The ASAD Model - Part 2

EC 313, Macroeconomics

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Book Chapter 7

Review

Review

Natural Output

Recall the **natural output level** is the equilibrium output implied by the AS curve when $P^e = P$

$$\text{AS Relation:} P = P^e(1+m)F(1-\frac{Y}{L}, z)$$

Review

Natural Output

Recall the **natural output level** is the equilibrium output implied by the AS curve when $P^e = P$

$$\text{AS Relation:} 1 = (1+m)F(1 - \frac{Y_n}{L}, z)$$

Assumptions: Given m, L, z, the natural rate of output is fixed.

Question: Given $m = 0, L = 1, z = 0.5$ and $F = z/(1 - \frac{Y_n}{L})$ what is the natural rate of output Y_n?

Review

AS Relation and AD Relation

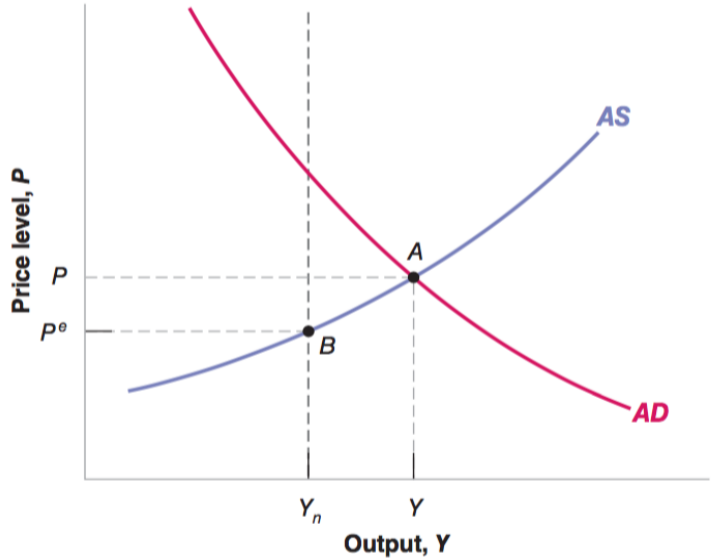
$$\text{AS Relation:} P = P^e(1+m)F(1-\frac{Y}{L}, z)$$

$$\text{AD Relation:} Y = Y(\frac{M}{P}, G, T)$$

Given P^e, m, L, z, and M, G, T these two relations will determine equilibrium output, Y, and prices, P.

Review

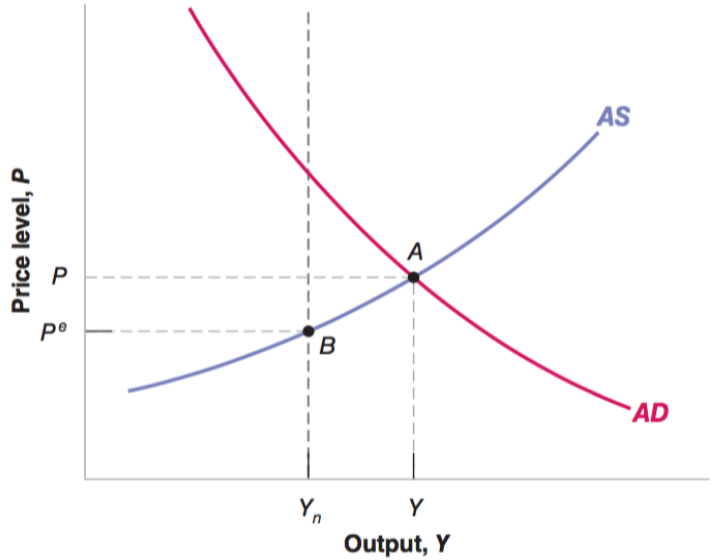
AS Relation and AD Relation



- At point A, we are in **a Short Run Equilibrium** implied by AS=AD (**As every point on AD is an SR equilibrium**).
- P_A and Y_A corresponding to point A represent **the equilibrium values of the Price Level and Output**.

