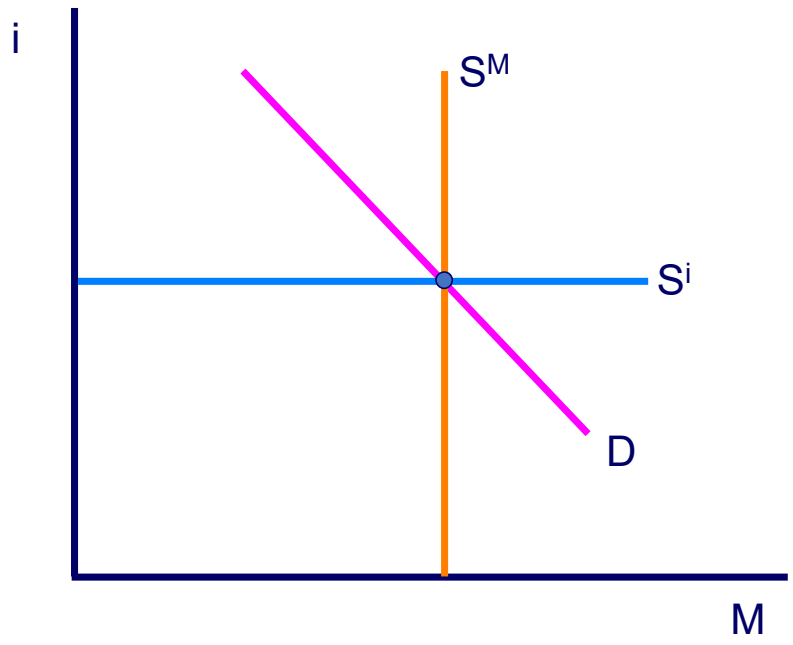
The Taylor rule

Fig. 10.5 (a)

Choice of the Monetary Policy Strategy



Tactics: The taylor rule

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

$$r=i-\pi$$

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

- **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

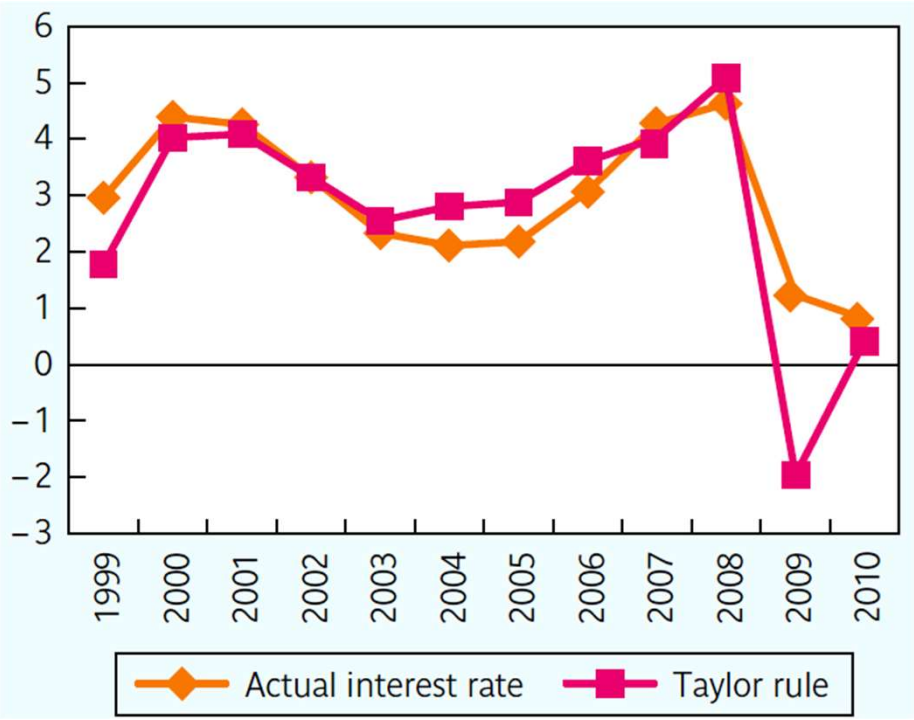
$\bar{i}$ = Anchor /neutral (long run)

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

Taylor principle: $a>1$

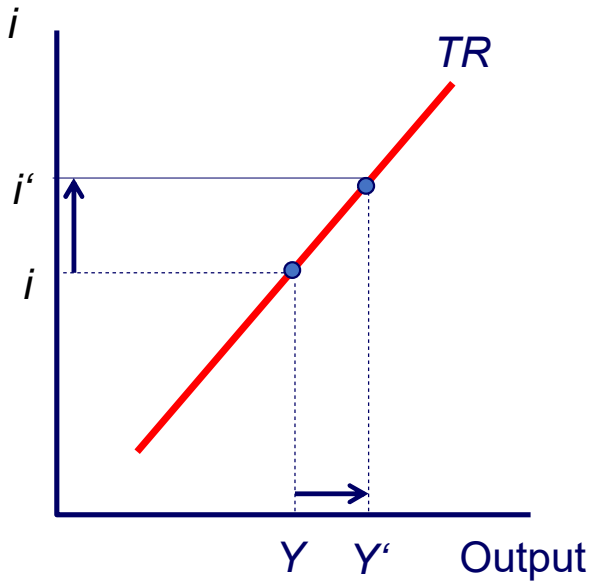
Fig. 10.9 (a)

