

IS-LM Model and Policy Analysis

Lecture #2

Public Finance

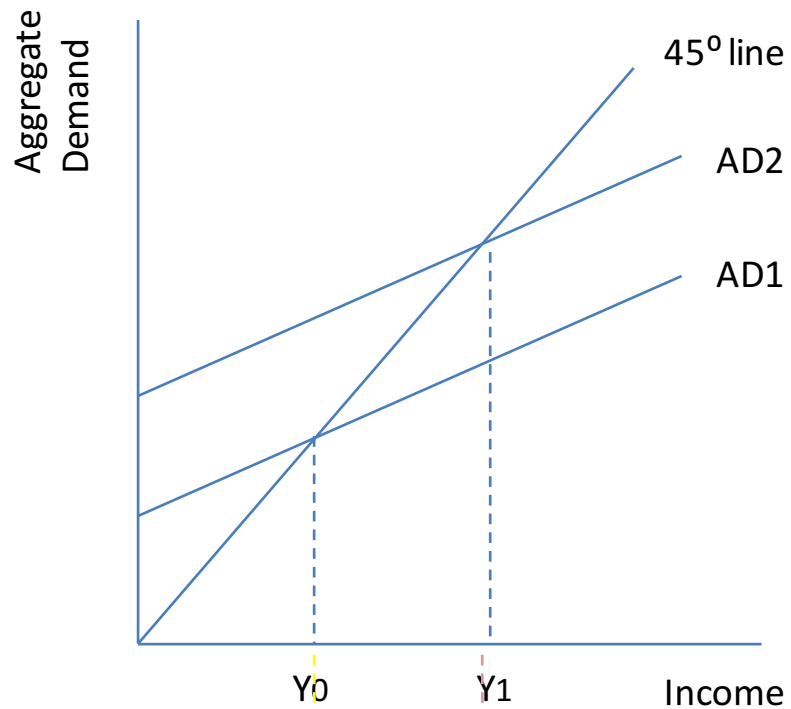
MPPA – Linkage Program

IS/LM Model

- The IS/LM model, first developed by **Sir John Hicks (1937)** and later extended by **Alvin Hansen (1949)** to summarize John Maynard Keynes' General Theory of Employment, Interest, and Money.
- The horizontal axis represents national income or real gross domestic product and is labeled Y . The vertical axis represents the interest rate, r . The graph thus represents the interface between the “real” and the “monetary” parts of the economy.
- The point where these schedules intersect represents a short-run equilibrium in the real and monetary sectors (though not necessarily in other sectors, such as labor markets). In IS/LM equilibrium, both product markets and money markets are in equilibrium. Both the interest rates and real GDP are determined.