Review

AS Relation and AD Relation

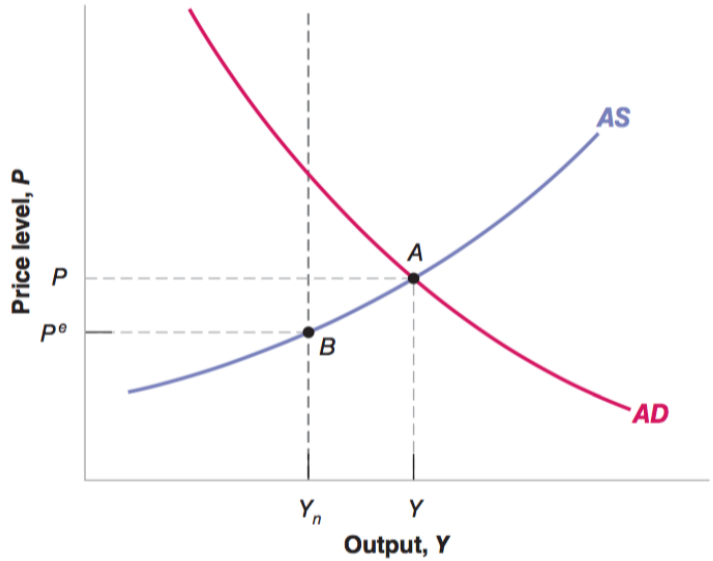


- Point A represents equilibrium in the **goods market, the money market** (**because it is a point on the AD curve, and AD comes from the IS-LM Model**) as well as **equilibrium in the Labor Market** (**because it is a point on the AS curve, and AS comes from the Labor Market**)

SR Transitions to MR

SR Transitions to MR

Consider the following AS-AD model.



Note: $Y > Y_n$ at point A.

- Here Y is found from AS=AD.
- Y_n is found given m, L, z

SR Transitions to MR

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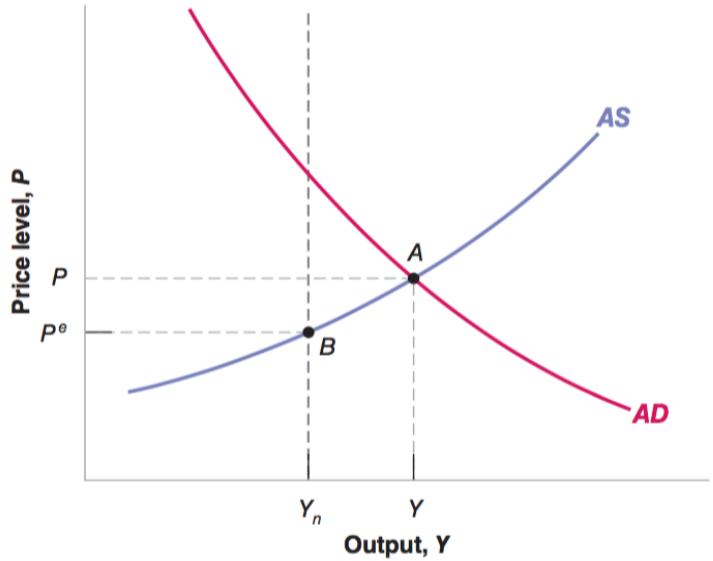

Question: When $Y > Y_n$ at point A, is P higher than P^e?

Answer: Yes!

SR Transitions to MR

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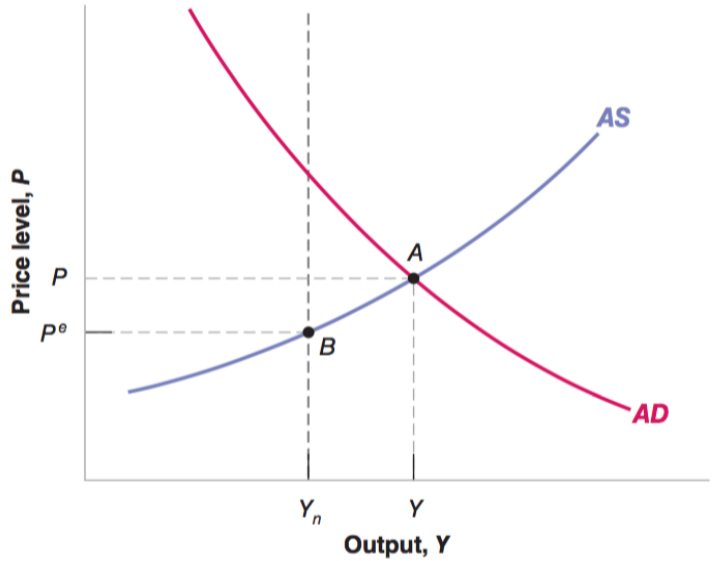

