

THE PROBLEM OF MONOPOLIZATION

Harold Demsetz
University of California, Los Angeles

June, 1982

Working paper #243

THE PROBLEM OF MONOPOLIZATION

by

Harold Demsetz*

Many paths to control over market price are discussed in the literature bounded by price theory and the economic history of industry. Private collusion and government regulation are probably the most important of these paths, but the focus of this paper is the acquisition of the power to set price via the systematic purchase of the assets of the competing firms in an industry. Collusion has received more than its fair share of attention in formal economic writings, while the purchase of competing assets has received very little; indeed, the folklore of the "robber barons" contains much of what has been written on the subject.

Setting aside collusion, the purchase of competing assets is the only possibly important purely private source of control over price that carries with it the economic stigma of inefficiency. Probably more inefficiency stems from government regulation, but this source lies partly in the public domain, and its analysis awaits further developments of the economic theory of political behavior. Pricing power acquired through better products or lower costs, while usually private in origin, conveys a picture that is difficult to mar with the label of inefficiency. Monopoly may also come to a person by luck, and this might very well give rise to inefficiency. Inheriting the total supply of uranium just before its energy potential becomes known, would be an example, but its fancifulness reveals how unimportant this source of monopoly is likely to be.

For these reasons, and because the acquisition of competing assets has been an important consideration in leading antitrust cases (Standard Oil and American Tobacco, for example), the analysis that follows largely ignores these other paths

*Ashok Guha, Ed Leamer, George Stigler, and Earl Thompson offered useful (and diverse) comments on earlier drafts of this paper.

to control over price. Among the conclusions reached by this analysis are those dealing with monopoly price, output, and welfare loss. It will be shown that the standard model of monopoly imparts an upward bias to price and welfare loss, and a downward bias to output. Beyond these conclusions, the analysis adds to our understanding of the underlying conditions of supply and demand that create for an industry a greater propensity to be monopolized. Before deducing these results, let us pause to set some preliminary ground work in place.

II. Underlying Assumptions.

The assumptions adopted here seek to approximate the monopolization process as it is perceived in the folklore of dominant firms -- the acquisition of monopoly through purchase of competitive capacity by a firm possessing no socially productive superiority. Dominance need not be delivered free to the monopolizer, but our folklore implies that the cost of monopolizing is not so high as to dissipate completely the expected profit. The following assumptions would seem to capture the spirit of this folklore.

1. The monopolizer faces no rivals as he proceeds to monopolize an existing competitive industry. This is, of course, unrealistic, but I wish to calculate the return to monopolizing under circumstances that do not reduce expected profit to zero, as would fully effective competition to monopolize.
2. Once acquired, the industry is operated by the monopolizer at the same cost as would have been incurred if the industry had remained competitively organized. That is, there are no special disadvantages of large firm size.

3. The dominance achieved by the monopolizer is not protected by legal blockage of entry. This to retain the purely private character of the process.
4. The supply of specialized factors used in the industry is upward sloping. This creates a potential profit to the monopolizer that is absent under open entry, constant returns to scale conditions. I do not consider scale economies because my interest is in industries that could operate atomistically without cost penalty were it not for the actions of a monopolizer.^{1/}

The cost of acquiring a monopoly through purchase, of course, depends on how much must be paid to obtain control over the specialized resources used in the industry. Two unrealistic extremes may be set out and rejected. Should the owners of existing competitive capacity know for certain that the industry is to be monopolized, they would not sell their specialized resources for anything less than the rent they could earn with price set at a monopoly level. This would immediately render monopolization unprofitable. On the other hand, should the owners of existing capacity feel completely helpless before threats of predatory action by the monopolizer, they would sell their specialized resources for prices no greater than the value placed on them by opportunities outside the industry; in this case there is no special cost to monopolization, as we shall see, and the monopolizer would enjoy a profit from monopolization equal to that indicated by the standard monopoly model. We know there is evidence of a special cost to acquiring control. Stock market take-overs, for example, requires the payment of premiums to shareholders of the acquired firm. U.S. Steel and Standard Oil also paid handsome prices for rival assets. This suggests that somewhere between these extremes

¹However, see my "Why Regulate Utilities," Journal of Law and Economics, (March 1968) pp. 55-65.

is a more reasonable pattern of buy-out prices.

A model that requires the monopolizer to pay more to acquire a given quality of specialized resource as he comes closer to successful monopolization of the industry seems a likely pattern of buy-out prices. This would implicitly tie the price of specialized assets to the expected price of the good produced by the industry, since an increase in the probability of monopoly implies an increase in the expected price of the good. The question then arises as to how to specify the buy-out price as a function of the fraction of the industry's capacity acquired by the monopolizer. In the absence of theoretical groundwork, there appears to be an infinity of functions that would satisfy our requirement. It would seem desirable to have the price of competitive specialized assets begin at a level equal to the rent earned on these assets at the competitive price of the good. That is, at the very beginning of the acquisition process, the probability of successful monopolization is close to zero, and so the price paid for specialized assets should be no greater than their value under competitive conditions. At the end of the monopolization process the price paid should be higher, but how much higher? If predation is meaningless (as it would be with efficient capital markets), a "hold-out" price might emerge, in which case the seller asks for more than simply the monopoly rent that will accrue to his assets when price is set at monopoly levels. If predation is not meaningless, the price he can ask may be pushed to the opportunity cost of his assets.

With little more to guide us, I choose to sacrifice theoretical nicety for ease of calculation. This does not alter the qualitative thrust of the arguments to be made, although, of course, the quantitative results are only as good as the

closeness of the assumed buy-out pattern to the correct price path. I assume that specialized capacity which exists in the industry at the time the buy-out commences may be obtained by the monopolizer for a price equal to the rent it yields when price of the good is competitive, but that the added capacity that would be attracted into the industry by a monopoly price is available to the monopolizer only at a price equal to the rents this capacity would receive when the good is sold at the price to be set by the successful monopolizer. This presents to the monopolizer a bifurcated pattern of rising buy-out prices, one that rises in a single step when the monopolizer switches from buying out existing capacity to buying out potential entrants. To further facilitate the discussion, I shall assume that each competitive firm owns one unit of specialized capacity and that this unit allows one unit of the good to be produced per period. And now to the argument.

