

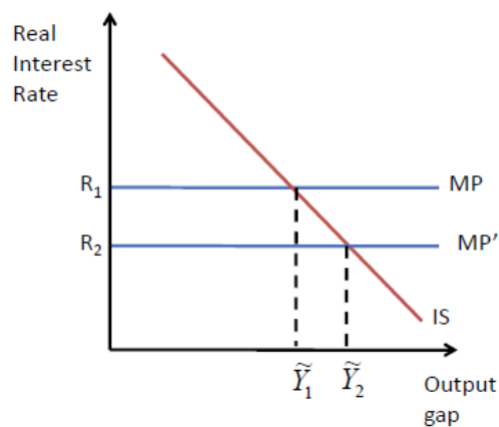
Recitation 13

Topics: Stabilization Policy, Fiscal Nature of Hyperinflation, Zero Lower Bound (ZLB)

1 Stabilization Policy

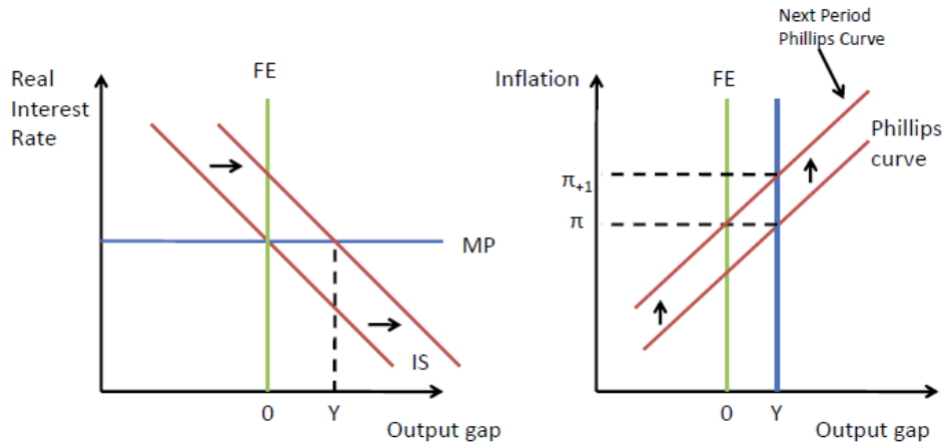
1.1 Monetary Policy

- Monetary policy can set real interest rate \Rightarrow MP curve is horizontal.

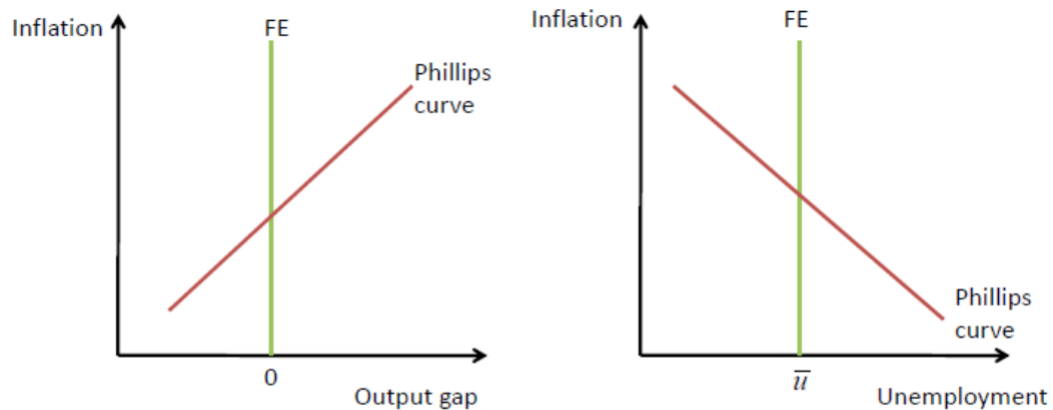


- The full modern business cycle model includes:
 - Monetary policy: set R_t
 - IS curve: $\tilde{Y}_t = a - b(R_t - r)$
 - Phillips curve: $\pi_t = \pi_{t-1} + v\tilde{Y}_t + o$
 - Okun's law: $\tilde{Y}_t = -2(u_t - u)$

