IS-LM Model
Part 1

Keynesian Model

The Keynesian model was developed in four stages by analyzing four separate models. Each model has a value in itself. The characteristics of each are:

- **Cross model : W, P and i are constant (and exogenous).**
- **IS-LM model : W, P are constant and i is endogenous.**
- **AS-AD model : W is constant, P and i are endogenous**
- The full Keynesian model : W is exogenous (but not constant), P and i are endogenous.

where P is price level and W is nominal wage.

When P is constant…

- Nominal Output and Real Output are equal.
- Nominal Interest Rate and Real Interest Rate are equal.

Chapter 8 Aggregate Expenditure and Equilibrium Output *(2 of 2)*

- **aggregate output (income) (*Y*)** A combined term used to represent the exact equality between aggregate output and aggregate income.
- Output *Y* refers to the quantities of goods and services produced, expressed in "real terms", not the dollars circulating in the economy.

Exogenous and Endogenous

- An exogenous variable is a variable that is **not** affected by other variables in the model.
- Endogenous variables have values that are determined by other variables in the model.
- Hence, **exogenous var. determines endogenous var.**

- Which variables in Keynesian Cross are endogenous and which are exogenous?
- $Y = C + I + G + X - M$

Overview of IS-LM Model

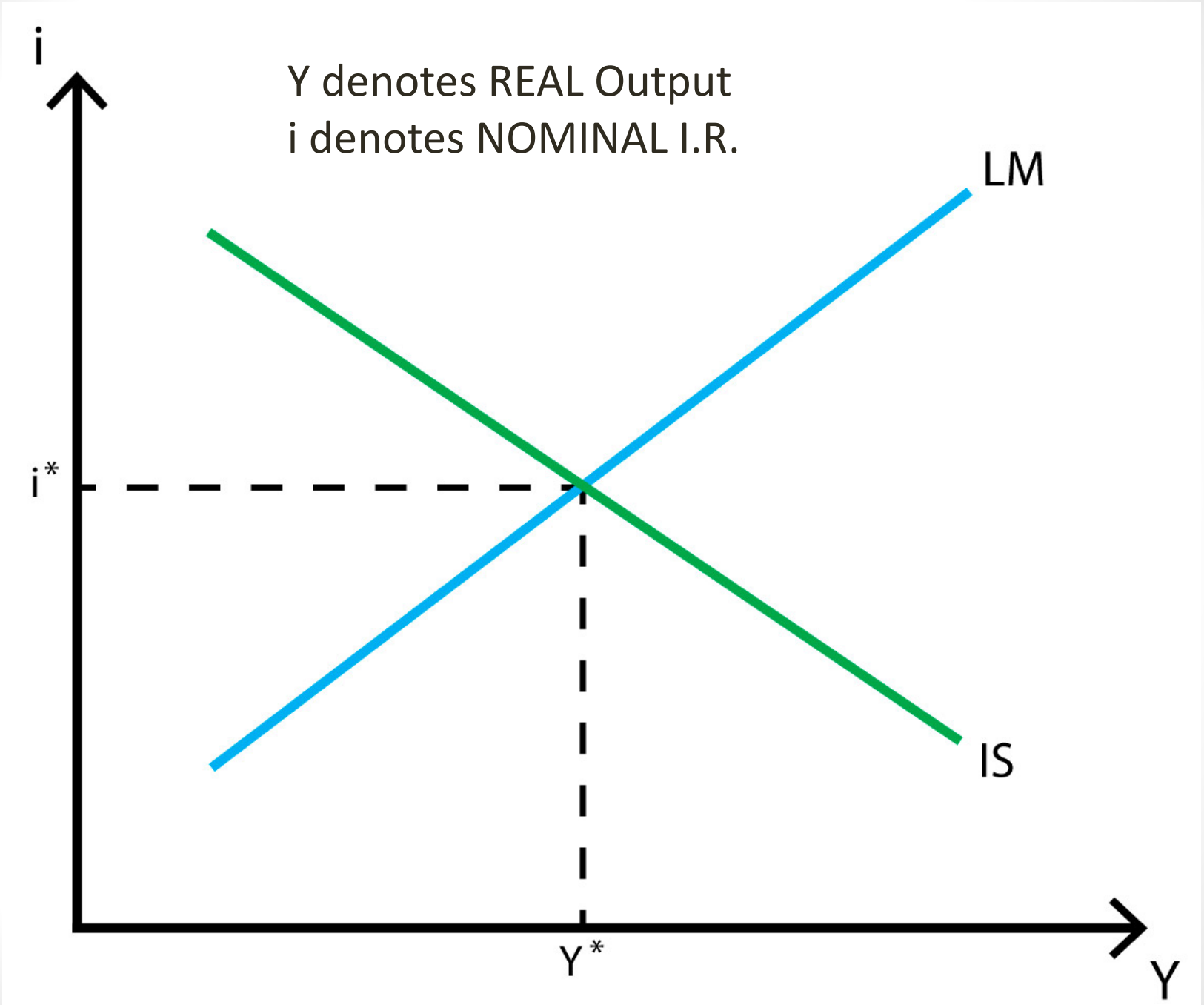
- IS-LM Model or “Investment-Saving and Liquidity Preference-Money Supply” Model.
- It is a model with the **general equilibrium**: there exists a common “price” that clears two or more markets.
- Two markets in this model are 1. the goods and services market and 2. the money market.
- The “price” that clears two markets is the interest rate.