Taylor Rule: Euro Area



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

The *TR* Curve

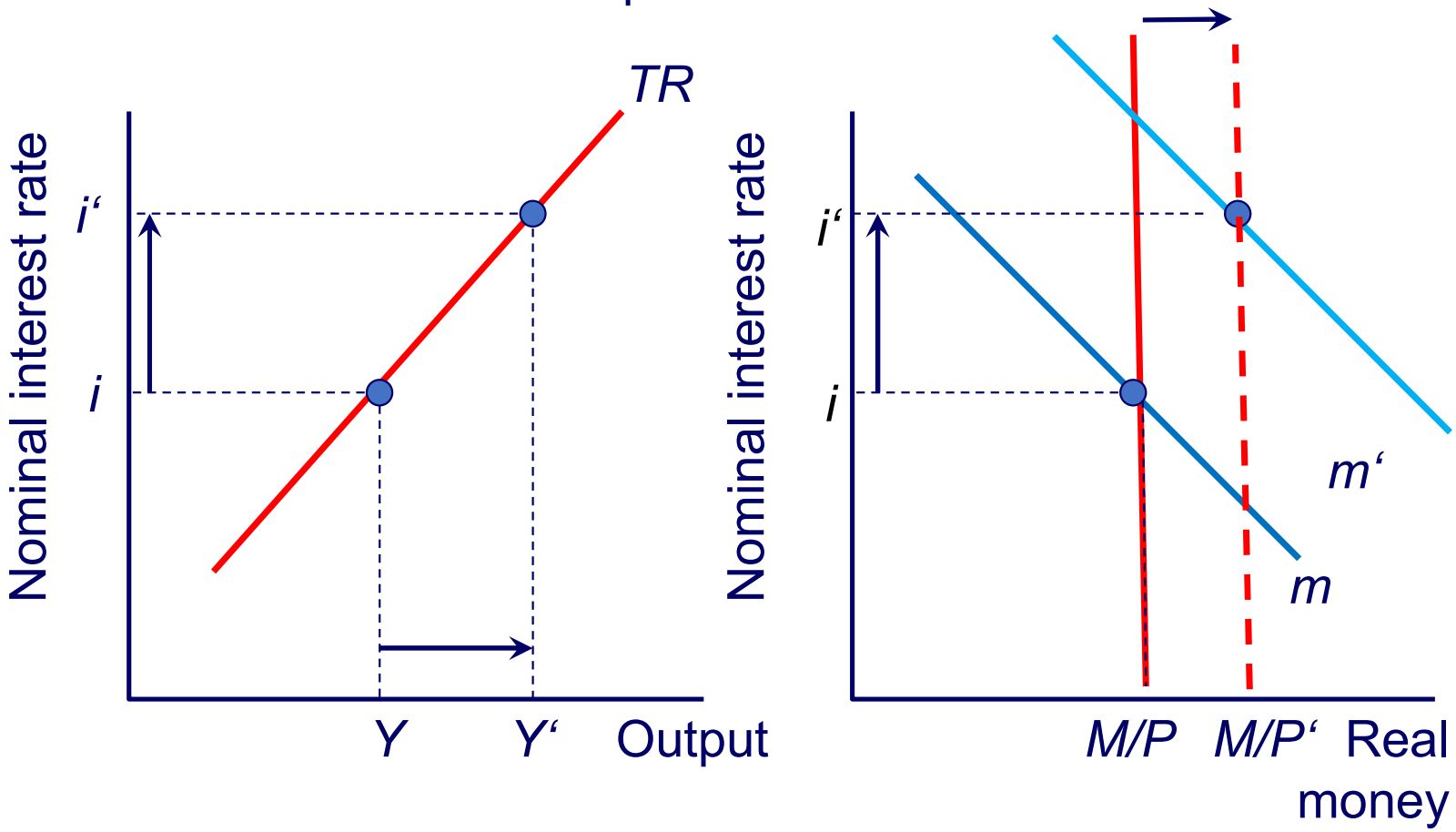


$$i = \bar{i} + a\left(\pi - \bar{\pi}\right) + b\left(\frac{Y - \bar{Y}}{\bar{Y}}\right)$$

