ESSAY 5

A FURTHER NOTE ON DECREASING COSTS

Interesting additions to the theory of decreasing costs have been made in recent numbers of the Economic Journal by Mrs. Robinson and Mr. Shove; complete precision in this field is almost within our grasp; certain obscurities, however, remain to be cleared up. In particular Mr. Shove’s criticism of Mrs. Robinson has brought to light some difficulties connected with her conception of a normal rate of profit.

She defines a normal rate as that which neither attracts new nor drives out old competitors. In the case of imperfect competition, however, it appears that this definition does not specify a particular rate, but only a range of rates.

If there were a unique rate such that any rate in excess of it attracted new competitors and any rate below it caused defection, we should surely be in the sphere of perfect competition. As Mr. Shove observes, Mrs. Robinson’s treatment suggests free entry into the trade, and free entry is impossible to reconcile with the notion of an imperfect market. Mrs. Robinson really does no more than define limits within which any rate may be considered as normal.

Nevertheless, in order to use an apparatus of cost curves effectively and to give any meaning to the expression, decreasing costs, it is necessary to specify a single rate of profit. It is this rate which has to be used in determining the supplementary cost due to a given capital installation.

1 Economic Journal, December 1932.
2 Ibid. March 1933.
3 Loc. cit. p. 119.
4 ‘If profits are more than normal, new firms will tend to enter the industry.
... If profits are less than normal, firms will tend to leave the industry.’ — Robinson, loc. cit. p. 548.
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Within the range of possible equilibrium rates which Mrs. Robinson's definition yields, one particular rate stands out with a marked claim to be considered the normal rate. This is the rate just sufficient to induce the firm itself to embark on additional fixed capital expenditure. It is likely to be lower than the rate required to attract new firms into the business and higher than the rate at which firms tend to fall out. In a period long enough to allow a firm to adjust its fixed equipment to the prospective demand, the rate of return to the marginal installation of fixed equipment tends to be equal to what the firm considers adequate. This rate of profit should be regarded as the supply price of fixed equipment for the firm, and should be used in computing its supplementary costs schedule.

It remains to consider how this definition of normal profit in imperfect competition affects the theory of equilibrium. In a short-period equilibrium, it will be remembered, marginal cost of production is equal to marginal revenue; price and average cost may have different values, but, if they have a common value, the price and average cost curves must be tangential at the equilibrium point. What of the longer period? First, profit on fixed equipment must lie within the limits postulated by Mrs. Robinson. This condition need concern us no further. The second condition may be expressed in two ways which come to the same thing. The firm will use such an amount of fixed equipment that it produces the equilibrium output in the cheapest way (charging fixed equipment with a normal rate of profit as defined above). Put otherwise, the marginal revenue due to the marginal outlay on fixed equipment yields a normal rate of profit upon it.

I showed in the previous essay that a firm's cost of production may be represented by a family of parabolas, each member of the family representing the cost of producing different amounts of output from a given amount of fixed

1 Mrs. Robinson has re-christened my somewhat clumsy 'increment of aggregate demand curve' with the more elegant name, 'marginal revenue curve'. Cf. Economic Journal, June 1930, p. 236, and December 1932, p. 546.

2 See above, p. 100.
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equipment. The cheapest mode of producing any particular amount of output, \( x \), is by using that amount of fixed equipment the parabola of which has the lowest ordinate of all the parabolas at \( x \). Since in a long period a firm will tend to produce in the cheapest manner, the long-period cost curve is the envelope of the family.

In constructing each parabola, a normal rate of profit, as defined above, should be assumed. For it is precisely this rate of profit which determines the action of a firm, when deciding whether to extend (or reconstruct) its plant or not. It will regard extension of plant as the cheaper way of producing an increment \( \Delta x \), when the extra prime cost required to produce \( \Delta x \) without extra plant exceeds that required to do so with the extra plant by anything more than an amount yielding a normal rate of profit, as defined, on the extra plant.¹

It follows that the second mode of stating the second condition for long-period equilibrium set out above comes to the same thing as the first mode. In long-period equilibrium the firm will be earning on its marginal outlay on fixed plant a rate of return which it regards as justifying fixed capital expenditure.

In long-period equilibrium the long-period cost curve and the curve showing total cost per unit of producing from the particular plant in use are tangential at the point of equilibrium output (vide supra). Are these curves also tangential to the demand curve?

If they are, the price is equal to the total cost of production per unit, which means that it yields an average rate of profit on the fixed plant that is equal to the rate used in constructing the cost curve, i.e. that the average rate of profit is equal to the normal and to the marginal rate. If, as Mrs. Robinson implies, the firm must earn a unique normal rate of profit on all its fixed equipment in long-period equilibrium, then her conclusion follows that the total cost per unit curve, which embodies this rate, must be tangential to the demand curve.

¹ If the next biggest size of plant can only be achieved, not by the addition of an extra piece, but by radical reconstruction, the period under consideration is longer.
curve, and, since that has a negative gradient in an imperfect market, an equilibrium firm working for an imperfect market must show decreasing costs.\(^1\) It is true that in equilibrium a firm's rate of profit on all its fixed equipment must be normal in her sense. It is not true that there is a unique normal rate of profit in this sense. Nor is it true that a firm must earn a normal rate of profit on all its fixed equipment in the unique sense defined above. It must earn a normal rate so defined on its marginal fixed equipment. If the price exceeds the total cost per unit, the average rate of profit on the firm's fixed equipment will exceed the marginal which is equal to the normal rate, and if the price falls short of the total cost per unit the average rate of profit in the firm will fall short of its marginal which is also its normal rate.

It seems to be true, therefore, that it is not a necessary condition of long-period equilibrium that the price should be equal to the total average cost per unit. If the price is greater than the total average cost per unit, the gradient of the demand curve has a greater negative value than that of the total cost per unit curve;\(^2\) in this condition, therefore, the long-period cost curve may not have a negative gradient at all. If the price is equal to or less than the total average cost per unit, the long-period cost curve must have a negative gradient. It seems to follow from this that after a period of prolonged depression when firms are tending to reach a long-period equilibrium at a low level of output, prices and profits, long-period decreasing costs are more than usually likely to be present in firms that are in imperfect competition.

This analysis confirms the view of an earlier article,\(^3\) that an equilibrium firm working in conditions of imperfect competition may be subject to decreasing long- and short-period costs in equilibrium. It is in conflict with the further contention that such a firm must be subject to decreasing costs.

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\(^1\) Cf. Robinson, loc. cit. p. 549.

\(^2\) Since the marginal revenue curve and the marginal cost curve intersect at the point of equilibrium output, \(x_e\), that average curve must have the greater negative gradient which has the greater value at \(x_e\). Cf. the formula on p. 570, Economic Journal, December 1931.

\(^3\) Economic Journal, December 1931.
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Mrs. Robinson's theorem is consistent with a possible definition of normal profit, but not with that given above. The definition I have chosen may be defended on the grounds, first, that it is natural and conformable with general economic usage, and secondly, that the cost curve which it entails is the most appropriate one, if cost analysis is undertaken with an eye to supply price analysis. Mrs. Robinson has shown that changes of supply price in imperfect competition, depend on the nature of changes in demand. The simplest kind of change in demand to suppose seems to be that the particular demand curve, as it shifts its position, retains a constant elasticity for each value of y. In the face of such changes the supply price curve and the cost curve constructed in the manner suggested above both have a negative gradient, both have a positive gradient or are both horizontal.¹

¹ The last two propositions were suggested to my mind by a hint given by Mrs. Robinson herself. She must not, however, be held responsible for them.