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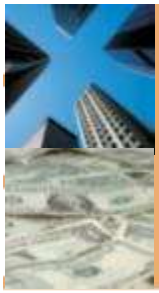
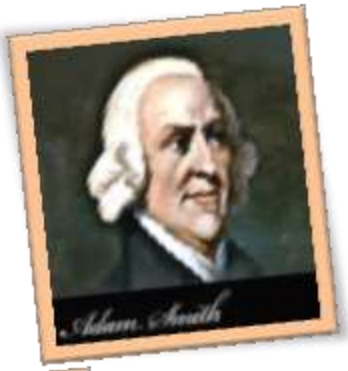
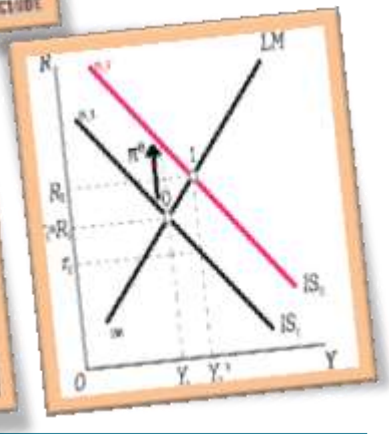


Prof. Simrit Kaur

ECONOMICS
GLOBAL BUSINESS ENVIRONMENT

Online Lecture 2





THE LM CURVE
REPRESENTING MONETARY POLICY

Monetary Policy: LM CURVE

(Basic Reference- Dornbusch and Fischer: Macroeconomics)

Contents:

i. Definition
ii. Graphical Representation
iii. Mathematical Derivation: Slope and Intercept
iv. Logical Reasoning

Important Terminology

Assets market: It is the market in which money, bond, stocks, houses and other forms of wealth are traded
Nominal Demand for Money: Demand for money in number of rupees
Real Demand for Money: Demand for money expressed in terms of number of units of good which that money would buy (buying power of the money or Purchasing Power of Money). It is equal to nominal demand for money divided by price level
Real money balances: Quantity of nominal money divided by the price level
Cost of holding money: Interest forgone by holding money rather than other assets

LM Curve

Definition – The LM Curve represent various combinations of Income (I) and Interest (i) along which the money market is at equilibrium

A Quick Recap: (Based on Rangarajan and Dholakia's Reading)

Demand for Money

i. Transactionary Demand for Money: Function of Income
ii. Precautionary Demand for Money: Function of Income
iii. Speculative Demand for Money: Function of Interest (It is important to understand the Inverse Relationship between Rate of Interest and Price of Bond. Only then, can the inverse relationship between Rate of Interest and Money Demanded for Speculation Purposes can be understood and appreciated).

$$P_B = \frac{R}{i}$$

Where P_B represents Price of Bond
R represents Return Fixed on Bond, and
i represents the Rate of Interest

So, Demand for Money depends on both Y and i.
Mathematically,
$m^d = k\,y - h\,i$

Where:
Small m: Represents real demand for money and not nominal demand for money
k: Represents responsiveness of Money Demand to Change in Income
h: Represents responsiveness of Money Demand to Change in Interest

m^s = Real Money Supply: $\frac{M}{P}$ (Assumed to be a constant)
At Equilibrium:

