Fall Semester '05-'06
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Lecture 18: The Complete Model

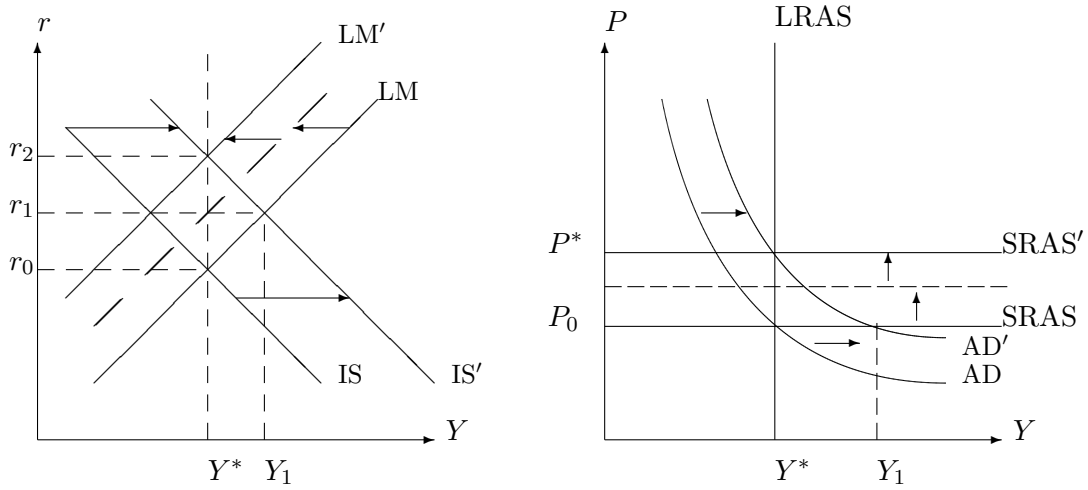
I. OVERVIEW

- In the last class, we looked at the complete model involving both IS-LM analysis and aggregate demand analysis. We showed that the relationship between the level of potential output and the short run equilibrium output from the IS-LM model determine whether prices increase or decrease in the intermediate run.
- Today we will take a close look at how we can use the complete model to analyze monetary policy decisions as well as fiscal policy decisions. Adding inflation to the IS-LM model greatly enhances its usefulness as a tool for evaluating monetary policy decisions in particular.
- In the next class, we will return to some of the applications we examined using the IS-LM model and take a fresh look at them using the aggregate demand/aggregate supply model.

II. FISCAL POLICY IN THE LONG RUN

Case 1: An Increase in G

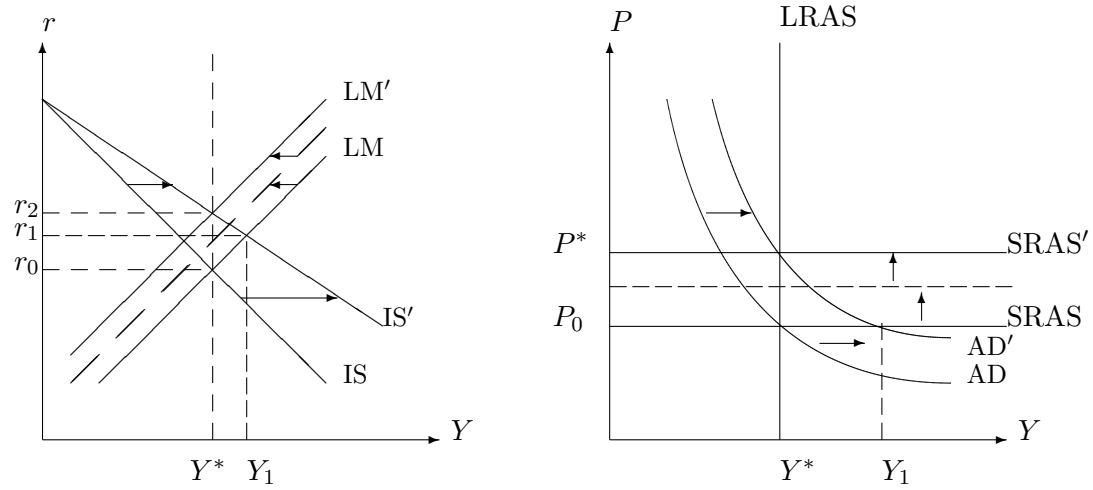
- Suppose the economy was initially at potential output. If the government increases the purchases of goods and services then the IS curve will shift out and the AD curve will shift out as well. In the short run interest rates will rise from r_0 to r_1, output will rise from Y^* to Y_1 and prices will not change.
- From the AD curve we see that the short run equilibrium level of output will exceed potential output. Then over time prices will increase.
- As P increases the LM curve will start shifting back, this process will continue until the economy returns to the original level of potential output. In the long run interest rates are much higher at r_2. Output has returned back to potential output Y^*. Prices, however are higher at P^*.
- Notice that the long-run multiplier effects of an increase in G is zero! Output is unchanged in the long run.