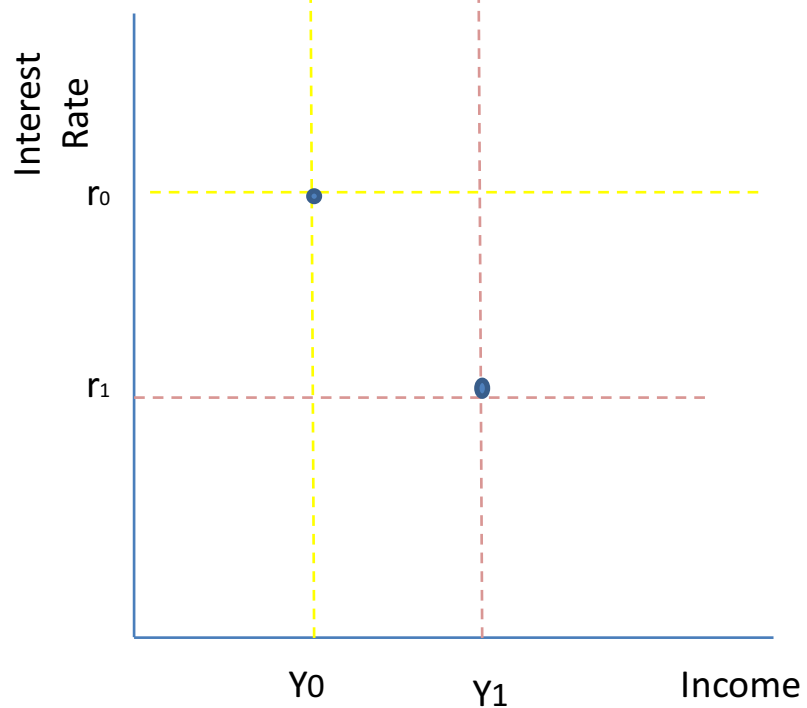
The IS curve

- An IS (Investments = Savings) curve shows the different combinations of income (Y) and interest rates (r) at which the goods market is in equilibrium.
- Remember, the IS curve shows the effect of interest rates in shifting AD and the resultant level of income
- If *anything else* changes, the IS curve will shift.

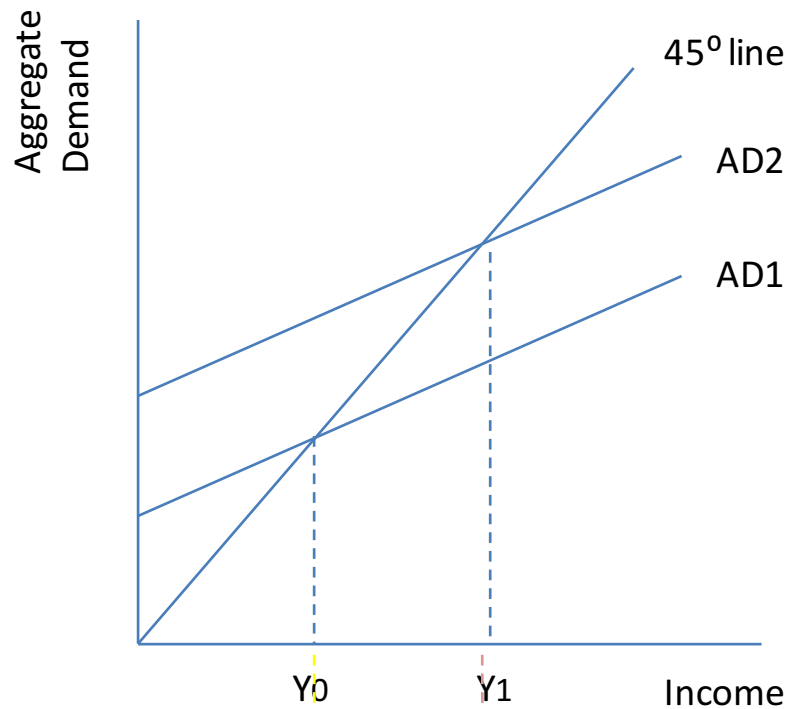


Now suppose that interest rates are lowered, to r_1 . Lower interest rates boost consumer spending and investment, and so AD rises.

We draw a new AD curve at AD₂. At this higher level of AD, the economy's goods market equilibrium is achieved at Y_1 .

