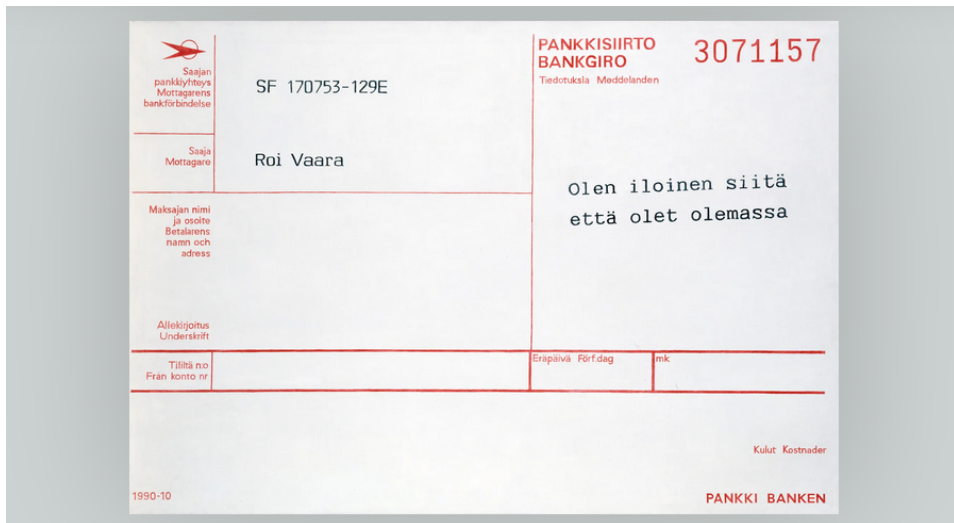


Aggregate Demand and Aggregate Supply (Chapter 14)

Part I

Roi Vaara: Olen iloinen siitä että olet olemassa



"I am happy that you exist", acryl on canvas, in the collection of Finnish National Gallery

Questions

How does expansive fiscal policy work in a country with a fixed exchange rate?

How effective are devaluations?

Outline

Aggregate demand under fixed exchange rate

- ▶ AS-AD model
- ▶ expansive fiscal policy
- ▶ devaluations

Note: fixed exchange rate regime

Reminder: Aggregate Supply

Supply side of the economy

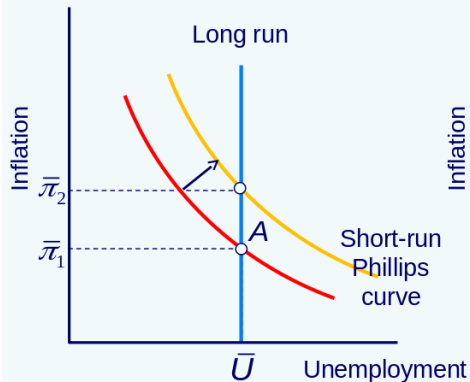
- ▶ short run AS curve $\pi = \tilde{\pi} + aY_{\text{gap}} + s$
- ▶ in the long run $\bar{Y}$ regardless of inflation (LAS curve)

Note: underlying inflation adjusts

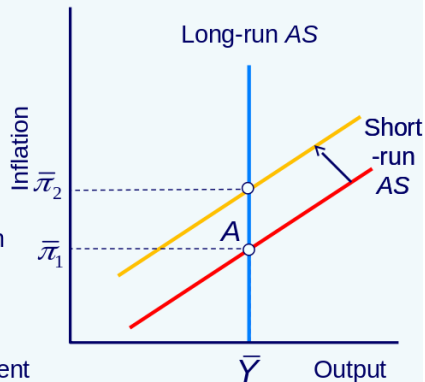
- ▶ if inflation changes, the underlying inflation follows

Reminder: Aggregate Supply

In the long run: underlying inflation will adjust.



(a) Phillips curve



(b) Aggregate supply

Long-Run Aggregate Demand

Long run

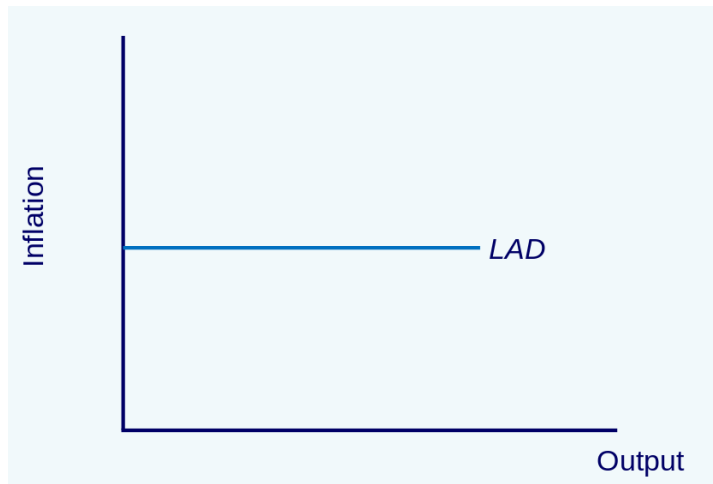
- ▶ note: fixed exchange rates
- ▶ real exchange rate is constant (relative purchasing power parity)
- ▶ $\sigma = SP/P^*$, S is the nominal exchange rate, P domestic price index, P^* foreign price index
- ▶ implication: domestic inflation rate equals the foreign inflation rate (S is fixed and σ constant)
- ▶ exchange rate becomes an anchor for monetary policy