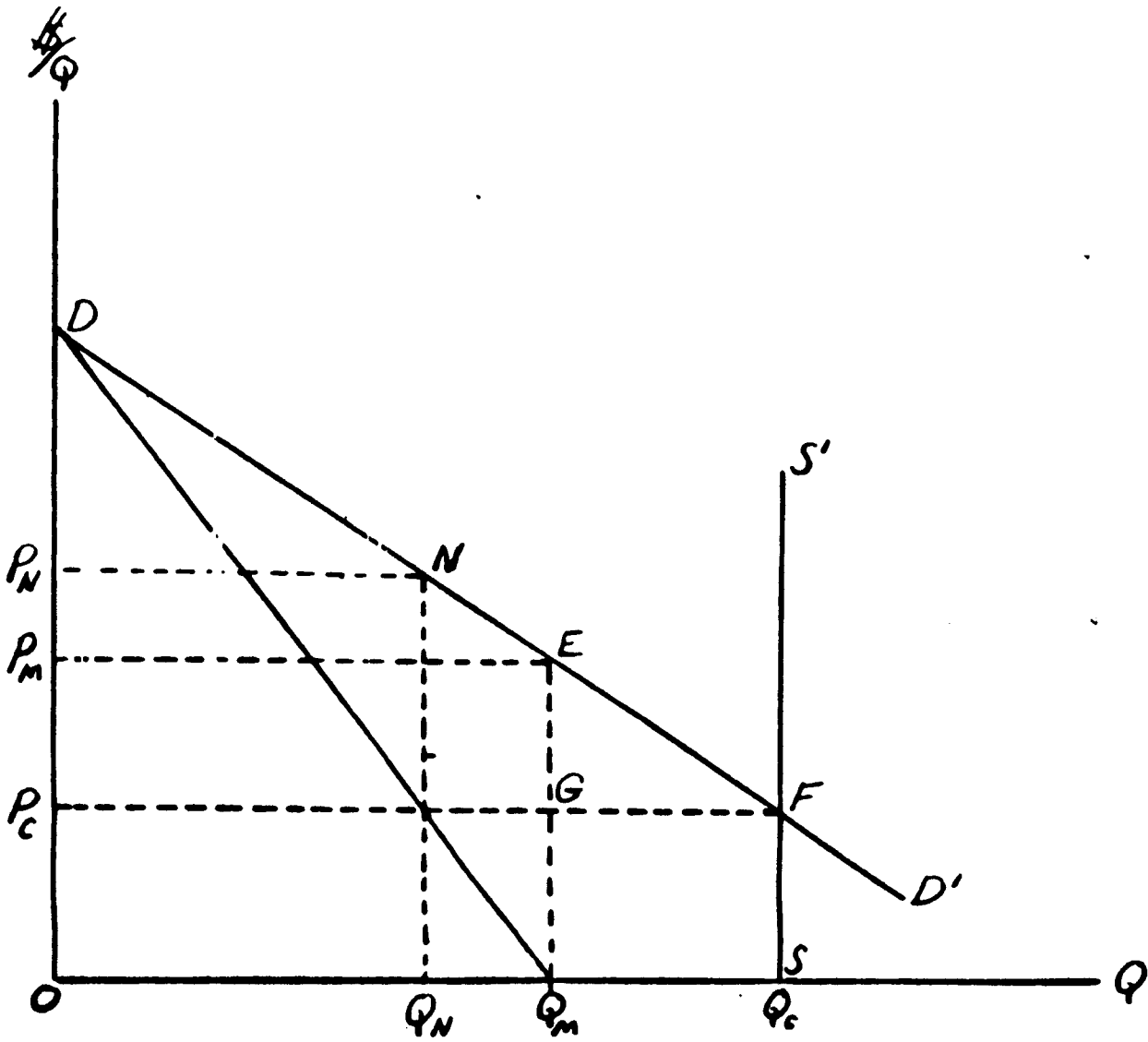


FIGURE 1

III. The Purchase of Monopoly

To make the analysis tractable both in geometric and algebraic terms, I develop the argument on the basis of linear functions. Let us begin by setting aside the problem of entry, so as to quickly focus on some central matters. The vertical supply condition shown as \overline{SS}' in Figure 1 accomplishes this. We may associate this supply with the traditional example of free flowing mineral water springs of which there are sufficient numbers to supply Q_C gallons, but no more, per period. I assume the land has no value in uses outside the mineral water industry, so the cost of providing mineral water to consumers is zero up to Q_C . (Consumers bring their own bottles to these springs.) Output will be Q_C and price P_C with market demand \overline{DD}' assuming competitive selling of mineral water. The standard monopoly solution is Q_M and P_M (assuming no price discrimination). Monopoly profit, following convention, may be designated as $P_M EQ_M O$.

Suppose, however, that the monopolizer must purchase his monopoly. His profit then turns on the price he must pay. This price is given by the assumption that the present owners of the competing springs are willing to sell their rights to operate in the mineral water industry for the equivalent of the competitive rents they can secure from present operations. With this assumption, the payment for monopolizing the industry is the equivalent of $P_C FQ_C O$ per period. This obtains for the monopolizer the right to be free from competitive production. Complete absence of competitive production, which may be termed complete monopolization of the industry, yields a profit per period equal to $P_M EQ_M O - P_C FQ_C O$, or $P_M EGP_C - GFQ_C Q_M$. This sum is considerably less than is portrayed by the standard

monopoly model.

Note that P_C should not be interpreted as the marginal cost to the monopolizer of producing the good. Such an interpretation would suggest that the monopolizer should purchase only sufficient capacity to produce at rate Q_N , choosing P_N rather than P_M as the profit maximizing price. But if he did he would no longer possess a complete monopoly, and this would deny him the ability to select from all the price-quantity combinations on $\overline{DD'}$. $P_C F Q_C O$ is properly viewed as the payment required to secure the ability to select from all these combinations. It may be called the cost of controlling prices. Once this control is acquired, the marginal cost of actually producing the good is zero in this special mineral springs example. The cost of controlling price becomes relevant to the optimal output only if this cost varies with the price chosen. In the present case it does not because higher prices cannot attract entrants, but in the more general case, as we shall see, it does.

The fortunate person who stumbles on monopoly through dumb luck certainly is wealthier than if the same monopoly were securable only at some positive cost. Still, the implicit cost, to him or to someone to whom he might sell the monopoly, of continuing to maintain the monopoly is the value of the resources employed competitively. This is the aggregate of the rents securable through competitive operation of the industry, shown in Figure 1 as $P_C F Q_C O$. The profit to the lucky monopolist of maintaining the monopoly, therefore is $P_M E Q_M O - P_C F Q_C O$, precisely the same as for a purchased monopoly of the same

industry. The difference between the two methods of acquiring monopoly is the greater wealth that accompanies the free monopoly, a difference revealed in the implicit nature of $P_C FQ_C O$ when monopoly is acquired through luck. In the present example, the monopoly is worth maintaining because it is worth buying, and vice versa; if it were not worth buying neither would it be worth maintaining if acquired at no cost.

