GENERAL EQUILIBRIUM OF PRODUCTION

BA 4TH SEM (H)
INTERMEDIATE MICRO ECONOMICS
UNIT-1

INTRODUCTION

- General equilibrium is concerned with analysing all the markets, along with considering the mutual dependence between them.

- from the perspective of attaining general equilibrium with production, we consider two factors of production Labour (L) and Capital (K) that firms employ for the production of the commodities X and Y.

ASSUMPTIONS

- To keep the analysis simple and to concentrate on the basic characteristics of general equilibrium with production, it is assumed that—

- i. There prevails perfect competition in all the markets.
- ii. Both Labour and Capital are available in fixed quantities in the economy.
- iii. The technology is given.

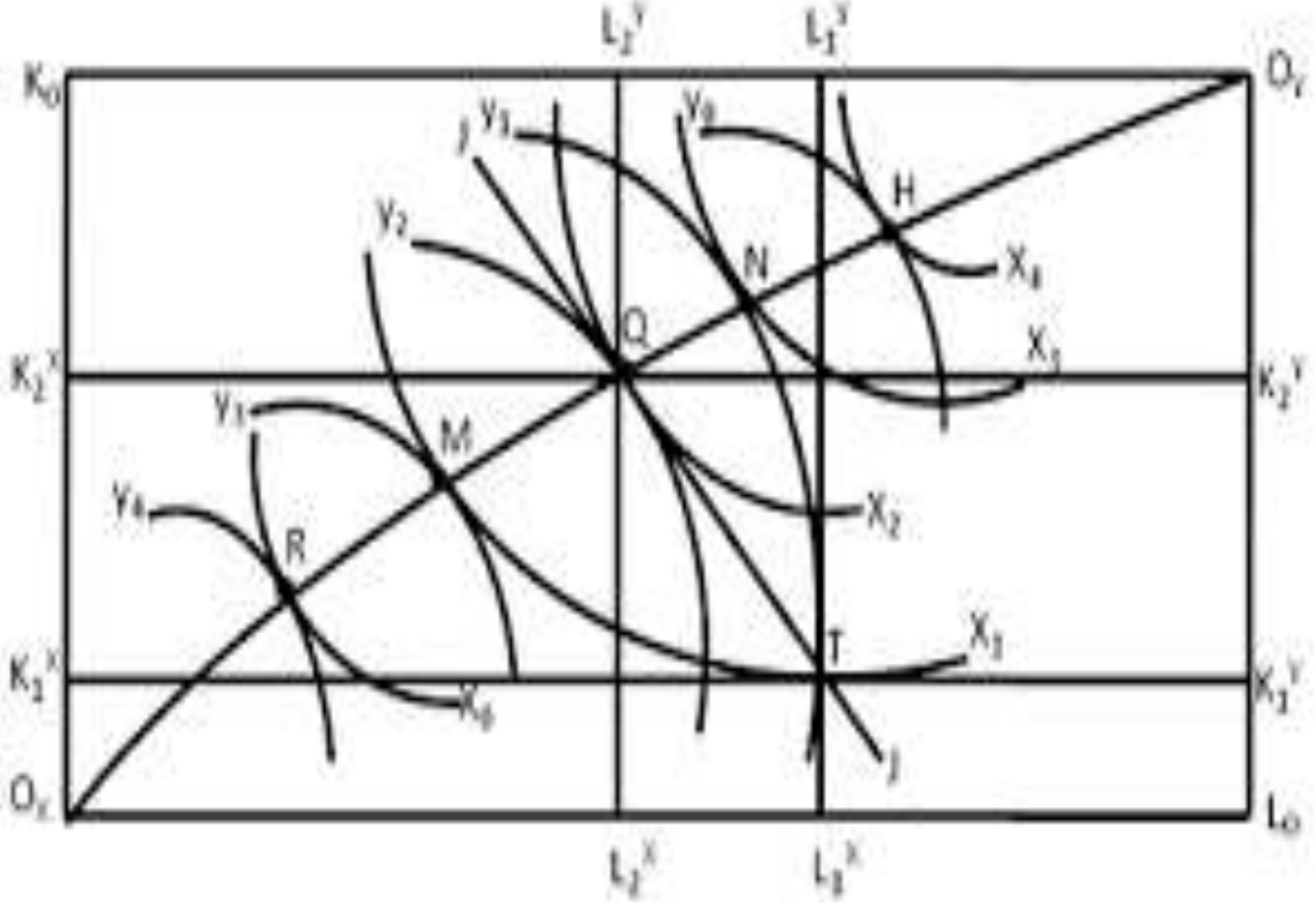
- Considering the above mentioned assumptions, in the context of General Equilibrium with production it is to be determined that how much of the capital and labour factors is to be used for production of each commodity.