Example: domestic inflation higher than foreign

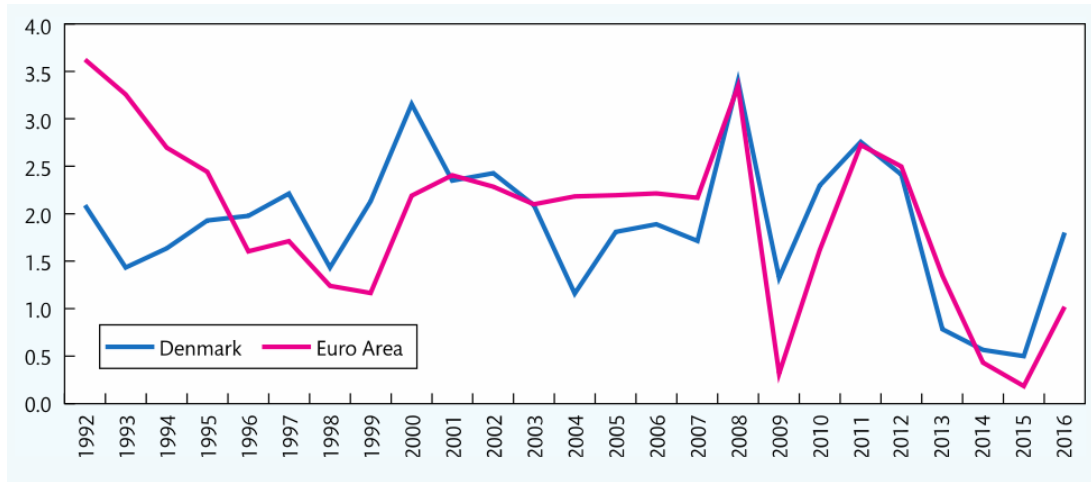
- ▶ real appreciation of the currency, more uncompetitive
- ▶ any permanent deviation from foreign inflation would lead to unsustainable current account deficits or surpluses

Horizontal LAD-curve

Long-Run Aggregate Demand



Inflation in Denmark



Money Growth under Fixed Exchange Rates

Purchasing Power Parity implies $\pi = \pi^*$

Interest rate parity $i = i^*$

Money market; money demand $M/P = k(i^*) Y$

- ▶ CB supplies all money demanded
- ▶ $\Delta(M/P)/(M/P) \approx \Delta M/M - \pi$ and at the same time $\Delta(M/P)/(M/P) = \Delta Y/Y$ which is denoted as g (GDP growth rate)
- ▶ $\Delta M/M \approx g + \pi^*$

Short-Run Aggregate Demand Curve

What happens if π (domestic inflation) increases?

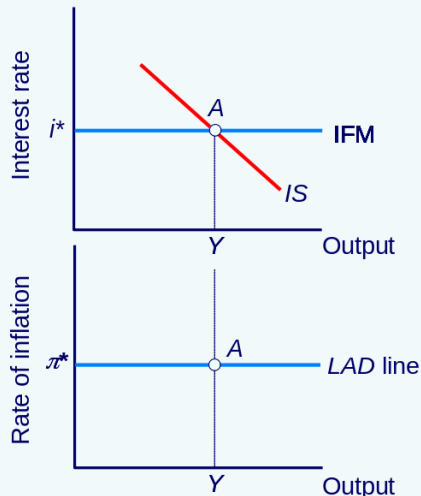
Real exchange rate appreciates ($\pi > \pi^*$)

- ▶ competitiveness erodes, net export account worsens, demand for domestic output declines
- ▶ IS curve shifts to left (new equilibrium)

If π (domestic inflation) decreases

- ▶ IS curve shifts to right (new equilibrium)

Short-Run Aggregate Demand Curve

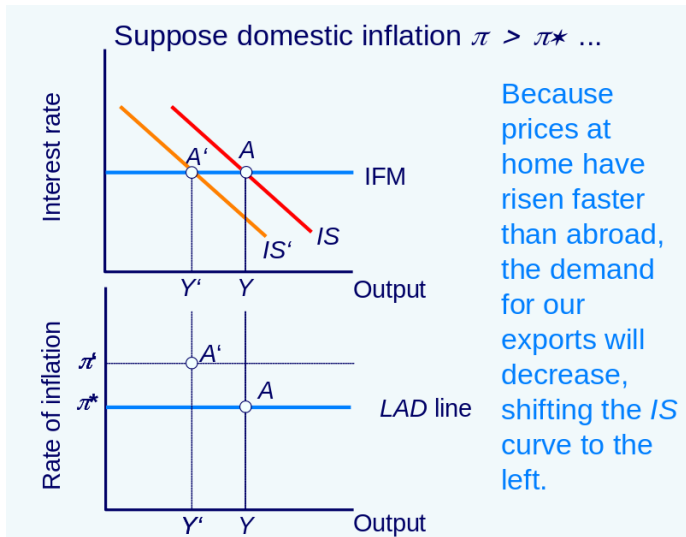


Interest rates determined by rate of return on assets in the rest of the world.

