

# Comments to Ravn and Mertens: "Fiscal Policy in an expectations driven liquidity trap"

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# About the paper

- Studies a relatively standard new Keynesian model, with
  - Calvo pricing
  - Interest rates set by a Taylor rule whenever possible
  - Nominal interest rate bounded below by zero
- Find that the model may have multiple equilibria
  - Liquidity trap gives rise to multiple equilibria
  - A "good" (or standard) equilibrium
  - A "liquidity trap equilibrium" characterized by
    - Zero nominal interest rates
    - Deflation
    - Potentially large output gap
- Clearly a very interesting and timely paper

# Multiple equilibrium, no shocks

- Suppose the equilibrium real interest rate is  $r^*$  and the inflation target is  $\pi^*$
- Multiple equilibria:
  - The normal equilibrium where the nominal interest rate is

$$i = r^* + \pi$$

- A liquidity trap equilibrium where

$$i = 0$$

$$\pi = -r^*$$

- Output is (slightly) lower in the latter equilibrium due to price dispersion

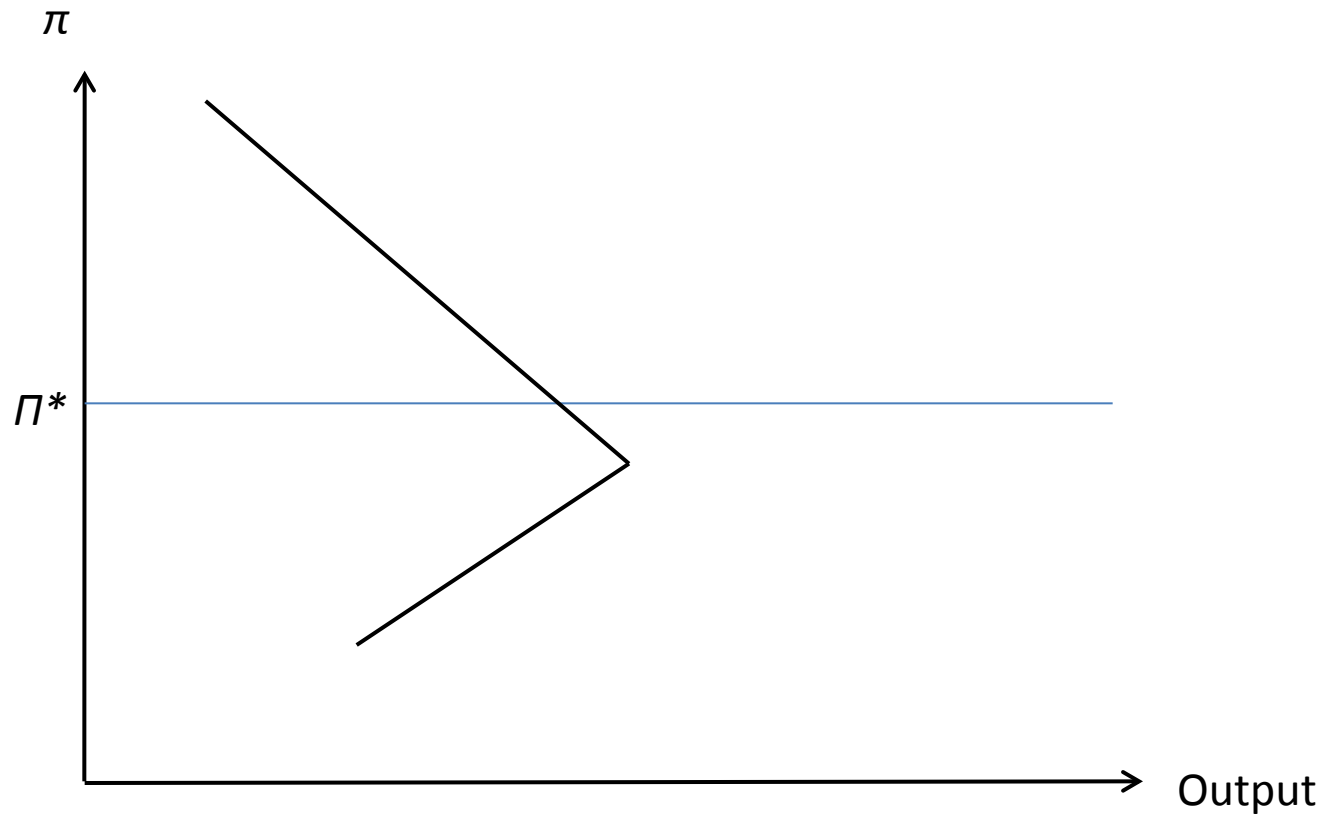
# Sunspot equilibrium

- In the bad equilibrium, there is a positive probability that the economy may return to the good state
- This makes the equilibrium more volatile, but the argument is not always so easy to follow

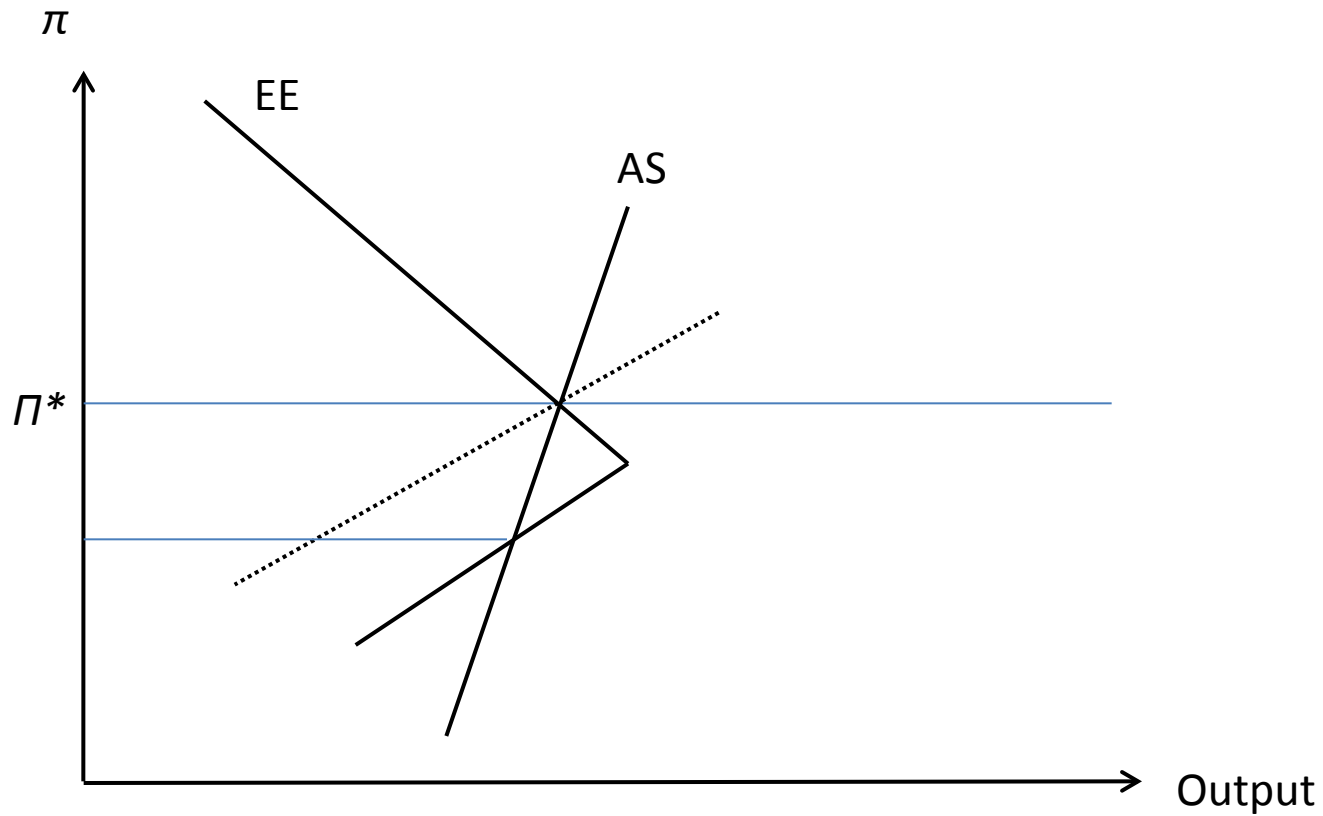
it makes the price setters more reluctant to cut prices, as they are considering the profit impact of their decision in all states of the world including a recovery. Furthermore, with constant short term nominal interest rates a fall in prices leads to a temporary increase in the real rate, triggering intertemporal substitution effects. A temporary rise in interest rates makes current consumption more expensive relative to future consumption and leads to an increased desire to save.