- **Hence, IS-LM shows the relationship between interest rates and assets (commodity and money) market.**

Overview of IS-LM Model

- Like Keynesian Cross, IS-LM is for short-run analysis.
- We note that the price (and wage) is sticky in short run.
- Therefore, we assume that price level is constant, and hence the inflation rate is zero ($\pi = 0$).
- From Fisher Equation ($i = \pi + r$), this implies

  Real Interest Rate (r) = Nominal Interest Rate (i).
- IS-LM is a **closed-economy** model. It has an open-economy version, called Mundell-Fleming Model.
- The model is used to analyze economic fluctuations and study the impacts of policies.


i
Y denotes REAL Output
i denotes NOMINAL I.R.
LM
IS
i*
Y*
Y

The IS Curve

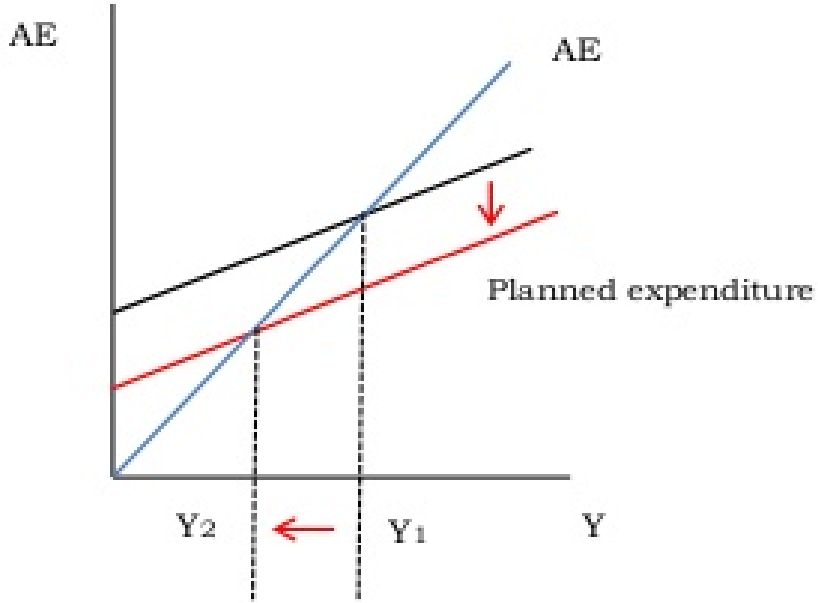
- The IS curve shows a negative relationship between i and Y in the commodity market.
- The curve is derived from a closed-economy Keynesian Cross, i.e. Y = C + I + G.
- Unlike Keynesian Cross that we studied before, we now assume that investment depends on interest rate.
- That is, I = I(i), and $dI/di < 0$: higher interest rates discourage investors from investing.
- Hence, we can write the IS curve as follows

$$Y = C(Y - T) + I(i) + G.$$

The IS Curve

- The IS curve is a LOCUS of “points”.
- Each “point” is an equilibrium in Keynesian Cross at each level of interest rate.
- $Y_1 = C(Y - T) + I(i_1) + G$
- $Y_2 = C(Y - T) + I(i_2) + G$
- Suppose i increases from i1 to i2. Higher interest rate discourages investors and hence reduces AE.
- As a result, when AE falls, Y also falls from Y1 to Y2.
- This negative relationship between i and Y is depicted in the IS curve.

a) The Keynesian cross



b) The IS curve

c) The investment function