

PERFORMANCE ISSUES OF THE AUTOMOBILE INDUSTRY

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BACKGROUND OF THIS PAPER

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Preface

No study which purports to analyze or comment on social, economic, and technical problems is likely to come to firm conclusions. Firm conclusions are limited by and large to the fields of deductive logic or mathematics, where propositions based upon logical reasoning from some set of assumptions can be adduced. Whether or not such propositions conform to reality is irrelevant. The virtue of the proposition is that it is based upon a reasoning which is not self-contradictory and which is in turn based upon premises which are not self-contradictory. Logic, ratiocination, and noncontradiction, of course, are necessary for any study of the nature of things. But the premises and the processes of the real world--which, in effect, is the world of affairs, a world of alternative premises and processes--are, of course, relevant if the exercise is to consist of more than abstract propositions. Our efforts, then, represent a gateway to further study and analysis in which empirical data, as well as logical formulations and notions of the industrial process, will be considered and reconsidered.

Our purpose was to examine some aspects of a concentrated industry. Although financing this study, the Automobile Manufacturers Association and its members, by agreement and at their own suggestion, provided no information other than public information, and offered no

particular or peculiar insights. Indeed, only two meetings were held with industry representatives, and these were on the superficial level of reporting progress and discussing some administrative matters. In this sense, the study cannot be viewed as serving any special interest group or justifying the status quo. This caveat is included because the automotive industry has been publicly criticized for its lack of concern with safety, for its contributions to negative externalities, and for its concentration. The reader must judge for himself, whether self-serving or sponsor-serving arguments and whitewashes have been resorted to by the authors.

The authors' orientation was to study a decreasing-cost industry producing durable consumers' goods which has national distribution and which is concentrated. Automobiles are merely a case in point. The case determined the specific analysis. In recent years much discussion has appeared in the technical, economic, and business literature of industrial organization about the implications of structure and performance. The issue is whether performance should be the test of an industry's contribution (or potential contribution) to consumer welfare. The structuralists argue that competitive structure is more likely to give better performance than non-competitive structure. They draw the conclusion that the more competitive the structure, the more likely it is that consumer welfare will be maximized or benefited. The performance argument holds that with economies of scale and the nature of the market, so often national in scope, a more

competitive structure does not of necessity provide greater consumer benefits than a less competitive structure. The play's the thing; performance is the test, performance being not only what is produced, but also what society wants as a matter of social policy. The weakness of the performance argument is that no one has been able to adduce a generally acceptable set of performance criteria.

The view of the present writers leans toward the performance argument. We do, however, assert that the attempts to find general performance criteria are hopeless. We need more information about particular industries-- about their characteristics and their several performances--so that an inventory of possible "ideal" performances may be devised. Different situations would be judged by different criteria.

The orientation of our reflections is different from that of many industry studies. Rather than concentrating exclusively or even mainly on the manufacturing aspects of the automotive industry with the idea that other phases of the industry adjust to the manufacturing activity, we have assumed that the industry consists of suppliers, manufacturers, and distributors and that there is a general and continual interaction within this large and complex entity. Thus, market segmentation and product differentiation are assumed to have a bearing on manufacturing policy, as well as the reverse. The issue is complicated by the fact that the automotive producers also make parts and components for their own use or the use of their competitors, and they may buy such parts

and components from independent firms. Vertical integration, interdependencies between final product producers, and relations between suppliers and manufacturers are considered in the models employed. In brief, we are attempting to examine the behavioral aspects or concepts of the industry rather than concentrating on the sheer logic of production. In our analysis, technology--using the word in its broadest sense to include organization as well as the mechanical aspects of technology--and consumer demand are treated as the principal forces motivating the system. The role and prevalence of decreasing costs, or economies of scale, and the requirement for technological improvement as contributing to consumer welfare are basic in the analysis.

In addition to the economic process as a viewpoint for examining the automotive industry, we have been forced to consider the general questions of noneconomic behavior which are closely related to the economic. Economists sometimes call such considerations "externalities based upon market failure," or give particular names to the externalities. We have reflected briefly on such externalities whose social role has become a major consideration in public debate.

The nature of the role of industrial structure in determining market and government policy has, in our opinion, scarcely been given appropriate weight. The Neal Report and the Stigler Report¹ are at

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The Neal Report (July 5, 1968) and the Stigler Report (Feb. 18, 1969) were submitted to Presidents Johnson and Nixon, respectively. Each dealt with questions of antitrust policy and industrial concentration, arriving at different conclusions because of different presuppositions.

loggerheads because they are probably based upon different presuppositions of what is and what ought to be. The thrust of the present study is toward an analysis of structure and its implications.

