

Lecture Notes

Goods and Financial Market

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In last two lectures, we looked at two different markets and how equilibrium in each market is determined. Now, it is time to integrate those two markets, and determine the equilibrium in the economy. We will be focused on chasing two variables: output (Y) and interest rate (i).

1. The IS Relation

Interest Rate \Rightarrow Output

We begin with the goods market. So far, we had assumed that investments are constant. We will relax this assumption by bringing in an intuition about the relationship between the interest rate and investments, and that greater demand for goods will lead to greater production of goods (higher investments). We can write down investment as a function of output and interest rate $I = I(Y, i)$. Recall that $Y = C + I + G$. So, we can now write down the goods market

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relation as:

$$Y = C + I(Y, i) + G \quad (1)$$

What would the $Y - i$ relationship be like? When $\uparrow i$, $\downarrow I$, and, therefore, $\downarrow Y$. So, you can draw a nicely downward sloping line in $i - Y$ plane. This will be known as the IS curve.

1.1 Shifts in the IS curve

- $\uparrow G$: When the government starts spending more, the output is going to rise at a given interest rate in the economy. So, the IS curve shifts to the **RIGHT**.
- $\uparrow T$: When the consumers face higher taxes, the output will go down at a given interest rate. So, the IS curve shifts to the **LEFT**.
- $\uparrow c_0$: If the base consumption (which is a measure of consumer confidence) increases, the output will also go up. Therefore, the IS curve shifts to the **RIGHT**.

2. The LM Relation

Output \Rightarrow Interest Rate

We know that money supply and money demand jointly determine the equilibrium interest rate in the economy. We can write:

$$\frac{M}{P} = Y \cdot L(i) \quad (2)$$

Leaving everything else unchanged, suppose that the output goes up $\uparrow Y$. When output goes up, the demand for money goes up. But, we know that money supply is fixed. Therefore, the interest rate must go up so that the money market is back into equilibrium. We have now derived a directional relationship between output and interest rate which we will label as the LM relation. The LM will be an upward sloping curve (why?).

2.1 Shifts in the LM curve

- If $\uparrow M^s$, the LM curve shifts to the **DOWNWARDS**.
- If $\uparrow M^s$, the LM curve shifts to the **UPWARDS**.

3. The Equilibrium and Thereafter

$$IS: Y = C + I(Y, i) + G$$
$$LM: \frac{M}{P} = Y \cdot L(i)$$

These two equations jointly determine the equilibrium interest rate and the output.

3.1 Shifts in Equilibrium

The following table offers you a cheatsheet of what happens to output and interest rate in the economy when you change different variables.

	Shift of <i>IS</i>	Shift of <i>LM</i>	Movement in Output	Movement in Interest Rate
Increase in taxes	left	none	down	down
Decrease in taxes	right	none	up	up
Increase in spending	right	none	up	up
Decrease in spending	left	none	down	down
Increase in money	none	down	up	down
Decrease in money	none	up	down	up

Let me take one example from this sheet. What happens when taxes go up? When taxes rise, personal disposable income will come down. This, in turn, affects consumption negatively. Therefore, the *IS* curve shifts to the **LEFT**. How about the *LM* curve? Taxes have no direct impact on the money market. So, the *LM* curve remains where it was. What is the new equilibrium? $\downarrow Y$, $\downarrow i$.