

MARGINAL COST PRICING IN PUBLIC ENTERPRISES*

RATIONALE

The pricing policy of public enterprises differs in some respects from the pricing policy of private enterprises inasmuch as the former has to take into account the interests of the community at large. Thus the price policy of public enterprises should be such as to maximise the interests of the society. The price fixation in fact is primarily a question of the determination of the objective. In a welfare state, the maximum welfare of the people can be the only guiding principle. It is on this principle that the marginal cost pricing is based.

The cost of a factor represents the sacrifice of the society just as the prices indicate satisfaction. So long as the satisfaction is more than the sacrifice, it will pay to increase the production because it will add to the aggregate benefit. The point where the price (or AR) is equal to the MC or the sacrifice, will give the point of maximum satisfaction or the best allocation of resources. If the price is more than the marginal cost, it shows that factors of production are being used in making some other less worthwhile product. Conversely if the MC is more than AR, it would show that the factors can be used better elsewhere. Thus the optimum distribution will be secured where $MC=AR$ i.e., the price changed is equal to the incremental cost. This is known as marginal-cost principle.

The MC rule attracted the attention of many economists like Dickinson, Lerner, Dobb in 1930's.[1] But the credit for initiating it is given to Harold Hotelling[2] who strongly advocated this rule on the ground that "the optimum of the general welfare corresponds to the sale of

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everything at MC.”[3] Criticizing the usual approach of covering the average cost which of course includes fixed costs, he said that the common assumption that every tub must stand on its own bottom is in consistent with the maximum of social efficiency. He rather advised “Let dead men and dead investment rest quietly in their graves so that rates assure most efficient operation.”[4]

Thus the foundations of MC principle are based upon the analytical model of a perfectly competitive market economy in which the entrepreneurs are supposed to have perfect foresight and no transfer of factors between uses can increase the satisfaction of one without reducing that of another (i.e., marginal cost measures opportunity cost). It also assumes the ideality of the given distribution of income and consumers preferences. In perfect competition $MC = AC = AR$, and therefore the ideal allocation of resources is automatically achieved. But in reality perfect competition is conspicuous only by its absence and therefore to achieve the optimum allocation of resources, marginal conditions of optimum should be satisfied by adopting MC rule. In private sector a producer tries to equate MC not with AR but with MR for he is interested in maximizing profit. But that point will not give maximum satisfaction to the society because at this point additional satisfaction will be more than the additional cost. Govt. can help in this direction by trying to encourage competitive conditions, but in the case of monopoly and increasing returns, this course of action can not be adopted. Thus economists like Meade,[5] Fleming, Oscar Lange[6] suggest the socialisation of these industries to attain optimum allocation. Oscar Lange puts MC rule in different words to mean that more should be produced with a given plant so long as the price of the product exceeds its prime cost i.e., a factor should be substituted so-long as its value of the marginal product is more than its cost.

This principle can be illustrated with the help of a figure also.

In figure No. I MC cuts AR at point P and hence the price given by marginal cost rule is PM and output OM will best meet the needs of the people. It can also be easily seen from the figure that this point of maximum satisfaction is different from the point of maximum profit i.e., Pt. Q ($MC = MR$) and the point of competitive price i.e., R ($AR = AC$)* which can also be described as the break even point or the point

*In fact, the revenue curves under perfect competition will be different.

of no profit no loss. Many economists are in favour of taking the last point as the price for public enterprises, but as can be seen it will not represent maximum satisfaction because after OM output, the additional output involves cost more than the satisfaction. Point S represents the most efficient point from the supply side.

It may thus be seen that the issue does not depend on whether a given output covers the AC of production, but on whether the total demand area under consumers demand curve exceeds or not their area under the demand curve of other goods from where factors are extracted.

Marginal cost rule is considered by many writers to be an ideal tool of welfare economics in that it kills two birds with one stone. It satisfies the marginal condition that prices should be equal to the value of the marginal product and at the same time it does away with the interpersonal comparisons which are implicit in the utility approach.