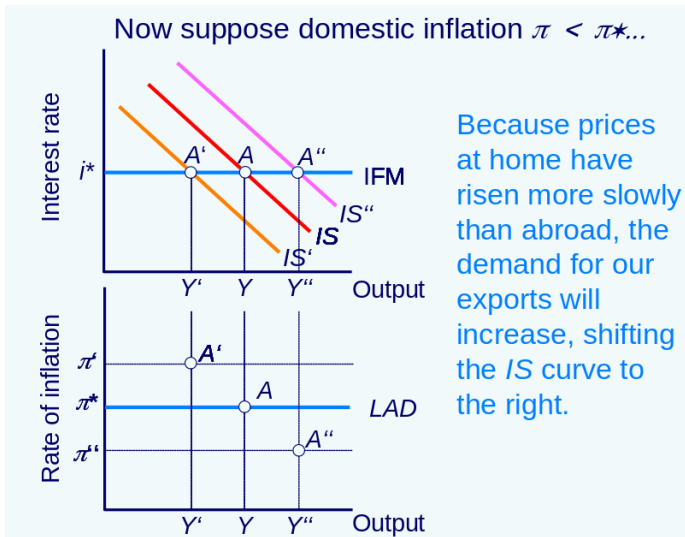
We start from a general equilibrium at point A where

$$\pi = \pi^*$$

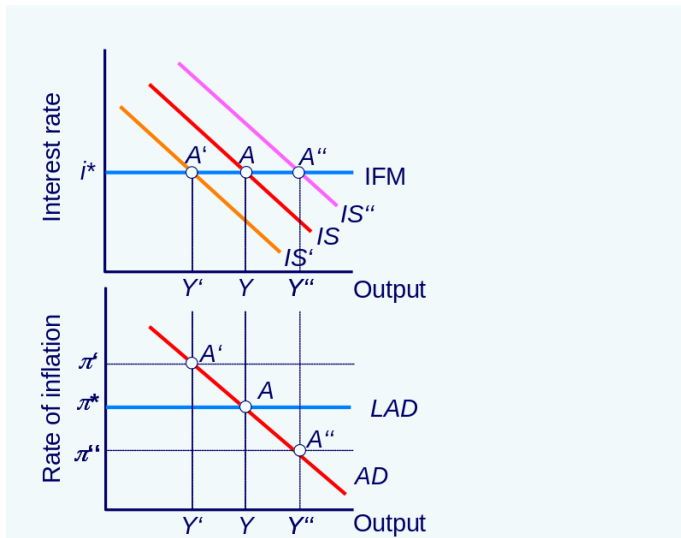
Short-Run Aggregate Demand Curve



Short-Run Aggregate Demand Curve



Short-Run Aggregate Demand Curve



Example: Deriving AD Curve

IS curve: $Y = 435 - 80i + 2G - T + NX$

Exports $NX = 100 - 0.1Y - 25\sigma$

- ▶ real exchange rate appreciates if $\pi > \pi^*$, assume that $\sigma = 1 + (\pi - \pi^*)$

Parameters

- ▶ assume $i^* = 0.25$, $\pi^* = 0.2$, note parity holds $i = i^*$
- ▶ $T = G = 45$

AD Curve

- ▶ $Y = 435 - 80 \times 0.25 + 90 - 45 + 100 - 0.1Y - 25 + 25 \times 0.2 - 25\pi$
- ▶ $1.1Y = 540 - 25\pi$, which gives AD curve $Y \approx 490 - 23\pi$

Summary: Some Principles behind the AD Curve

Desired demand depends on net exports

- ▶ IS curve inherits the dependence from DD

Net exports are decreasing as a function of the real exchange rate σ

- ▶ market forces remove the arbitrage between domestic and foreign goods

Real exchange rate $\sigma = SP/P^*$ is affected by inflation

- ▶ if $\pi > \pi^*$, σ increases when S is fixed

Demand Shocks

AD curve shifts whenever IS curve shifts

- ▶ shifters: foreign demand (Y^*), Tobin's Q , fiscal policy (G)
- ▶ note: AD curve is the summary of IS-IFM framework
- ▶ each point on the AD curve corresponds to a different IS curve

Inflation does not shift AD curve

- ▶ inflation is endogenous in AS-AD model
- ▶ when inflation changes there is a movement along the curve
- ▶ remember: changes of $\tilde{\pi}$ shift AS curve