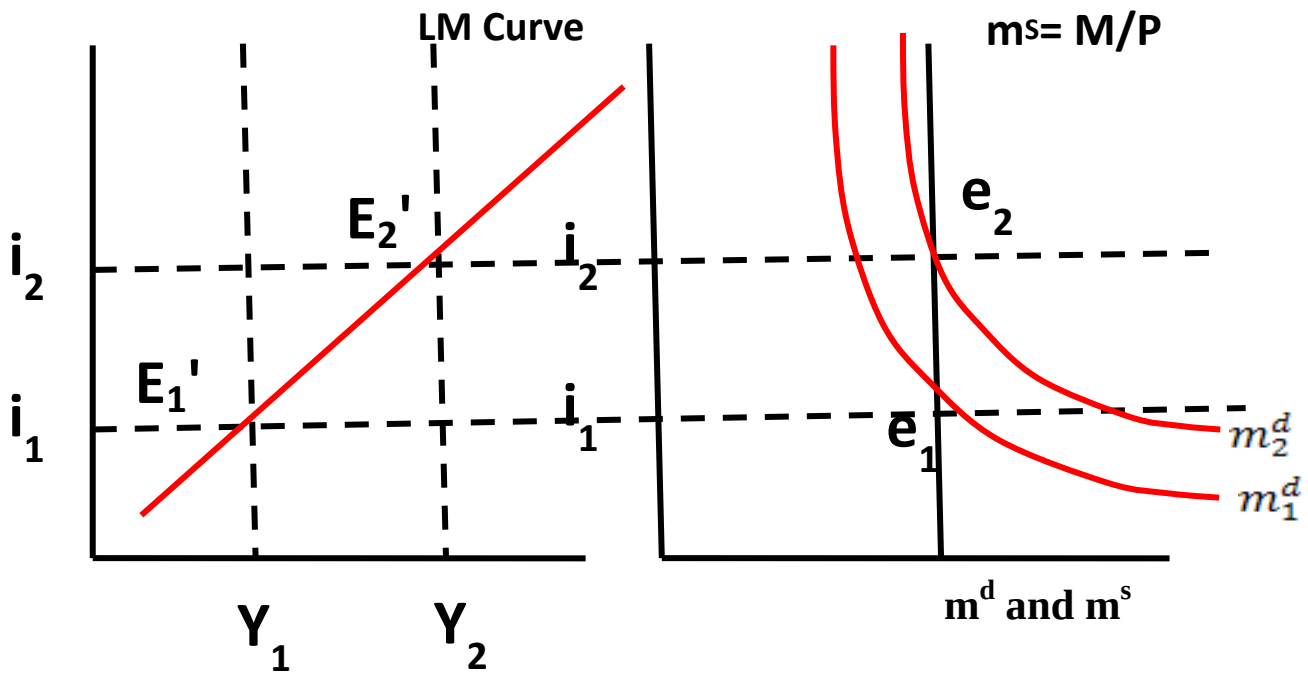
Real Demand for Money=Real Supply of Money
(Note: Both Demand and Supply of Money are in Real Terms and Not Nominal Terms)

Basic Concern: It determines the equilibrium rate of interest, under the assumption that level of Income which is determined in the Goods Market is already known.

If not known, then how do we determine both i and Y simultaneously?

This is done using the Hicksian IS-LM Framework.

The LM Curve: Graphical Derivation



LM Curve: The graphical representation indicates that for various combinations of Income (Y) and Interest (i), the money market is at equilibrium

Mathematical Derivation of LM Curve

At Equilibrium:

$m_d = m_s$

That is: m_T^d =M/P

$m_T^d = m_t^d + m_{sp}^d$ (Note the difference between 'T' and 't': While 'T' represents Total Demand for Money, 't' represents Transactionary Demand, which also includes precautionary demand)

Thus, Capital T represents Total Demand for Money (Transactionary + Precautionary +Speculative); while 't' represents (Transactionary + Precautionary)

$$m_T^d = k\,y - h\,i$$

Transactionary demand for money m_t^d

Speculative demand for money m_{sp}^d

$$m_t^d + m_{sp}^d = \frac{M}{P}$$

$$\Rightarrow \quad \frac{M}{P} = k\,y - h\,i$$

$$k = \frac{\Delta m_t^d}{\Delta y} \quad and \quad h = \frac{\Delta m_{sp}^d}{\Delta i}$$

'k' measures the responsiveness of transactionary demand for money (including precautionary demand) due to change in level of income $0 < k < 1$

