A Study on the Tramp Freight Rate under Monopolistic Competition

by

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〈要　約〉

어떠한 産業에 참여하는 企業의 數가 多數이며, 異質의 財貨 또는 서어비스를 生産하고 參入이 自由로운 상태에서 그 企業이 생산하는 商品의 差別化로써 어느 정도 價格에 獨占力을 行事할 수 있는 경우가 獨占的競爭이다.

海運에 있어서 不定期船市場의 경우는 多數의 不定期船業者가 比較的 參入이 自由스런 상태에서 치열한 집하경쟁을 하고 있지만, 그들이 생산하는 서어비스는 船質이나 영업기반 등의 點에서 반드시 同一한 것은 아니며, 市場形態는 하나의 獨占競爭狀態로 볼 수도 있다. 따라서 本稿에서 筆者는 不定期船市場을 獨占的競爭市場으로 看做하여, 短期 및 長期에 있어서 運賃의 均衡狀態를 分析하였다.

要컨대, 個別企業의 限界收入曲線이 限界費用曲線과 均等해지도록 産出量을 調節하며, 産業의 수요곡선과 한 企業의 個別需要曲線이 交叉하는 點에서 短期均衡의 運賃水準이 이루어지고, 또 한편으로 長期均衡은, 한 企業의 個別需要曲線이 平均總費用曲線과 接하며, 産業의 需要曲線이 接點에 있어서 한 企業의 個別需要曲線 및 費用曲線과 接하는 경우 達成된다.

I. Monopolistic Competition Defined

In the late 1920s and early 1930s economists began turning their attention to the middle ground between monopoly and perfect competition, which is pure in that the analytical results are completely independent of personal influences, especially entrepeneurial expectations and speculation concerning the behavior of rivals, and is extreme from the standpoint of numbers and profit.[1] In perfect competition the number of the firms in an industry is indefinitely large, while monopoly is a one-firm industry. Similarly, zero economic profit per firm is the central charactritic of long-run equilirium in perfect competition. In contrast, monopolization of a market guarantees the single firm a greater long-run pure profit than it could earn under any other organization of the market (that is, than if there were one or more rival firms in the market.[2]

1) Although economists have been aware of the model of monopolistic competition since the late 1920s, the model has not played a very central role in economic analysis. In part, this is because many situations that economists wish to analyze are explained quite well by the models of perfect competition or pure monopoly. Those situations that do not seem to fit these models well often fall into the broad class of oligopoly models(small numbers of sellers).

2) C.E. Ferguson/J.P. Gould, *Microecomic Theory*(4th ed.; Homewood, Illinois: Richard D. Irwin, Inc., 1975), p.312.

Those two of the most notable achievements were attributable to an English economist, Joan Robinson,[3] and to an American, Edward H. Chamberlin.[4] Of the above two, Chamberlin based his theory of monopolistic competition on a soild, empirical fact: there are very few monopolists because there are very few commodities for which close subsitutes do not exist; similarly, there are very few commodities that are entirely homogeneous among producers. Instead, thre is a wide range of commodities, some of which have reiatively few good substitutes and some of which have many good, but not perfect, substitutes.[5]

Thus, when the number of sellers is large enough so that the actions of any one have no perceptible effect upon other sellers, and their actions have no perceptible effect upon him, the industry becomes one of monopolistic competition. Under this monopolistic competition, product differentiation[6] leads some consumers to prefer the products of particular sellers over those of others.[7] Consequently, the demand curve facing the firm is negatively sloped and enables the firm to exercise a small degree of control over their product price. Ordinarily the demand curve faced by the firm will be very elastic within its relevant range of prices because of the numerous good substitutes available for the product.

In summary, the monopolistic competition contains elements of both monopoly and perfect competition. It is akin to perfect competition in that the number of sellers is sufficiently large so that the actions of an individual seller have no perceptible influence upon his competitors. It is akin to monopoly and differentiated oligopoly in that each seller possesses a negatively sloped demand curve for his distinct product.