Thus, even in the case of a free monopoly, the standard monopoly model is misleading. It indicates that monopoly profit is simply the difference between monopoly revenue and the cost to the monopolist of producing the output that yields this revenue. This difference, $P_M EQ_M O$ in Figure 1, may be appropriate (in some cases) for ascertaining the correct output rate (although, as we shall see, it is not the correct measurement for this task in all cases), but it is never the correct measure for deciding whether it pays to create or to maintain a monopoly. It mistakenly ignores the opportunity cost to monopolization, the value of securable competitive rents.

To see this clearly, consider an heir to a bequest that delivers to him the total supply of a valuable resource. Assume two alternative conditions of the bequest, (A) the resource must be sold (or operated) competitively or, if the heir wishes (B) the resource may be sold monopolistically. It is the excess in the value of (B) over (A) that is the proper measure of the gain to monopoly, not the total value of (B). The bequest has value even under competitive conditions -- the competitive rent that it would yield, and this value should not be counted as part of the return to monopolizing. If we wish to know whether an industry will exhibit a propensity to monopoly,

then it is not $P_M EQ_M Q$ but the difference between $P_M EGP_C$ and $GFQ_C Q_M$ that is our guide.

The derivation of this monopolistic propensity is a bit more complicated when supply conditions make entry a relevant consideration. In Figure 2, since there exists greater than zero elasticity of supply in the neighborhood of the competitive price, the resources that must be acquired to be able to control price will be a function of the price itself. Monopoly price P_M will attract Q_J resources into the industry. As the acquisition process progresses, the expected product price might rise to reflect the increased expectation of monopoly pricing. The path followed by the expected price of the good, as a function of the monopolizer's purchases, might look like the S shaped curve $P_C P_D J$ in Figure 2. As already noted, theory provides no clear guide to the precise shape of this price path. There are geometric and algebraic advantages to the dichotomized representation of this curve based on the assumption that P_C determines the rent that must be paid to acquire those resources that are in the industry when the industry is organized competitively, while P_M determines the rent that must be paid to acquire those resources that would seek to enter the industry if price were P_M . This distinction preserves the folklore dynamics of a monopolizer who acquires existing firms cheaply but then finds that he faces the problem of warding off the entry.

The monopolizer, having acquired control of price through the purchase of assets must decide what to do with these assets. Part of them he will use to produce the rate of output that he chooses to sell. The remainder of the acquired assets either remain idle in his possession, to keep them from reentering