- Thus, the task under general equilibrium here is to determine equilibrium relative prices and quantities of both the factors employed, labour (L) and capital (K), corresponding to the point at which all markets reach equilibrium simultaneously.

EDGEWORTHBOX AND EFFICIENCY IN PRODUCTION

- A rectangular Edgeworth box with fixed dimensions (given by total endowment of capital and labour) depicts all possible allocations of capital and labour employed for the production of commodities X and Y.
- Commodity X is represented by origin OX at the lowerleft corner, while commodity Y by OY at the upper-right corner.
- From origin OX, height of the box (OXK0) represents total endowment of capital available in the economy, while its width (OXL0)represents total endowment amount of labour available.
- Similarly, the respective opposite sides from origin OY represents the total capital and labour available in the economy.
- Isoquants with respect to origin OX (i.e., X0, X1, X2 such that X0 < X1 < X2) represent different combinations of capital and labour required for producing a given level of output of commodity X, while those with respect to origin OY gives capital-labour production combinations producing a given level of output of commodity Y (i.e., Y0, Y1, Y2 such that Y0 < Y1 < Y2).

EDGEWORTH BOX



- In the Figure, point T represents the initial factor allocation among production of commodities X and Y.

- Here X1 amount of commodity X is produced using OxL^{x}_{1} amount of labour and OxK^{x}_{1} amount of capital and Y1 amount of commodity Y is produced with remaining amounts (i.e.OyL^{y}_{1} amount of labour and OyK^{y}_{1} amount of capital)of two factors of production.

- All other points also represent the similar allocation of total amount of both the factors of production. Isoquants representing input allocation for the production of commodities X and Y passing through the initial factor allocation point T form a lens-shaped area (shaded-region)

- The significance of this lens-shaped area is that every allocation of inputs identified by a point inside this area involves larger outputs of both commodities (called Pareto improvement) than at point T.

- For instance, point Q can be reached as improvement from point T by increasing production of both commodities.

- Movement from point T to Q involves shifting some labour from good X to Y industry and some capital from good Y to X industry, increasing outputs of both the commodities at no additional cost.

- The locus of all the tangency points of the isoquants from the origins is called a contract curve.
- The general equilibrium, that is, when all markets are simultaneously in equilibrium will lie somewhere on this contract curve.
- Slope of an isoquant is given by the Marginal rate of technical substitution between capital and labour for production of a good ($MRTS_{LK}$), hence at an efficient resource allocation point
  - $MRTS^{x}_{LK} = MRTS^{y}_{LK}$
- The above condition reads— marginal rate of technical substitution between capital and labour for production of good X is equal to marginal rate of technical substitution between capital and labour for production of good Y.