Ⅱ. Characteristics of Monopolistic Competition

1. Ideal Output and Excess Capacity

The concept of ideal output and the associated concept of excess capacity refer only to the long run. In the short run, under any type of market organization, there can be all sorts of departures the ideal, reflecting incomplete adjustment to existing market conditions.[8] Before Castles,[9] the ideal out of a firm was generally regarded as that output assiciated with minimum long-run average cost, the output corresponding to the points labeled Ec in Figure 1, Conseqently, the ideal plant size is the one giving rise to the short-run average cost curve that is tangent to the long-run average cost curve at the latter's mininum point. Excess

3) Joan Robinson, *The Economics of Imperfect Competition* (London: Macmillan & Co., Ltd., 1954).
4) E.H. Chamberlin, *The Theory of Monopolistic Competition*(7th ed.; Cambridge, Mass.: Harvard University Press, 1956).
5) C.E. Ferguson/J.P. Gould, *Ibid.*, pp. 313-4.
6) According to Chamberlin, this differentiation may be based upon certain characteristics of the product itself, such as exclusive patented features; trade-marks; trade names; peculiarities of the package or container, if any; or singularity in quality, design, color, or style. Chamberlin, *Ibid.*, p. 56.
7) Richard H. Leftwich, *The Price System and Resource Allocation* (5th ed.; Hinsdale, Ill.: The Dryden Press, 1973). p. 289.
8) C.E. Fergusan/J.P. Gould, *Ibid.*, p. 321.
9) J.M. Cassels, "Excess Capacity and Monopolistic Competition," *Quarterly Journal of Economics*, vol. 51(1936-37), pp. 426-43.

capacity, therefore, is the difference between ideal output and the output actually attained in long-run equilibrium. [10]

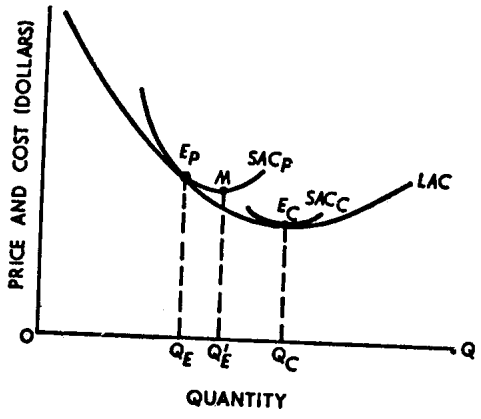

Figure 1. Ideal Output and Excess

However, following Cassels, excess capacity is composed of two parts, as illustrated in Figure 1. Suppose in a monopolistically competitive market, a typical firm attains long-run equilibrium at the point Ep, with the output OQ_E. From the standpoint of the firm, long-run optimal plant size is given by $SACp$. According to the present view of ideal output, the socially optimal plant size is represented by SAC_C and excess capacity is measured as Q_EQ_C units of output.

The measure of excess capacity may be divided in two parts. First, given the plant SAC_P, the firm operates at point Ep rather than at the point of minimum unit cost M. From a social point of view, the resources used by the firm would be more efficiently utilized if OQ_E', rather than OQ_E, units were produced. Thus, a portion of excess capacity, represented by Q_EQ_E', is attributable to socially inefficient utilization of the resources actually used. The second portion of excess capacity, Q_EQ_E, arises because socially and individually optimal sizes differ. The monopolistically competitive firm does not employ enough of society's resources to attain minimum unit cost. [11]

2. Nonprice Competition and Excess Capacity

According to Chamberlin, long-run equilibrium under monopolistic competition does not give rise to excess capacity so long as the market is characterized by active price competition. In his view, excess capacity arises when free entry is coupled with the absence of price competition. [12] This brand of excess capacity is illustrated by Figure 2.

If there is free entry and price competition, long-run equilibrium is attained at Ep, where the percieved demand curve $dpdp'$ is tangent to LAC, the long-run average cost. As noted, Ep must lie to the left of the competitive equilibrium Ec; but with active price competition it

10) C. E. Ferguson/J. P. Gould, *op., cit.* pp. 321-2.
11) *Loc. cit.*
12) *Ibid.*, p. 323.

will tend to lie rather close to the competitive point.