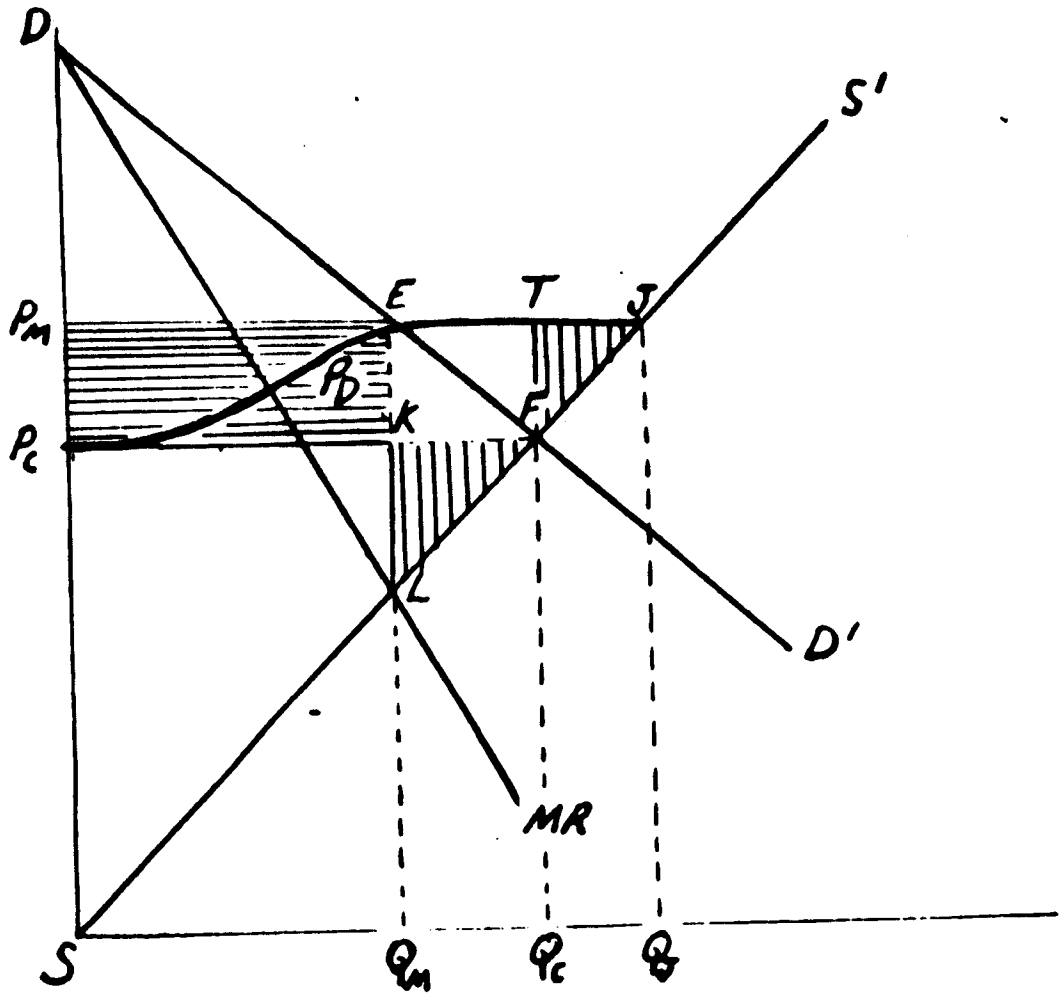


FIGURE 2

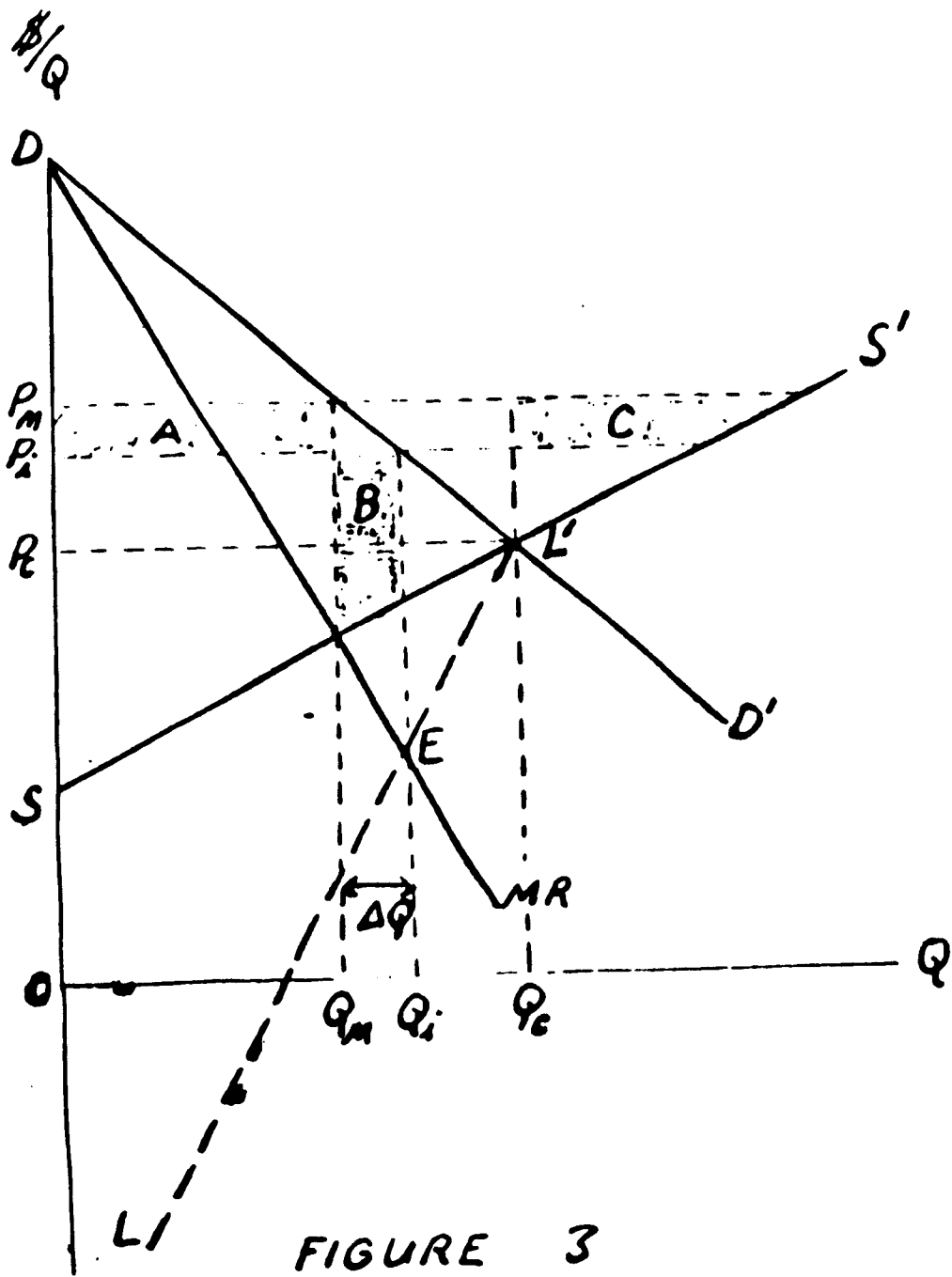
the monopolized industry with positive output, or he employs them or sells them for use in other industries. Successfully employing them in other industries requires the monopolizer to forego specializing his effort. Selling them for use in other industries requires writing and enforcing a contract that bars their reentry into the monopolized industry. Both options are likely to impose costs on the monopolizer that should be deducted from the profits of monopolization, but I will suppose these costs are negligible so that he captures for himself the full value of these resources in their next best uses. This value is given by the supply prices of these resources to the monopolized industry.

Under these conditions, the profitability of converting a competitive industry to a complete monopoly is $P_M E K P_C - KFL - TJF$. This is derived as follows. Q_M capacity is used to produce the monopolist's output. His total cost per unit of output on this capacity is P_C , for he incurs an annual operating cost equal to SLQ_M and an annual charge for competitive rents equal to $P_C KLS$. It is as if he purchased Q_M units of output at P_C and resold it at P_M . Since revenue of $P_M EQ_M S$ is generated by this production, there is a contribution of $P_M E K P_C$ to profit. Capacity $Q_J - Q_M$ is directed to alternative employments, and from these it secures revenues equal to $LJQ_J Q_M$. Subtracting these revenues from the annual cost of acquiring this "excess" capacity, $P_C(Q_C - Q_M) + P_M(Q_J - Q_C)$, leaves a remaining net cost of $KFL + TJF$. Subtracting this sum from the annual contribution to profit of the producing capacity yields the profit to complete monopolization, shown in Figure 2 as the difference between the horizontally striped rectangle and the run of the vertically striped triangles. It is obvious that suitably elastic demand and supply conditions in the region

above F make complete monopolization a losing proposition, and that for this to be the case there is no need for either elasticity to be so large as to approach infinity.

It is no longer clear that the most profitable course of action is to establish the traditional monopoly price. The last component of the cost of monopolization, portrayed in Figure 2, is TJF , varies directly with the price set by the monopolizer. A price set between P_M and P_C may be the best choice. With competitive supply positively sloped, the monopolizer's preferred course generally will be to raise output and lower price from those levels that would characterize the standard monopoly solution.

Let ΔQ , the difference between Q_1 and Q_m in Figure 3, depict a contemplated increase in output by the monopolizer. Such an increase would be unwarranted in the standard monopoly model because the profit component, indicated by shaded area A, sacrificed though the consequent fall in price to P_1 is greater than the profit gained through the additional output, shown as area B. The reduction in product price must be viewed now as also reducing the amount that must be spent to buy out entrants. The reduction in the cost of deterring entry, shown as area C, must be taken into account when the monopolizer calculates the profit to be obtained from different output rates. Output should be expanded if $B+C$ exceeds A, which they will in the standard monopoly equilibrium. The infinitesimal equivalents of A and B are just equal to each other at Q_m in the standard equilibrium, so adding C to the calculation, no matter how small C may be, calls for an expansion of output beyond Q_m . How far this expansion should carry depends on the nature of the supply and demand



functions. The linear case can be analyzed as follows. Denote demand and supply by

$$p^D = a - bQ \quad (1)$$

$$p^S = c + dQ, \text{ where } b, d > 0. \quad (2)$$

Profit, Π , is maximized by maximizing the difference between the horizontally shaded rectangle and the sum of the vertically shaded triangles shown in Figure 2. This difference may be written

$$\Pi = (P_M - P_C)Q_M - \frac{d}{2}(Q_C - Q_M)^2 - \frac{1}{2d}(P_M - P_C)^2 \quad (3)$$

$$\frac{\partial \Pi}{\partial Q_M} = P_M - P_C + Q_M \frac{\partial P_M}{\partial Q_M} + d(Q_C - Q_M) - 1/2(P_M - P_C) \frac{\partial P_M}{\partial Q_M} \quad (4)$$