- 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

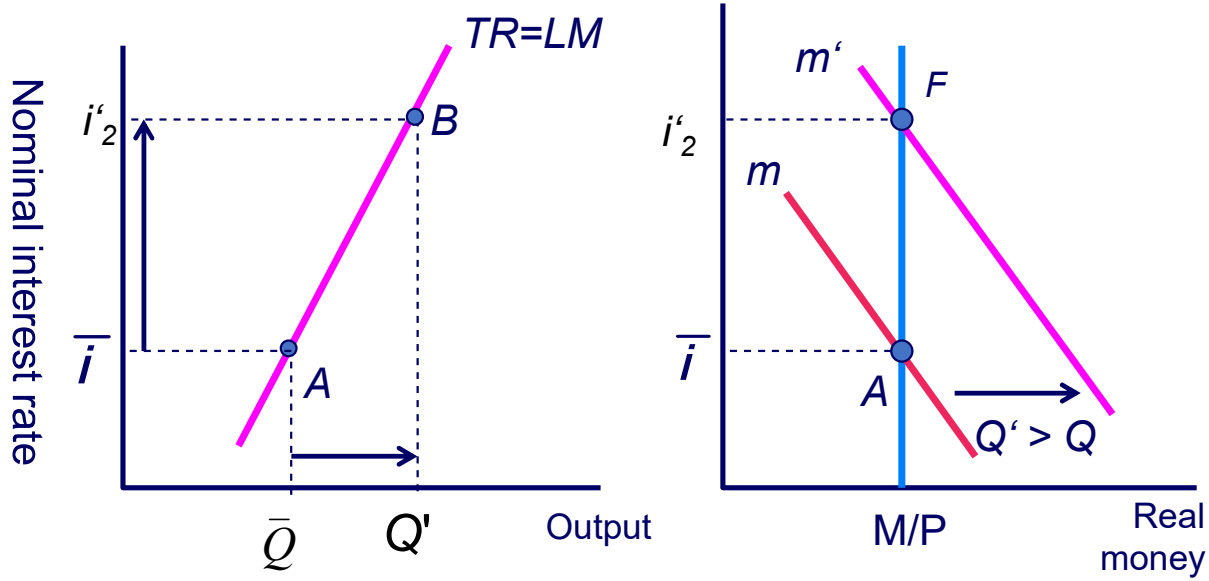
The *TR* Curve and Money Market Equilibrium

The Slope of the *TR* Curve



The *TR* Curve and Money Market Equilibrium

The Slope of the *TR* Curve



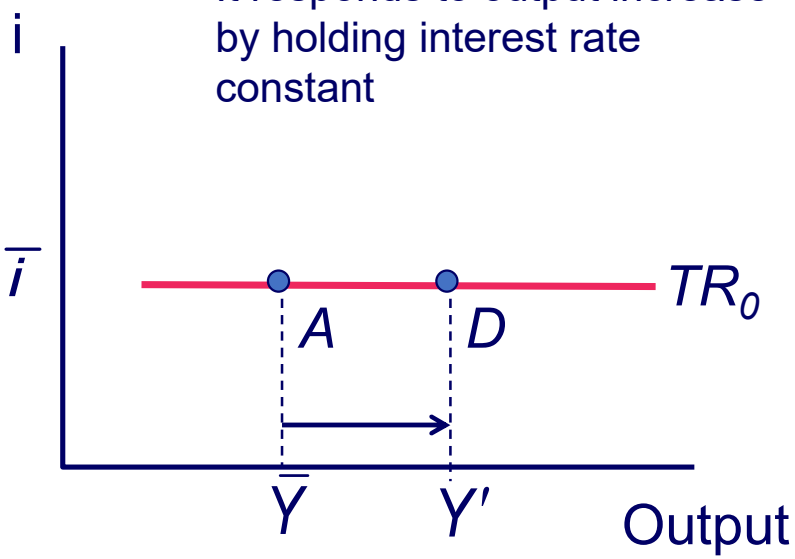
When the CB wants to keep M unchanged: central bank responds to output increase by strongly raising interest rates (old LM curve).

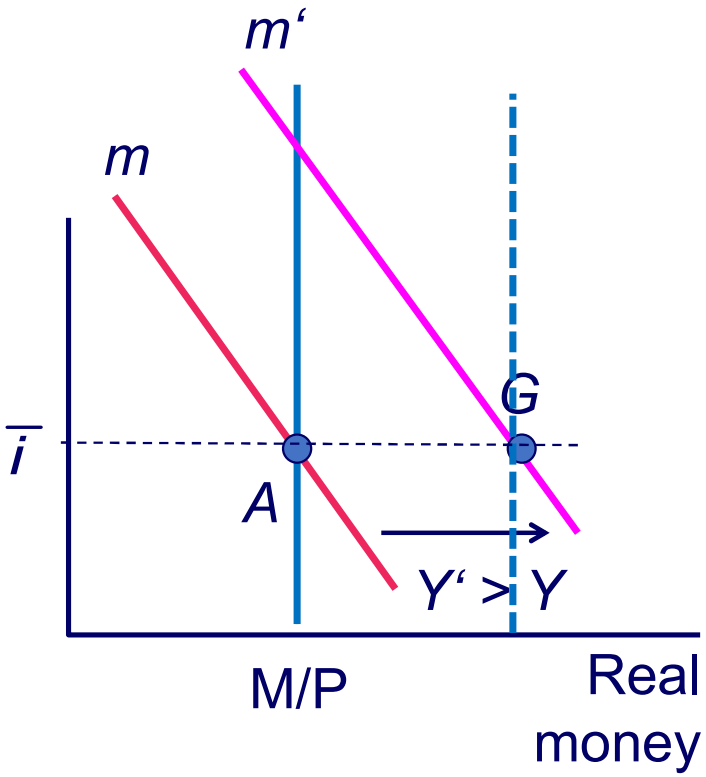
Figure 11.8 (a)

