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The Welfare Economics of Competition and Monopoly

Competition has long been viewed as a force that leads to an ideal solution of the economic performance problem, and monopoly has been condemned through much of recorded history for frustrating attainment of the competitive ideal. To Adam Smith, the vital principle underlying a market economy's successful functioning was the pursuit of individual self-interest, channelled and controlled by competition. As each individual strives to maximize the value of his own capital, said Smith, he

. . . necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. . . . [H]e intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.[1]

Smith's "invisible hand" is the set of market prices emerging in response to competitive forces. When these forces are thwarted by "the great engine of . . . monopoly," the tendency for resources to be allocated "as nearly as possible in the proportion which is most agreeable to the interests of the whole society" is frustrated.[2]

Much of Smith's detailed analysis is obsolete. Yet his arguments on the efficacy of free competition remain intact, a philosophical lodestar to nations relying upon a market system of economic organization. Economists have, to be sure, amended their view of competition since Smith's time, and they have developed more elegant models of how competitive markets do their job of allocating resources and distributing income. One objective of this chapter is to survey these modern views. In addition, we shall examine some of the qualifications and doubts that have led to the partial or complete rejection of Smith's gospel in many parts of the world.

Competition Defined

We must begin by making clear what is meant by *competition* in economic analysis. Two broad conceptions, one emphasizing the conduct of sellers and buyers and the other emphasizing market structure, can be distinguished. Adam Smith's widely scattered comments, dealing with both conduct and structural features, typify the dominant strain of economic thought during the eighteenth and nineteenth centuries.[3] On the conduct side, Smith considered the essence of competition to be an *independent striving* for patronage by the various sellers in a market. The short-run structural prerequisites for competitive conduct were left ambiguous. Smith observed that independent action might emerge with only two sellers, but it was more likely (that is, collusion among the sellers was less likely) with

1. Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York: Modern Library edition, 1937), p. 423.
2. Smith, *Wealth of Nations,* pp. 594–595. See also pp. 61, 147, and 712.
3. For admirable surveys of the development of economic thought on the nature of competition, see George J. Stigler, "Perfect Competition, Historically Contemplated," *Journal of Political Economy,* vol. 65 (February 1957), pp. 1–17; J. M. Clark, *Competition as a Dynamic Process* (Washington: Brookings, 1961), Chapters 2 and 3; Paul J. McNulty, "A Note on the History of Perfect Competition," *Journal of Political Economy,* vol. 75, Part 1 (August 1967), pp. 395–399; and *idem,* "Economic Theory and the Meaning of Competition," *Quarterly Journal of Economics,* vol. 82 (November 1968), pp. 639–656.

turn has served as a model for many other nations. As James Madison wrote (under the pseudonym Publius) in Federalist Paper No. 10, nothing was more important to a well-constructed union than avoiding the imposition on all citizens of measures favored by narrow factions.[9] Factions, continued Madison, arise most frequently from the unequal distribution of property, pitting the wishes of "a landed interest, a manufacturing interest, a mercantile interest, a moneyed interest, with many lesser interests" against the common good. The best way to avoid faction-dominated outcomes, said Madison, was to keep the individual factions so small and diverse that they would be "unable to concert and carry into effect schemes of oppression."

A closely related benefit is the fact that competitive market processes solve the economic problem *impersonally*, and not through the personal control of entrepreneurs and bureaucrats. There is nothing more galling than to have the achievement of some desired objective frustrated by the decisions of an identifiable individual or group. Who, on the other hand, can work up much outrage about a setback administered by the impersonal interplay of competitive market forces?

A third political merit of a competitive market is its freedom of opportunity. When the no-barriers-to-entry condition of perfect competition is satisfied, individuals are free to choose whatever trade or profession they prefer, limited only by their own talent and skill and by their ability to raise the (presumably modest) amount of capital required.

The Efficiency of Competitive Markets

Admitting the salience of these political benefits, our main concern nonetheless will be with the economic case for competitive market processes. Figure 2.1(*b*) reviews the conventional textbook analysis of equilibrium in a competitive industry, and Figure 2.1(*a*) portrays it for a representative firm belonging to that industry. Suppose we begin observing the industry when the short-run industry supply curve is S_1, which embodies the horizontal summation of all member firms' marginal cost curves. The short-run market equilibrium price is OP_1, which is viewed as a parameter or "given" by our representative firm, so the firm's subjectively-perceived demand curve is a horizontal line at the level OP_1. The firm maximizes its profits by expanding output until marginal cost (MC) rises into equality with the price OP_1. It produces OX_1 units of output and earns economic profits — that is, profits above the minimum return required to call forth its capital investment — equal to the per-unit profit GC_1 times the number of units of output OX_1. Because economic profits are positive for the representative firm, this cannot be a long-run equilibrium position. New firms attracted by the profit lure will enter the industry, adding their new marginal cost functions to the industry's supply curve, and existing firms will expand their capacity, so the industry supply curve shifts to the right. Entry and expansion will continue, augmenting output and driving the price down, until price has fallen into equality with average total cost (ATC) for

7. See William J. Baumol, John C. Panzar, and Robert D. Willig, *Contestable Markets and the Theory of Industry Structure* (New York: Harcourt Brace Jovanovich, 1982).