CHAPTER I

INTRODUCTION

This monograph is concerned with the automotive industry. Our interest lies essentially in the consideration and analysis of so-called concentrated industries. The automotive industry has been chosen partly as an ideal type, and partly because of more mundane reasons of funding.

It is more of a conceptual study than one concerned with the historical development, or role, of the automotive industry in the American economy. The very size and significance of automotive manufacturing, touching as it does the lives and fortunes of a vast fraction of the American population and in varying degrees the populations of other parts of the world, tend to lead the inquiring mind into asking such questions as "How did the industry get to be the way it is?" "What are its effects on national income or employment?" "What about its technology and potential technology?" Currently, of course, the great interest in safety and ecology has focused interest on the automotive industry. Discussions of these issues are significant and instructive from the viewpoint of public policy, as well as in assisting people to understand the nature of the American society and the American theme.

Yet, these concerns are not those which motivate the present study. We are concerned with the more technical aspect, namely: to construct, if possible, a framework within which one can examine the performance of the automotive industry. The key word is performance. Not only does

performance imply considerations of effectiveness and efficiency in the manufacture, design, and sale of automotive products, but it implies a consideration of the relations between the automotive industry and what we might call the rest of the world. By rest of the world we mean the economic and social aspects of the society which are affected by and in turn affect the automotive industry. Its size, organizational structure, internal links--that is, links within the industry--and external links with other industries and other aspects of social behavior are the subjects of our concern.

The vastness of the project, as well as its intricacies require that some sort of a manageable, simplified model be constructed as a simplistic image of the industry, to provide an important first step on the path of understanding the performance of the automotive industry. Detail must be sacrificed for at least a limited generalization if both writers and readers are to avoid being lost in a welter of minutiae which would serve only to make reality more opaque. Models are a first approximation and hence conceptual. They are good only insofar as they are useful in interpreting and understanding behavior and structure. Therefore, models are both dangerous and tricky, for they might lead reader and writer away from reality and truth to a never-never land of imagination and irrelevant theorizing which have neither counterpart nor correspondence to reality.

In this study we shall attempt to construct some models of behavior. The models will have attributes of dynamism. These models of behavior

will be concerned with processes which, in the opinions of the writers at least, are significant. The processes we are concerned with are not peculiar to this study but have received the attention of economists, social scientists, and thoughtful people generally. We do not pretend to have exhausted the areas of concern--the processes--for our major thrust has to do with the meaning and socioeconomic implication of the automotive industry as a concentrated industry. Concentration is variously measured but always implies that the number of firms engaged in the manufacturing process in no way approximates the limiting theoretical case of pure and perfect competition.

Concerned as we are with the automotive industry as an example of a concentrated (we prefer the word "autonomous") durable consumer goods industry, the major area of interest is the performance of the industry. In performance we include both its economic as well as its social effectiveness. By an autonomous industry we mean one in which the firms exercise some choice, or decision making, over prices and quantities produced, and over the nature of the product produced. In technical language, each firm in the industry acts as if it has a defined demand curve (or demand function) in which price and quantity are inversely related. That is to say, for the individual firm the higher the price, the smaller the quantity sold; and, conversely, the lower the price, the greater the quantity sold. This attribute in an autonomous industry applies to each firm as well as, of course, to the industry generally. In pure and perfect competition one of the attributes of the demand curve for the individual firm is that, at the going market price, the firm can sell any number of

units without affecting market price. In other words, the quantity demanded of the product is infinite, with respect to the individual firm, at the market price. In an autonomous industry the concept of market price tends to be related to the output and the nature (differentiation) of the product of the individual firms.

Let us hasten to add that in an autonomous industry, that is, one which does not fall under the rubric of pure and perfect competition, the degree of competition among competitors may be, and often is much sharper than if each firm in the industry met the market price and produced a homogenous product. This caveat is introduced because the very phrase "pure and perfect competition" contains for many people the implication of an ideal state of affairs in which the purity and perfection assure the consumers of the largest output at the lowest possible price. The competition aspect added to the adjectives "pure and perfect" assure (for the uninitiated) a kind of social justice and welfare which cannot be bettered in this imperfect world.