The *TR* Curve and Money Market Equilibrium

The Slope of the *TR* Curve

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





Aggregate demand

Aggregate Demand

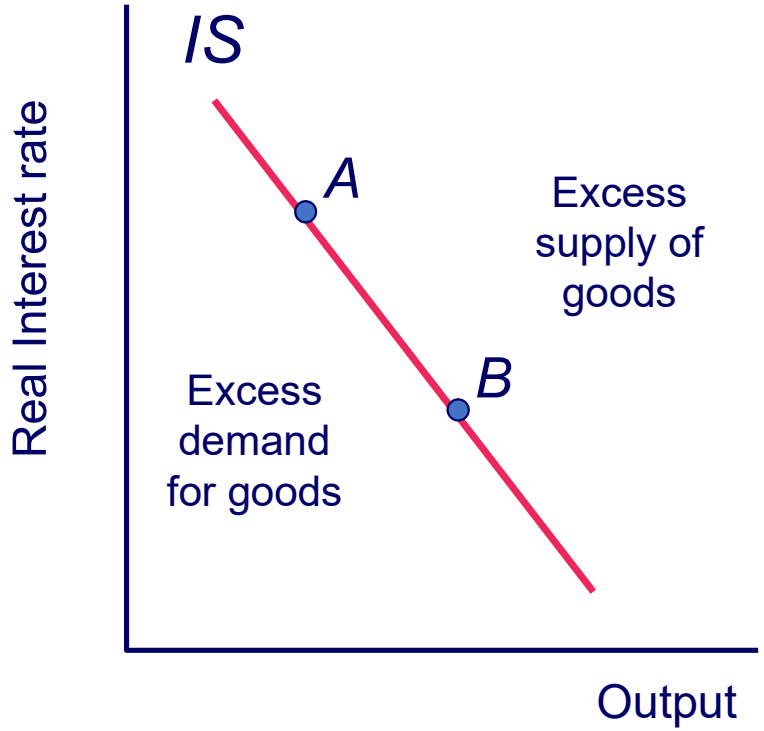
- Aggregate demand is made up of four component parts:
  - **consumption expenditure**, the total demand for consumer

  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

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

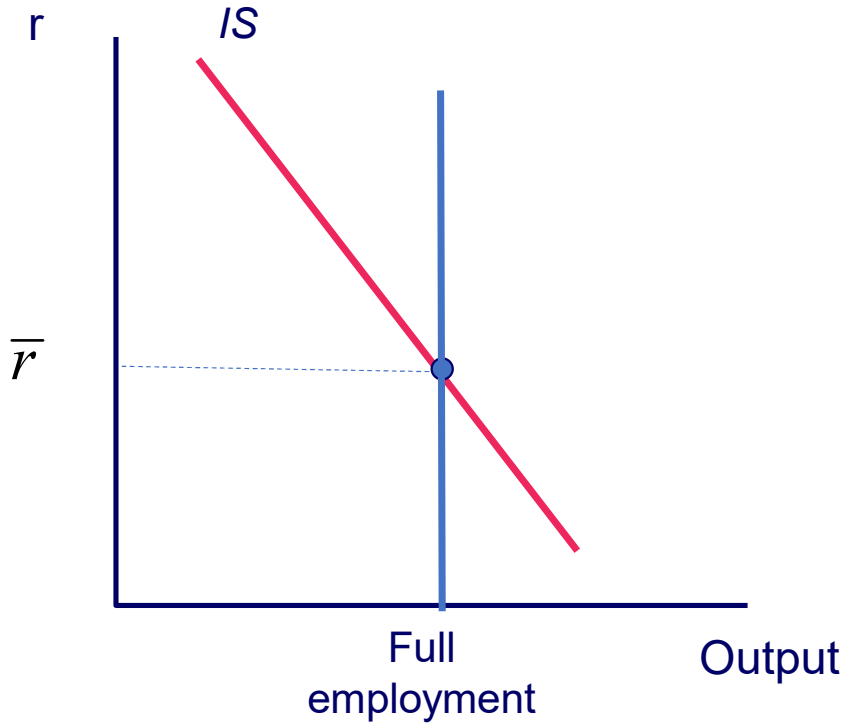
- To the left of the *IS* curve, demand for goods exceeds their supply
- The *IS* curve shifts whenever there is a change in autonomous factors (factors independent of aggregate output and the real interest rate)



