A reorganisation of production

Finance, Market

Pareto optimality is a central concept in economics, especially welfare economics, as a measure of efficiency. The term is named after Vilfredo Pareto, an Italian economist who used the concept in his studies of economic efficiency and income distribution. An allocation of resources is Pareto optimal if there is no way that one individual could be made better off without making any other individual worse off following a reorganisation of production or distribution.

It is a point where there is no other feasible allocation which either consumer prefers. If not Pareto efficient, we are being wasteful, because someone could be made happier without making someone else less happy. Pareto optimality is, therefore, a situation in which economic welfare is maximised. Welfare economics is concerned with the " social desirability of alternative economic states" 2. The Fundamental Theorems of Welfare Economics link the concepts of competitive equilibrium and Pareto-optimal allocation.

From the First Fundamental Theorem of Welfare Economics we know that, in a market economy where producers and consumers are all price takers, any competitive equilibrium is Pareto optimal, in that markets clear, consumers maximise utility and firms maximise profits3. There are no externalities and the price mechanism is the best way to determine demand and supply. The Second Fundamental Welfare Theorem goes further, to state that any Pareto-optimal allocation can be achieved as a competitive equilibrium, provided there is an appropriate redistribution of initial endowments4 (and through optimising behaviour on the part of society).

These two theorems imply that efficiency can be dealt with separately from equity; if a particular distribution of welfare is pursued, this should be done by altering the distribution of initial endowments, or by redistributing purchasing power, for example using lump-sum taxes and allowances, rather than by interfering with markets. The Edgeworth Box5 is used in general equilibrium analysis and shows the allocations of two goods between two 'agents' using indifference curves and a contract curve.

The area enclosed in the box represents all possible combinations of the goods, and therefore any point represents some distribution of the goods between the agents. Consumer A's utility increases the further from OA it is, and the utility for consumer B increases the further away from OB it is. The contract curve (OA-OB) joins all the consumption-efficient allocations, which are all the points of tangency between consumer A and consumer B's indifference curves.

At each of these points, the slopes of the indifference curves must be the same; hence marginal rates of substitution are equal. One method of reallocating resources is for the government to " transfer the purchasing power of endowments" 7 - that is, the government could tax consumer A according to the value of his endowment and transfer thatmoneyto consumer B. This would result in a shift of the budget line from M0 to M1, so the endowment would change from R to W, as seen below:

This movement from R to W is possible due to the Second Welfare Theorem. It enables consumers to move from one budget set to another. The mechanisms of a competitive market would then ensure that the Pareto-

optimal allocation (at E) is achieved. The consumers can therefore benefit from an allocation that still maximises utility, yet is also more equitable. Due to the difficulty in measuring consumers' endowments, we must use a non-distortionary form of lump sum taxation - this measures the potential (rather than actual) value.

The tax is therefore based on the endowment itself, which cannot be changed, and not on consumers' choices, as inefficiencies result when taxes depend on choice8. We have seen that the Second Welfare Theorem proves that any Pareto efficient allocation can be achieved by redistribution of endowment. However, there is an exception to this; if one agent's preferences are non-convex, then it is possible to have a Pareto-optimal allocation which is not in equilibrium, as seen below. Consumer A wants allocation M, but consumer B wants allocation N - the optimal demands are in disequilibrium.

Welfare economics is a framework for deciding on the optimal use of scarce resources. Pareto-optimal allocation occurs when it is not possible to redistribute goods to increase the welfare of one consumer without reducing the welfare of another. Conversely, therefore, a situation is not Pareto-optimal if you can make someone better off without making anyone else worse off. Such inefficient outcomes are to be avoided, and therefore Pareto efficiency is important for evaluating economic systems and political policies.

In terms of efficiency alone, Pareto-optimality is best, but it is important to remember that efficiency does not guarantee equity, so Pareto-optimality does not necessarily ensure the maximisation of social welfare. The First

Theorem of Welfare Economics only guarantees that an efficient outcome will occur in a perfectly competitive market. As a result, the government might have a role to play.

The Second Theorem of Welfare Economics tells us that one way of achieving a particular Pareto efficient allocation is to " adjust" the budget constraints, i. e. redistribute endowments, and then let competitive markets 'work'. That is, the only intervention that is needed to achieve any Pareto efficient allocation is the redistribution of initial endowments. The Second Welfare Theorem effectively separates efficiency and distribution issues. Distribution objectives are achieved by the redistribution of endowment, while efficiency is achieved by market mechanism.

The social welfare theorems indicate that under conditions of perfect competition, market exchanges will result in a distribution of goods and services that maximize the overall welfare or utility of individuals in society, so long as there is some form of intervention to redistribute the endowment. It is true, then, that any pareto efficient allocation can be achieved by lump sum redistribution of endowment, provided the preferences (diagrammatically, the indifference curves) of all consumers involved are convex.