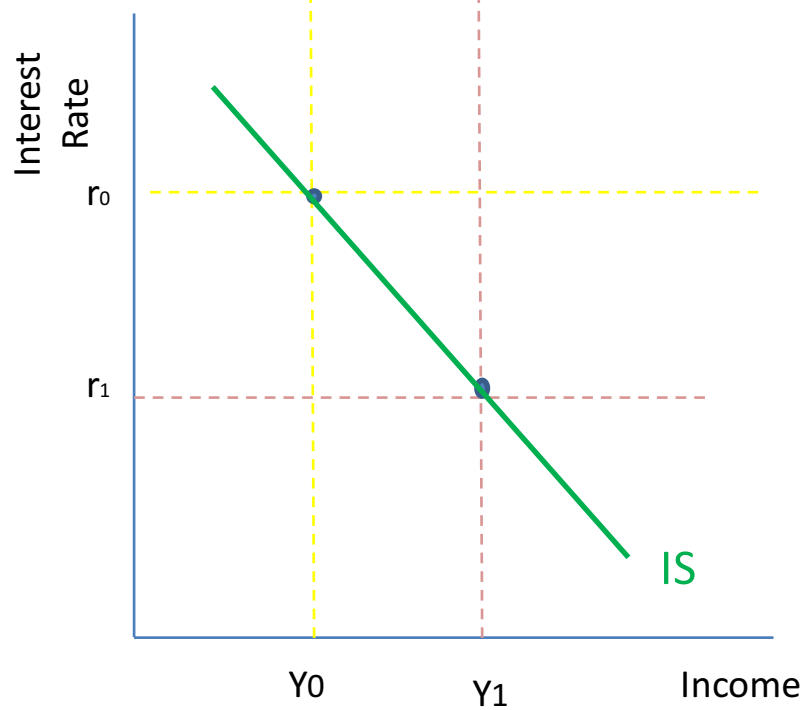


Now we plot a point at the intersection of Y_1 and r_1 to indicate the point at which the goods market is in equilibrium.



We can repeat this process for all interest rates, and then plot all of the relevant points on the bottom diagram.

If we join the dots, we create an IS curve.