- But if firms are more reluctant to reduce prices, why don't real interest rate *decrease*?

# Aggregate demand



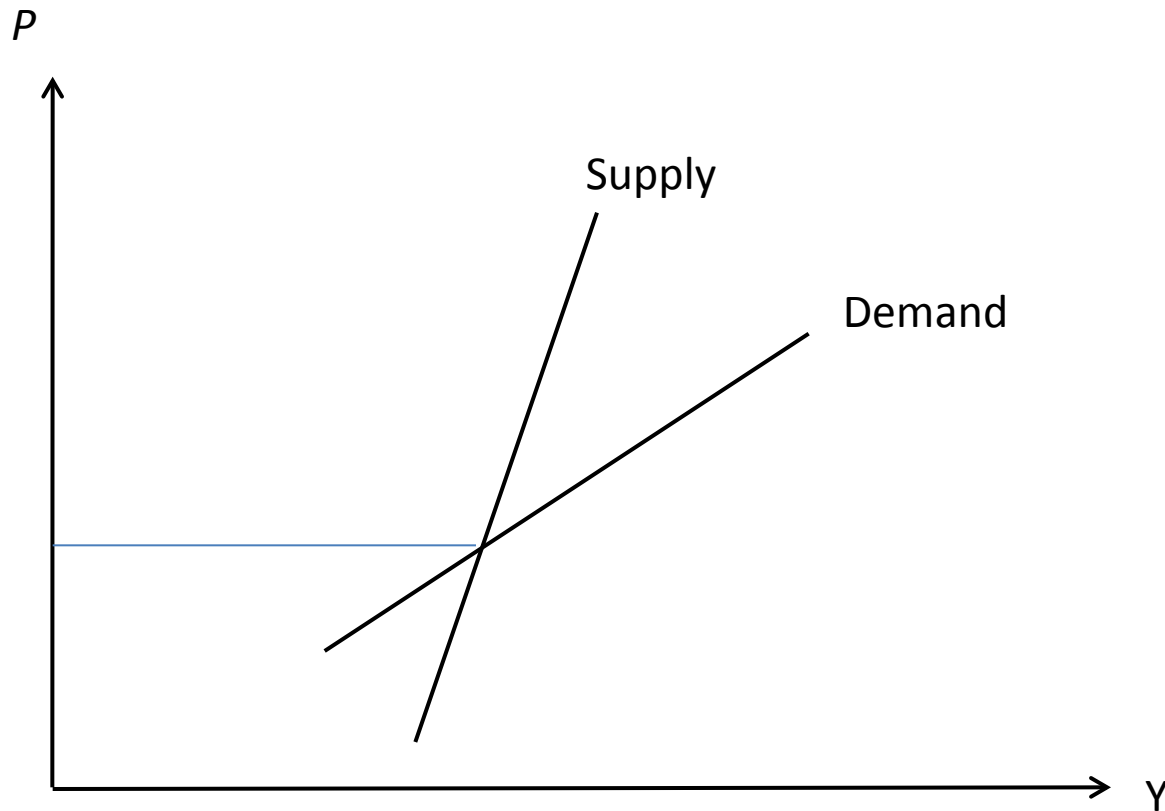
# Equilibrium



# Policy conclusions

- The model has very strange effects of policy
- Increasing demand (government purchases) reduces output
- Increasing supply (reduced taxes) increases output
- Why is this?

