



Imperfect Competition and the Trade Cycle

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INTRODUCTION

IT is the purpose of this article to consider the relation between certain well-known phenomena of the trade cycle and the theory of imperfect competition. The following features of the trade cycle are taken for granted as established by wide observation: (1) the fact that rising output, rising commodity prices, rising rewards to prime factors (measured in money), and rising profits are associated, and, conversely, declining output, declining prices, declining rewards to prime factors, and declining profits; (2) the fact that the commodity price fluctuation has greater amplitude than that of (money) rewards to prime factors; (3) the fact that the profit fluctuation has greater amplitude than any of the afore-mentioned fluctuations. No attempt is made here to present evidence for these features. The relation of the amplitude of the fluctuation in the output and prices of capital goods to that of the fluctuation in the output and prices of consumable goods is not considered, although that relation is of fundamental importance for trade cycle theory. In this article, attention is directed to a limited set of relations within the whole complex.

The leading principle of the theory of imperfect competition is that entrepreneurs tend to equate marginal cost to marginal revenue.¹ This is a tendency which should operate in the short period. Insufficient attention appears to have been paid to this in trade-cycle studies. The following considerations are based on the supposition that it is realized.

It is not to be supposed that marginal revenue is always and in all circumstances equated to marginal cost. To suppose that would be to exaggerate the knowledge and alertness of *homo economicus*. To assume it may be regarded as making a first approximation to the truth. No

¹ In the theory of imperfect competition, which deals with that great intermediate region between pure competition, on the one hand, and pure monopoly on the other, marginal revenue is defined as the difference between a producer's receipts if he chooses to market n units of his commodity per unit of time and his receipts if he chooses to market $(n-1)$ units. For any given price, the marginal revenue will be less, the less the elasticity of demand for his product. If he is to maximize his profits, each producer should choose to sell that quantity of a commodity which equates the marginal revenue from it to its marginal cost of production.

doubt, in fact, many entrepreneurs are the victims of convention and fallacious rules of thumb in the treatment of overhead cost and in the adaptation of their price quotations to what the market will bear. It may be also that the psychological conditions in boom and slump produce a systematic deviation from the procedure which would yield an optimum result in the short-period situation. Pessimism is said to prevail in the slump. It is not quite clear which of two contradictory policies pessimism should lead entrepreneurs to adopt, namely, producing a smaller quantity than they could advantageously market or quoting a lower price than they could advantageously ask. Psychological theorists usually assume that the former of these errors is made, but I do not recollect any cogent justification of that assumption. It implies no denial of the possibility of important systematic deviations of this kind, if we ask how the magnitudes of output, price, cost, and profit may be expected to be related in the absence of such deviations.

In accordance with the theory of imperfect competition, if an entrepreneur, having been in equilibrium, is confronted with a rise in his marginal revenue or a fall in his marginal cost, he must increase output in order to reach a new equilibrium. If he is confronted with a fall in his marginal revenue or a rise in his marginal cost, he must restrict output. These propositions, while generally true, would have to be interpreted in a somewhat Pickwickian way to cover the case of a particular class of producers, namely, those whose own efforts constitute a considerable part of their cost of production. If a farmer, working largely on his own, finds that the price of his output rises (or falls), his income, if he continues to produce at the same rate, will rise (or fall), too; and this, by altering the marginal utility of his income per unit of purchasing power, will alter the terms at which he is willing to do any given amount of work. Thus the change in demand simultaneously alters that part of his cost of production which is constituted by the disutility of his own work; and the possibility of making a sharp distinction between changes of revenue and changes of cost disappears. It may well happen that a fall in the price of his product will so raise the utility of his income that the

utility of the diminished amount of income which he can get per unit of his work rises; in this case, his increased willingness to work will cause him to work more than before, so that the consequence of a fall in his marginal revenue is that his output rises. This phenomenon is observed to occur in agricultural communities. Owing to the complexities of the relations between revenue and cost involved in this class of cases, it will not be considered in the limited piece of analysis here undertaken. Here it will be assumed that the level of output is governed by entrepreneurs whose sole task it is to coordinate the other factors and the disutility of whose own work is not itself a function of the level of output.