The Natural Interest rate

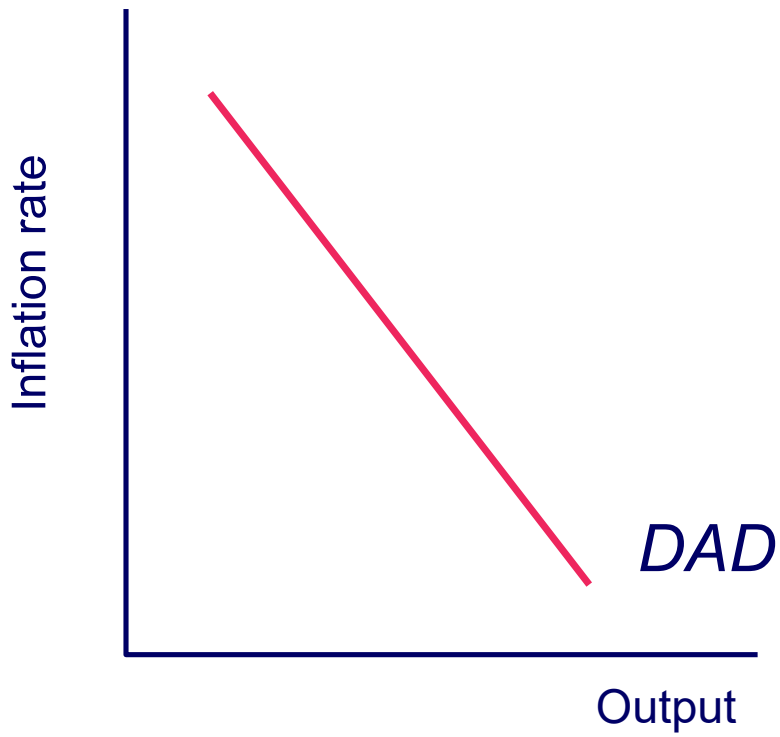
$$Y=C(Y-T,r)+I(r)+G+TB(Y,Y^*,\theta)$$

The real interest rate that would be consistent with full employment



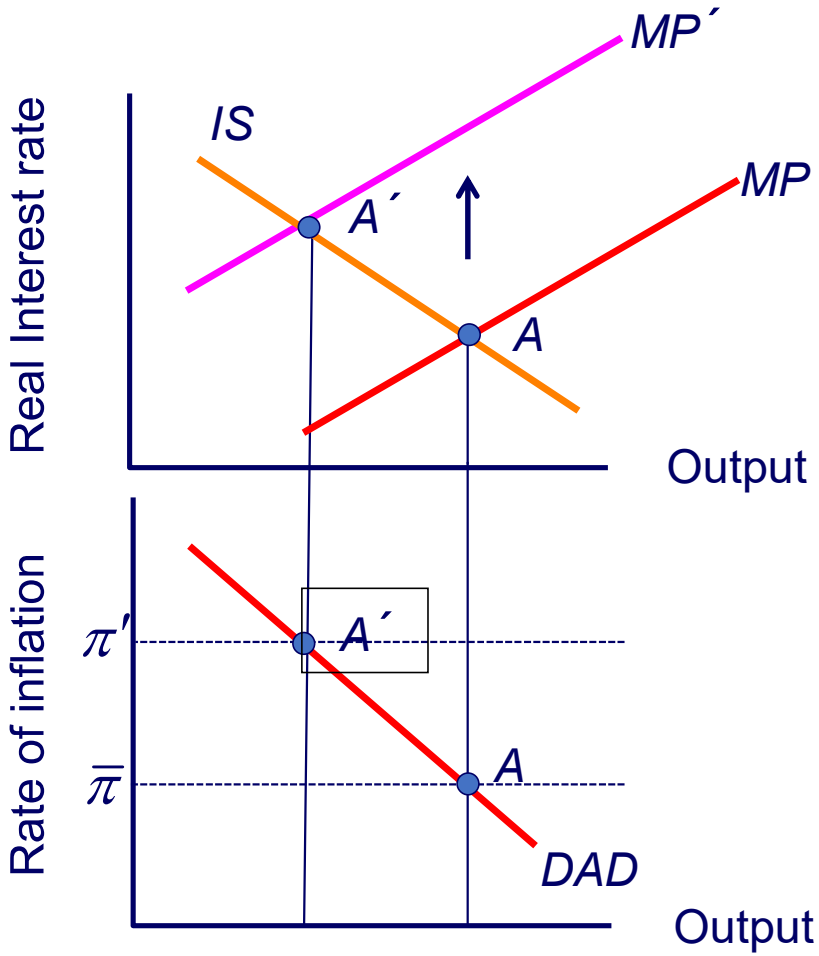
The Aggregate Demand Curve

- 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 *TR/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