We are all familiar with the adage that proof of the pudding is in the eating. Like many adages this is too simple. If one is frankly disposed against puddings, indeed, the proof of the pudding may be in the eating, because one knows beforehand that the proof, the testing of the pudding, is not going to have an enjoyable outcome. But, even if one is neutral toward puddings, there is no assurance that the proof or testing of the pudding is in the eating unless the consumer has had a variety of experiences with puddings so that in his own mind he can classify and evaluate puddings. In other words, the consumer must have some set of indices by which

to test the goodness or badness of the pudding. In short, he must have a conceptual model, and one which adjusts to circumstances. Testing of performance, be it the goodness of a pudding or the performance of an industry such as the automotive, requires comparisons, the evaluation of alternatives, the consideration of what is possible and what actually has been achieved.

Ten or fifteen years ago the general public was not concerned with air pollution, while safety was considered a personal rather than a mechanical attribute of transportation. Yet, public debate, reflection, the analysis and concern of ordinary people as well as technicians have raised considerations of safety and pollution to major questions of public policy. All good and decent people are against pollution and for safety and often act as if these attributes are their birthright. Yet in truth, they are still catchwords, be it highly moral ones, without any clear-cut definition or characteristic in the public mind. The goals or ideals imposed upon an industry such as the automotive change over time, and the several individual goals, purposes, or ideals change in relative importance as part of the changing ideology of the society, or the changing requirements and potential of technology, and thus of consumer social demands.

For our purpose, we may view the set of economic, industrial, and social goals of affecting the trends of economic activity, recognizing all the while that the ends of an economic activity may be themselves the means to accomplish other kinds of activity. Surely no one can argue that the whole purpose of this or any society is comprehended by the ideal of the production of automobiles or of any combination of goods or services.

The goods and services themselves are means to obtain other goals. But for purposes of analysis we may assume that economic activity, which we will define as the automotive industry, can be measured or evaluated by a set of goals, so that alternative ways of accomplishing these goals may be compared. The issue is more complicated than it appears on the surface because alternative ways of producing automobiles might produce, and probably would produce, a different mix of goals with differing emphasis placed upon particularly defined or individualized goals. An example will illustrate:

If the number of automotive firms were multiplied, let us say, by 2, 3, or 4, it is entirely possible that price structure, the number and nature of automobiles produced, the innovations in the industry with respect to technology and design, the relations between employers and employees as well as between governmental administrative bodies and firms would be quite different from the present situation. Different structure would create different tensions and stresses in the society, so that the hierarchy of values achieved and their relative emphasis would be different in the differing circumstances.

From the viewpoint of the neutral observer, the goals of consumers and the society are arbitrarily set, if somewhat subject to advertising, to dissemination of technical information and the vagaries of public sentiment and wants. For the moment, let us assume that the private and public emphases given to the goal and structure are constant. We then can provide the static goal structure--the aims of activity socially defined--into two major classifications. The first we may call economic or welfare considerations, or the market-welfare considerations. The second set of

activities we may describe as "externalities."

The first category requires no special definition. We must hasten to add that although definition of market effectiveness or consumer-market welfare is easy to grasp as a general concept, the intricacies are many, and trade-offs--giving up parts of some benefits to secure others--are a common occurrence; for example, price rises are traded off against sales or employment, technology against cost, etc.

Externalities as a bundle of activities is more difficult to grasp. By externalities we mean those effects of the economic process which occur without the recipient of the effects wanting them, asking for them, or paying for them. They are used in the market system. Furthermore, the firm which in its operation provides the external effects because of technology or cost considerations typically does not desire to create a given externality, e.g., smoke or smell.

Market-Consumer Welfare

The following discussion, the reader is reminded, continues on a conceptual plane. We shall attempt to list some of the ideal, hence unreal, but suggestive conditions of efficiency and effectiveness in the market place with respect to economic activity. As we shall see, many or at least some of the goals or ideals of economic activity are contradictory or not congruent with other ideals or goals. Some do not always apply to any particular industry (the automotive industry in this case); some may at different times in history have higher or lower priorities and significance

in the value system of a society than at other times. In essence these goals or ideals represent a yardstick against which to measure economic behavior. They in themselves are not measured, nor are they always mensurate.

The truth is that the real world is bigger and more complicated than the economic world, even though economics play a great part in reality. The real world is a complex of economic, social, esthetic, and political values.