'h' measures the responsiveness of speculative demand for money to the change in level of interest $0 < h < \infty$

$$i = \frac{1}{h}\left[kY - \frac{M}{P}\right]$$

$$i = \frac{k}{h}Y - \frac{M}{Ph}$$

Intercept

Slope

The Three Phases of LM Curve

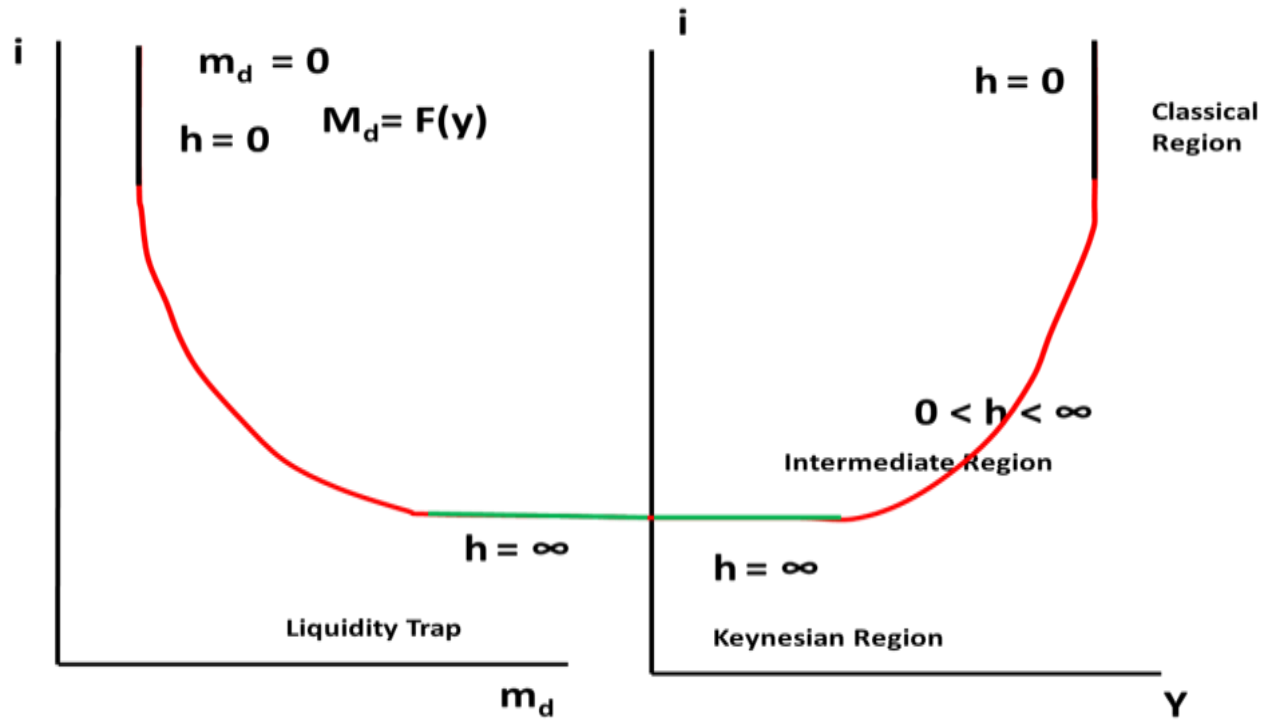
- Horizontal
- Vertical
- Upward Sloping

i. *Horizontal:*
Liquidity trap Region: This region of the LM Curve is referred to as the Keynesian region of m^d curve

ii. *Vertical:*
Classical region: The vertical region of the curve is called the classical region.
Here the following holds:
⇒ Income level is maximum
⇒ Full employment exists
⇒ Money is demanded only for transactions and not for speculation
⇒ LM is vertical and m^d is vertical and speculative demand for money is zero.