ASSUMPTIONS

In order to focus attention on the operation of certain factors, it will be well to consider not the real world with its actual fluctuations, but a system supposed to fluctuate in a particular manner. Suppose in any community an equiproportional increase (or decrease) to occur in the production of various commodities: it may be expected in general that their relative prices will change. Now there must be some set of amounts of increase in the output of various commodities, which, when taken in conjunction with a given amount of increase in the production of one commodity, leaves relative prices unchanged. The ratios among the various magnitudes in this set depend on the elasticities of demand considered as functions of the prices of commodities and the level of total income. I propose to call an increase (or decrease) of the output of various commodities such that their *relative* prices remain unchanged, a uniform increase (or decrease). I propose to consider a system which fluctuates in such a way that changes in the level of output are uniform in this sense.

Such a system, though unlike the real world, resembles it sufficiently to be worth examining. Real fluctuations may be regarded as uniform movements with deviations superimposed. Mark a point in an n -dimensional manifold, of which each of the ordinates represents the quantity of output of each of n commodities at a given point of time in a given real system. Through this point, draw a graph the ordinates of which represent for every amount of a given commodity the amount of each commodity which would have to be produced in the real system in order that

the relative prices of all the commodities should remain unchanged. Mark a second point in the manifold to represent the actual output in the real system at a second point of time, and find the point on the graph to which this is nearest. The amount of uniform change of output between the two points of time might be represented by the distance of the second from the first point on the graph. The real movement might be regarded as compounded of that amount of uniform movement and a deviation from it. If the fluctuations of any real system were examined from this point of view, there is little doubt that they would be found, so far as the uniform factor was concerned, to consist of alternating increases and decreases in the alternating phases of the trade cycle.

In a real fluctuation, some prices are higher and others lower than they would be if there were no deviations from uniformity. The general level of prices is neither higher nor lower. Consequently, if we find in the real world that generally a higher level of prices is associated with higher output and a lower level of prices with lower output, we may surmise that a higher level of prices is associated with a higher level of output on the uniform scale, and conversely.

COST MOVEMENTS IN RELATION TO PRICE MOVEMENTS

In considering costs, it is desirable to draw a distinction between reward costs and work costs. Reward costs constitute the rates of pay accruing to factors per unit as measured by existing practice. Work costs constitute the number of such units required per unit of output. Changes in reward costs are observable phenomena; we assume that the generalization may be accepted that the fluctuation of reward costs (measured in money) is smaller than the fluctuation in prices.

If this is so, it follows that the fulfillment of the marginal condition (marginal revenue = marginal cost) requires that, within the ambit of the cycle, work costs rise and fall with rises and falls in output and/or the ratio of marginal revenues to prices falls and rises with rises and falls in output.

There is no *prima facie* difficulty in supposing that marginal work costs do in fact rise with rising, and fall with falling, output. But one must beware of exaggerating the importance of

this. Prime work costs are said to rise in the short period on the principle that increasing quantities of prime factors applied to a given quantity of fixed equipment must yield diminishing returns. But the period to which that dictum relates is too short for trade cycle analysis. It is well known that within the course of the boom, plant is rapidly extended, sometimes even beyond the limit of requirements at the peak. Moreover, fixed technical equipment, unlike the land, does not generally show diminishing returns, at a very early point, from the application of labor to it. On the contrary, it is quite unusual for marginal prime costs to rise until the point of normal capacity is reached. Similarly in the slump, while there may be some fall in marginal work cost if the plant has been used above its normal capacity (with overtime, etc.) at the peak, no further reduction of marginal work cost is to be expected as the employment of the plant falls from 100 to 50 per cent of capacity or lower. It hardly seems possible to account for a considerable slump of prices in this way.

Of greater importance is the human factor. Returns, considered in the last paragraph, were conceived as accruing to increments of homogeneous labor. When trade is active, labor of progressively inferior quality may be taken on. Furthermore, when money-making is easy and attention is devoted to expansion rather than the perfection of existing methods, the management may become careless and marginal prime costs creep up through lack of proper coördination.

Movements in work costs may thus go some way towards explaining the fact that price fluctuations have greater amplitude than reward cost fluctuations. To hold that they go the whole way would be to hold that marginal costs, taken to include both ingredients, fluctuate as much as prices. Yet testimony seems opposed to this; especially may we become sceptical when we consider the great price falls that often occur at the outset of a slump.

MARGINAL REVENUE MOVEMENTS IN RELATION TO PRICE MOVEMENTS

It remains to consider possible variations in marginal revenue. As output moves up or down uniformly, so that *relative* prices are unchanged, relative marginal revenues may nevertheless change, since the relative elasticities of demand for various commodities may alter as income

grows or falls. It might be suggested that since marginal revenue is the significant magnitude on the demand side in determining output, uniform movement should be redefined as one which leaves relative marginal revenues unchanged. This plan would be inconvenient since the normal behavior of marginal revenues is not known statistically and could not be determined without great difficulty.