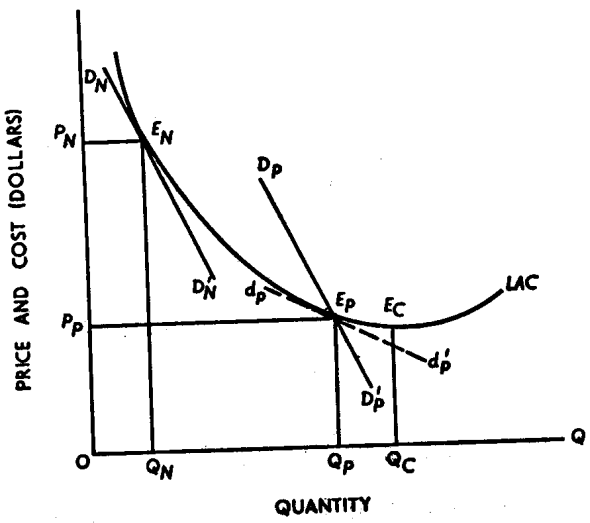

Figure 2. Long-Run Equilibrium with Nonprice Competition and Excess Capacity

With free entry in the absence of price competition, long-run equilibrium is attained only when enough firms have entered the industry to push the demand curve to D_ND_N'. Equilibrium is attained at E_N, with output OQ_N and price OP_N per unit. In Chamberlin's opinion, Q_NQ_P represents excess capacity: it is the difference in output attributable to the absence of effective price competition.

Ⅱ. Tramp Shipping Market as a Monopolistically Competitive One

The market for the voyage chartering of tramp shipping is near to being a perfectly competitive market on an international scale and its freight rates are therefore subject to the law of supply and demand; but for some purposes it is necessary to think of it as a number of separate markets according to the commodities, areas or types of ships, although because of the versatility and ubiquitousness of the average tramp, given sufficient time, there is considerable overlapping between these markets.[14,15]

In general, however, tramp shipping has been regarded as an industry that has a market

13) In this regard, Chamberlin concludes that by nonaggresive price policies sellers protect, over short periods, their profits, but over longer periods, their numbers, since prices do not fall costs rise, the two being equated by the development of excess productive capacity…for which there is automatic corrective…It may develop over longer periods with impunity, prices always covering costs, and may…become permanent and normal through a failure of price competition to fuction. The result is high prices and waste…attributable to the monopoly element in monopolistic competition. Cahmberlin, *ibid.*, pp. 107, 109.

14) Carleen O'loughlin, *The Economics of Sea Transport* (London: Pergamon Press Ltd., 1967), p. 136.

15) For details, see my article, "A Study on the Determination of Tramp Freight Rates", *Journal of the Korean Institute of Navigation*, vol. 4(1980), pp. 56-61.

which functions under conditions that are not dissimilar to the theoretical model of perfect competition.[16] Nevertheless, we find imperfections to be noted in the functioning of the tramp freight market.[17]

We cannot accept that the services which shipping firms produce are absolutely identical.[18] And, as we understand it, a tramp shipping firm can be operated with only a ship only if there exists an excess capacity in the tramp shipping market, which means that free entry is expected in the market. This contitutes a specific form of competition called "monopolistic competition". Accordingly, in this article, the tramp shipping market is regarded as a monopolistically competitive one and equilibria in the short-run and in the long-run are to be analysed.

Ⅳ. The Tramp Freight Rates under Monopolistic Competitions

1. Concept of Equilibrium

In order to understand price fluctuations and the mechanics of price formation in the market it is essential to apply the concept of equilibrium.

The world tramp shipping industry could be in stable long-run equilibrum if freight rates the world over were offering no inducement to entrepreneurs either to and new units to their fleets or to withdraw the existing ones from the market without replacement. In this state freight rates would be such that there would be no advantage for entrepreneurs outside it to enter the market by creating new firms nor for shipping firms to leave the industry. The availability and requirements for tramp shipping services required would be equal. Average freights rates for the various tramp shipping services required would be equal to the average costs incurred for producing these services. Each one of the existing tramp shipping firms

16) Professor Metaxas says in his *The Economics of Tramp Shipping*, "There are hundred of firms owning tramp ships which are capable of producing identical services····· Moreover, there are no artificial impediments to entry, and new entrants can produce services identical to those of established firms. The increments to the industry's output resulting from the entry of one additional firm is so small as to have no perceptible effect on freight rates. Thus, the potential entrant is not deterred by fear of changing the existing situation so far as price levels are concerned. Nor are there any artifical obstacbles to free exit from the market for the tramp shipping firms. Needless to say that the exit of a firm from the freight market does not necessarily mean a corresponding decrease in the supply of tonnage, since a firm leaving the market may decide to sell its tonnage to another firm and the new owners may continue operating this tonnage until the end of its economic life. Adverstisement for the services offered by the tramp shipping firm is not necessary and information regarding freight rates and other business matters is freely obtainable····· Thus it may be said that, on the whole, the tramp shipping firm participates in a world-wide market functioning under conditions closely reflecting the theoretical model of perfect competition. B. N. Metaxas, *The Economics of Tramp Shipping* (London: The Athlone Press of the University of London, 1971), pp. 19–20.