DIFFICULTIES

The MC pricing looks very ideal and convincing, but in practice it is beset with a number of practical and conceptual difficulties. Even Harold Hotelling was conscious of these when he recognised the technical problem of interpretation and determination. Below is given a brief account of these difficulties and problems.

At the outset the difficulty is of defining the marginal cost. Of course MC includes variable expenses, but there are some expenses which are semivariable e.g. depreciation repairs etc. The advocates of MC rule suggest that whatever increase is there in the cost as a result of the marginal output, that may be taken as MC. While this will be valid in the case of wages and raw materials, it may not be true of the semi variable expenses which have exponential curves. Moreover there is also the problem of time horizon. In the long run all costs are variable and thus the price determination for a long time may not be the same as far the short time. In long run MC rule will thus equate with AC rule.

Even if some of the costs are identified as variable costs, there remains the difficulty of calculating it. This is because the factors are not freely variable in very small quantities. If that were so MC should have been equal to AC. In reality there is an element of indivisibility

that leads to fixity of factor intake, which may be different from the factor use. Thus if, for example an extra bale of cloth is produced by the existing looms, there is factor use only and no factor intake (apart from raw material). But if for producing this extra bale of cotton, there is the need of installing one more loom which in fact can produce several bales of cloth, the factor intake would be much more than the factor use. The problem arises as to what should be included in the price. Marginal cost measures factor intake and therefore MC rule implies that no charge should be made for factor use. This will create difficulty especially in public enterprises where the fixed investment is quite high. Thus in a train two or three extra persons who will not need any factor intake should be allowed free travel according to the MC rule.

Besides, this indivisibility also makes MC move abruptly i.e., MC increases by jumps. So the adherence to MC rule would suggest that some units should not be charged, while others will be heavily charged e.g., if maximum capacity of a bus is 50 persons, 48 are travelling, these two more will cost nothing while the third one will necessitate a new bus. As per MC rule, all the cost of the new bus should be charged from 51st unfortunate person. Hotelling advised that a sharp increase in railway rates to unlucky passenger can be avoided by an averaging of rates according to the probability of having to run another train; or if it is not possible the charge should be of sufficient magnitude so as to enable those who are willing to pay the most to ride. However this smooth curve reasoning to these uneven steps implies inter-personal comparison and makes MC pricing arbitrary.

Apart from the technical reason of indivisibility, there is the historical or temporal reason also which leads to difficulty in the determination of MC. This is what Phelps Brown[7] calls "irrevocability". i.e., a fixed commitment is already there in the form of a durable and specific goods, whether it is fully utilised or not e.g., a high horse power engine. The MC rule ignores it as it involves no current opportunity cost. But it is argued that there is only the displacement of time between the factor use and opportunity cost and these expenditures do involve the anticipated or postponed opportunity cost in the form of interest and maintenance costs. These costs cannot be charged as and when they arise but they have to be spread over all the users and there comes the element of arbitrariness in the determination of M.C.

A very serious objection to MC rule is that it may not always cover the total cost. Under conditions of decreasing returns it is not a problem because MC rule will cover the total cost. In a normal 'U' shape cost curve, the firm must try to augment its output upto the break even point which can be easily calculated.[8] As the share of fixed cost is relatively high in public enterprises, the break even point is generally quite large. This necessitates the promotional aspect in the price policy. However if decreasing cost continues to operate the adoption of MC rule will give rise to a big deficit because MC and hence AR will be lower than the cost. It is therefore suggested by the critics that the rule should be suspended in such cases.