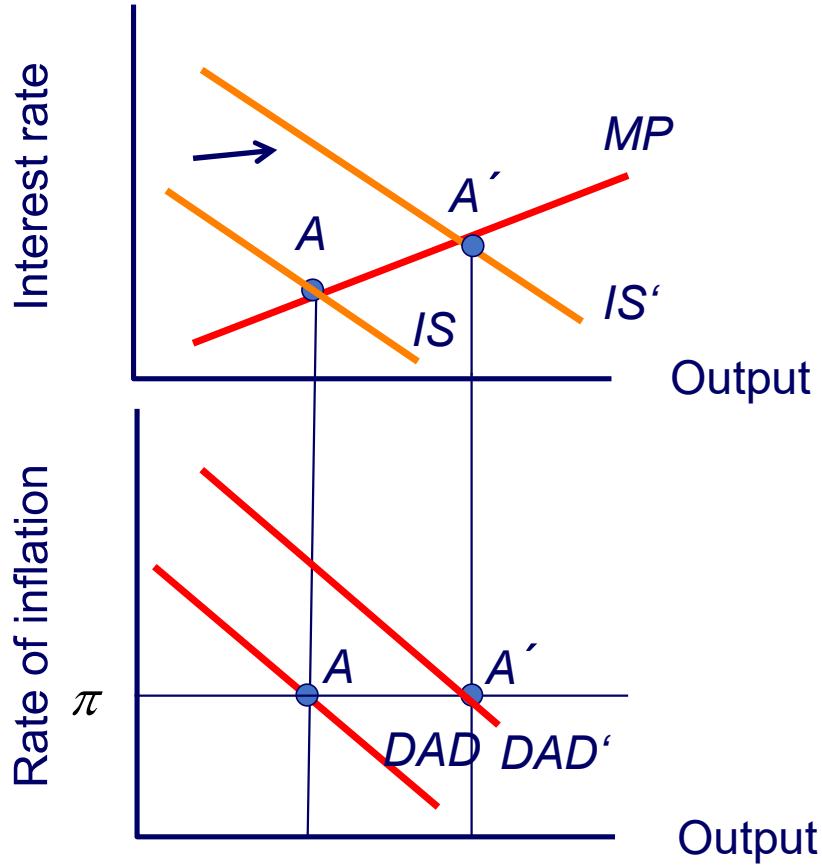
- The upward sloping monetary policy (*MP*) curve shows how the real interest rate reacts to the output gap via Taylor rule
  - In response to output expansion, the central bank raises the interest rate.
- Higher inflation shifts the MP curve upwards
  - The increase in real interest rate reduces demand (point A')