17) *Loc. cit.*

18) The services which tramp shipping firms produce may vary with the types of ships, the speeds, dates built, etc. This product differentiation leads some shippers to prefer the services of particular shipping firms over those of others and enables tramp shipping firms to exercise a small degree of control over their freight rates.

would fix its vessels or vessels at such rates that the revenue obtained from each additional voyage would be just enough to over the cost for producing this additional service-including normal profit. In order words, marginal cost, i. e. the cost per additional voyage, would be equal to marginal revenue.[19]

Needless to say, such a long-run permanent state of equilibrium has never been attained nor is it likely to be. There have been only brief periods of time when the availability and requirements for tramp shipping tonnage have tended to match.[20]

The absence of stable equilibrium should not be taken to indicate that the functioning of the tramp freight market mechanism is not characterized by the inevitable tendency towards long-run equilibrium, a tendency of the industry to adjust itself to demand requirements. When profitability prospects are high the industry expands. When expectations for profitable trading are poor the rate of expansion gradually diminishes and when prospects for future trading do not seem to be either good or bad the magnitude of the fleet is maintained more or less on the same level. Thus, irrespective of the influence of exogenous factors it may be said that there exists a long-run tendency towards equilibrium position.[21]

2. The Equilibrium in the Short-Run

It is an easy step from the discussion of perfect competition to Chamberlin's model of monopolistic competition. The proportional demand curve D has the same meaning as in perfect competition and it is also assumed that all firms have identical costs.[22] The key difference is that each firm perceives its own demand curve(i.e., the one that would obtain if it changed its price while all other firms left their price unchanged) to be less than perfectly elastic because its output is not a perfect substitute for the output of other firms. This is illustrated in Figure 3 where the demand curve perceived by the representative firm, d, is downward sloping instead of horizontal as in perfect competition. If every firm charged p, each would sell q_1, units of output. The typical firm, acting on the assumption that the other firms will keep the rate at p, finds it profitable to reduce the rate to p' and sell an output of q_2. Here, we note that p' and q_2 are on the perceived demand cure d. The important difference between this case and that in perfect competition is that the downward slope of d means that the firm perceives that it must reduce the rate to get more customers. Accordingly, the curve mr, which is the marginal revenue curve for d, will be equated with the marginal cost curve MC to find the profit maximizing output and rate p' and q_2, respectively. This is the "monopolistic" aspect of monopolistic competition.

19) B.N. Metaxas, *ibid.*, p. 191.
20) *Ibid.*, p. 193.
21) *Loc. cit.*
22) Chamberlin clearly intended this definition of D at least expositional purposes. In his words, "Such a curve will, in fact, be a fractional part of the demand curve for the general class of product, and will be of the same elasticity. If there were 100 sellers, it would show a demand at each price which will be exactly 1/100 of the total demand at that price(since we have assumed all markets to be of equal size)" Chamberlin, *ibid.*, p. 90.

