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ECONOMICS
GLOBAL BUSINESS ENVIRONMENT
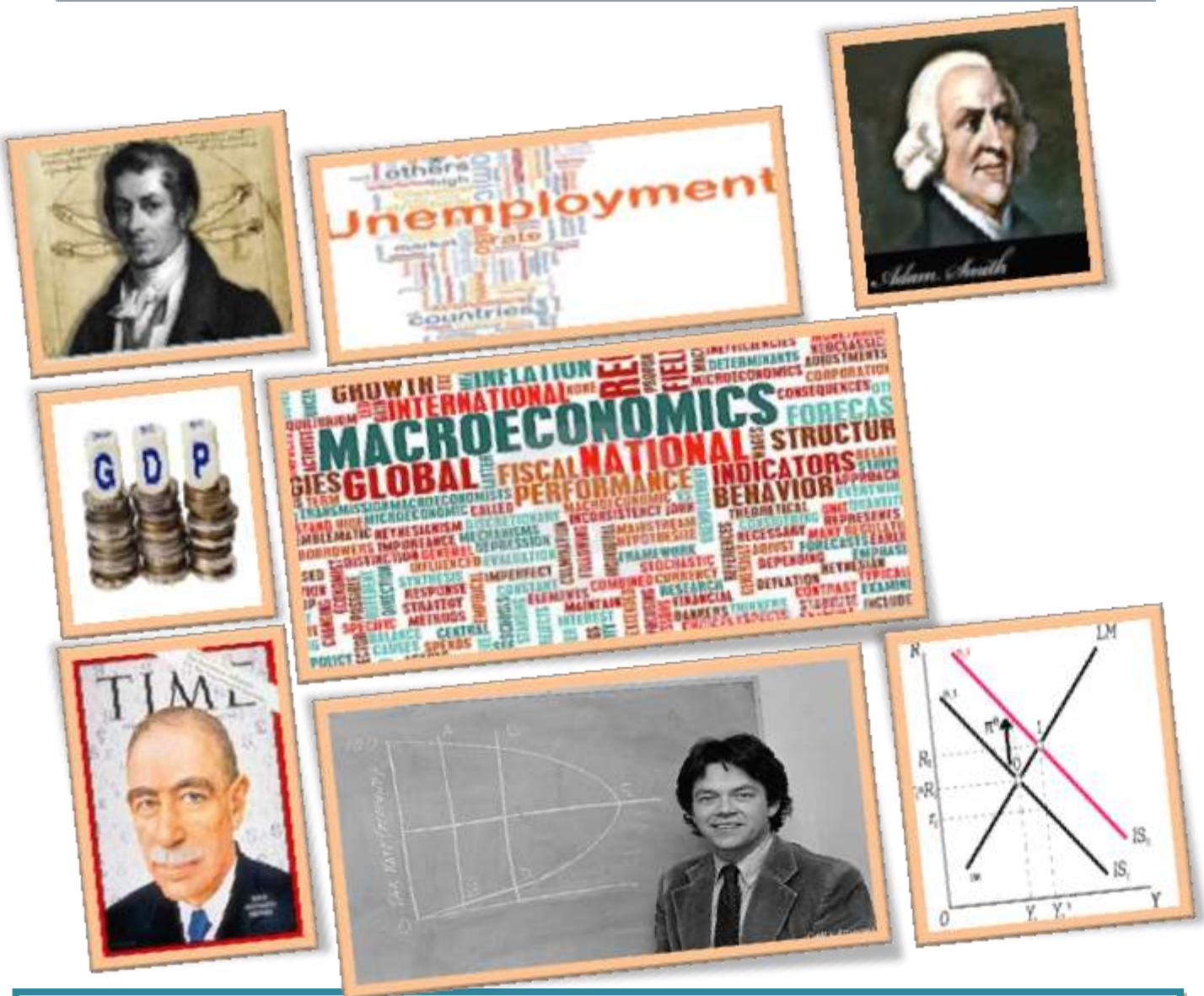
THE IS CURVE
(REPRESENTING FISCAL POLICY)

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Paper Code: 2.1   Paper Title: Global Business Environment

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The 'IS' Curve and Fiscal Policy

Lecture Plan
1. Definition of the IS Curve
2. Graphical Derivation
3. Mathematical Derivation
4. Slope and Intercept of the IS Curve

Definition of the IS Curve:

The IS curve shows combinations of interest rates and levels of output such that planned spending equals income.