Shifts in the dynamic 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



Shifts in the AD curve

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

Shifts in the *MP* curve

- Autonomous (out of rule) 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

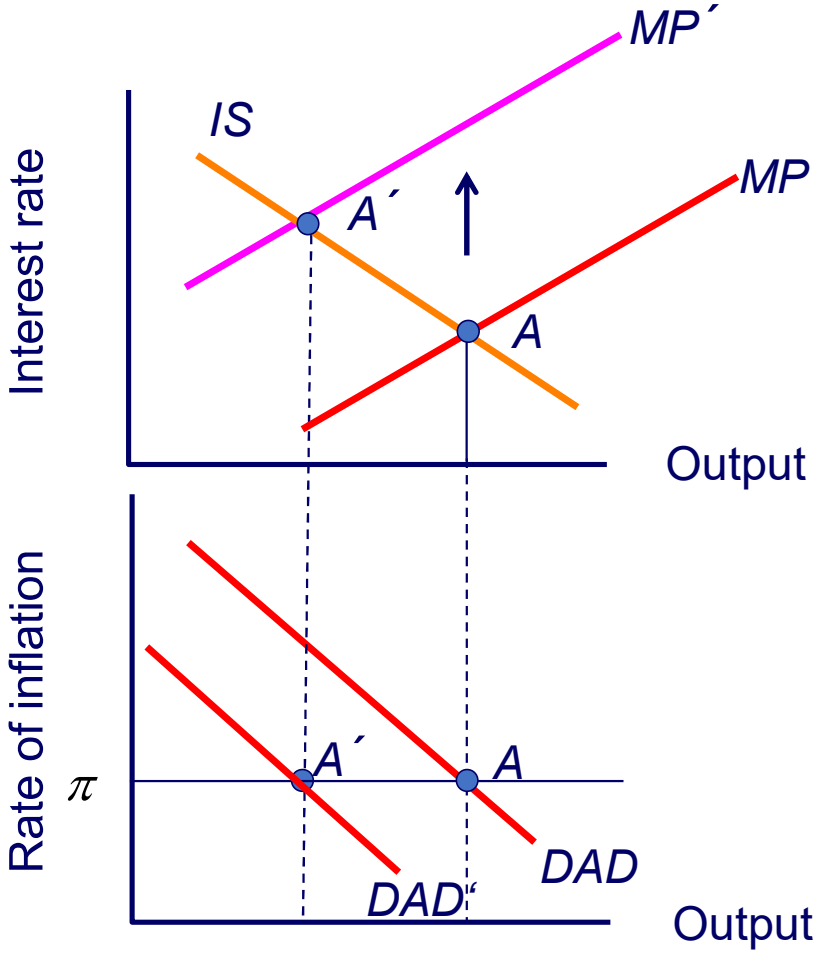
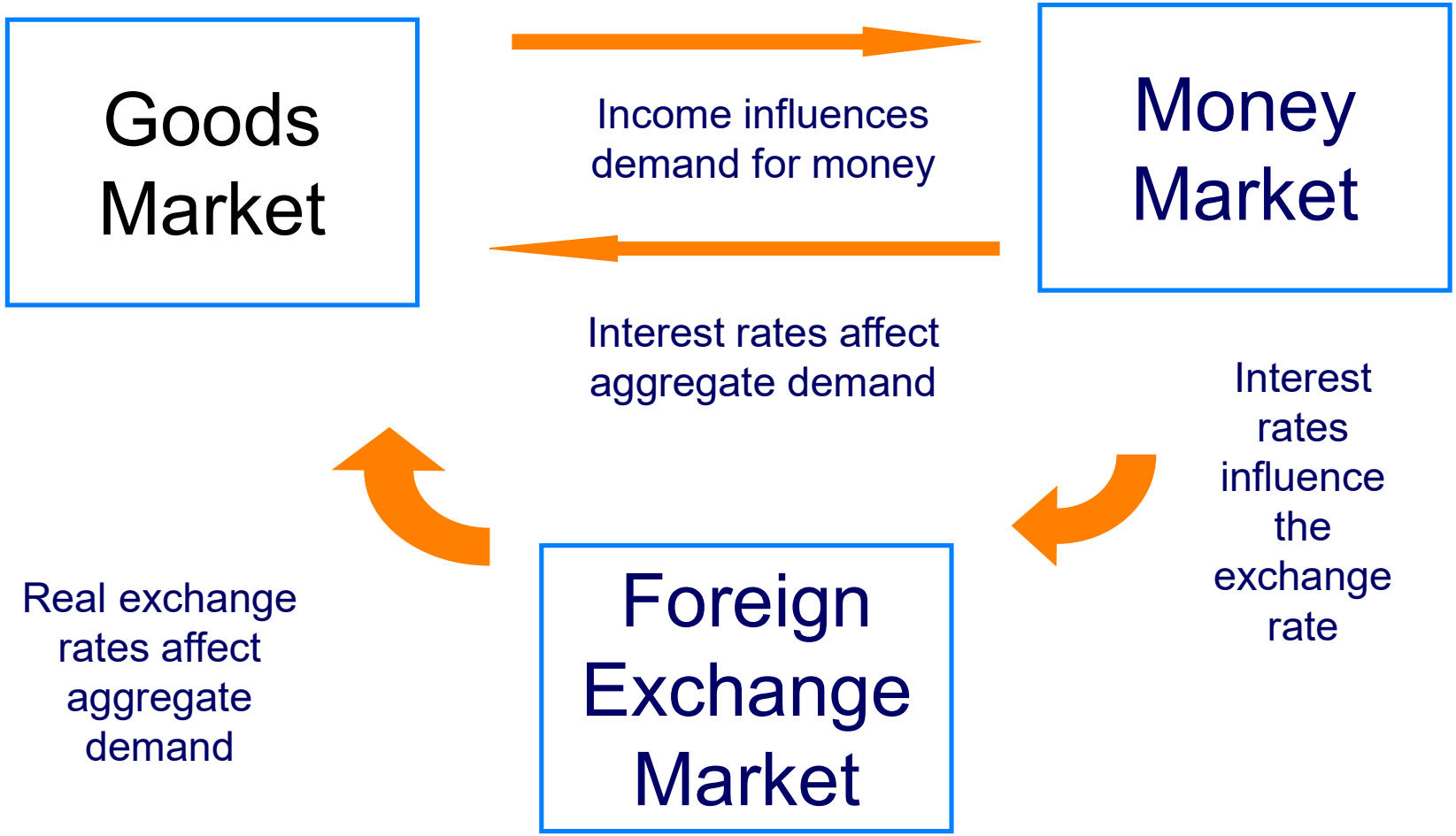


Figure 11.2 (b)

Macroeconomic Equilibrium: Open Economy



Real interest rate parity condition

- Uncovered Interest Rate Parity

$$i = i^* + \hat{e}^e$$

- The domestic rate of interest must equal the foreign rate of return, where the foreign rate of return includes both the foreign interest rate and any anticipated change in the exchange rate.

- Relative PPP

$$\hat{e}^e = \pi^e - \pi^{e*}$$

- Real interest rates

$$r = i - \pi^e$$

$$= \left(i^* + \hat{e}^E \right) - \pi^e = i^* - \pi^{e*}$$

$$r = r^*$$

Deriving the Aggregate Demand under float

- Higher inflation triggers higher interest rate *via Taylor rule*: *MP* shifts up to *MP'*
- Higher interest rate: Capital inflow
- Real exchange rate appreciates, reducing demand (point *A'*).
- AD is flatter than in the case with no capital mobility.