It is important to observe that as output increases uniformly, not only may the marginal revenues accruing to particular entrepreneurs not move in proportion to the prices of their goods, but also the movement of the average of all marginal revenues may not be proportional to the movement of the average of all the prices of the goods which yield them. It is possible for the ratio of the average of marginal revenues to the average of prices to rise or fall. It will rise if the average of elasticities of demand becomes greater and fall if it becomes less.

Imperfection of competition is due to habit, inertia, and lack of knowledge. Imperfection is greater, the less the elasticity of demand for the product of a particular entrepreneur. There is some reason to suppose that as income rises, the elasticity of demand becomes less. Quest for the cheapest market is a discommodity and one which the richer man can afford not to incur. The pressure of poverty is necessary to drive people to the trouble of avoiding waste; why should the rich man incur it, if almost all of his needs are satisfied? There may be two commodities of equal serviceability to the purchaser priced at eighty dollars and a hundred dollars. Consider one rich and one poor purchaser in the habit of buying the hundred-dollar article. The trouble of discovering the existence of the eighty-dollar article may be the same for the richer as for the poorer man; but the utility of twenty dollars is less for the richer man; consequently there is less probability that it will outbalance the disutility of readjustment. What is true of the ultimate consumer is also true of the business firm. An enterprise making good money cannot afford to concern itself with trifles. Imaginative planning is for the time being more remunerative than attention to rigid economy.

If the principle be correct that in good times demand is apt to get less elastic and competition more imperfect, the phenomenon of the amplitude of price fluctuation exceeding that of cost

fluctuation is readily explained. Marginal cost tends to be equated to marginal revenue. If the ratio of price to marginal revenue rises owing to decreasing elasticity, the excess in the rise of price over that of cost in the boom is accounted for in accordance with the general theory of value.

The view that the elasticity of demand may be an important factor in the determination of the movement of the price level in boom and slump, is supported by the phenomenon of the catastrophic price fall in the early stage of the slump. A psychological principle must be called in aid here, but it is one that may be accepted without difficulty. With an expanding income, a man may slip by imperceptible stages into careless habits. A contraction recalls him to his senses. He is loath to relinquish enjoyments to which he has become accustomed and immediately begins to cast about for means of meeting adversity with the least inconvenience to himself. That same force of habit, which in times of improvement tends to make him an imperfect buyer, reinforces his activity when it is a question of economizing. He seeks to economize with the smallest possible loss of substantial utility. An enjoyment which has become a habit has established the power of possession, and to retain it a man will make efforts which he would never have made to secure it before it had become wanted. The same force acts upon business establishments. The management will take greater pains to avoid a given reduction of dividends than to secure an increase of like amount when dividends are rising in any case. The prospect of bankruptcy may be still more stimulating. There is no reason to suppose that the professions, so often made by the management in the depression, that they are exerting special efforts to secure economy, are mere eye-wash. Economy is always profitable. But there are good psychological reasons why its benefits should be more vividly appreciated when depression sets in. If the argument of this paragraph is correct, it helps to account for the fact that the curve of falling prices in the depression is steeper than that of rising prices in the immediately preceding period. Once the slump has set in, demand becomes suddenly much more elastic; this, *ceteris paribus*, reduces prices if marginal revenue is to be equated to marginal cost, as we assume it will be under conditions of imperfect competition.

FLUCTUATION OF PROFITS

We may next turn our attention to the amplitude of profit fluctuation. Profit for this purpose may be defined as the excess of price over average prime cost per unit multiplied by the number of units produced and sold. A firm's total profit will thus rise if its turnover is increased, the excess of price over average prime cost remaining the same. This by itself may not account for an increase of profit as a percentage of the capital in a boom, if plant is increased. But it accounts for the fall of profit on capital in the slump and for the rise of profit on capital in the early stages of recovery when excess capacity is taken back into use.

If the amplitude of profit fluctuation is greater than the amplitude of fluctuation in the total income of the community, the ratio of price to average prime cost must rise in the boom and fall in the slump. But the ratio of marginal revenue to marginal cost is assumed to be constant. Therefore the ratio of average prime cost to marginal prime cost must fall in the boom and rise in the slump sufficiently to account for the profit fluctuation and/or the ratio of marginal revenue to price must fall in the boom and rise in the slump. The relation of marginal prime to average prime cost is considered first.