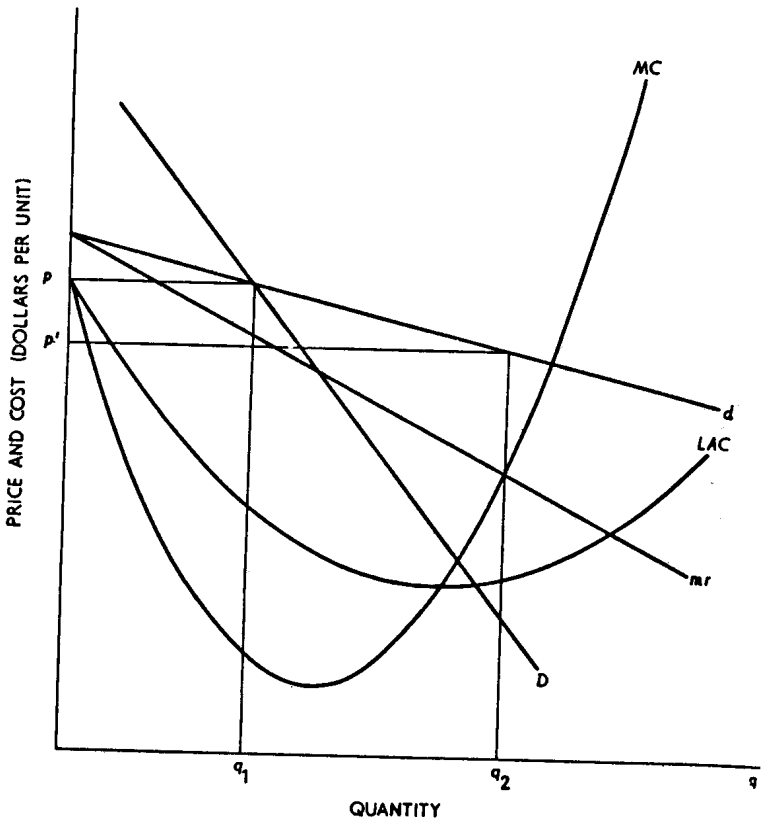

Figure 3. The Firm in Monopolistic Competition

Just as in perfect competition, the assumption that all firms are identical means that what looks good to one looks good to all. When every firm cuts its rate, a new d curve is established for every firm. The new d curve intersects D at a lower rate than the former d curve, and firm's attempt to get to output q_2 is frustrated. Such rate cutting will continue so long as each firm finds it advantageous to expand output by reducing it rate below the current market rate.

In strict analogy to perfect competition the short-run equilibrium must have the characteristic that at the current market rate no firm has an incentive to change its own rate.[23] This means that in equilibrium the mr curve of each firm must equal marginal cost at an outoput such that the market rate at that output is on D. This is illustrated in Figure 4. When firms equate mr with MC, the output q_e is exactly that required for a market rate of p_e as indicated by the intersction of d and D at p_e. In summary, short-run equilibrium in monopolistic competition has two characteristics: (a) each firm picks output to equate mr and MC and (b) d intersects D at the output chosen by the firm.[23]

3. The Equilibrium in the Long-Run

The equilibrium in Figure 4 shows that each firm is making positive economic profits

23) C.E. Ferguson/J.P. Gould, *ibid.*, pp. 317-20.