AS-AD model

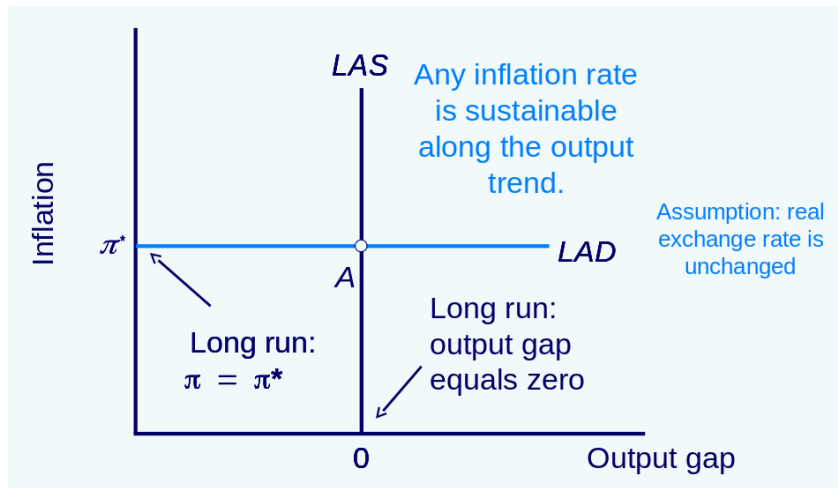
Demand side

- ▶ short-run aggregate demand curve
- ▶ long run horizontal LAD line

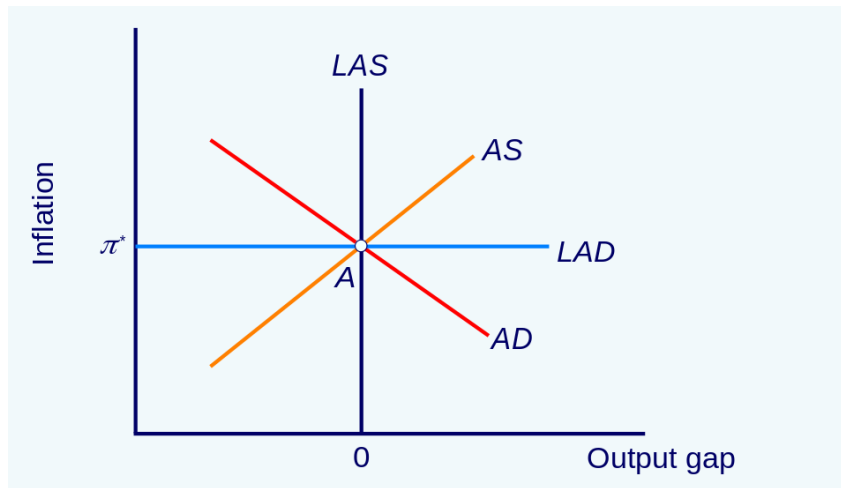
Supply side

- ▶ upward sloping short-run supply curve, position depends on $\tilde{\pi}$
- ▶ vertical long-run line LAS
- ▶ note: $\tilde{\pi}$ adjusts!