- Let's see how this works: Assume we get an outward-shift of the IS curve (due to more government spending, for example). This increases the output gap \Rightarrow This new output gap leads to a higher inflation as can be seen in its intersection with the Philips Curve \Rightarrow Inflation expectations adapt, leading to an upward shift in the Philips Curve as people expect higher inflation for any level of output in the future



- Okun's law lets us go back and forth between Output gap and Unemployment:

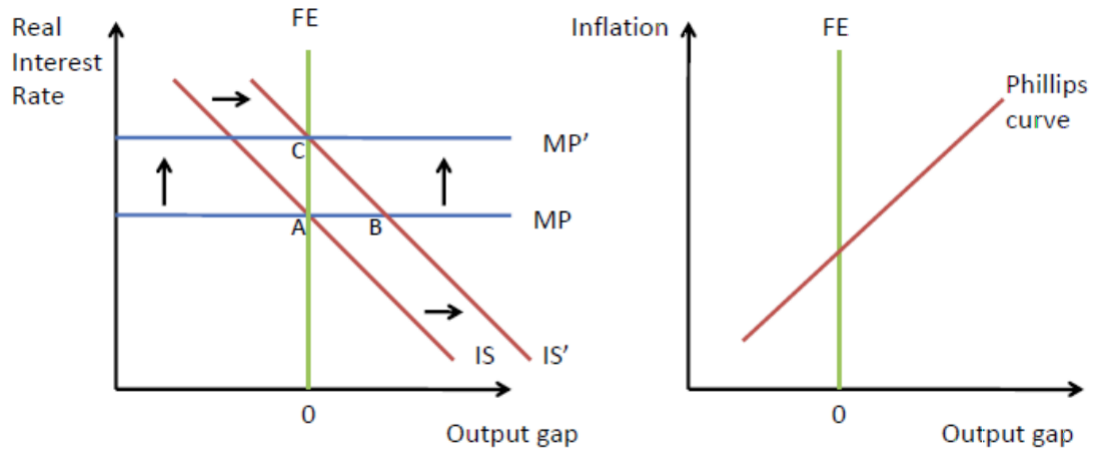


$$\pi_t = \pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o} \longrightarrow \pi_t = \pi_{t-1} - 2\bar{v}(u_t - \bar{u}) + \bar{o}$$

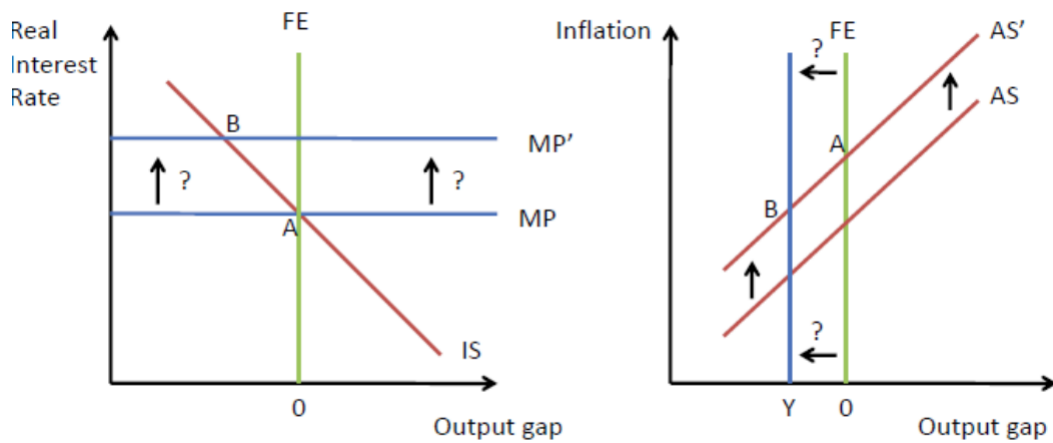
$$\tilde{Y}_t = -2(u_t - \bar{u}) \longrightarrow$$