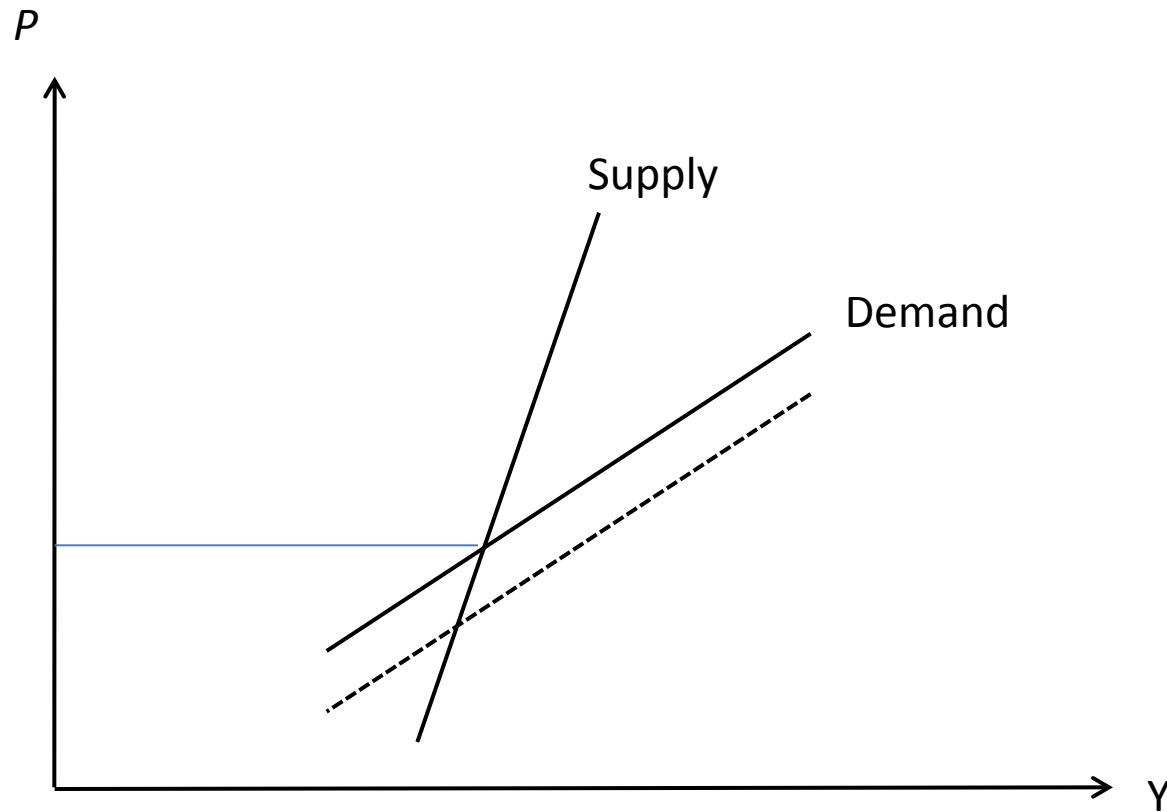
# Analogy-demand and supply



Demand is increasing in price, and more so than supply.  
What happens if demand shifts out