AS-AD Model



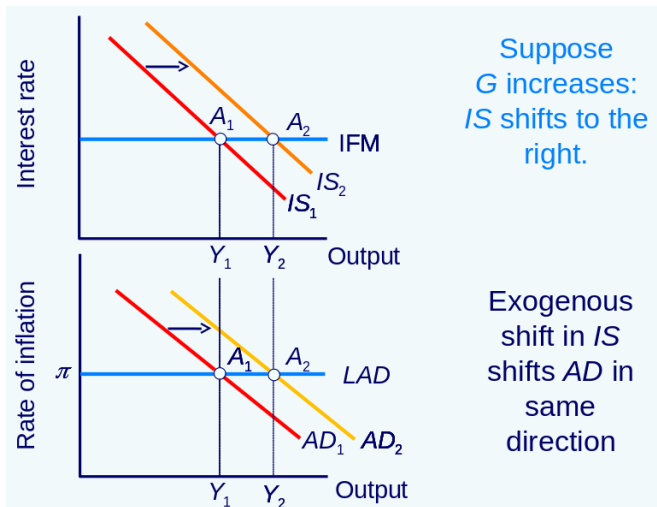
AS-AD Model



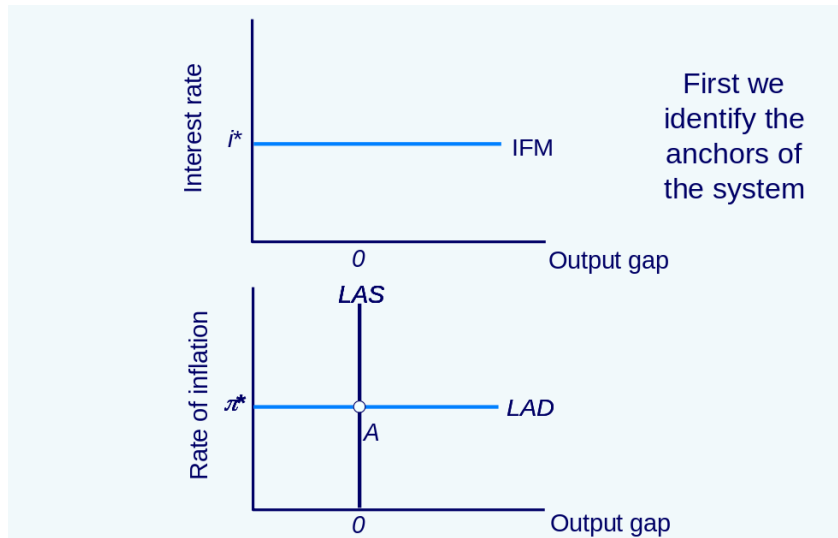
Expansive Fiscal Policy

1. Increase in G (or decrease in T)
 - ▶ IS-curve shifts to the right, increase in equilibrium output
 - ▶ note: the increase is only temporary
2. AS-AD model: AD curve shifts right
 - ▶ higher output in all levels of inflation
3. Higher inflation decreases net exports
 - ▶ IS curve starts to shift back (decreasing AD curve)
 - ▶ short run AS-AD equilibrium
4. Realized inflation higher than underlying inflation
 - ▶ underlying inflation starts to increase
 - ▶ AS curve shifts left, realized output decreases
 - ▶ note: note: fiscal expansion generates inflation which undermines its effect
5. AD curve shifts back when the expansion is over
6. LAD-LAS equilibrium is eventually restored

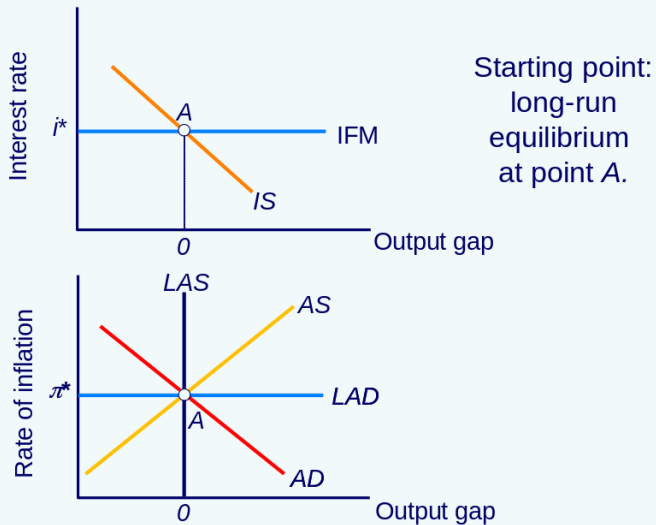
Expansive Fiscal Policy: Short Run



Expansive Fiscal Policy: Full Story

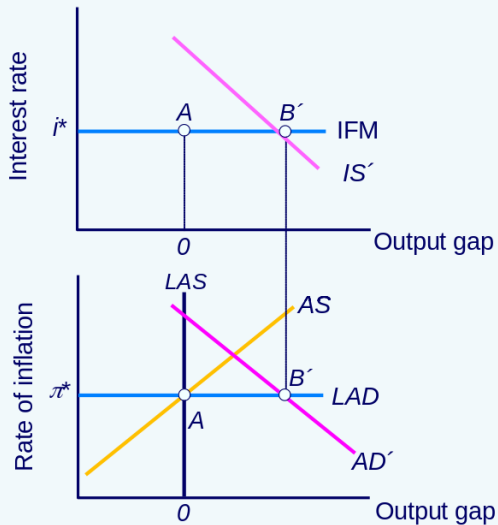


Expansive Fiscal Policy: Full Story



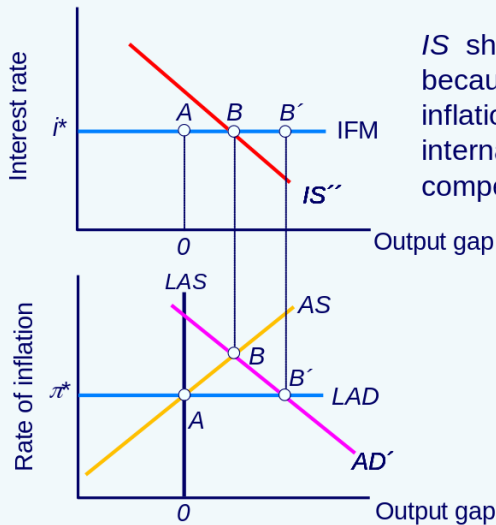
Expansive Fiscal Policy: Full Story

A fiscal expansion shifts the IS and AD curves to the right.