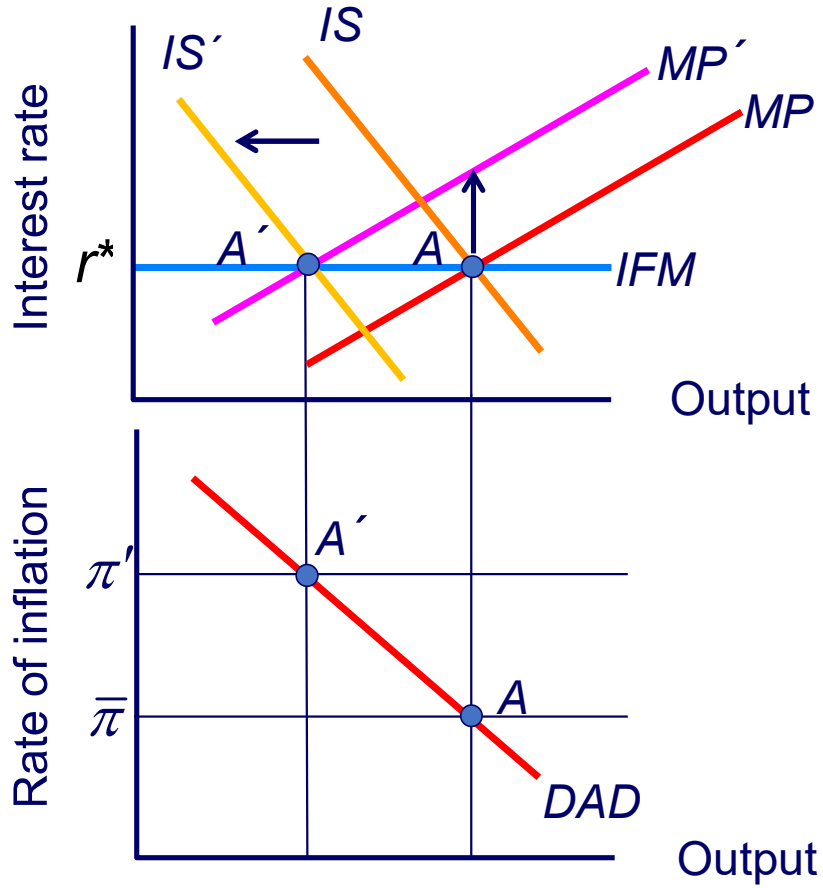
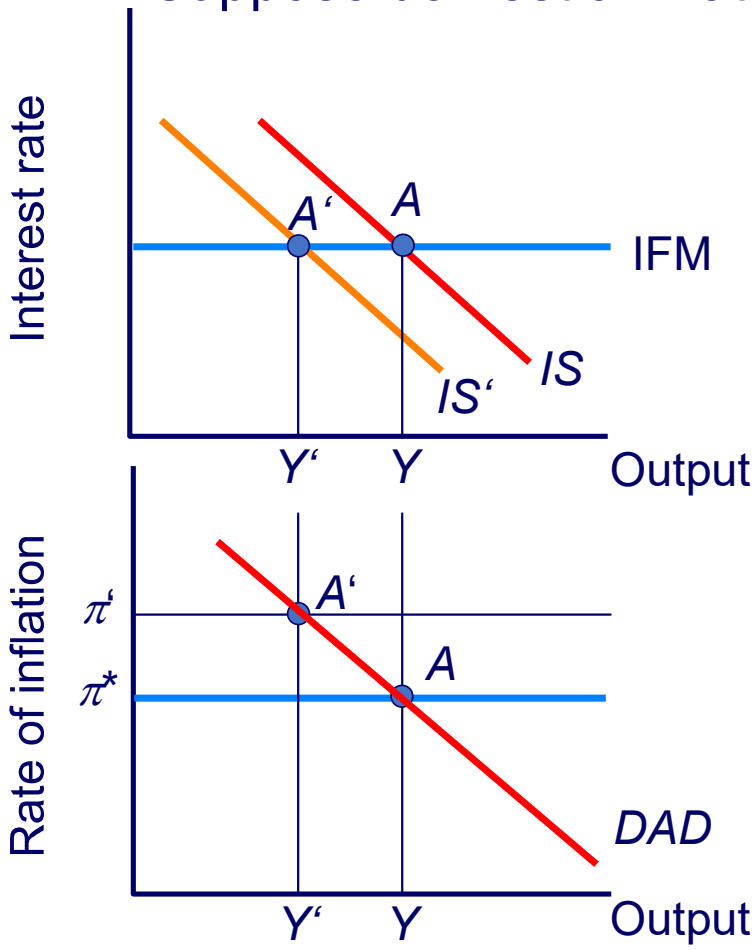


Figure 14.3 (b)

Aggregate Demand, Fixed Exchange Rates

Suppose domestic inflation $\pi > \pi^*$ ...



Because prices at home have risen faster than abroad, the demand for our exports will decrease, shifting the *IS* curve to the left.