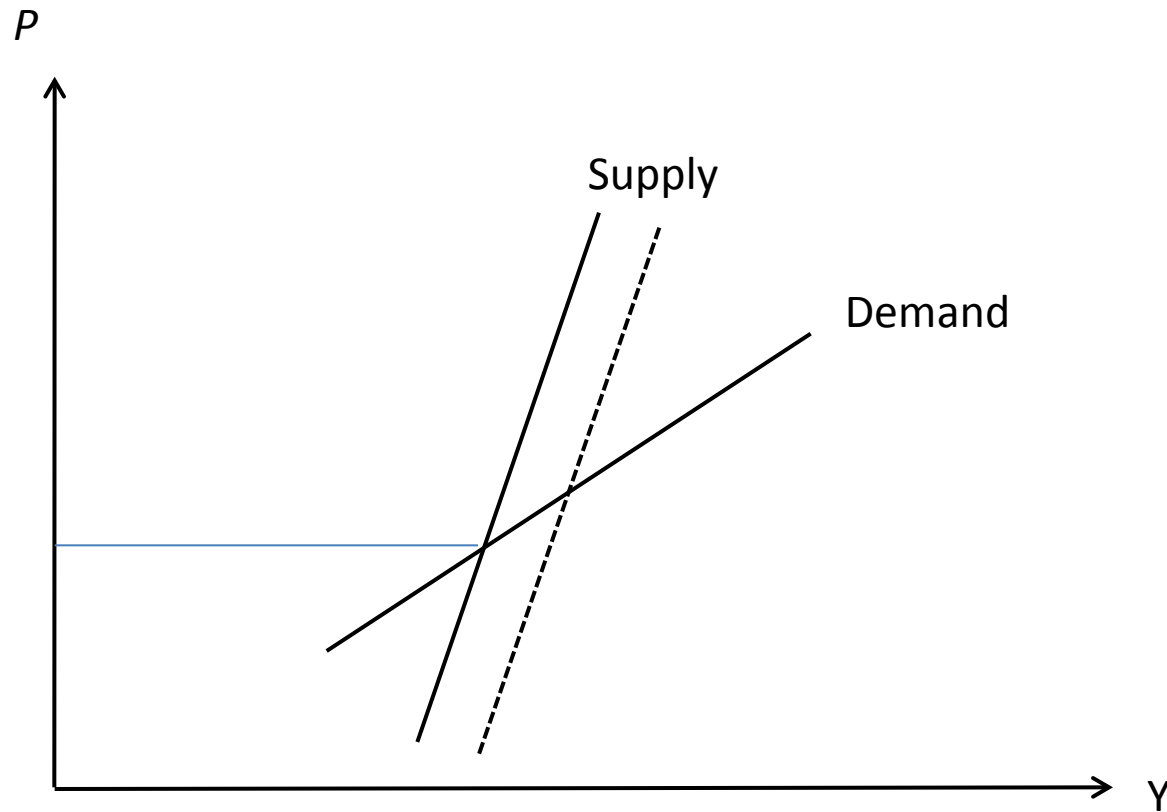


# Shifts



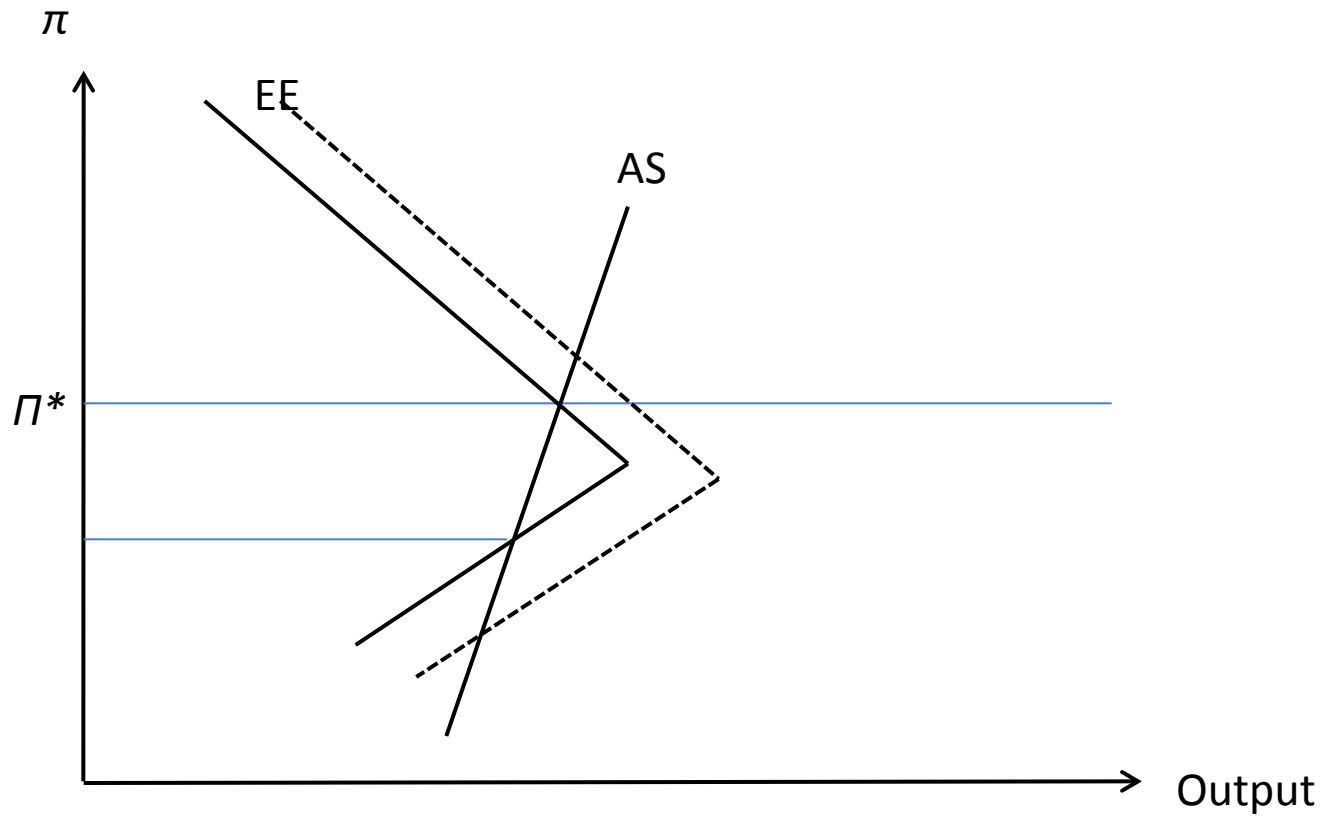
Shift in demand curve reduces output

# Shifts



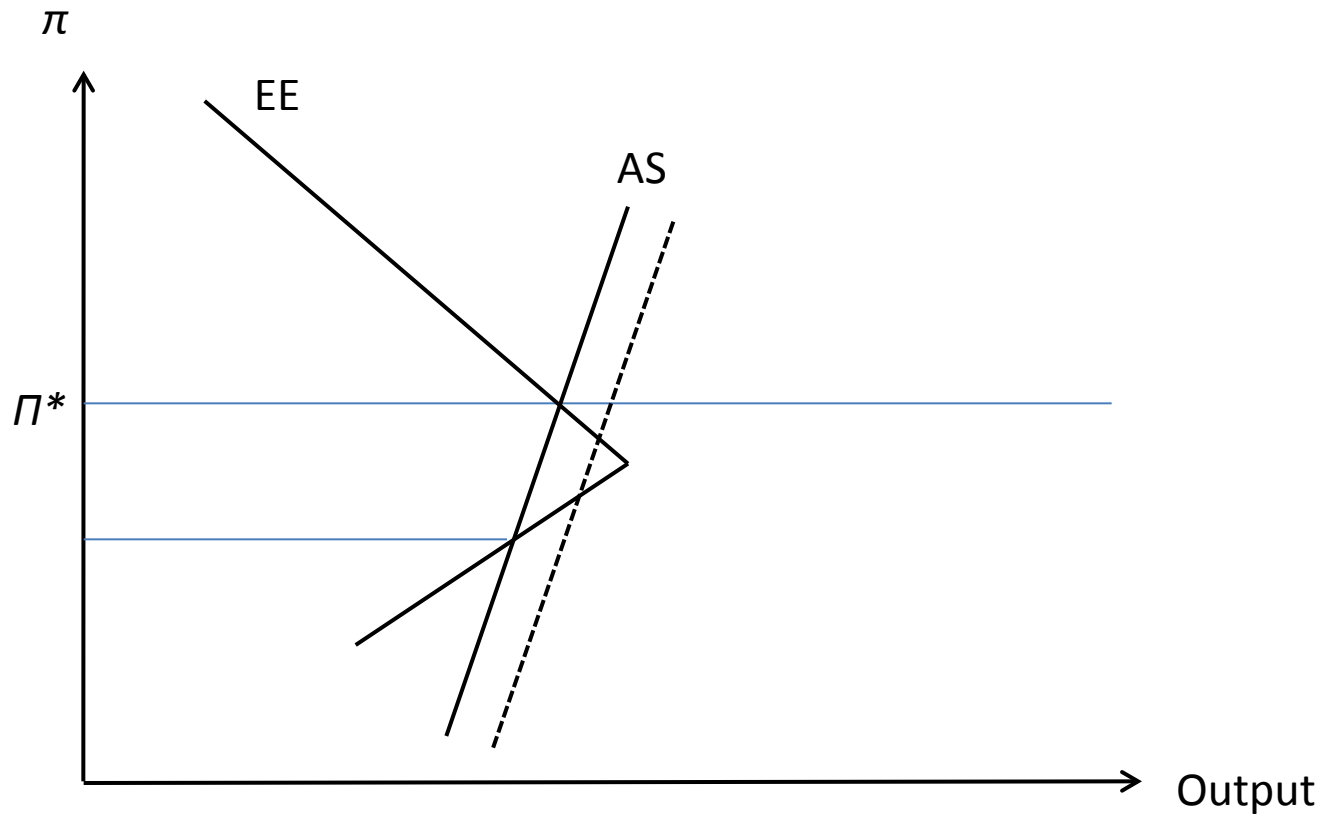
Shift in supply curve increases output