Substituting and transforming from (1) and (2) above, (4) becomes

$$\frac{\partial \Pi}{\partial Q_M} = -b(Q_M - Q_C) - bQ_M + d(Q_C - Q_M) - b^2/d(Q_M - Q_C) \quad (5)$$

Setting (5) = 0 and adding bQ_C to both sides allows the maximization condition to be written as

$$Q_M/Q_C = 1 - \frac{1}{b/d + d/b + 2} \quad (6)$$

or, in elasticity terms

$$Q_M/Q_C = 1 - \frac{1}{e_s/e_d + e_d/e_s + 2} \quad (7)$$

Let $Z = \frac{1}{b/d + d/b + 2}$. Then Z is maximized and Q_M/Q_C minimized when

$b = d \neq 0$. If $b = d$, then $Z = 1/4$ and $Q_M/Q_C = 3/4$. The maximum impact of

monopolization on output, then, is to reduce output to 3/4 its competitive level. Whenever $b \neq d$, the monopoly output will exceed 3/4 of its competitive level.

For given linear demand and supply, the standard monopoly output, call it Q_{SM} , expressed in terms of the coefficients in equations (1) and (2) and the competitive output rate, Q_C , is

$$Q_{SM} = \frac{b+d}{2b+d} Q_C \quad (8)$$

This may be compared with the monopoly output, Q_M , implied by the purchased monopolization of the same industry. For profit maximization, we require

$\frac{\partial \Pi}{\partial Q_M} = 0$. Setting equation (5) equal to zero and simplifying, Q_M must satisfy

$$Q_M = \frac{(b+d)^2 - bd}{(b+d)^2} Q_C \quad (9)$$

Forming the ratio Q_M/Q_{SM} , we have

$$Q_M/Q_{SM} = \frac{[(b+d)^2 - bd](2b+d)}{(b+d)^3} \quad (10)$$

which, upon simplification becomes

$$Q_M/Q_{SM} = 1 + \frac{b^3}{(b+d)^3} \quad (11)$$

Q_M , then, always exceeds Q_{SM} , and the ratio Q_M/Q_{SM} increases with b and decreases with d . At one limit, if $b = 0$, or b or $d = \infty$, then $Q_M = Q_{SM}$. In the first case, $b = 0$, $Q_M = Q_{SM}$ because the best the monopolist can do is set the competitive price and produce the competitive output. In the second case, if $b = \infty$, the competitive output is again the solution (but not the competitive price),

and if $d = \infty$ the two monopoly outputs are the same because there is no entry problem. For all other cases $Q_M > Q_{SM}$. When $d = 0$, the difference is greatest, with Q_M twice as large as Q_{SM} ; this is because $d = 0$ creates an unbearable entry problem that makes $Q_M = Q_C$. The standard monopoly model ignores the problem of entry posed by a horizontal supply curve, implicitly presuming some unspecified legal barrier to entry.

IV. Susceptibility to Monopolization

From the perspective of a potential monopolizer, what underlying conditions of competitive demand and supply would offer the most attractive target? The more inelastic the industry's demand, ceteris paribus, the greater the profit potential. This is widely recognized. The desirable conditions of supply are not. The monopolizer seeks two characteristics of supply that, together, are incompatible with any competitive supply function that closely approximates a linear supply. He seeks to be free of the threat of entry once he has monopolized the industry. This requires competitive supply to be vertical in the region of competitive output. He also seeks to be able to dispose of unwanted competitive capacity, once acquired, at no loss. This requires competitive supply to be horizontal at the level of competitive price.

These two conditions are admirably satisfied by the conjunction of D and $\overline{SS'}$ as shown in Figure 4. Competitive capacity may be acquired at a price, OS, no greater than the value it can command in other industries. Assuming that suitable contracts can be devised easily that bar the reentry of the part of acquired capacity that is not wanted by the monopolizer, this horizontal section of supply contributes a zero amount to the cost of monopolizing. The vertical section of supply eliminates the entry problem no matter how large is the increase in price