Shifting the IS curve: ΔG

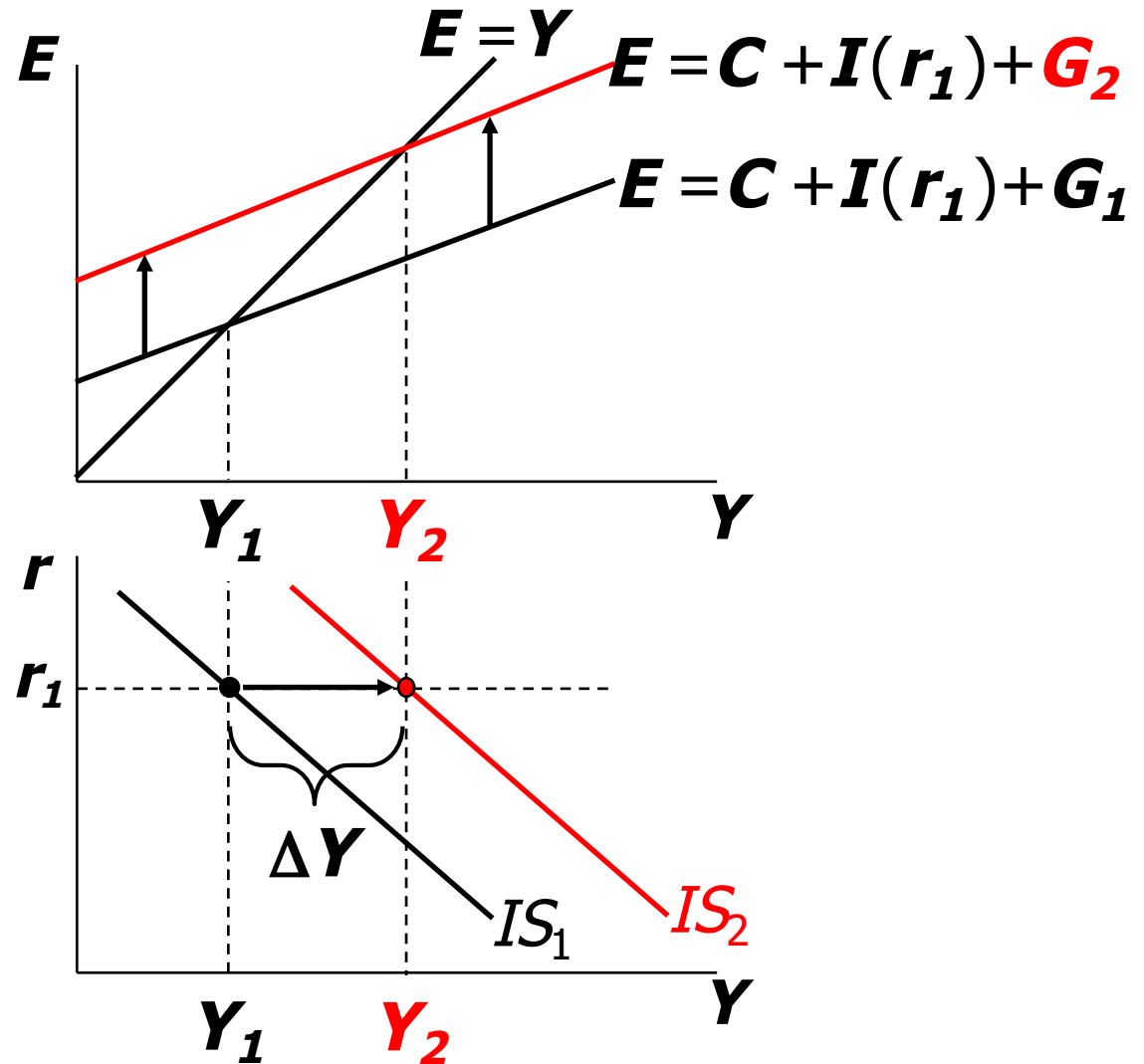
At any value of r , $\uparrow G$

$\Rightarrow \uparrow E \Rightarrow \uparrow Y$

...so the IS curve shifts to the right.

The horizontal distance of the IS shift equals

$$\Delta Y = \frac{1}{1 - \text{MPC}} \Delta G$$



Shifts in the IS curve

- What would happen to the IS curve if:
 - Government spending increased?
 - Consumer confidence fell?
 - Business optimism about future profits improved?

The LM Curve:

Real Money, Real Income, and the Interest Rate

- **The *LM* relation:** In equilibrium, the real money supply is equal to the real money demand, which depends on real income, Y , and the interest rate, i :

$$\frac{M}{P} = YL(i)$$

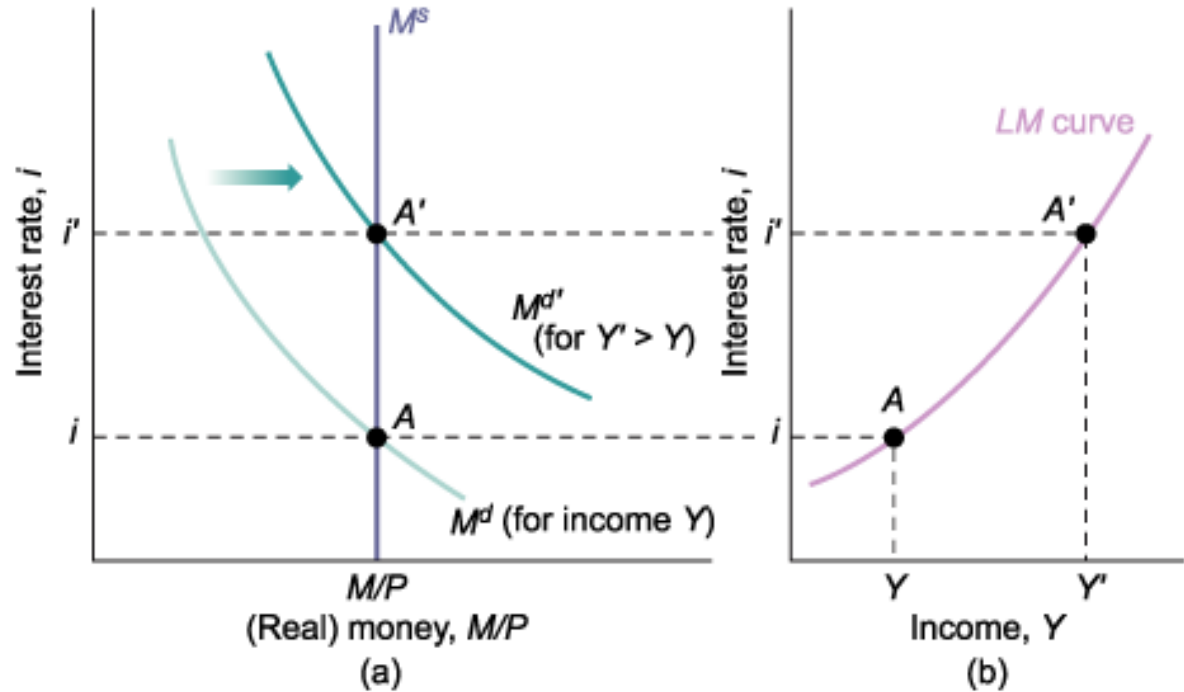
- From chapter 2, recall that Nominal GDP = Real GDP multiplied by the GDP deflator:

$$\$Y = YP$$

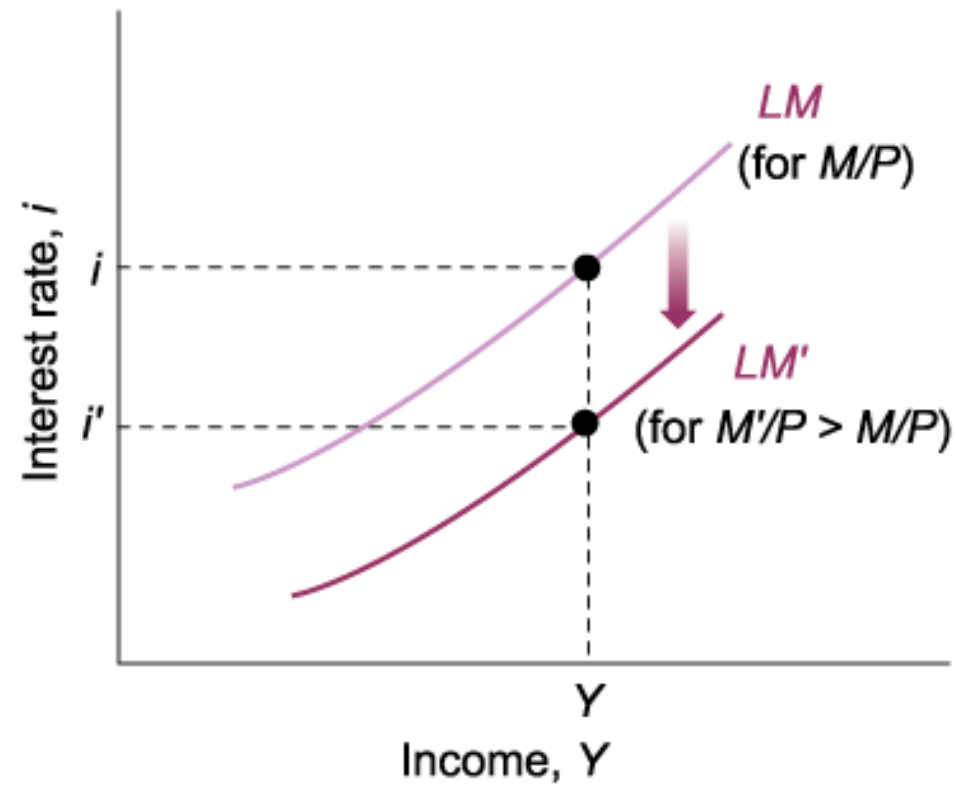
Equivalently:

$$\frac{\$Y}{P} = Y$$

Deriving the *LM* Curve



Shifts of the LM Curve



IS – LM model

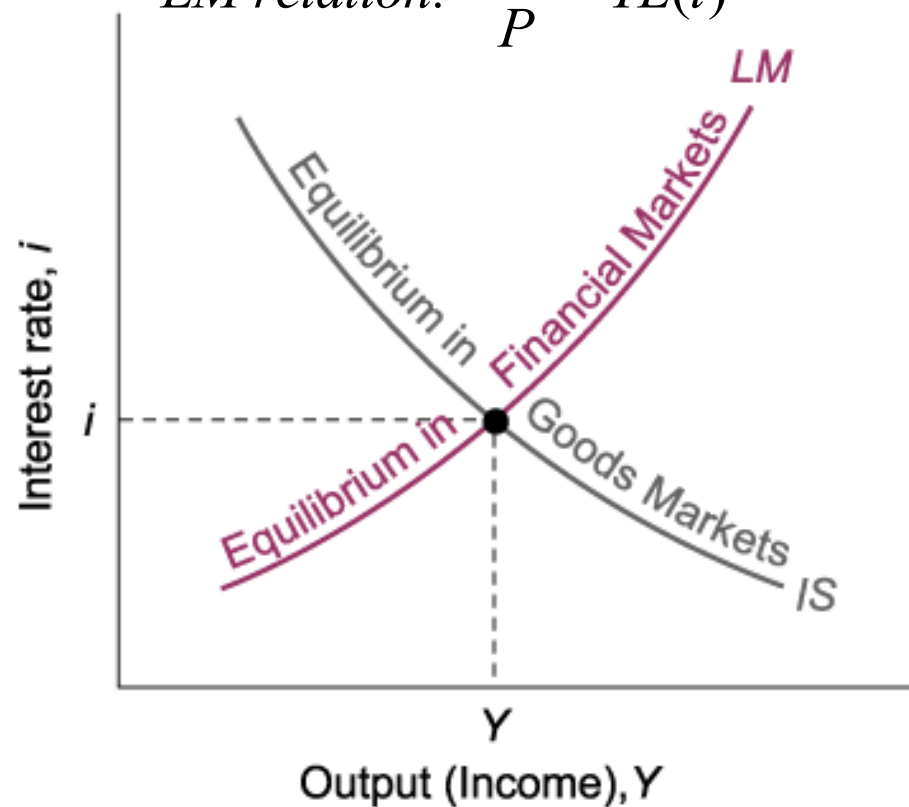
- Equilibrium on the goods market and on the financial market
- Find (i, Y) such that both markets are in equilibrium
- IS: Combination of i and Y such that the goods market is in equilibrium
- LM: Combination of i and Y such that the financial market is in equilibrium