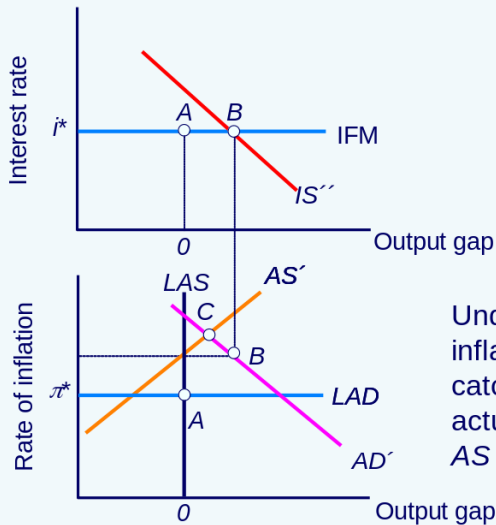
Expansive Fiscal Policy: Full Story

A fiscal expansion shifts the IS and AD curves to the right.



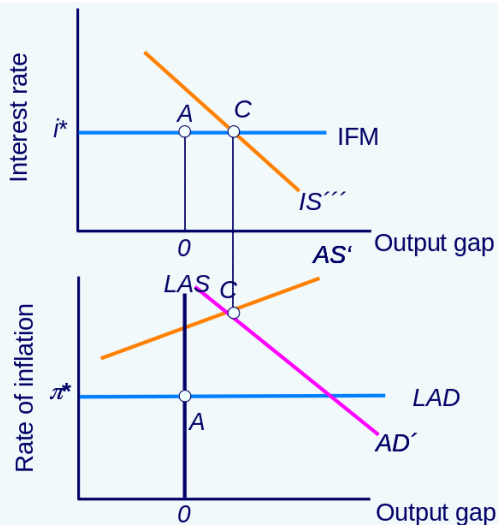
IS shifts back because increased inflation reduces international competitiveness

Expansive Fiscal Policy: Full Story



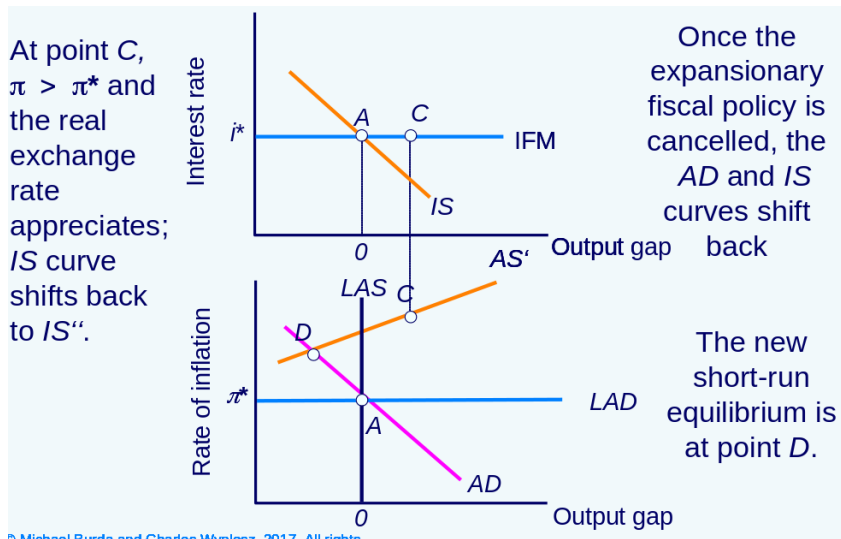
Expansive Fiscal Policy: Full Story

At point C,
 $\pi > \pi^*$ and
the real
exchange
rate
appreciates;
IS curve
shifts back
to IS'' .



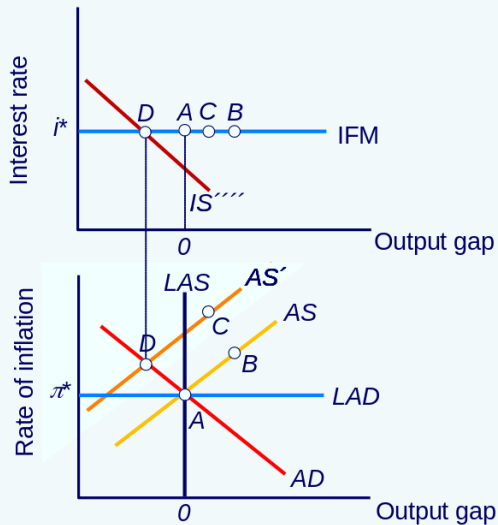
© Michael Burda and Charles Wyplosz 2017. All rights reserved.

Expansive Fiscal Policy: Full Story

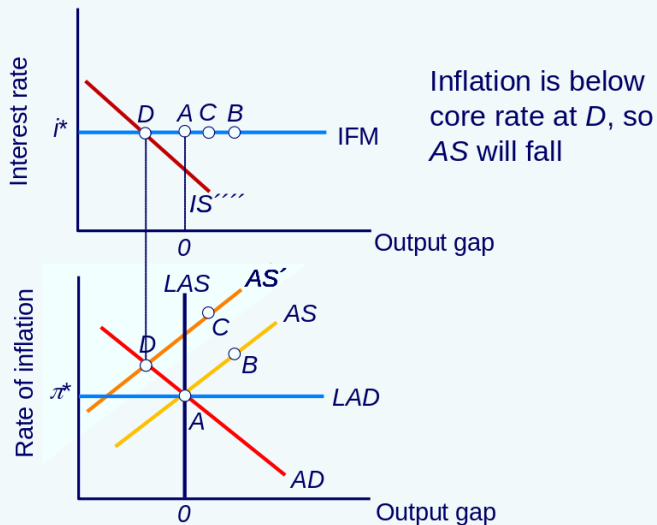


© Michael Burda and Charles Wyplosz 2017. All rights reserved.