The goals or ideals which one ascribes to an economic system because it is part of a large, often unstable social system are extremely difficult to define and unlikely to retain the same relative importance through time or under different social circumstances. The issues and considerations of externalities and constraints are additions to the pure social considerations of price, quantity, and technological innovations of the market. Such noneconomic considerations are conditioned by, and sensitive to, economic activity but are not themselves economic.

A few examples will suffice to indicate the nature of externalities required of an economic system. Economic security in the sense of the assuredness of income and the assuredness of job availability is a prime consideration and quite independent of any discussion of the business cycle or a business fluctuation. There is something essentially improper in unemployment affecting a person whose decision-making role, whether or not he is employed, is often effectively zero. Yet, the economic system has, in a sense, the goal or ideal of supplying jobs for people.

Similarly, the ideal that people should be able to be potentially socially mobile as well as potentially geographically mobile is an important one. Theology as well as political theory makes much of the perfectibility of mankind which is the realization of social mobility, although not necessarily of income redistribution. Such redistribution is, indeed, a justification of public school systems, or at least a partial justification for school systems, in that each person should have the right to develop his capacity to the utmost. Such development is (ideally) assumed satisfying to him and somehow believed to be satisfying to society, provided his capacities are within some definition of the socially acceptable. Yet this takes some economic doing, including accumulating capital, developing technology, matching people to jobs, etc. Closely related to social mobility as a social activity is the notion of equality of opportunity. Both individuals and agglomerations of individuals, as a matter of public value, should (ideally) be given the opportunity--within certain rather poorly defined constraints often having to do with "natural" abilities--to compete on an equal basis with others in the system. The tax, education, segregation, and political implications are enormous, and sometimes appear insoluble.

In its operation as an ideal, the economic system should not exploit the environment. Pollution must be avoided, the balance of nature maintained, esthetics given their due. Those supplying disbenefits to the society as externalities should be charged in some fashion, and by such charge be forced to stop negative externalities, or at least pay damages, as it were, for these externalities.

On the other hand, relatively little has been said about the firm or industry providing positive externalities and being recompensed for them. The notion of a firm or an industry providing positive externalities is more or less assumed to be part of the social structure and incidental to the operation of the firm or industry. Indeed, it is sometimes implied that positive externalities also provide offsets in the form of positive benefits to the firm or industry in question. This is, of course, an implied assumption which may or may not have validity in any particular case.

1. Resources are optimally allocated. This means that, given the conditions of demand, the scarce factors of supply (land, capital, cost, and management) are so allocated that changing their use would result in a decline in total income. Put another way, the yield for each factor, at the margin, is equal to its cost.
2. As a result of this ideal, allocation of scarce factors of production, costs, and prices is equal, treating profits as a necessary residual to ownership. Furthermore, the value of output for the whole society is, given the conditions of demand, maximized.
3. Factors of production automatically flow to their most effective use, and so changing demand conditions are satisfied. Furthermore, technology is introduced as it makes the use of factors of production more effective, in the fashion described above in 1 and 2.

The necessary conditions for such factor use and income maximization are the familiar ones of pure and perfect competition. Entry and exit of firms are unhindered and costless; products in a given market, either factor or final, are homogeneous; the number of buyers and sellers is so large that no individual can affect price by his behavior. In other words, buyers and sellers, by their individual actions, are not sufficiently important to make any difference to quantities of goods

and services offered for sale or demanded. Also buyers and sellers have full information about the market, and full and free mobility to move.

Diminishing returns operate so that along with changes in demand and limitations on technology, costs of productions in any market tend to fall for some range of output, but for the relevant range, tend to rise. Thus average costs are U-shaped, or bowl-shaped.

Externalities are considered as neutral or, more accurately, are not considered in the bare bones of theory.

In brief, economic activity is assumed to be activity to which values not only can be ascribed but are ascribed. All exchanges are assumed to be monetized or monetizable. The market does not fail. Again, this is an assumption which may have some conceptual, analytical value but certainly has no perceptual validity. Nor, as a general rule, is it a unique guide to firms or public policy.

Closely related to the notion that all economic activity falls under the exchange institutions of the market is that economic activity should not be of such a nature as to make untoward demands on government or individuals. The government ideally is assumed to be neutral in economic matters, or where it does intervene its intervention only helps some individual or group but never adversely affects other individuals or groups (the Pareto ideal). This obviously is a most unlikely situation in a world of scarce resources and in a world in which firms and individuals are competing against other firms and individuals for both resources and consumer income.