'OR'

The IS Curve represents various combinations of interest and income along which the goods market is in equilibrium.
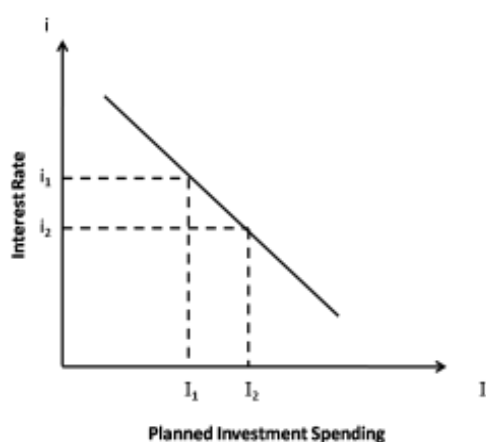
Rate of Interest is now included in Model Estimation

Earlier in the pure Keynesian framework, it was assumed that Rate of Interest does not affect determination of income. Investment 'I' was considered to be exogenously determined; However, *now* we introduce interest rates as a part of model. The component 'I' of Aggregate Demand (AD=C+I+G), representing Investment is now a function of Interest rate. So, investment spending becomes endogenous. Earlier it was considered exogenous.
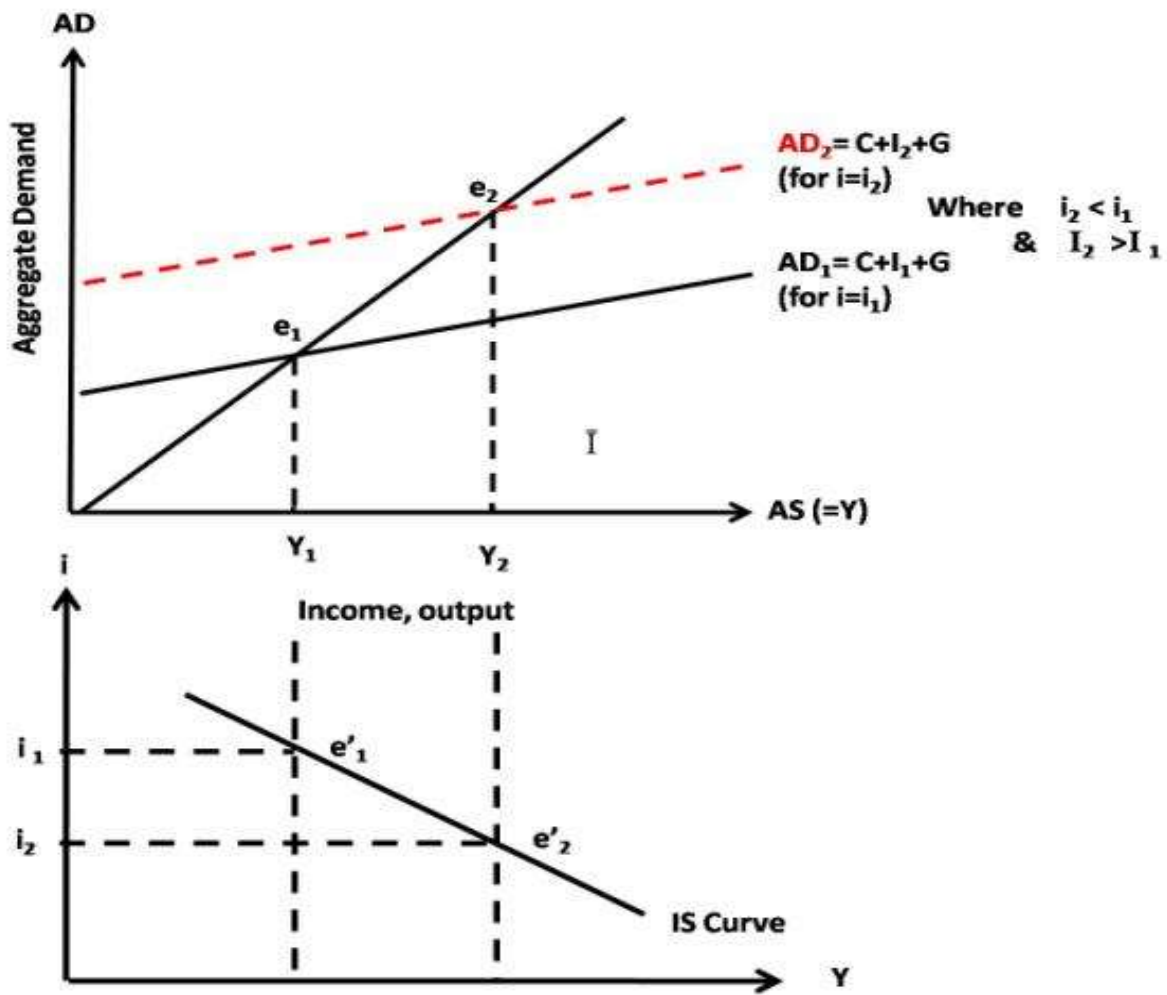
Thus, in the Hicksian IS-LM Framework