8. *U.S.* v. *Besser Mfg. Co.,* 96 F. Supp. 304 (1951), affirmed 343 U.S. 444 (1952).

9. *The Federalist Papers,* Mentor Book edition (New York: New American Library, 1961), pp. 77–84.

a. Firm

b. Industry
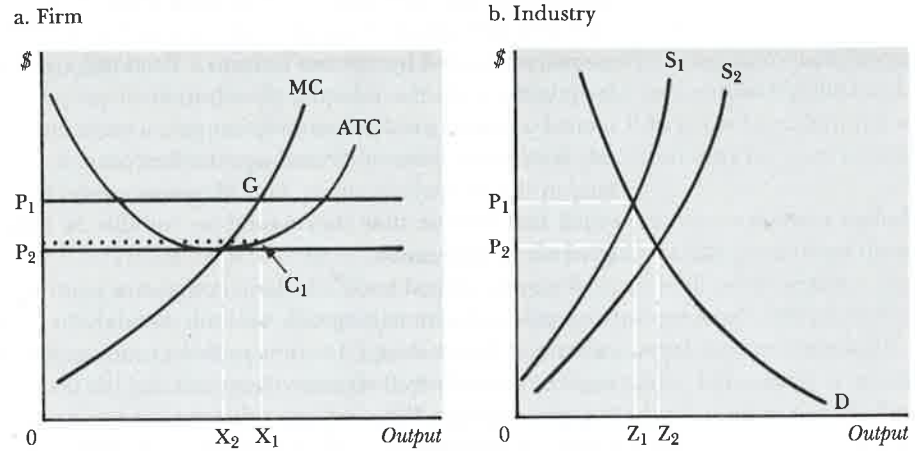
Figure 2.1
Equilibrium under Pure
Competition

the representative firm.[10] In the figures shown, this zero-profit condition emerges with the short-run supply curve S_2, yielding the market price OP_2. The representative firm maximizes its profits by equating marginal cost with new price OP_2, barely covering its unit costs (including the minimum necessary return on its capital) at the output OX_2.

The long-run equilibrium state of a competitive industry has three general properties with important normative implications:

a. The cost of producing the last unit of output — the marginal cost — is equal to the price paid by consumers for that unit. This is a necessary condition for profit maximization, given the competitive firm's perception that price is unaffected by its output decisions. It implies efficiency of resource allocation in a sense to be explained momentarily.

b. With price equal to average total cost for the representative firm, economic (that is, supra-normal) profits are absent. Investors receive a return just sufficient to induce them to maintain their investment at the level required to produce the industry's output efficiently. Avoiding a surplus return to capital is considered desirable in terms of the equity of income distribution.

c. In long-run equilibrium, each firm is producing its output at the minimum point on its average total cost curve. Firms that fail to operate at the lowest unit cost will incur losses and be driven from the industry. Thus, resources are employed at maximum production efficiency under competition.

One further benefit is sometimes attributed to the working of competition, although with less logical compulsion. Because of the pressure of prices on costs, entrepreneurs may have especially strong incentives to seek and adopt cost-saving technological innovations. Indeed, if industry capacity is correctly geared to demand at all times, the *only* way competitive firms can earn positive economic profits is through innovative superiority. We might expect therefore that techno-

logical progress will be more rapid in competitive industries. However, doubts concerning the correctness of this hypothesis will be raised in a moment.

The Inefficiency of Monopoly Pricing

Monopolists and monopolistic competitors differ from purely competitive firms in only one essential respect: They face a downward-sloping demand curve for their output. Given this, the firm with monopoly power knows that to sell an additional unit (or block) of output, it must reduce its price to the customer(s) for that unit; and if it is unable to practice price discrimination (as we shall generally assume, unless otherwise indicated),[11] the firm must also reduce the price to all customers who would have made their purchases even without the price reduction. The net addition to the nondiscriminating monopolist's revenue from selling one more unit of output, or its *marginal revenue*, is equal to the price paid by the marginal customer, minus the change in price required to secure the marginal customer's patronage multiplied by the number of units that would have been sold without the price reduction in question.[12] Except at prices so high as to choke off all demand, the monopolist always sacrifices something to gain the benefits of increased patronage: the higher price it could have extracted had it limited its sales to more eager customers. When demand functions are continuous and smooth, marginal revenue under monopoly is necessarily less than price for finite quantities sold. When the monopolist's demand function can be represented by a straight line, marginal revenue for any desired output is given by the ordinate of a straight line intersecting the demand curve where the latter intersects the vertical axis, and with twice the slope of the demand curve, as illustrated in Figures 2.2(*a*) and 2.2(*b*).[13] We will normally use straight-line demand curves in subsequent illustrations because they make it easier to get the geometry of their associated marginal revenue curves exactly right.