Question: In the short run, is it ok for P to be higher than P^e?

Answer: Yes! In the short run, prices do not change. P doesn't have to be the same as P^e

SR Transitions to MR

Q: What happens when **Pe < P** as we move to the **Medium Run**?

- If **Pe < P**, then actual prices are above expected prices. What will this do to expectations?

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Another way of saying all of this: **Pe increases, so the AS curve shifts up**!

SR Transitions to MR

Q: If we increase Pe, the AS shifts up, and we still aren't in equilibrium at Yn, what do we do?

- We increase our expectations AGAIN!

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SR Transitions to MR

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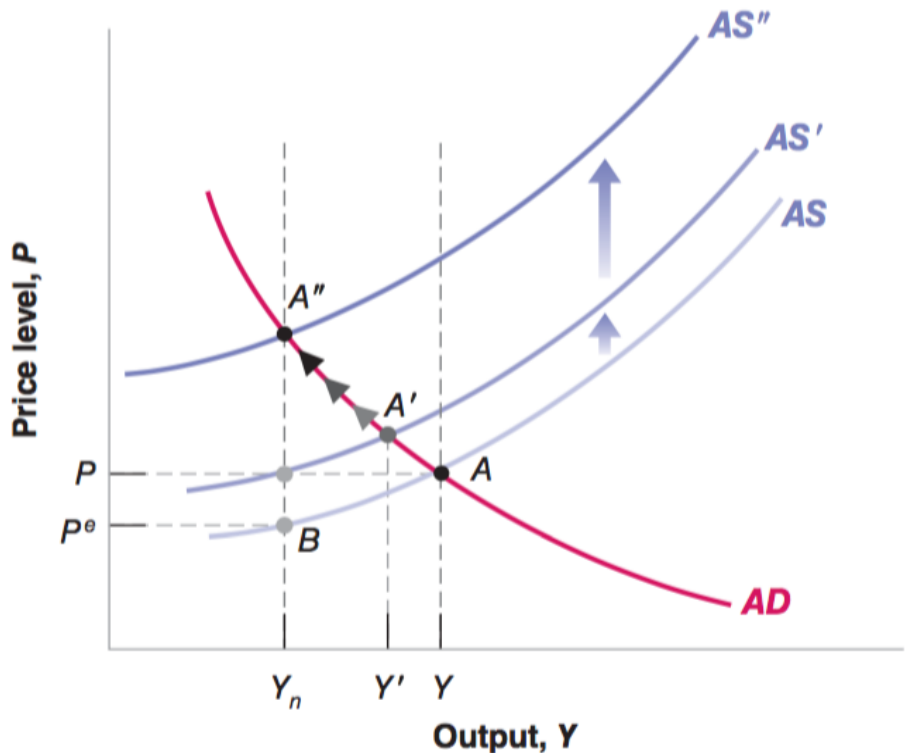
- We increase our expectations AGAIN!
- We increase **Pe** until expectations match equilibrium prices **P**!
- At this point, there is no incentive to change expectations.
- $P_e = P$ and $Y = Y_n$, our **short run equilibrium** has transition to **the medium run equilibrium**!

SR Transitions to MR

If we **increase P_e, the AS shifts up**, and we **still aren't in equilibrium at Y_n**

- What do we do?
- $Y' > Y_n$



SR Transitions to MR

Takeaways:

- Whenever equilibrium output is higher than the natural rate of output, equilibrium prices are higher than expected prices.

