From the Short to the Medium Run: the IS-LM-PC Model

HE2002 Macroeconomics II

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Motivation

- In Chapters 3 through 6, we looked at equilibrium in the goods and financial markets, and how output is determined in the short run.
- In Chapters 7 and 8, we looked at equilibrium in the labor market.
- We now put the two parts together and use this IS-LM-PC (PC for Phillips curve) model to characterize the behavior of output both in the short run and the medium runs.

The IS-LM-PC Model Setting

- Recall the Phillips curve:

$$\pi - \pi^e = -\alpha(u - u_n)$$

- If we assume output equals to employment and L denotes labor force, then

$$Y = L(1 - u).$$

- We define *potential output* (Y_n) as the output level when the unemployment rate equals to the natural rate:

$$Y_n = L(1 - u_n).$$

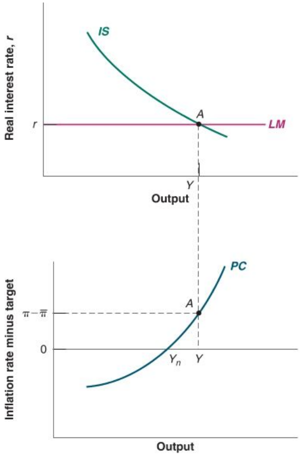
- *Output gap* is the difference between actual output and potential output $Y - Y_n$, and it equals to

$$Y - Y_n = -L(u - u_n).$$

- Combining with the Phillips curve we have

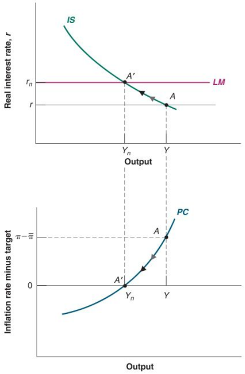
$$\pi - \pi^e = \frac{\alpha}{L}(Y - Y_n).$$

The IS-LM-PC Model Figure



From the Short to the Medium Run

- Over the medium run, the economy converges to the natural level of output and stable inflation.
- r_n is called the natural, neutral, or Wicksellian rate of interest.

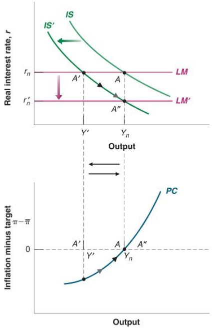


Neutrality of Money

- Recall that $i = r + \pi$, then in the medium run, the nominal interest rate (i) equals to $r_n + \bar{\pi}$.
- In the medium run, the real variables, such as output, unemployment and the real interest rate, are independent of monetary policy.
- Monetary policy determines the rate of inflation and the nominal rate of interest.
- The fact that monetary policy does not affect real variables in the medium run is referred to as the neutrality of money.

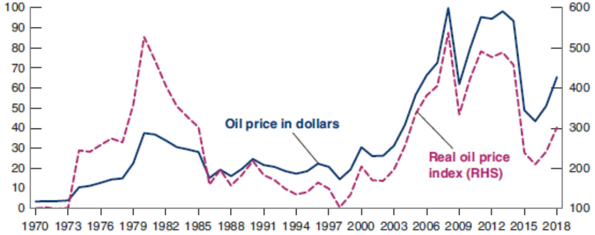
Fiscal Consolidation Revisited

- Suppose the output was initially equal to potential output, in the short run, fiscal consolidation leads to recession.
- In the medium run, the real rate is lowered so that output is back to potential level.
- Investment may decrease in the short run, but increase in the medium run.



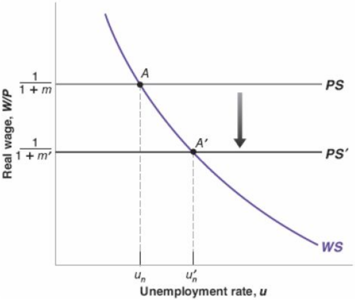
The Nominal and the Real Price of Oil, 1970—2018

The question is: What would we expect the short- and medium-run effects of such increases in oil price to be?



The Effects of an Increase in Oil Price

We capture the increase in the price of oil by an increase in the markup of the price over the nominal wage.



The Effects of an Increase in Oil Price

- In the short run, an increase in the price of oil leads to higher inflation. If the price increase is permanent, it leads to lower output in the medium run.
- Stagflation (lower output and higher inflation) occurs along the way.