- We can get intuition for why the multiplier effects are smaller by looking at what happens to the various components of the IS curve and the LM curve when G **increases** (you should be able to figure out what happens when G decreases).
  - $C = \bar{C} + b(1-t)Y \leftrightarrow$ (since Y is unchanged)
  - $I = \bar{I} - \beta r \downarrow$ (since r increased)
  - G $\uparrow$ (G increased, according to the question)
  - NX $\leftrightarrow$ (NX is exogenous and unchanged)
  - $M^s \leftrightarrow$ (Exogenous and unchanged)
  - $M^d \leftrightarrow$ ($\downarrow$ since r increased and $\uparrow$ since P increased. We know that they must offset because $M^s = M^d$ and $M^s \leftrightarrow$)

Case 2: A Tax Cut

- Let's assume the economy starts out at $Y*$.The first task is to look at what would happen to the economy as a result of the tax cut. The tax cut will swing the IS curve out (i.e. shift it out and make it flatter) and also shift the AD curve out as well.
- In the short run, output rises to Y_1, interest rates rise to r_1 and prices remain unchanged.
- Since output is above potential prices will rise over time shifting the LM curve back gradually to LM'. The long-term impact is to raise prices to P^*, leave output unchanged at Y_1 and leave interest rates higher at r_2. [See below]
- Again, notice that the long-run effects of a tax-cut is zero! Output is unchanged in the long run.

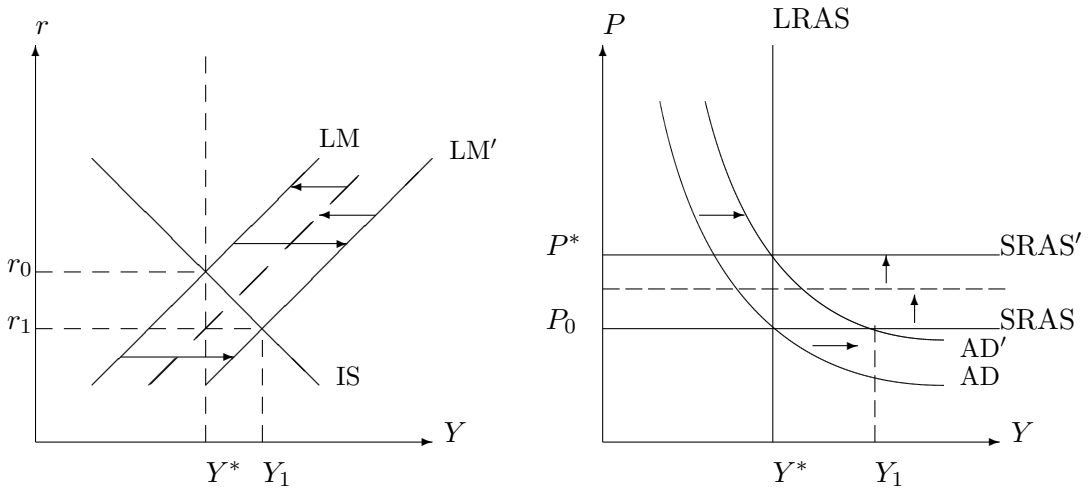


- We can look at what happens to the various components of the IS curve and the LM curve when t **decreases** (you should be able to figure out what happens when t increases).
  - $C = \bar{C} + b(1-t)Y \uparrow$ (since Y is unchanged but t is lower)
  - $I = \bar{I} - \beta r \downarrow$ (since r increased)
  - G $\leftrightarrow$ (G is exogenous and unchanged)
  - NX $\leftrightarrow$ (NX is exogenous and unchanged)
  - $M^s \leftrightarrow$ (Exogenous and unchanged)
  - $M^d \leftrightarrow$ ($\downarrow$ since r increased and $\uparrow$ since P increased. We know that they must offset because $M^s = M^d$ and $M^s \leftrightarrow$)

III. MONETARY POLICY IN THE LONG RUN

- We can use this model to examine the impact of monetary policy in the long run.
- Suppose the economy was initially at potential output. If the Fed increases the supply of money then the LM curve will shift out and the AD curve will shift out as well. In the short run interest rates will fall from r_0 to r_1, output will rise from Y^* to Y_1 and prices will not change (since SRAS is horizontal)
- From the new AD curve we see that the short run equilibrium level of output exceeds potential output. Over time prices will increase as the economy moves back to the level of potential output.
- As P increases the LM curve will start shifting back, this process will continue until the LM curve returns back to the original location. In the long run interest rates have returned to the original level of r_0. Output has also returned back to potential output Y^*. Prices, however are higher at P^*.
- While the short run effects of expansionary monetary policy (in an economy that was at potential) was to raise Y, in the long run, all the policy manages to accomplish is to raise prices, i.e. cause inflation.

- This is one of the most important ideas in macroeconomics, that monetary policy can only influence the real economy (i.e. output) in the short run (when prices are fixed or sticky) but not in the long run (when prices are flexible).



  - $C = \bar{C} + b(1-t)Y \leftrightarrow$ (since Y is unchanged)
  - $I = \bar{I} - \beta r \leftrightarrow$ (since r is unchanged)
  - G $\leftrightarrow$ (G is exogenous and unchanged)
  - NX $\leftrightarrow$ (NX is exogenous and unchanged)
  - $M^s \uparrow$ (Increased)
  - $M^d \uparrow$ (Since P increased)