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SR Transitions to MR

Takeaways:

- Whenever equilibrium output is higher than the natural rate of output, equilibrium prices are higher than expected prices.
- Whenever equilibrium prices are higher than expected prices, expected prices increase!
- In the **medium run**, **equilibrium output is always equal to the natural rate of output**!

SR Transitions to MR

Takeaways:

- **Medium Run Equilibrium output** in the AS-AD model is entirely determined by **the labor market**!
    - Recall that Y_n depends on only m, L, z

SR Transitions to MR

Takeaways:

- **Medium Run Equilibrium output** in the AS-AD model is entirely determined by **the labor market**!
    - Recall that Y_n depends on only m, L, z
- **Monetary and Fiscal policy only have short-run effects on output** in the AS-AD model (see examples in the next few slides)!

Policy Evaluation

Policy Evaluation

Policy Neutrality

The distinction between **Neutral** and **non-Neutral Policies** is very important when discussing the medium-run effects of Monetary and Fiscal Policy.

A policy change (changing M, G, or T) is said to be neutral if:

- **The policy doesn't change the real variables**
- So far, we have seen four real variables: Y (output), i (interest rate), W/P (real wage), M/P (real money supply)

Policy Evaluation

Method 1

When we change **policy variables (M, G, or T)** in our AS-AD model...

Method 1: Ignore the IS-LM Model, and analyze both the short run and medium run effects of a policy change **using only the AS-AD graph**.

- **Advantage**: **Quicker and simpler** method for understanding the impact of a policy change on P and Y in the Short Run and Medium Run.
- **Disadvantage**: We do not know what happens to the interest rate.

Policy Evaluation

Method 2

When we change **policy variables (M, G, or T)** in our AS-AD model...

Method 2: **Graph the IS-LM Model above** our AS-AD market and analyze policy changes in both markets.

- **Advantage**: We now have a way of understanding the impact of our policy in the Short Run and Medium run on the **interest rate, prices, and output**.
- **Disadvantage**: We have to be more careful in the way that we graph our policy shocks and equilibrium adjustments.

Monetary Expansion

Monetary Expansion

AS-AD

$$\text{AS Relation: } P = P^e(1+m)F\left(1-\frac{Y}{L}, z\right)$$

$$\text{AD Relation: } Y = Y\left(\frac{M}{P}, G, T\right)$$

Q: Starting at the Medium Run equilibrium point, if the Fed decides to purchase bonds, what happens to M?

A: M increases!

Q: If M increases, what happens to the AS relation and the AD relation?

A: M is not in the AS relation, so the AS curve stays the same. M enters into the AD relation positively, so for the same value of P, Y is now higher! The AD curve shifts right!

Monetary Expansion

Method 1

Suppose we are at some point A where AS=AD. At point A, $Y_A = Y_n$ so $P_A = P^e$. **What are the SR and MR equilibrium effects of the Fed buying bonds?**

Short Run Equilibrium:

- When M increases, the AD curve shifts right (for the same P, Y is higher).
- AD and AS intersect at a new point, A', corresponding to higher output ($Y_{A'} > Y_A = Y_n$) and prices ($P_{A'} > P_A = P^e$).

Monetary Expansion

Method 1

Suppose we are at some point A where AS=AD. At point A, $Y_A = Y_n$ so $P_A = P^e$. **What are the SR and MR equilibrium effects of the Fed buying bonds?**

Medium Run Equilibrium:

- Equilibrium prices are higher than expected prices.
- Expected prices, P^e increase. This shifts the AS curve up.
- This continues until AS intersects AD at the MR equilibrium point A''.
- At A'' , Prices ($P_{A''}$) are higher than they were at A or A' and **output has returned to its natural rate**.