iii. *Upward Sloping Region*: Intermediate Region

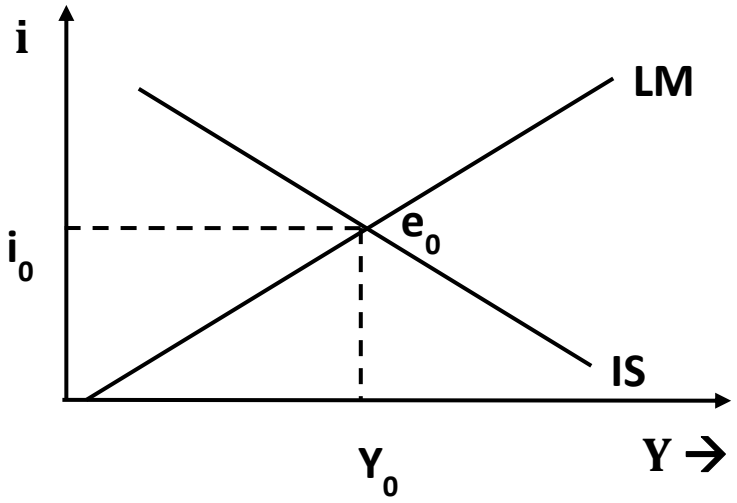
Complete Shape of LM is represented by:



Demand for Money Curve The LM Curve

Next Lecture: Preview

Simultaneous Determination of Income and Interest: IS-LM Interaction
Graphical Representation:



Mathematical Derivation: Simultaneous Determination of Income (Y) and Interest (i)

$y = \propto_g (\bar{A} - b\, i)$ --------- Equation of IS curve - **Eqn 1**

$i = \frac{1}{h}(ky - \frac{M}{P})$ --------- Equation of LM curve - **Eqn 2**

Inserting Eqn 2 in Eqn 1 we get

$$y = \propto_g [\bar{A} - \frac{b}{h}\left(ky - \frac{M}{P}\right)]$$

$$y = [\propto_g \bar{A}] - [\propto_g \frac{b}{h}k]y + [\propto_g \frac{b}{h}\frac{M}{P}]$$

$$y + [\propto_g \frac{b}{h}k]y = [\propto_g \bar{A}] + [\propto_g \frac{b}{h}\frac{M}{P}]$$

$$y\{1 + [\propto_g \frac{b}{h}k]\} = [\propto_g \bar{A}] + [\propto_g \frac{b}{h}\frac{M}{P}]$$

$$y = \left[\frac{\propto_g}{\{1 + [\propto_g \frac{b}{h}k]}\right]\bar{A} + \left[\frac{\propto_g}{\{1 + [\propto_g \frac{b}{h}k]\}}\right]\frac{b}{h}\frac{M}{P}$$

Let $\left[\frac{\propto_g}{\{1 + [\propto_g \frac{b}{h}k]\}}\right] = \gamma$ (pronounced as gamma)

$$y = \gamma\,\bar{A} + \gamma\,\frac{b}{h}\,\frac{M}{P}$$ ⟹ **Determination of Equilibrium Income in IS-LM**

Where:

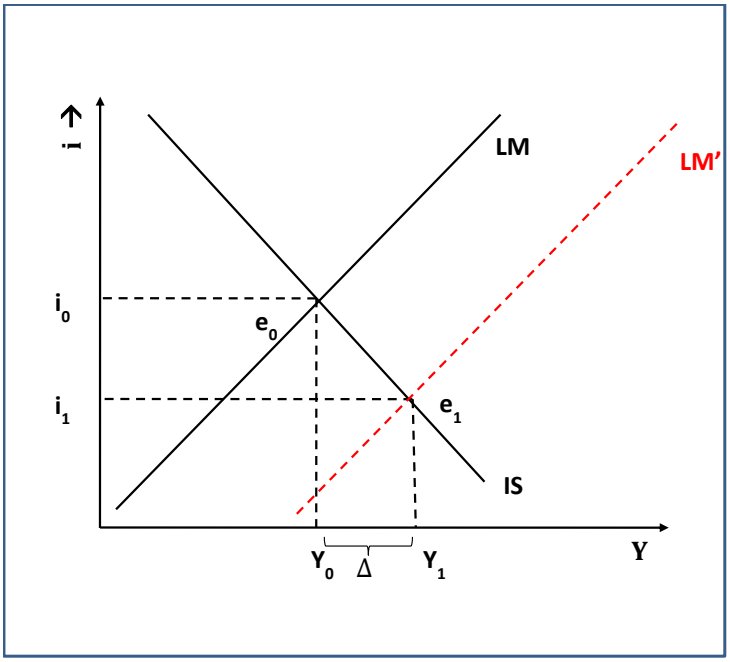
$$\bar{A} = C_0 - cT + c\,\bar{T}\bar{R} + \bar{I} + \bar{G}$$

Fiscal Policy Multiplier and Monetary Policy Multiplier in IS-LM Framework

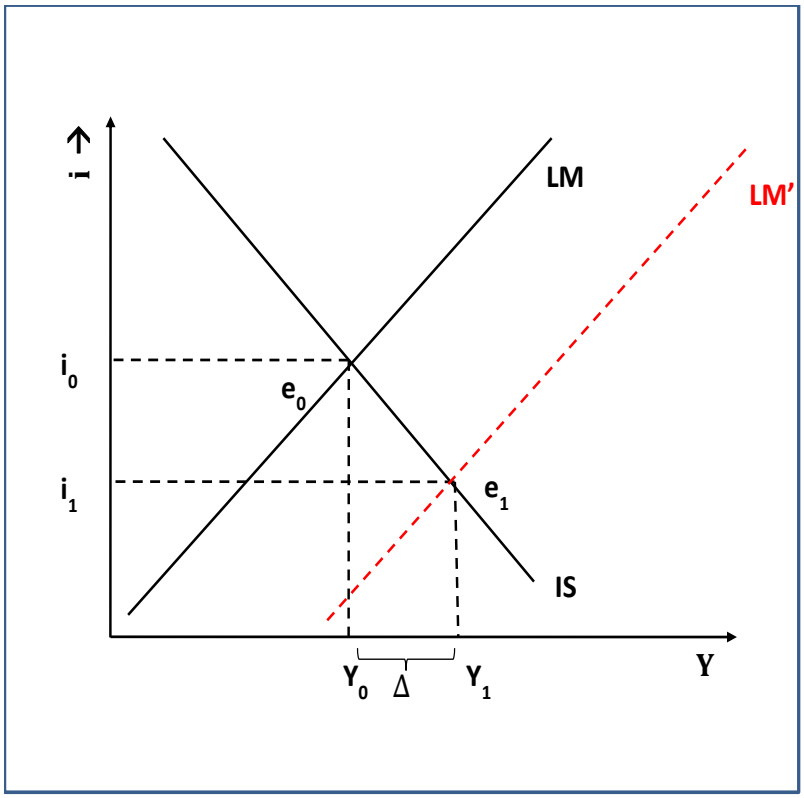
$$\frac{\Delta y}{\Delta \bar{A}} = \frac{\Delta y}{\Delta G} = \gamma = \left[\frac{\propto_g}{\{1 + [\propto_g \frac{b}{h}k]\}}\right]$$ ⟹ Change in income due to change in any component of Ā, Say G: **It represents Fiscal policy multiplier in IS-LM framework**

$$\frac{\Delta y}{\Delta \frac{M}{P}} = \gamma\,\frac{b}{h}$$ ⟹ Change in income due to change in Money Supply: **It represents Monetary Policy Multiplier in IS-LM framework**

Fiscal Expansion: Fiscal Policy Multiplier (IS Shifts)



Monetary Expansion: Monetary Policy Multiplier (LM Shifts)



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