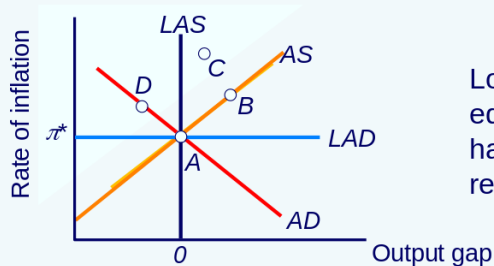
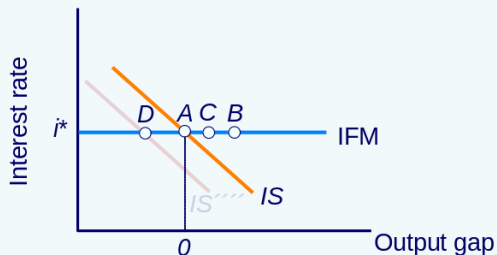
Expansive Fiscal Policy: Full Story



Expansive Fiscal Policy: Full Story



Expansive Fiscal Policy: Full Story



Long-run
equilibrium
has been
reestablished

Expansive Fiscal Policy: Full Story

1. AD shifts
2. Underlying inflation catches up
3. Expansionary fiscal policy loses impact
4. Underlying inflation adjusts until it equals actual inflation
 - ▶ long run equilibrium is established

Monetary Policy and Realignments

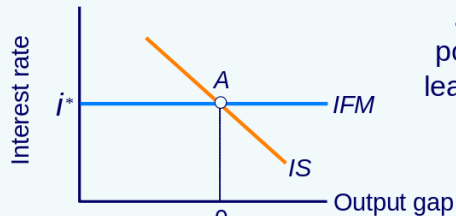
Fixed exchange rate

- ▶ autonomous monetary policy is impossible but
- ▶ exchange rate parities can be changed

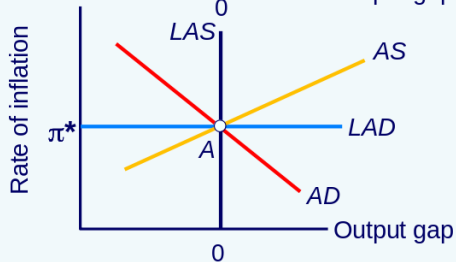
Devaluation

- ▶ CB announces new parity with lower S
- ▶ increased supply of currency (lower interest rate, capital outflows, interest parity is reached with new S)
- ▶ note: devaluation recovers monetary policy instrument temporarily
- ▶ output expansion, increased inflation, increased underlying inflation
- ▶ real exchange rate appreciates

Devaluation



... a monetary
policy expansion
leads to a nominal
depreciation

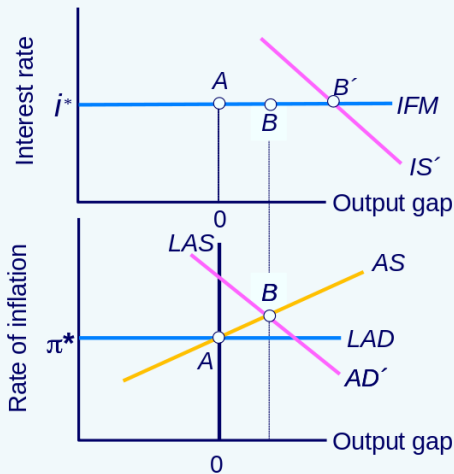


Starting at
the long-run
equilibrium
point A,
where
 $\pi = \pi^*$

..

Devaluation

Rising inflation due to output expansion shifts IS' to IS'' .

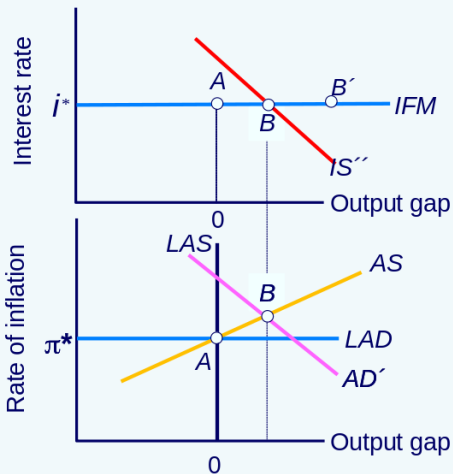


The improved current account shifts the IS curve to IS' .

The demand expansion shifts AD curve to AD' with short-run equilibrium at point B .