Monetary Expansion

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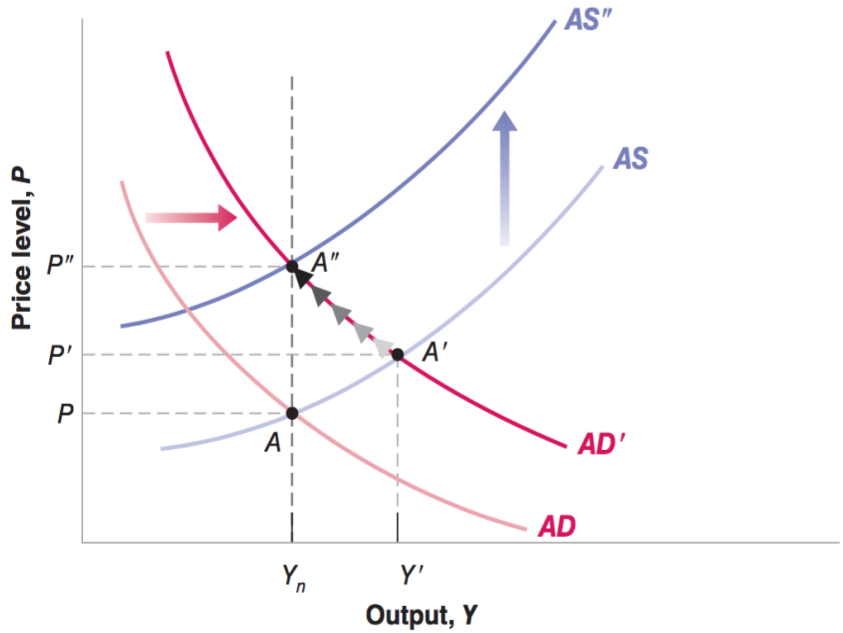


Monetary Expansion

Method 2: Short Run

IS-LM:

- M increases. Nothing happens in the goods market. IS curve does not shift.
- M increase leads to M^s shifting right. Thus i is lower, but Y has not changed.
- LM curve shifts down. New equilibrium at B with $Y_B > Y_A$

Monetary Expansion

Method 2: Short Run

AS-AD

- $Y_B > Y_A$, but prices hanven't changed. Thus AD **shifts right** to AD'.
- AD' intersects AS at a new point B. $Y_{A'} > Y_A$ and $P_{A'} > P_A$.

Back to IS-LM

- Price has increased. Thus the **real money supply** has decreased, and LM shifts up until IS=LM at point A'.

