The Paretian Optimum

Efficiency in Consumption or Exchange:

A distribution of the given quantities of the two commodities Q_1 and Q_2 among two consumers I and II is said to be Pareto-efficient if it is impossible, by a redistribution of these goods, to increase the utility of one individual without $_0$ reducing the utility of the other.

The marginal condition for efficiency in consumption or exchange can be derived with the help of the Edgeworth box diagram given in Fig. 21.2. The dimensions of the rectangle in Fig. 21.2 represent the total available quantities, q^0_1 and q^0_2, of the two goods in a pure- exchange economy.

Any point in the box represents a particular distribution of the commodities between the two consumers. For example, if the distribution of commodities is given by point A, the quantities of Q_1 and Q_2 consumed by consumer I are measured by the coordinates of A with respect to the origin O and the quantities of the two goods consumed by II are measured by the coordinates of A w.r.t. the origin O'.

The indifference map of consumer I has been given w.r.t. the origin O and that of II has been given w.r.t. the origin O'.

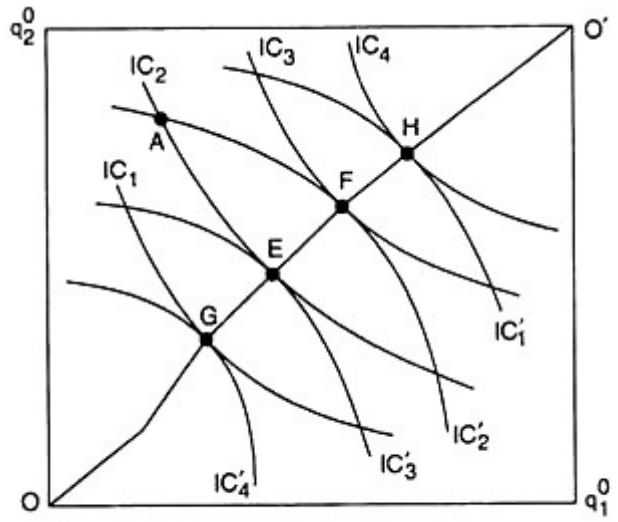

Fig. 21.2 Efficiency in consumption or exchange

Now, the marginal condition for Pareto efficiency in consumption or exchange would be obtained if we maximise the utility level of consumer I or II subject to the given utility level of consumer II or I. Such maximisation would occur at a point of tangency between the indifference curves (ICs) of the two consumers. For example, maximisation of utility of consumer I subject to the utility level of II as given by IC_1 of consumer II, would occur at the point of tangency, E, between the ICs of two consumers.

Similarly, maximisation of utility of consumer II subject to the utility level of I as given by IC_3 of consumer I would occur at the point of tangency, F, between the ICs of the two consumers. It may be added, therefore, that the exchange equilibrium is not unique.

Now, at the point of tangency between the ICs of the two consumers, we have numerical slope of IC of consumer I = numerical slope of IC of consumer II

=> $MRS_{Q1,Q2}$ of consumer I = $MRS_{Q1,Q2}$ of consumer II (21.11)

Thus, the marginal condition for Pareto efficiency in consumption is given by (21.11). It is obvious from above that any point of tangency between the ICs of two consumers is a Pareto efficiency point. If we join all such points of tangency by a curve in Fig. 21.2, we obtain what is known as the Edgeworth contract curve for consumption or Exchange (CCC or CCE), which would run from the point O to the point O'.

Therefore, all the points on the contract curve at which (21.11) is satisfied, are Pareto-efficient points in consumption. For, if we are at some point on the contract curve, in Fig. (21.2), we are not able to effect, by a change in the distribution of the goods, an improvement in the utility of one consumer without reducing the utility of the other.

Therefore, let us note again that the point of Pareto efficiency in exchange is not unique. On the other hand, any point like A, which does not lie on the contract curve and which does not satisfy (21.11), is Pareto-non-optimal. At the point, A, consumer I is on his IC_2 and consumer II is on his IC_2.