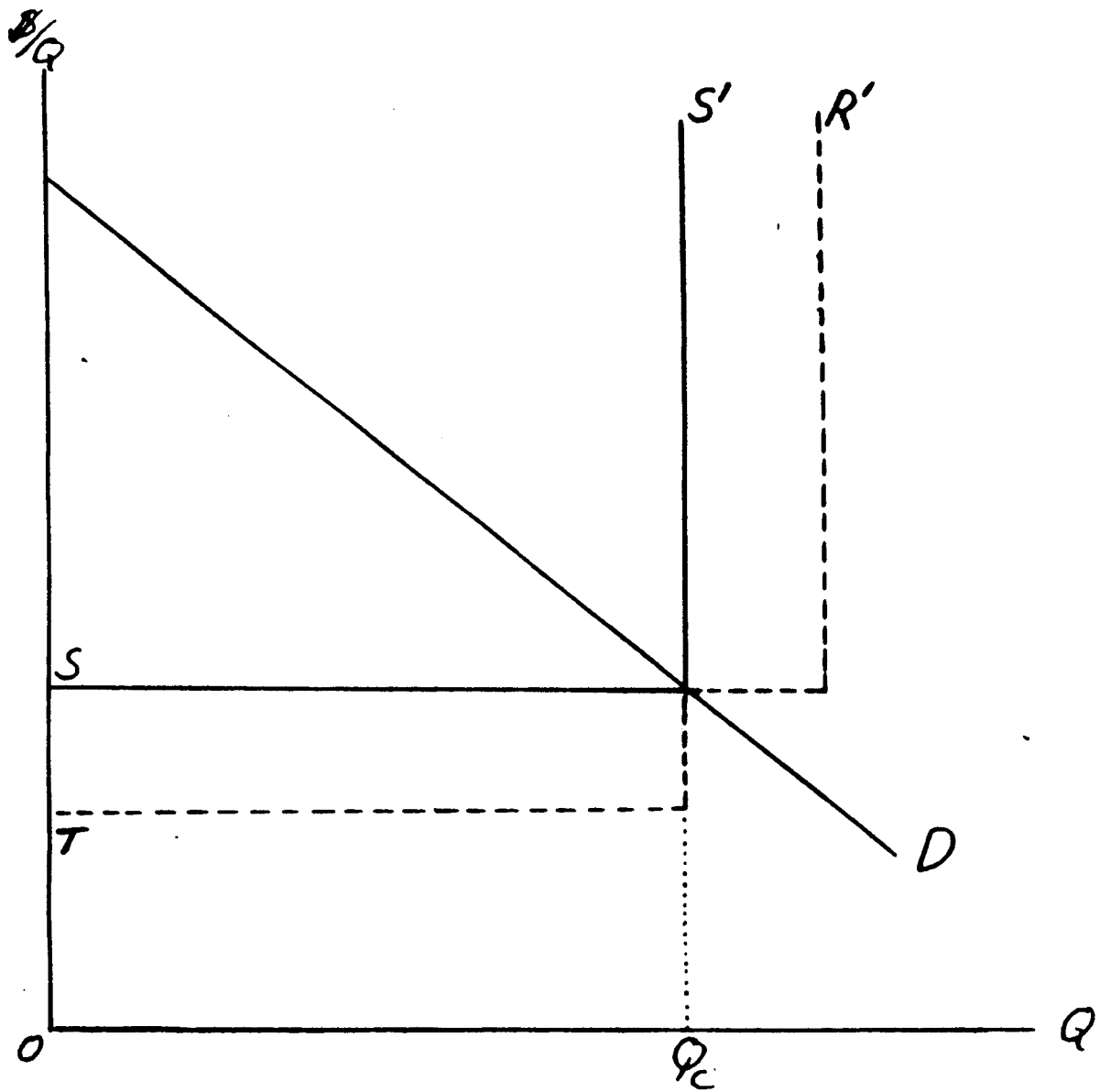


FIGURE 4

that is brought about by monopolization.

The monopolizer, of course, would fare still better if demand, while still intersecting \overline{SS}' at its "corner", were less elastic. As D is rotated clockwise at the corner, the profit to monopolization increases, and the difference between Q_M and Q_C decreases.

But for given demand, say D , it is clear that \overline{SS}' dominates both \overline{TS}' and \overline{SR}' in attractiveness to the monopolizer. Neither \overline{TS}' nor \overline{SR}' deliver larger revenues than \overline{SS}' , but both impose larger costs of monopolization. \overline{TS}' imposes a larger cost because some of the rent paid to acquire resources, $S-T$ for each quantity of capacity sufficient to produce one unit of output, must be absorbed as an "unrecovered" cost of monopolization even if "excess" capacity can be contracted into alternative uses. \overline{SR}' imposes a larger cost than \overline{SS}' because payment will be required to discourage or buy-out entrants if price is raised above its competitive level. For a given size of competitive industry, Q_C , the prime candidate for monopolization is an industry whose competitive supply condition is given by \overline{SS}' ; the less elastic the demand, the "primer" is the candidate.

The probability of finding such a candidate is not very great because we expect to see some persistence in underlying cost conditions. Industries for which supply is relatively elastic at moderate output rates are likely to exhibit elastic supply in the region of market demand also.

The next best opportunity to a supply curve with a corner at the right level relative to demand may very well be an old fashioned corner on a commodity market. Commodities sold on organized exchanges offer substantially vertical supply conditions in the neighborhood of competitive price because total supplies can be increased only slowly, as with some minerals and metals, or, more likely,

because of the interval between harvests of agricultural products. Until the market suspects that the probability of a successful corner is high, the rise in the acquisition price of the commodity will be that of only the normal competitive rise in price brought about by the monopolizer's acquisition of entitlements. The price rise can be quite moderate during the early part of the acquisition process. The cost of attempting to corner the market is the difference between what must be paid by the monopolizer for the commodity and what it will bring if he were forced to sell his entitlements under full competitive conditions. The supply of the commodity to him is more positively sloped the more seriously the market takes his attempt to corner it, so it is not likely that the supply curve will take the ideal horizontal shape (shown in Figure 4) during the entire purchase process.

Nonetheless, the prospects for profitable monopolization when the monopolizer possesses no special cost or product superiority over rivals is unlikely to be better than in attempting to corner the supply of a limited amount of product sold on an organized exchange. Although there is considerable uncertainty about the proportion of successes, attempts to corner a commodity traded on an organized exchange are the only repeated attempts to purchase a monopoly with which I am familiar. The reason for such repetition is to be found in the vertical supply condition that exists in the neighborhood of market price.

V. The Welfare Loss From Monopolization

There are serious questions that may be, and have been, asked about the alleged inefficiency of monopoly, but let us set such considerations aside to see what implications the above analysis has for the standard economic evaluations of the impact of monopoly on resource use. The older measure of the "waste" of

monopoly -- the value of output lost through restriction of output -- has been supplemented in recent years by adding to this the value of the resources used to compete for monopoly. These alternative measures are shown in Figure 5. ACF is the deadweight loss triangle of the standard measure, and $ACF + P_C P_S^{AB}$ is the larger loss attendant upon the competition to secure monopoly.

A competition among equals to secure a monopoly would, if they were risk neutral, dissipate the profit potential of the monopoly. The assumption adopted in Part III above, that there is only one monopolizer, is tantamount to assuming that one of the would-be rivals is recognized to possess a dominant advantage in the monopolization process. This reduces the amount that he must pay to secure monopoly, giving him the prospect of an expected profit of the sort deduced in Part III. The more intensive and even-handed the rivalry to monopolize the closer this expectation is to zero. So far, there is no divergence of analysis between the rent-seeking analysis of monopolization and our analysis of the purchase of monopoly.

A difference does emerge when the content of the expenditure to secure monopoly is considered. One type of expenditure is to lower cost or improve product so as to gain a decisive advantage in the rivalry to monopolize. Such expenditures, of course, cannot be counted as a complete waste from the viewpoint of consumers, and, so dissipation of profit does not imply dissipation of value of output. But let us set this problem aside as one that is recognized. The purchase of government protection that delivers monopoly might involve a simple transfer of money wealth from would-be monopolists to government personnel, and this would be difficult to count as anything more than a pure transfer. But, if we suppose such open payments are politically damning, then the payoff tends to take the

form of real resources employed for the purpose of reelecting or otherwise improving the well-being of government employees. These we may count as waste from the viewpoint of consumers.