What we have left out

In the preceding discussion of markets and externalities as ideals we have consciously ruled out the notion of collusive activity in the market place. That is to say, we have assumed that competition of one sort or another exists regardless of whether it is pure or perfect or some degree of imperfect competition. Collusive activity--e.g., the sharing of markets and the fixing of prices--in brief, unacknowledged or secret mutual or joint decision making by firms--is ruled out as conspiracy or as per se violation of the ethics and law of any kind of competitive market system. Yet absence of collusion doesn't rule out the consideration that in an imperfect competitive market, that is, a market of an autonomous industry, some firms might follow the price leadership of other firms; nor does it necessarily rule out consideration of price leadership as socially undesirable.

An example will indicate what we mean. Suppose there are a small number of firms in an industry, but one firm is much larger than the rest. If the cost functions of the firms are approximately similar, but if these firms also enjoy (or suffer from) some unused capacity, it is conceivable that the smaller firms will not cut their prices below the price of the larger firm. If they did, the larger firm would in turn cut its price, with disastrous effects on the smaller firms. Few would argue that this is socially desirable, since in the ensuing reorganization of the industry there might result only a single firm, with all the dangers of monopoly. Of course the assumed conditions of pure and perfect competition have been assumed away in this discussion.

On the other hand, let us suppose that the firms follow the price leadership, and as a result of doing so the smaller firms sell rather less of their product than if they did not follow the price leadership. While the competitive position of the smaller firms might be reduced, it does not necessarily follow that the consumer is worse off. The consumer might buy from a different producer if the price structure changed, but by our assumption the firms produce homogeneous products or approximately homogeneous products. It makes relatively little difference to the consumers whose product they consume, since their welfare is not especially affected. The welfare of the several competitors might be adversely or beneficially affected by price leadership or constant deviation from price leadership. Divestiture of the largest firm would solve no problem, since the industry would continue to have overcapacity. Indeed divestiture might lead to price instability (a price war) with uncertain results as to monopoly or price fixing on a grand scale. This raises a rather significant point, the question of whose ox is being gored, the consumer's or the producer's. As a social matter the interests of producers and consumers are not always consonant, just as other considerations of market and of externalities are not always congruent and complementary.

Like virtually all industries in the United States and other industrialized countries, the automotive industry does not meet the conditions of pure and perfect competition which, as we previously indicated, is a

conceptual limit rather than a conception based upon perceptions of reality. Indeed, one may ask the question whether the conceptions of pure and perfect competition are very helpful in analyzing the problems in industrial organization, structure, and behavior. That some economic theorists can move from pure and perfect competition to the realities of industrial structures and behavior is to their credit; and, insofar as a simplification such as pure and perfect competition is analytically useful, it has a role to play. Our feeling is that in discussing an industry like the automotive industry, or any autonomous industry, pure and perfect competition is simply irrelevant as a model and may lead one astray in analyzing the achievement of the complex economic and social goals which we have posited for industry. We hasten to add that the goals we have posited are not uniquely suggested by the present writers. The types of economic and social goals we have suggested are despite all their contradictions and tensions, nevertheless generally agreed upon in nature, if not in the specifics we have mentioned. Indeed, the number of goals could easily be increased.

Competition and Performance

In our consideration of the automotive industry, we assume that the production process ranges from suppliers of automotive parts and components through the design and manufacture activity to distribution. The industry is viewed as autonomous, which is to say, competitive but not perfectly competitive.

One may ask why, if the study concerns itself with suppliers of automotive parts, it does not go back to those who supply resources. The answer is, of necessity, arbitrary, and we have arbitrarily decided to start with suppliers of automotive parts. The suppliers of resources or the suppliers of goods and services to the auto industry as well as to other industries are subject to market forces different from those that affect firms primarily concerned with automotive activity. Firms in the automotive industry are not significant producers of nonautomotive products, in the light of their automotive income, commitments, and employment. With the possible exceptions of the diesel locomotive industry, the firms in the automotive industry are not significant producers of products other than those which they manufacture. Therefore, in a pragmatic sense the automotive industry is fairly "clean" from the statistical viewpoint. Where the firms in the auto industry do supply products not considered usually automotive, e.g., steel, diesel automotives, cooling equipment, certain military items, the activity of the industry can scarcely be considered of major significance in these nonautomotive activities.