Monetary Expansion

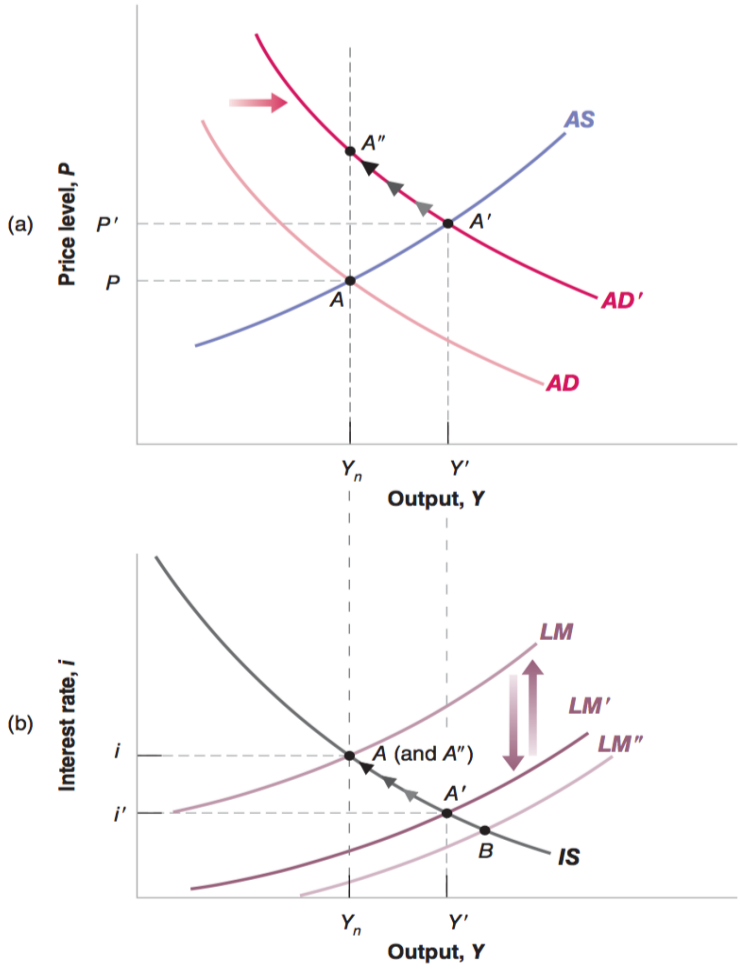
Method 2: Medium Run

Back to IS-LM

- Equilibrium prices are higher than expected prices.
- Expected prices, P^e increase. This shifts the AS curve up.
- This continues until AS intersects AD at the MR equilibrium point A''.
- At A'' , Prices ($P_{A''}$) are higher than they were at A or A' and **output has returned to its natural rate**.
- **Price increases, real money supply increases, the interest rate goes up and hence LM shifts up.**

Monetary Expansion

Method 2: Short Run + Medium Run



Monetary Expansion

More Questions

When the monetary expansion occurs:

Q: What is the **SR equilibrium effect** on output, prices, and the interest rate?

A: In the SR, **output, and prices are higher**, and the **interest rate is lower** than before the monetary expansion.

Monetary Expansion

More Questions

When the monetary expansion occurs:

Q: What is the **MR equilibrium effect** on output, prices, and the interest rate?