A difference begins to emerge because of the difficulty of conceiving circumstances in which the use of real resources is an efficient way to secure purely private monopoly. The simple transfer of wealth for the purchase of competitive assets clearly avoids losses to both parties to the exchange that would be associated with the use of real resources. In a world free of antimerger laws and other impediments to the straightforward use of money, but a world in which private rights are respected, there would be little or no drain on real resources because of the rivalry to secure monopoly.

The more subtle point, however, is that in such a situation the profit maximizing output of the successful monopolist is not the output that maximizes profit in the standard monopoly model. When a monopoly is secured by winning government protection, presumably the target rate of output is the standard monopoly solution, shown as Q_S in Figure 5. But the purely private acquisition of monopoly is competed for most efficiently by a winning monopolizer who reduces the price and increases the output relative to the standard monopoly solution. He does this, as we have seen, to reduce the amount he must pay to ward off entrants. The purely private pursuit of monopoly in a world in which the purchase of monopoly is legitimate thus (1) reduces (possibly to zero) the use of real resources in the competition to secure monopoly and (2) reduces the amount of the deadweight loss attributable to the monopolist's (now smaller) restriction in output. The waste of monopolization in this case is limited to the value of triangle EFL in Figure 5, where Q_M is the correct equilibrium output.

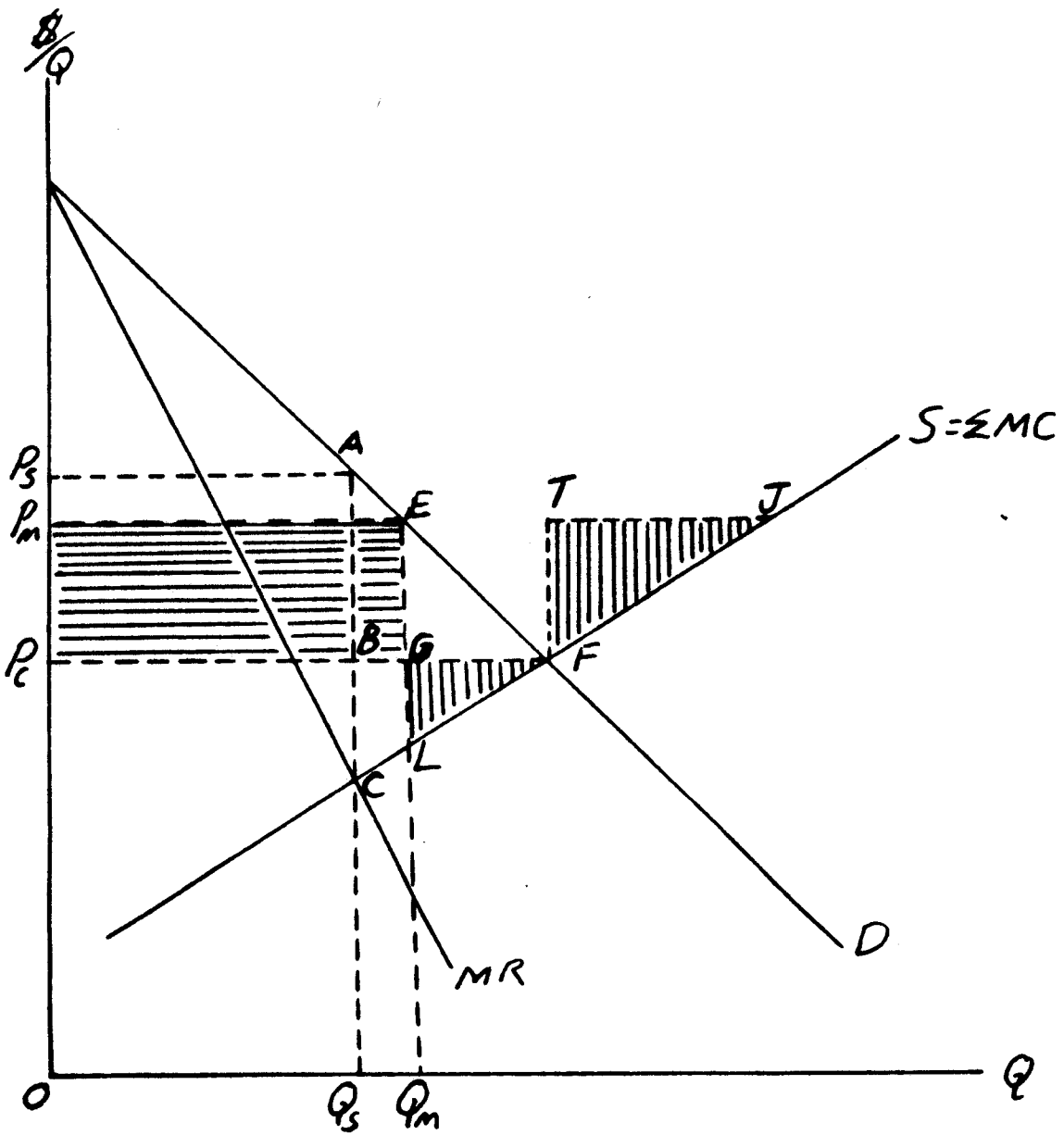


FIGURE 5

To the extent that purely private monopolization characterizes monopoly whose origins are neither luck nor government, the welfare loss from monopolization is approximated, not by $ACF + P_C P_S AB$, nor by only ACF , but by ELF in Figure 5. Most empirical estimates of the welfare loss are based on the estimation of the value of the deadweight loss triangle, and the calculated estimates are generally quite low. A variety of assumptions are utilized to ease the estimating procedure. Harberger,^{2/} for example, assumes horizontal cost curves and unitary elastic demands, and these assumptions, as others have noted, lead to errors in the estimates. The present analysis suggests another source of error.

The deviation in an industry's profit rate from the average of manufacturing profit rates, or some such measure, is used as an index of the deviation of monopoly price from competitive price in Harberger-type estimates. But monopolization via purely private expenditures to monopolize should yield to the winner a smaller recorded profit for successful monopolization. Effective rivalry thus implies a basic problem in deducing price increases from profits. The most that can be said for this estimating method is that it offers an index of the price increase brought about by monopoly when the monopoly is obtained by luck, or, alternatively, that it offers a still rougher index when one monopolist is very superior in the race for monopoly. In the latter case, expected profits are not dissipated completely. However, the profit that is retained by the superior competitor will reflect a process of acquisition of monopoly such as that which is discussed in Part III above. The profit that will obtain in a limiting case is that which we have already discussed extensively -- the horizontally striped rectangle of Figure 5 minus the sum of the two vertically striped triangles. This

²A.C. Harberger, "Monopoly and Resource Allocation," American Economic Review, Vol. 54 (May 1954), pp. 77-87.

is a "limiting" case because it comes about as close to monopoly by pure luck as the necessity for purchasing monopoly allows. It assumes only one monopolizer and rather moderate costs of acquiring competitive firms. The limiting nature of the case is important because effective rivalry to monopolize renders the profit rate a useless index of the deviation of monopoly price from competitive price.