Putting the *IS* and the *LM* Relations Together

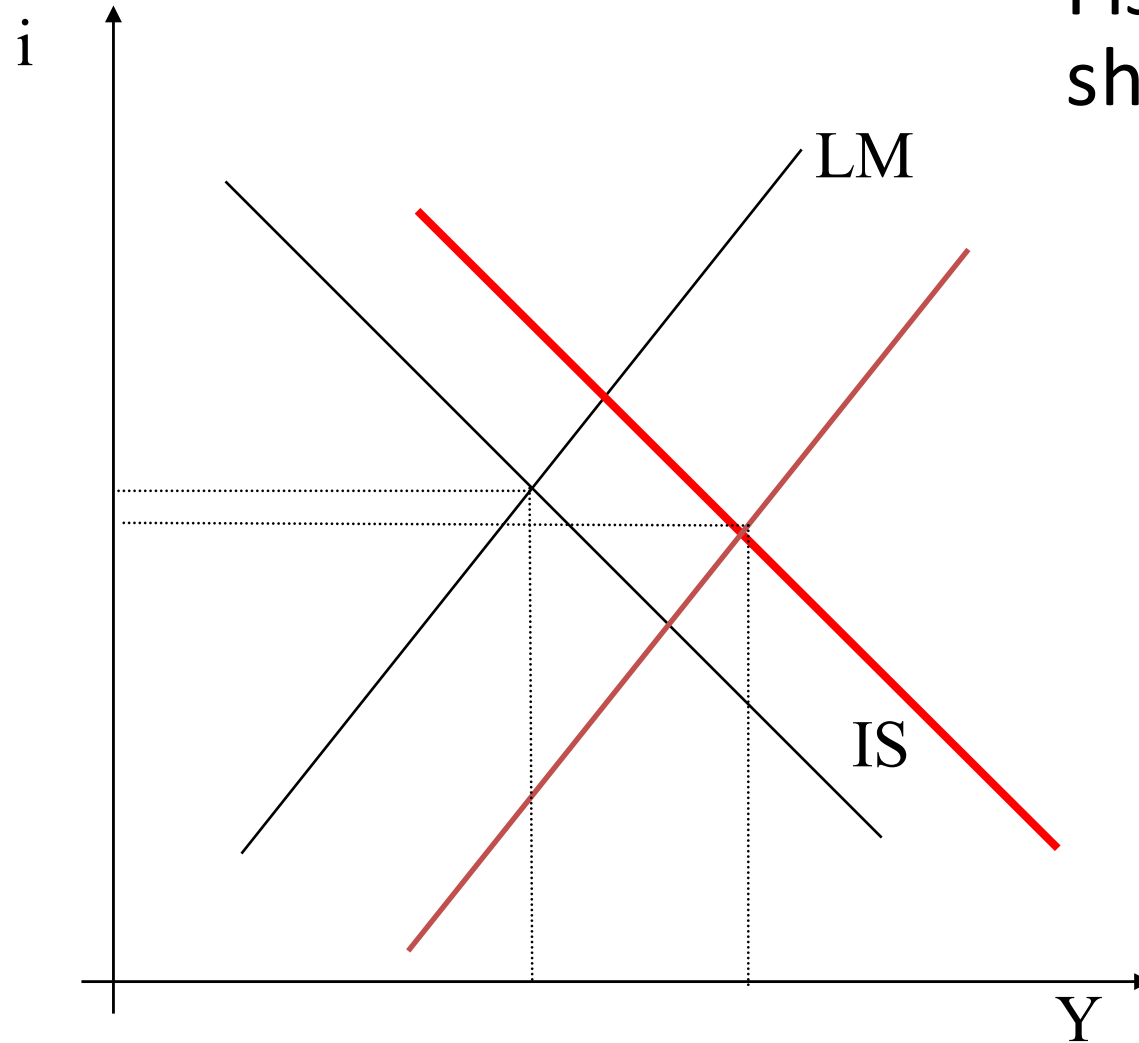
$$IS \text{ relation: } Y = C(Y - T) + I(Y, i) + G$$

$$LM \text{ relation: } \frac{M}{P} = YL(i)$$

The basic relations between
Fiscal and Monetary policies



IS - LM



- Monetary Policy: M , shifts the **LM curve**
- Fiscal Policy: T, G , shifts the **IS curve**

Using a Policy Mix

- The combination of monetary and fiscal policies is known as the *monetary-fiscal policy mix*, or simply, the *policy mix*.

	Shift of IS	Shift of LM	Movement of 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

Example:

The Clinton-Greenspan Policy Mix

Table 2 Selected Macro Variables for the United States, 1991-1998

	1991	1992	1993	1994	1995	1996	1997	1998
Budget surplus (% of GDP) (minus sign = deficit)	-3.3	-4.5	-3.8	-2.7	-2.4	-1.4	-0.3	0.8
GDP growth (%)	-0.9	2.7	2.3	3.4	2.0	2.7	3.9	3.7
Interest rate (%)	7.3	5.5	3.7	3.3	5.0	5.6	5.2	4.8