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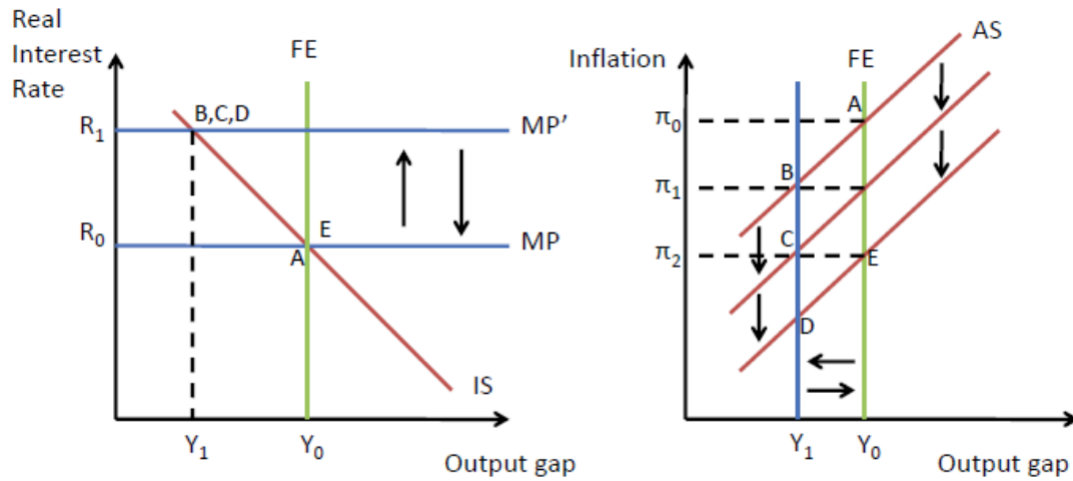
- Suppose we have an IS curve shock: stabilization policy works as followed to stabilize both inflation and output gap. If the central bank acts immediately and with the appropriate magnitude, neither inflation nor output deviate from their initial values



- In response to price shocks, there is a trade-off between creating a recession (point B) and accept higher inflation (point A)



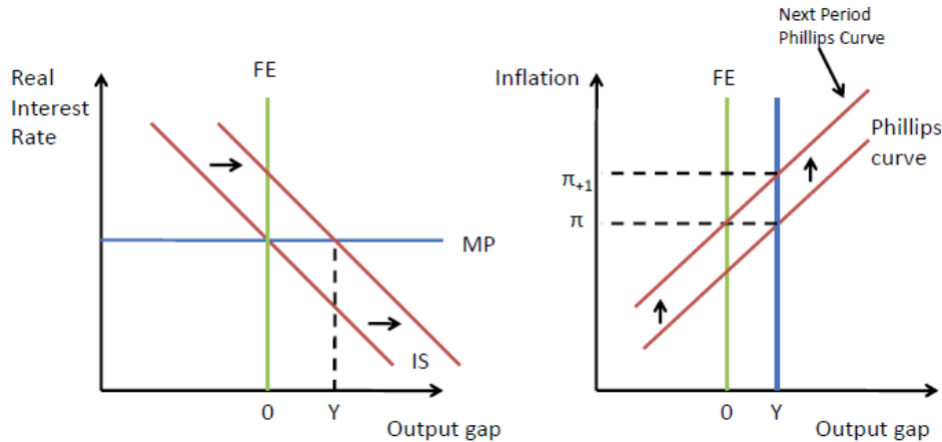
- How did it work during Volker disinflation: In response to the very high inflation when he took office, Volcker raised interest rates drastically and thereby orchestrated a recession. This led to lower inflation and hence lower inflation expectations which continues as long as the negative output gap persists, so the Philips Curve shifts down repeatedly. When inflation expectations were sufficiently low, Volcker decreased interest rates again and the economy reverted back to full employment, but at a significantly lower level of inflation than where it started (compare point A and point E).



1.2 Fiscal Stimulus

- Case 1: Normal Times without Monetary Policy Response

- IS curve $\tilde{Y}_t = a - b(R_t - r)$
- G increases by 1%, then how much does output goes up by? 1%! So multiplier is 1 because a change in a by one will increase output by 1
- Fiscal multiplier is defined as the % increase in output when government spending increases by 1% of GDP, so in this case the multiplier is one!



- Case 2: Monetary Policy Response:

- Monetary policy will systematically offset some of the effects of government spending
- Increases in output from government spending will increase inflation and make the central bank increase interest rates
- Fiscal stimulus will thus induce higher R_t
- Then fiscal multiplier is between 0 and 1 because both a and R_t increase, with the increase in R_t mitigating some of the increase in a
- Aggressiveness of monetary policy response to inflation determines where between 0 and 1 the multiplier is (more aggressive monetary policy leads to a lower government multiplier)

- Case 3: Hand-to-mouth consumers (without Monetary Policy Response)

- Remember: IS curve becomes $\tilde{Y}_t = \frac{1}{1-x} [a - b(R_t - r)]$ (review last week's recitation notes for the derivation)
- Fiscal multiplier is $\frac{1}{1-x} > 1$!