However the advocates of MC rule do not feel convinced of it and say that this notion is a 'carryover' of the book-keeping rule. They assert that whereas equality of MC & AR is a condition of welfare optimum, the equality of AC & AR has no such condition. Some of them even suggest the socialisation of units where increasing return is found operating because private producer will never adopt this rule. In fact Marshall also suggested the subsidy to increasing returns and taxes on diminishing return units on the ground that this would increase total consumer surplus. The same reasoning applies to this rule. To the question as to how these losses should be met by govt., the advocates point out that these losses can be met either through the profits of the remaining enterprises, or else through taxes. Hotelling also suggested taxes but such taxes which affect only the distribution of national income and not its size. Thus he preferred income tax to commodity tax because latter affect prices and thereby consumption. Writers like Samuelson believe that income tax is also an 'indirect' tax as it is a tax on some factor of production. In any case these taxes shift the resources from the tax-payers to consumers and there is distribution of income. Thus where the distribution of income is ideal, taxes will divert it from there.

A very serious limitation of MC rule lies in its fundamental assumption that conformity to consumer's wishes implies optimum allocation. As pointed out earlier, it is based on another assumption that distribution of income is equitable. But in fact in most of the countries, especially underdeveloped countries including India, there is mal-distribution of income which vitiates the pattern of consumer's desire. If the affluent demand the luxuries while the majority class of

paupers does not have enough income to provide a "demand" for food, it is wrong to think that the production of these luxuries in preference to necessities will optimise the allocation of resources and maximise the interests of the society. The facile belief of maximising consumer's satisfaction by adopting MC rule is only superficial and there is no relevance of this principle in countries like India Dr. V.K. R.V. Rao says "There is no sanctity attached with MC or the objective of no profit no loss. The most important objective is the country's interest." [9]

Besides these major criticisms, there are some other limitations also. For example the problem of measuring efficiency will become more complex and it is feared that what is gained by the MC rule may be more than lost by the inefficiency. Moreover there is the problem of deciding the investment criterion. Hotelling suggested [10] if some distribution of burden is possible such that every one concerned is better off than without the new investment, then there is a prima facie case for making the investment." Besides the political set up may present difficulty in adopting it.

CONCLUSION

The MC rule has some strong points in its favour, but it is so full of difficulties that it is not adopted in practice in its strict form. Its assumptions are also not completely realistic. Thus Dr. J. De. V. Graaff remarks, "The survival of MC principle is probably no more than an indication of the extent to which professional economists are ignorant of the assumptions required for its validity." [11]

That MC rule has some difficulties does not mean that its should be absolutely ignored. To the above remark, Mr. M. J. Farrell [12] replies, "If clocks and watches are subject to error, shall we take astronomical observation whenever we want to know the time." In simple words, the MC rule provides a more objective basis for welfare optimum. Thus in practice attempt is made to evolve a price system which approximates with MC rule. For example in public utilities like electricity, it is done by what is called "Two-part Tariff", i.e., two charges one for prime cost and the other as a contribution towards overhead cost. But it is possible only where the customer is regular and the services can not be transferred. So in other cases price discrimination

is adopted to provide maximum satisfaction.

In India MC rule has not attracted the attention of the policy makers and the economists. More emphasis is placed on a policy of rationalized profit making so as to provide funds for economic development and self financing. Planning Commission wants the public enterprises to be self reliant. Sometimes the losses are permissible or the subsidies are given, but that is not in pursuance of MC rule, but on the ground of externalities and national interest.

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- [2] "The General Welfare in relation to problems of Taxation and of railway and utility rates" *Econometrica*, 1938, pp. 241-269. Harold Hotelling based his article not upon his contemporaries but on the works of an engineer Jules Dupuit who wrote as early as in 1844 that maximum benefit would come if prices are equal to the cost of the best alternatives to its use
- [3] *Ibid.*, p. 241
- [4] p. 269
- [5] *Economic Journal*, Dec. 1944
- [6] "Economic Theory of Socialism"
- [7] *Courses in Applied Economics*, p. 184
- [8] Given the fixed cost which will have a parallel line to cost ordinate, and the variable cost which will be a linear function, break even point can be calculated as shown in figure. No. II
- [9] *Commerce*, 4th March 1961, p. 384
- [10] *Ibid.*, p. 267
- [11] *Theoretical Welfare Economics*, p. 154
- [12] *In Defence of Public Utility Price (Oxford Economic Papers 1958)*, p. 121

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