Marginal prime cost is that which could be avoided by not producing the marginal output. Total prime cost is that which could be avoided by not continuing production. Profit is equal to the excess of receipts over total prime costs. A large part of prime costs, so defined, would be reckoned by accountants as overhead. And a large part of this overhead is invariable in response to changes in the amount of output per unit of time. A minimum cadre of clerical staff, cleaning staff, stokers, porters, foremen, etc., is indispensable if production is to proceed at all. For short-period variations in output, the invariable minimum causes the average prime cost to be lower and therefore profit to be higher per unit for higher levels of output than for lower.

Part of this type of prime cost is dependent on the size of the plant. Thus if plant extension is necessary in a boom, the prime cost due to this element may not fall substantially. But the opposite is the case when depression comes. Reconstructions and extensions once made cannot be undone; the process is irreversible; hence, when the slump comes, that part of prime cost

which is due to this element will rise, and profit will fall accordingly, even though it had not risen on this account in the later stages of the boom.

The effect of changes in the marginal prime cost on the average prime cost must be considered. If a plant is working below capacity, marginal prime cost may as a rule be expected to be below the average prime. Any rise in the marginal prime cost in these circumstances tends to reduce the gap between the average prime and the marginal prime, and lowers the ratio of the average prime to the marginal prime cost.

In perfect competition, the optimum rate (which is also the long-period equilibrium rate) of working fixed equipment is considered to be one in which the price (equal to marginal cost) exceeds the average prime cost by an amount sufficient to give a normal profit on that equipment. It is possible that this theory of the optimum rate implies greater plasticity in productive methods than is conformable with real conditions in many cases. It may happen that before marginal costs have risen seriously, further production from the plant becomes impossible; in these circumstances, the price (equal to marginal revenue) may stand above the marginal cost of production not merely by enough to yield a normal profit, but by more than enough, if the high prices are judged to be so temporary as not to justify an expansion of plant. In this case, the large price drop and the still larger drop in profits in the slump are readily accounted for.

In the more usual case of imperfect competition, additional plant may be expected to come into existence before the marginal cost rises above average prime cost and, accordingly, the analysis, presented two paragraphs above, applies. It applies also if marginal cost is somewhat above average prime cost. More distant ranges need not be considered.

Various reasons have been adduced from the relation of marginal to average prime cost for supposing that profit fluctuation may be expected to be greater than price fluctuation. These are: (1) the greater spreading of the "overhead" elements in average prime cost in the early stages of recovery and the greater concentration of them upon a small volume of output in the slump; (2) the fall in the ratio of the average prime cost to the marginal prime cost, which would be due to a rise in the latter within the

ranges of output that need to be considered, and conversely in a recession; and (3) in conditions of perfect or nearly perfect competition, the increasing excess of marginal revenue over marginal cost, within certain limits, in a boom, and the relapse in a slump.

It may be doubted if all these reasons, taken together, are sufficient to explain the great amplitude of profit fluctuation. Apart from (1), there is nothing to account for the asymmetry between the curve of rising profits in the later stage of the boom and the more abruptly declining curve in the early stage of the slump; and (1) does not seem enough to explain this phenomenon adequately. And apart from industries subject to perfect or nearly perfect competition, there is nothing to account for the precipitous decline in the slump; yet this great decline in profit per unit is by no means confined to highly competitive industry.

The matter may be readily explained if it is supposed that there is a sharp decrease in the imperfection of competition in the slump, entailing a large drop of the price level towards the average of marginal revenues. Suppose the average elasticity of demand confronting all entrepreneurs to be initially 4, which would entail an average gross profit on prime expenses (assuming marginal prime = average prime cost) of $33\frac{3}{4}$ per cent. Suppose this average elasticity to rise in a recession to 5. This would entail a fall in prices of $6\frac{1}{4}$ per cent and in profit of 25 per cent. This is the kind of relative change which does occur.

CONCLUSION

The scope of the foregoing is strictly limited. It takes no account of a large class of producers (page 84, above). It is not concerned with the causation of the cycle. It makes the assumption that the entrepreneur tends to equate marginal revenue to marginal cost within a period shorter than the duration of the cycle itself.

Its claim for consideration rests on its attempt to rescue the theory of output in the cycle from excessive dependence on the hypothesis of time lags. It gives certain broad reasons for supposing that the entrepreneur's variations of output within the cycle may be represented not as mal-adjustments, but as conformable to the postulates of the general theory of value.

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