2 Fiscal Nature of Hyperinflation

Two views about the causes of inflation:

"Inflation is always and everywhere a monetary phenomenon" (Milton Friedman)

$$M_t \bar{V} = P_t Y_t$$

"*High* Inflation is always and everywhere a fiscal phenomenon" (attributed to Thomas Sargent)

$$G_t = T_t + \Delta M_t$$

This is just an accounting identity: If the government spends more than they receive, they must give out currency in order to pay for their unfunded government spending.

Idea behind Sargent's statement:

- Changes in the monetary base are responsible for inflation ($\Delta M_t = \Delta P_t + \Delta Y_t$)
- Pressure by the fiscal authorities often are responsible for increases in the monetary base
- The government can "finance" its deficit by creating inflation so that the real value of its debt decreases
- This implies that a crucial condition for hyperinflation to end is fiscal consolidation so that the pressure to increase the money supply and thereby inflation is alleviated
- Also underlines importance of central bank independence: If central banks independent, they won't give in to the government's pressure to create inflation

3 Zero Lower Bound (ZLB)

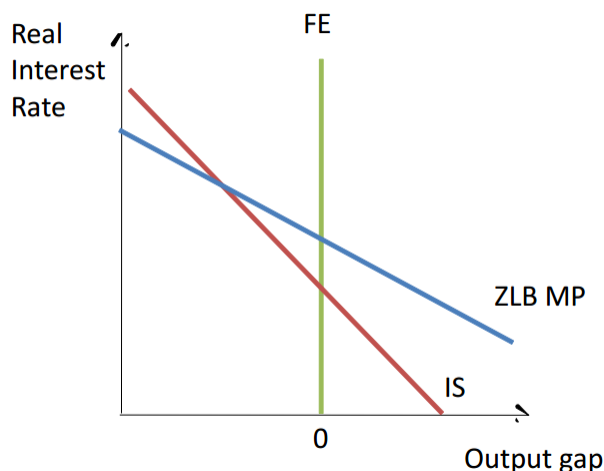
3.1 Monetary Policy

At the ZLB, nominal interest rates are stuck at zero. Then the Fisher equation says that real interest rate are equal to the negative inflation rate:

$$i_t = r_t + \pi_t \Rightarrow r_t = -\pi_t \text{ if } i_t = 0.$$

Then the Philips Curve implies

$$r_t = -\pi_t = -(\pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o})$$



3.1.1 Policy Options at the ZLB

At the ZLB the Fed has two main additional policy options: Forward Guidance and Quantitative Easing.

1. Forward Guidance

At the ZLB, the Fed cannot set the *current* interest rate anymore because it is constraint by the ZLB. However, it can tell people where it intends to set interest rate *in the future* and hence guide their expectations for the future (which is why this policy is called forward guidance). Specifically, after the crisis the Fed has made a series of statements about how long it expects interest rates to remain at the zero lower bound. Since long-term interest rates reflect the average short-term interest rate over the long horizon, such statements should decrease long-term interest rates as people expect short-term rates to remain lower for longer. Those long-term rates (think mortgage rates, car loans, corporate bond yields) are what actually drives most borrowing- and saving-decisions, so lowering them can provide further accommodation to the economy.

2. Quantitative Easing

Another tool to lower longer-term interest rates is the use of Quantitative Easing, where the Fed directly purchases large quantities of longer-term assets to bring up their prices and lower their yields. For example, after the crisis the Fed purchased mortgage-backed-securities (MBS) - you can think of them as a package of many individual mortgages - which lowered mortgage yields and hence made it easier for people to buy houses, which stimulated the economy.

3.2 Fiscal Policy

- At ZLB, the real rate is equal to negative inflation
- An increase in output from government spending also increases inflation
- As long as the central bank is bound by the ZLB, this increase in inflation will decrease real yields, this decrease in real yields further increases output
- This sets off a virtuous cycle and leads to a government multiplier of larger than 1
- The idea is that Monetary Policy in this case does not offset any of the fiscal stimulus by increasing nominal interest rate as it usually would under normal conditions