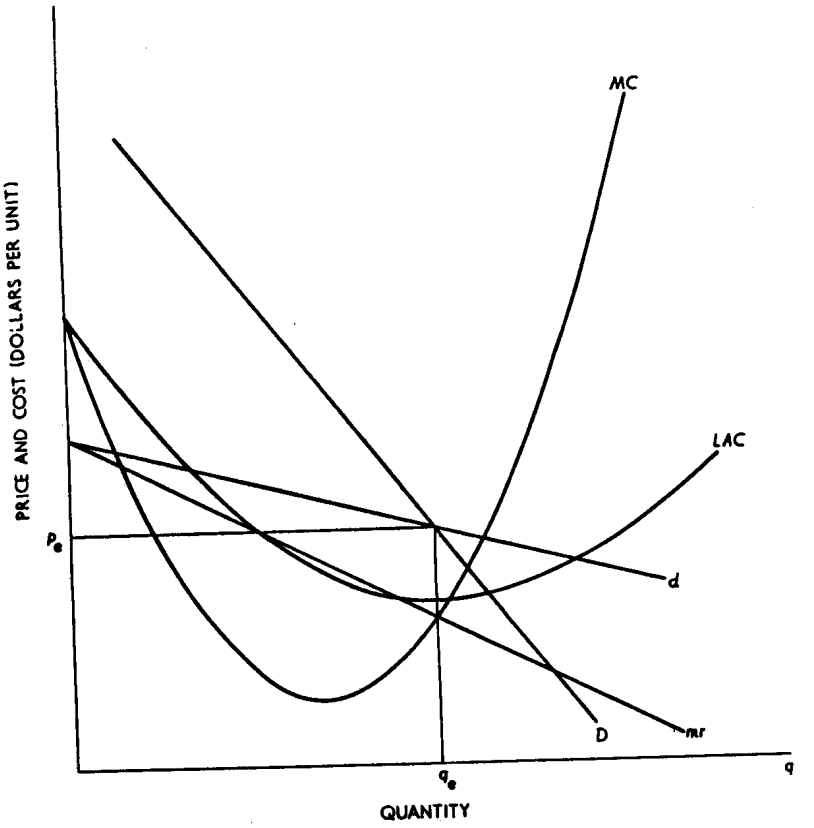

Figure 4. Short-Run Equilibrium in Monopolistic Competition

because rate is above average cost at output q_e. Monopolistic competition assumes that entry of new firms to the product group is uninhibited. As firms enter, the proportional demand curve D will move to the left until economic profits are driven to zero. A typical long-run equilibrium(zero economic profit) is shown in Figure 5. This equlibrium has the short-run characteristic that no firm has an incentive to alter its rate or output since $mr = MC$ at q_e. Moreover, at the market rate p_e, the proportional demand curve D intersects the average cost curve so no economic profits are being made and no firm has a motivation to enter or leave the product group.

Long-run equilibrium is defined by two condions: (a) d must be tangent to the average total cost curve and (b) the proportional damand curve D must intersect bothe d and average cost at the point of tangency. The conditions are the same as short-run equilibrium with the additional requirement that d be tangent to ATC at the equilibrium output.[24]

24) *Ibid.*, pp. 320-21.

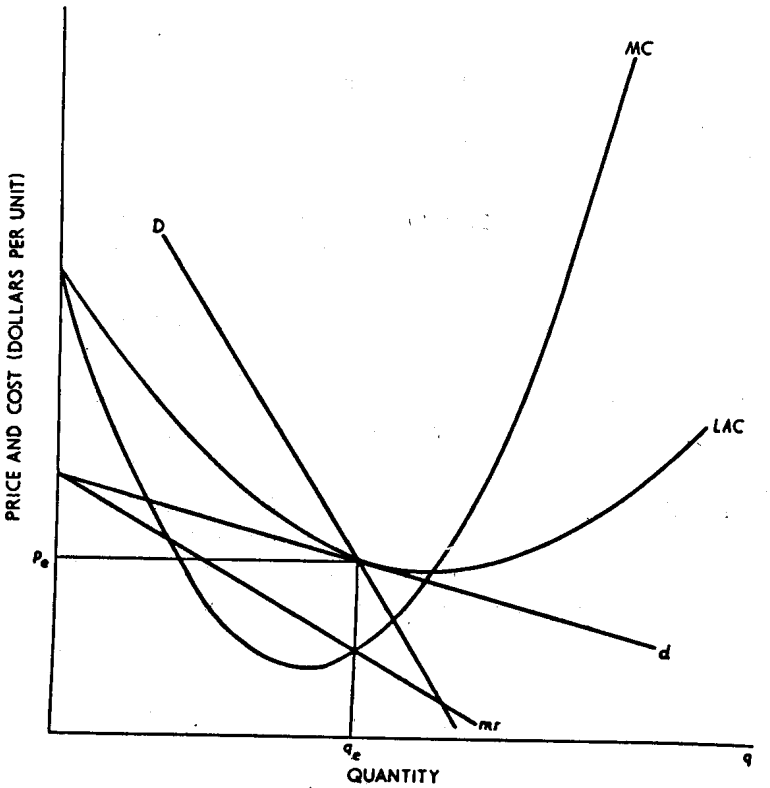

Figure 5. Long-Run Equilibrium in Monopolistic Competition.

V. Concluding Remarks

The market under monopolistic competition combines the following characteristics: (a) competition among now treated as individual firms; (b) free entry; and (c) heterogeneous products among firms. The first two characteristics represent the competitive aspects of monopolistic competition and the monopolistic aspect is represented by the third element, the uniqueness of the firm's product offered to the market.[25]

The tramp shipping market can be regarded as the one under monopolistic competition in that it produces heterogeous services which enables the firms to excercise a small degree of control over their freight rates and that each firm can enter freely in the market.

Under this condition, the short-run equilibrium has charateristics: (a) each shipping firm picks output to equate *mr* and *MC* and (b) the demand curve perceived by the representative firm, *d*, intersects the proportional demand curve, *D*, at the output chosen by the firm. In the meanwhile, long-run equilibrium is defined by the two conditions: (a) *d* must be tangent to the average total cost curve and (b) the proportional demand curve *D* must intersect both *d* and average cost at the point of tangency.

25) Jack Hirshleifer, *Price Theory and Applications* (Englowood Cliffs, N. J. : Prentice-Hall, Inc., 1976), p. 307.

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