# Equilibrium



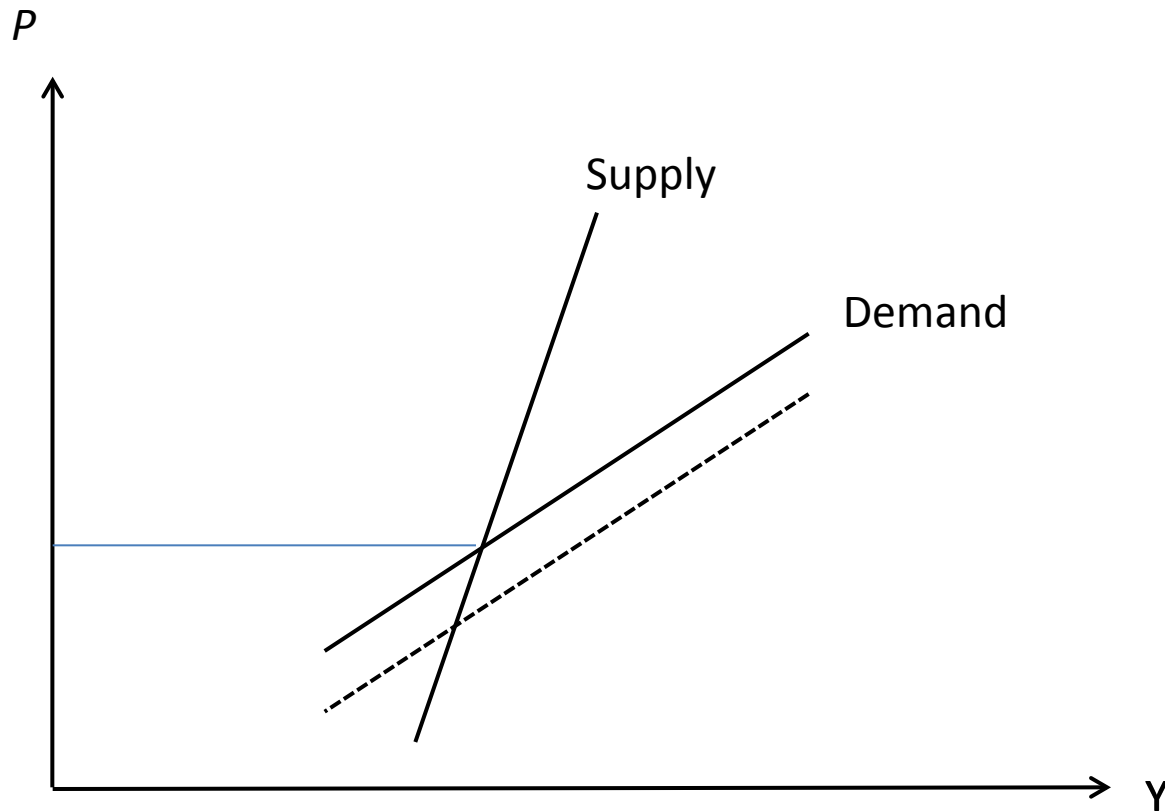
A positive shift in demand reduces output

# Equilibrium



A positive shift in supply increases output

# Is the equilibrium stable?



Price above equilibrium price, supply smaller than demand, price likely to *increase*

# Stability

- Is the equilibrium stable?
- More specifically, the model analyzes the steady-state equilibrium in the negative state
- Will the equilibrium converge to this steady state, or will it diverge?