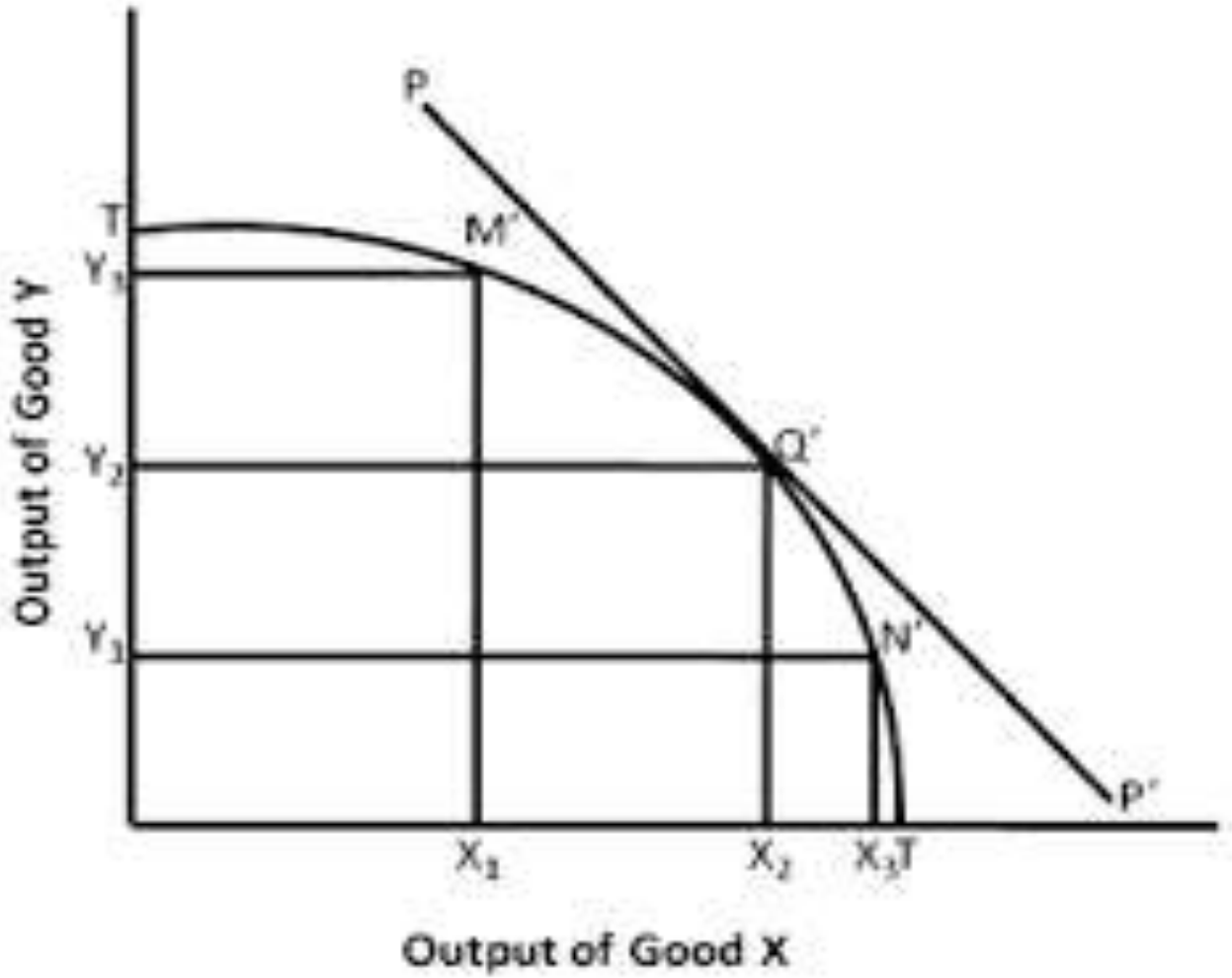
TRANSFORMATION CURVE

- A Transformation curve (also called the Production Possibility Frontier) shows the maximum amount of different combinations of the two goods that an economy can produce by fully utilising all its resources.

- It basically shows the transformation of one good into another by transferring resources between the productions of two goods.

- We derive the transformation curve from the contract curve by bringing down the various combinations of the output of two goods produced from fixed endowments of factors of production from the input-space to the output-space.

Fig: Transformation Curve



IMPORTANT FEATURES OF TRANSFORMATION CURVE

- The transformation curve represents a set of technically efficient combinations of two final goods that can be produced with fixed endowment of factor inputs.
- The points inside the curve are feasible but are technically inefficient.
- The points outside this curve might be technically efficient and are certainly more desirable than the points on the curve but are not feasible

- Slope of the transformation curve measures the rate of technical transformation from one good to the other (at the margin) known as the marginal rate of product transformation between two goods X and Y (MRPTxy)
- It simply equals the amount of good Y sacrificed by releasing resources from its production to produce additional units of good X.
- It equals: MRPTxy= MCx/MCy
- Where MCx is marginal cost of production of good X, MCy is marginal cost of production of good

- Transformation curve is concave to the origin because the amount of Y that has to be given up for increasing the production of good X increases as one produces more of good X.

Reason:

- Diminishing returns, that is, fall in the efficiency with increase in the scale of production
- Every point on the PPC or TC is a point of general equilibrium of production.