To make this limiting case consistent with as many Harberger-type assumptions as is possible, assume the industry supply curve contains a horizontal component, \overline{PF} , joined to a positively sloped component, \overline{FS} . The positively sloped component is needed to allow to the monopolizer the possibility of blocking entry by buying out a limited number of potential entrants. The monopolist's profit then becomes the difference between $P_C P_M \overline{EG}$ and FTJ , and this is the profit that would be recorded in the statistics relied upon to make Harberger-type estimates. It is too small a profit on which to base an estimate of \overline{EG} . The estimate of \overline{EG} would be better if it could be based on $P_C P_M \overline{EG}$ only. If there is purely private monopolization, to the extent that its presence is established through a process similar to our limiting case, the Harberger-type estimates will underestimate the welfare loss of monopolization by underestimating \overline{EG} . This underestimate is more severe should supply conditions be typified by a supply function positively sloped throughout its relevant range. In this case, the recorded profit is approximated by the horizontally striped rectangle of Figure 5 minus the sum of the two vertically striped triangles. Since \overline{EL} is what we seek to index through profit when supply is positively sloped, the better measure to use would be $P_C P_M \overline{EG} + GLF$. Rather than subtracting the first triangle from the rectangle, it should be added. The difference between the desired (but not obtainable) revenue measure and the recorded profit measure is thus larger than in the case of a horizontal supply segment.

VI. Monopolization vs. Dominance

It is not necessary for the monopolizer to buy-out all competitors. He might consider tolerating a competitive fringe if this increases his profit. He has a choice between buying a complete monopoly and buying a dominant firm. The smaller is the capacity acquired by the dominant firm, the greater is the competitive fringe supply curve. He thus has a choice of competitive fringe supply such that his investment is less the smaller are his acquisitions, but the smaller his acquisitions the lower is the price that maximizes his dominant firm's profit.

However, under the conditions of monopolization we have been supposing, if it is profitable to create a dominant firm it is even more profitable to completely monopolize the industry. Consider first the purchase of existing capacity. The ability to produce a unit of the competitive industry's good can be purchased for P_C . This includes payment for competitive rent on specialized resources and payment for nonspecialized inputs. If the entire competitive capacity is not purchased, a fringe of price-takers remains to face the price that will be set by the dominant firm. This price, being higher than competitive price, delivers supra competitive rents to this fringe. The dominant firm could have obtained this fringe's producing ability for P_C per unit of output. If purchased at this price and kept in production by the dominant firm, the good's price would be no different than if the fringe were independently owned; the dominant firm would thus lose no profit on its dominant firm output, yet it could have captured the supra competitive component of the fringe's rent. Hence, its profit can only

be increased by purchasing all existing capacity, especially since it will then be able to set a price that is higher than could have been set in the face of an independent fringe.

The same reasoning rules out an independent fringe whose source is new entry. For any given supply from entrants, the dominant firm must accept a lower profit maximizing price than it could set if it controlled the total relevant supply. This price, however, is still higher than the competitive price because the dominant firm does not fully utilize the capacity it has acquired. If the dominant firm were to buy-out the independent entrant fringe, it could retire their (more) costly-to-operate capacity from production, replacing it with less costly-to-operate capacity that it otherwise would have been forced to retire had it accepted the role of dominant firm. Price would remain unchanged but its profit would have been increased by realizing a larger rent on its now unretired capacity than it paid to acquire the capacity of entrants. Moreover, it is in the nature of the case that it will always own sufficient (retired) capacity to accomplish this substitution; if the price that is set by the firm acting as a dominant firm is higher than the competitive price, the dominant firm must have taken more capacity out of production than has been added by entrants. If dominance is profitable, monopolization is still more profitable, not only because profit can be made from this type of capacity arbitrage but also because price can be raised still higher.

VII. The Risks of Monopolization

A departure from the "easy monopolization" assumptions with which we started makes it clear that attempts to monopolize are fraught with risks of various kinds. (1) The monopoly may turn out to be a more costly producer than is the competitive industry being monopolized. (2) The monopolist may find it costly to enforce contracts meant to bar the return from other industries of capacity that the monopolist sought to retire; either this capacity will need to be retained in idle condition by the monopolizer or he must deploy this capacity himself in diversified employments outside the monopolized industry; both alternatives reduce profit relative to the profit projected by the "easy monopolization" assumptions. (3) The supply of output may be more elastic beyond competitive output than is supposed, in which case the cost of excluding new capacity may more than dissipate the profit from monopolization, and (4) Rival monopolizers (or hold-outs) may raise the price for purchasing competitive capacity.

All these possibilities increase the risks that accompany an attempt to monopolize an industry, and several present a would-be monopolizer with asymmetrically poor risks. Possibilities (1) and (3) might pose symmetric risks; the monopoly firm may be less costly to operate and supply may turn out to be less elastic than anticipated. But (2) and (4) present downside risks for which there seems no upside counterweight. Relative to the profit prospect deduced from the assumptions with which we began, themselves yielding a lower profit than is suggested by the standard monopoly model, the profit prospects of any real attempt to privately monopolize an industry must be gauged as dimmer still.

Purely private monopolization is surely less promising of profit than the folklore of populism suggests, at least for cost conditions that do not offer scale economies to the monopolizer. Some of the risks of monopolization, and some of the costs of deterring entry can be offset by abandoning the purely private approach in favor of securing government aid. Entry barriers imposed and policed by the government present a formidable hurdle to the reentry or new entry of capacity. Abandonment of monopolization in favor of cartelization of an industry also reduces the financial stake required of any one firm to retire unwanted capacity from the industry; where monopolization requires one firm to bear the entire cost of purchasing and retiring such capacity, cartelization permits a sharing of cost. The disadvantage of cartelization is the risk that one or more firms will cease cooperating, but this risk may be worth bearing to reduce the risky financial commitment that would be required by a monopolizer seeking to raise price on his own. Regulation and/or collusion could easily dominate purely private monopolization as the preferred route to profit. If so, a combination of attention by antitrusters to discovery and prosecution of collusion and by deregulators to rejection of legal bars to competition represents a more potent and less risky antimonopoly policy than one devoted to preventing mergers and various pricing and marketing practices thought to be evidence of a campaign to privately monopolize industry.