Now the profit-maximizing firm with monopoly power will expand its output only as long as the net addition to revenue from selling an additional unit (the marginal revenue) exceeds the addition to cost from producing that unit (the marginal cost). At the monopolist's profit-maximizing output, marginal revenue equals marginal cost. But with positive output, marginal revenue is less than price, and so the monopolist's price exceeds marginal cost. This equilibrium condition for firms with monopoly power differs from that of the competitive firm. For the competitor, price equals marginal cost; for the monopolist, price exceeds marginal cost. This difference has important implications to which we shall return in a moment.

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10. We assume perfect imputation of all factor scarcity rents here. If the imputation process is imperfect, only the marginal firm — the firm just on the borderline between entering and not entering — will realize zero economic profits.

11. The logic of price discrimination will be explored in Chapter 13.

12. Generally, for the monopolist price is a function $P = f(Q)$ of the quantity Q sold. Total sales revenue $R = PQ$. Marginal revenue is the change in total revenue associated with a unit change in quantity sold, thus, $MR = dR/dQ = P + Q(dP/dQ)$. P in the MR expression is the price paid by marginal consumers; dP/dQ is the change in price necessary to attract them (usually with a negative sign); and Q corresponds approximately to the quantity that would be sold without the price reduction.

13. Proof: Let the demand curve have the equation $P = a - bQ$, where Q is the quantity demanded. Total revenue $R = PQ = aQ - bQ^2$. Marginal revenue $dR/dQ = a - 2bQ$. At $Q = 0$, $P = MR$. The slope $(-2b)$ of the marginal revenue function is twice the slope $(-b)$ of the demand curve.

a. Pure monopolist

b. Monopolistic competitor
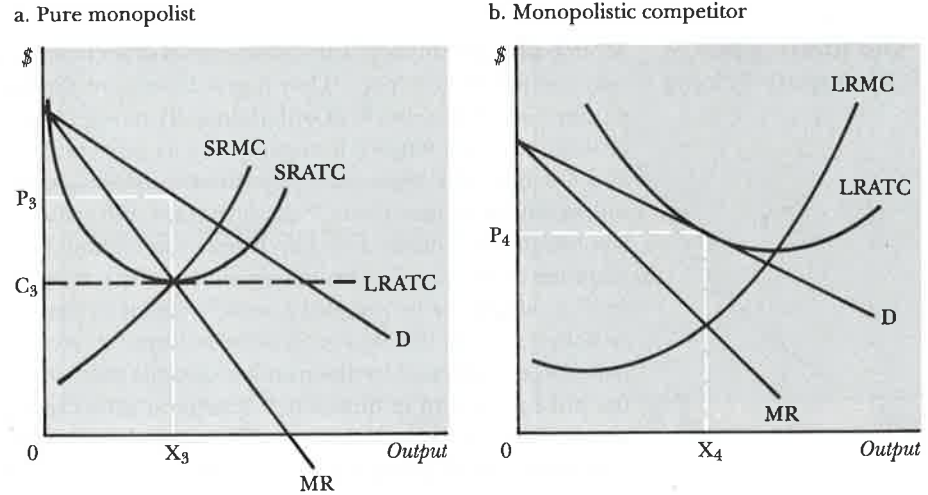
Figure 2.2
Equilibrium under Monopoly

The competitive enterprise earns zero economic profit in long-run equilibrium. Is the firm with monopoly power different? Perhaps, but not necessarily. Figure 2.2(a) illustrates one of the many possible cases in which positive monopoly profits are realized: specifically, the per-unit profit margin P_3C_3 times the number of units OX_3 sold. As long as entry into the monopolist's market is barred, there is no reason why this profitable equilibrium cannot continue indefinitely. Figure 2.2(b), on the other hand, illustrates the standard long-run equilibrium position of a monopolistic competitor.[14] The crucial distinguishing assumptions are that monopolistic competitors are small relative to the market for their general class of differentiated products and that entry into the market is free. Then, if positive economic profits are earned, new firms will squeeze into the industry, shifting the typical firm's demand curve to the left until, in long-run equilibrium, it is tangent to the firm's long-run unit cost function LRATC. The best option left for the firm then is to produce output OX_4, where marginal revenue equals marginal cost (as in any monopolistic situation) and the average revenue or price OP_4 is barely sufficient to cover unit cost. Thus, while firms with monopoly power *may* secure monopoly profits, they need not, especially under the plausible conditions of monopolistic competition.

We found earlier that in long-run equilibrium, the purely and perfectly competitive firm produces at minimum average total cost. Is this true also of the monopoly? Many textbooks imply that it is not, or that it will be true only by accident. Again consider Figure 2.2(a). It assumes that the monopolist operates under constant long-run cost conditions; that is, that plants (or plant complexes) designed to produce at high outputs give rise to roughly the same cost per unit as those designed to produce at low outputs. We shall see in Chapter 4 that many real-world cost functions exhibit this property over substantial output ranges. If so, the firm will invest in a plant complex characterized by the short-run cost function SRATC, with minimum short-run unit costs identical to the minimum long-

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