A: **Output: In the MR**, output returns to it's original value, Y_n . (See IS relation)

A: **Interest Rate: In the MR**, the output returns to Y_n. Thus the IS and LM intersect at their original point, and the interest rate is unchanged.

A: **Prices: In the MR**, Prices P increase.

Monetary Expansion

Neutrality of Money

In the SR, a money supply increase leads to higher output.

In the MR, the output is unaffected by a money supply increase, and the entire effect of an increase in M is absorbed by the rise in the price level, P. So real money supply (M/P) is unchanged.

Monetary Expansion

Neutrality of Money

The Neutrality of Money:

In the medium run,

- money has no real effect. It does not impact Y or i
- It has a nominal effect (P increases).

Q: Does this mean the fed should not perform monetary policy?

A: NO!

"In the long run, we are all dead!" John Maynard Keynes.

Monetary Expansion

Neutrality of Money

Sometimes **short run gains are justifiable** even if they have no long-run effects!

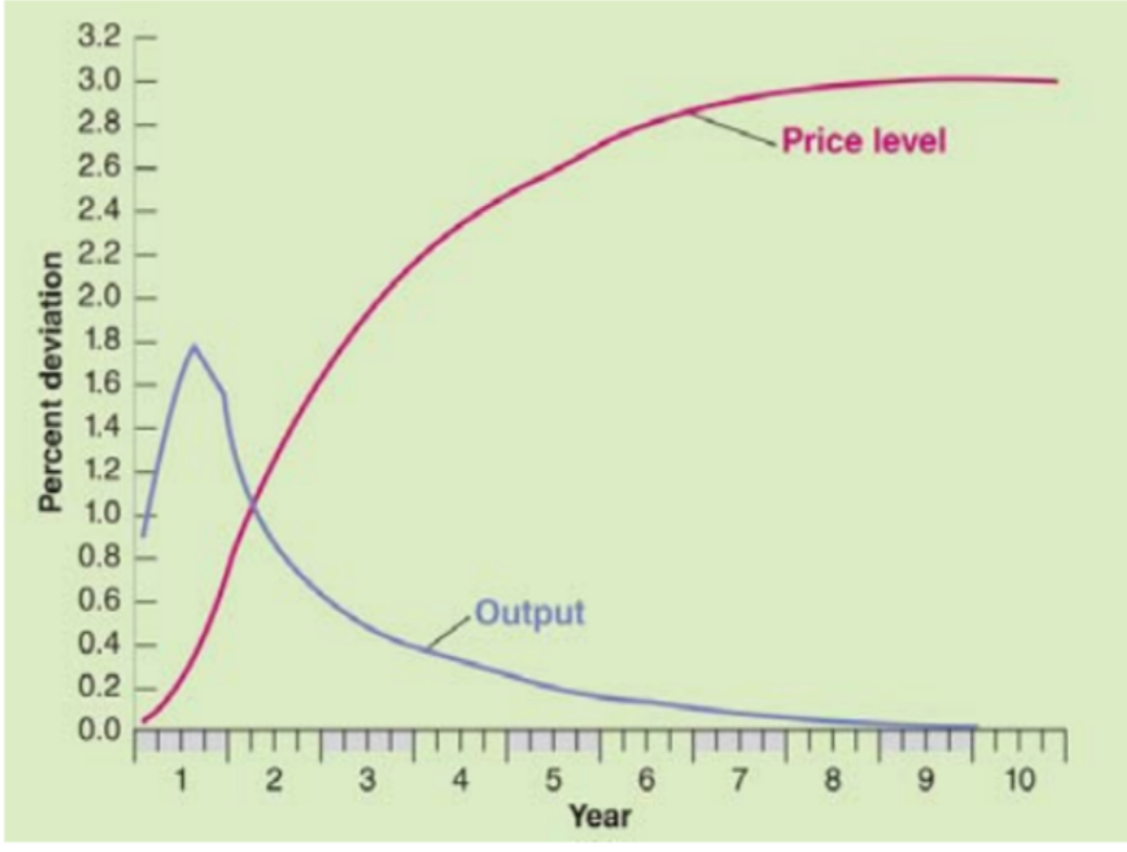
Also:

- We analyzed a policy change when we **started in with a natural rate of output**.
- If we start **below the natural rate of output**, then the expansionary policy could speed up our return to the **MR**!
- If we start **above the natural rate of output**, then the contractionary policy could speed up our return to the **MR**!

Monetary Expansion

Neutrality of Money

The Effects of an Expansion in Nominal Money in the Taylor Model.



Fiscal Contraction

Fiscal Contraction

Method 1

Suppose AS=AD at some point A. At A, $Y_A = Y_n$ thus $P_A = P^e$. What are the SR and MR effects of **a decrease in government spending from G** to **G′ < G**?

Short Run Equilibrium:

- When G decreases, the AD curve shifts left (for the same P, Y is higher).
- AD and AS intersect at a new point, A', corresponding to lower output ($Y_{A'} < Y_A = Y_n$) and prices ($P_{A'} < P_A = P^e$).

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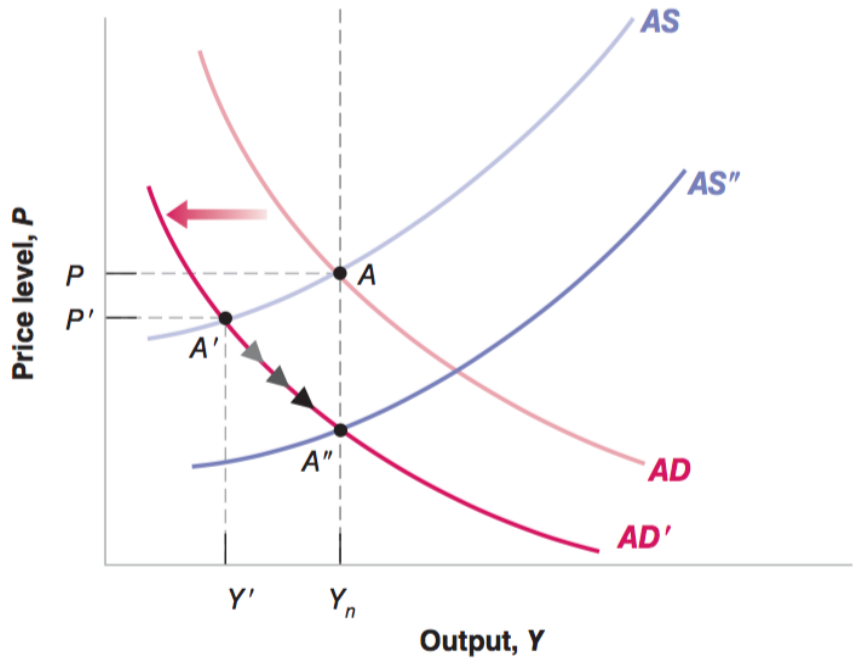
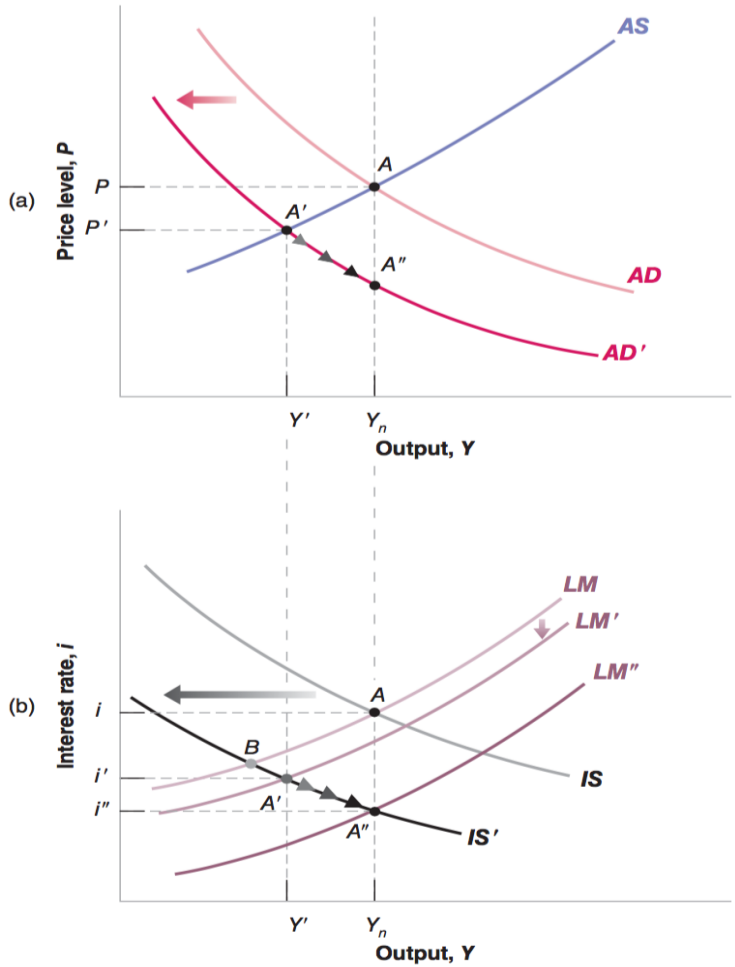


Fiscal Contraction

Method 2: Short Run + Medium Run



Fiscal Contraction

More Questions

When fiscal contraction occurs:

Q: What is the **SR equilibrium effect** on output, prices, and the interest rate?

A: In the SR, output, prices, and the interest rate are all lower than before the decrease in G.

Monetary Expansion

More Questions

When the monetary expansion occurs:

Q: What is the **MR equilibrium effect** on output, prices, and the interest rate?

A: **Output: In the MR**, the output returns to its original vale, Yn.

A: **Interest Rate**: Looking at the IS-LM relation, we can see that the interest rate has decreased in the medium run. This must happen to balance the IS relation!!!

A: **Prices: In the MR**, Prices P decrease

Fiscal Policy is NOT Neutral in the Short Run OR the Medium Run!

SR vs. MR

Monetary Expansion and Fiscal Contraction

Monetary and Fiscal Policy has different effects in the Short Run than they do in the Medium Run!

	Short Run			Medium Run		
	Output Level	Interest Rate	Price Level	Output Level	Interest Rate	Price Level
Monetary expansion	increase	decrease	increase (small)	no change	no change	increase
Deficit reduction	decrease	decrease	decrease (small)	no change	decrease	decrease

SR vs. MR

Monetary Expansion and Fiscal Contraction

Red Line: Medium Run Natural Rate of Output

Blue Line: Short Run Deviations from the Natural Rate