Devaluation

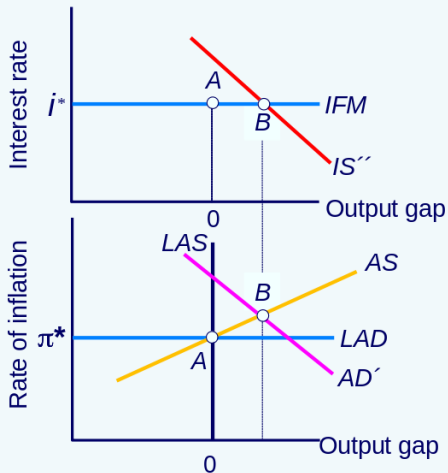
Rising inflation due to output expansion shifts IS' to IS'' .



The improved current account shifts the IS curve to IS' .

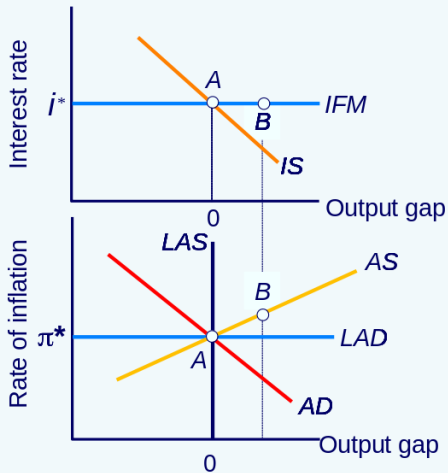
The demand expansion shifts AD curve to AD' with short-run equilibrium at point B .

Devaluation



Inflation is now above the world level and competitiveness is reduced, shifting IS back

Devaluation



Inflation is now above the world level and competitiveness is reduced, shifting IS back

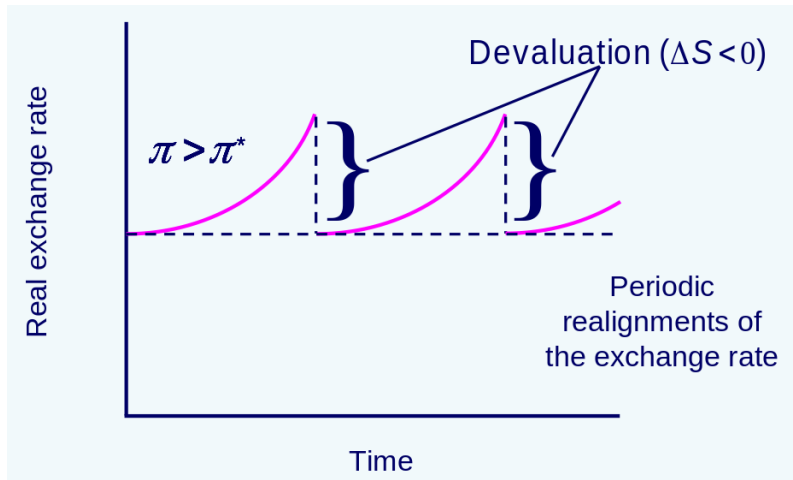
Devaluation Cycle

After a devaluation $\pi > \pi^*$

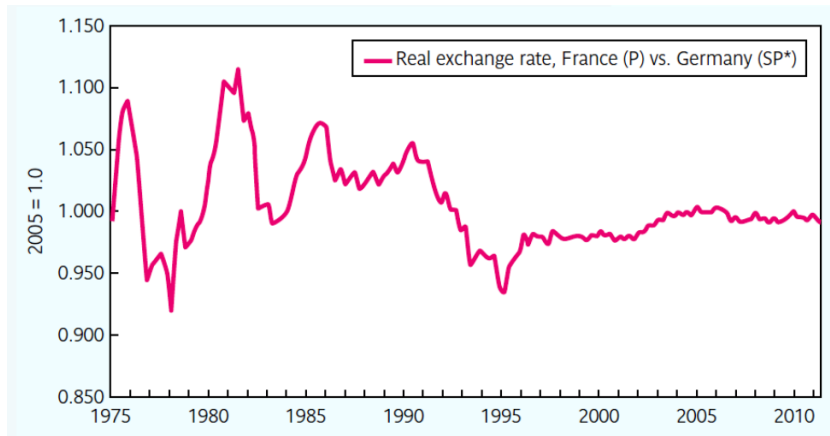
Real exchange rate appreciates until pre-devaluation level is reached

New devaluation and so on ...

Devaluation Cycle



France and Germany



Fiscal Devaluation

Member of a currency union cannot change the nominal exchange rate

What if there is a problem with competitiveness in terms of overly high production costs?

- ▶ decreasing exports, high unemployment
- ▶ decrease in domestic demand
- ▶ example: Finland 2009–2015

Solution 1: decrease nominal wages

- ▶ nominal wages are sticky (especially downwards)

Solution 2: decrease employer contributions, increase VAT

Expected outcomes

- ▶ increase of net exports, improved employment, VAT increase has adverse impact on demand
- ▶ in total AD curve should shift right