$I = \bar{I} - bi, b > 0$

Given $b > 0$, Investment and Interest are negatively related. That is, an increase in interest reduces Investment, and vice versa. This inverse relationship is depicted in the following graph, wherein a higher interest is associated with lower Investment.

Graphical Derivation of IS Curve

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So now we are saying $I = \bar{I} - bi$, $b > 0$
Investment is function of interest rate
i.e. $AD = C + I_1 + G$ (for $i = i_1$)

Supposing Rate of Interest goes down (i_2),

Then the investment goes up (I_2)

So AD Curve shifts up (AD_2)
   Equilibrium moves from e_1 to e_2
   And, the level of income goes up from Y_1 to Y_2
   So, e_1 is a combination of i_1 and Y_1, and
       e_2 is a combination of i_2 and Y_2

We also know that
     $i_2 < i_1$ (by assumption), and
     $Y_2 > Y_1$ (clearly visible from graphs shown above)

At e1   :   AD=AS, i.e. Goods Market is at equilibrium

Since e'1 (e prime 1) is originating from e_1,

∴   Again by inference
     At e'$_1$ also   ➡   Goods Market is at equilibrium.

  Similarly,   at e'$_2$ also ➡   Goods market is at equilibrium.

Joining various e' points (e prime points), and extending the line, we get the **IS Curve**

Therefore, the IS Curve represents various combinations of interest and income where the goods market is at equilibrium.

Mathematical Derivation of IS Curve: Slope and Intercept of IS
Earlier $AD = C + I + G$
But Now, $I \neq \bar{I}$, but $I = \bar{I} - bi$, $b > 0$
      (where b is the change in investment due to change in interest, $b = \frac{\Delta I}{\Delta i}$)

So Substituting,
   $AD = C_0 + c[Y - (\bar{T} + tY) + TR] + \bar{I} - bi + G$
=> $AD = c(1 - t)Y + C_0 - c\bar{T} + cTR + \bar{I} + G - bi$
Since at equilibrium, AD=AS (=Y),
∴ $Y = c(1 - t)Y + C_0 - c\bar{T} + cTR + \bar{I} + G - bi$
=> $Y[1 - c(1 - t)] = \bar{A} - bi,$ where, $\bar{A} = C_0 - c\bar{T} + cTR + \bar{I} + G$
=> $Y = \frac{1}{1 - c(1-t)} \times (\bar{A} - bi)$
=> $Y = \alpha_g(\bar{A} - bi)$ → *This is the equation of IS Curve*
$OR, \quad i = \dfrac{\bar{A}}{b} - \dfrac{Y}{\alpha_g b}$
 → *This form of equation clearly provides the slope and the intercept of the IS Equation*

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The intercept primarily depends on $\bar{A}$, while the slope depends upon α_g and b, wherein

- $\bar{A} = C_0 - c\bar{T} + cTR + \bar{I} + G$
- α_g represents Keynesian government expenditure multiplier in a three sector model (3SM), and
- b represents the change in investment due to change in interest, $b = \frac{\Delta I}{\Delta i}$

Intercept:
The IS curve is shifted by changes in autonomous spending A ($\bar{A} = C_0 - c\bar{T} + cTR + \bar{I} + G$)
For instance, an increase in autonomous spending can occur due to increase in government purchases, as represented by G. An increase in G shifts the IS curve to the right.

Slope:
The smaller the multiplier α_g and the less sensitive investment spending (I) is to changes in the interest rate (i), the steeper the IS curve.

Logical Reasoning for IS Curve to Slope Downwards:

The IS curve is negatively sloped because a decrease in the interest rate (i) increases planned investment spending (I) and therefore increases aggregate demand, thus increasing the equilibrium level of income.

Next Few Classes:

1. Derive LM
2. Intersect IS and LM to simultaneously determine Income and Interest

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