Structure vs. Performance

Leaving out curiosity as a motive (though it is a grand and wonderful one), scholars often study industrial organization to determine the performance of an industry. The performance they are concerned with is to be found in the two great pools of market-consumer welfare and externalities we have outlined above. We remind the reader that we are still

at the conceptual stage, but here we have refined our conceptions to rule out the study of an industry for the sake of learning about it as a whole. We limit ourselves to the study of the industry to learn about its performance.

Two schools of thought have emerged in the United States with respect to performance. The first is what we will call the structural or competition school (normally it is referred to as structural). This school of thought argues that the greater the number of competitors, the more likely it is that economic and social goals will be achieved. Now, of course, the sheer number of competitors is too simple a test. The structuralists will study the degree of concentration in terms of employment, output or assets, the relation of manufacturers to suppliers, the degree of price leadership, and the merger activities or asset acquisition activities of several firms. As its name implies, the elements in the industrial technical makeup and organization of the industry are studied by the structuralists. The purpose of each study--remembering that we are not concerned with academic curiosity or knowledge for its own sake but only with performance--is to ascertain whether or not economic power is concerned or dispersed, whether or not there are arbitrary and artificial barriers to entry, whether or not the potential sharing of the market among a great number of competitors is or is not achieved.

The essence of the argument is that if the number, strength, and size of competitors are less than they possibly could be, performance is less than it might have been:

Of all sad words of tongue or pen
the saddest of these, "It might have been."

If, on the other hand, the number and relative size of the competitors is about what one could reasonably expect, then the performance of the industry is about what one could expect.

The structuralist point of view has long been dominant in American economic theorizing, and in many of the court decisions. The consumer is considered to benefit, since competitors are given a relatively free range of action. Performance flows from the competitive nature of competitors. Again we are, of course, ruling out collusive activity, although the courts and economists have made great use of such collusive activity as exists, citing it as proof that competitors are not acting like competitors, but acting rather like joint conspirators.

The other approach which is gaining acceptance by American economists and, one hopes, among American jurists and lawyers as well is the performance aspect. Test of performance is performance rather than structure. Those concerned with performance, of course, are concerned with structure, because structure does have a bearing on performance. But a given structure is not necessarily correlated with a given level of performance; nor is any degree of performance related uniquely to a given kind of structure. The performance economist picks out the various, relevant economic and social goals and examines how well they have been met and whether different structures would have been achieved better or lesser results in performance. The ideals of performance are the ideals of the market and of society as understood by the researchers and analysts. The performance approach, as opposed to the competitor or structural approach, does not make the assumption--which we consider an almost fatal assumption--that structure is predictive of performance. The performance of agriculture, which certainly is a competitive industry from the viewpoint of structure, has been remarkably

bad. Performance of the coal-mining industry is competitive and has been remarkably bad. It is not at all clear that when there were thirty or more firms in the automotive industry its performance was better than it is at the present with four major firms. Servan-Schreiber, the French publicist and social critic, finds that the structure of American industry, although relatively highly concentrated, has a performance record which far outshines that of Europe, which is also concentrated but on a smaller scale. Indeed, American industry is supposed to be the envy of industry of the world from the viewpoint of performance, and yet its structure is, in general, concentrated.

Generalizations about the relation between the degree of competition as measured by the number and relative strength of competitors are not only unpredictable of performance, but precious little data exist which accurately define the number and relative strength of competitors and their behavior. Firms have a way of not conforming to statistical categories. The automobile industry is statistically moderately clean. But what about the steel industry? Firms making basic steel make other steel products--such as shapes and forms, and many fabricated and semi-fabricated products--and may even be extremely important in the latter industries. Yet, since a major part of their activity is making basic steel they are classified as basic steel. Firms which derive the greatest part of their income from tires and tubes make up a host of other products; and in those markets they are extremely important. The other products are not at all competitive with tires and tubes but simply use rubber in their manufacture. Such firms are classified as tire and tube firms, or as rubber firms, depending on the fineness of the digital-class need. Often firms in a given classification make products unrelated to their "basic" output.

In this monograph we do not assert that structure is unimportant or irrelevant. We simply assert that structure is significant if one is discussing performance only insofar as it can be shown to affect performance, but that there is no necessary relation between structure and performance.

Trade-offs

The performance approach requires that the analyst consider both the market goals and the goals in the pool of externalities. Trade-offs between market and other considerations are an external part of social policy. An example will illustrate what is meant. Technical innovations cost money and are therefore a cost of production. A great deal of technical innovation is undertaken by a firm. In the short run, at least, the costs of that firm rise and prices therefore rise. There is a trade-off which a firm has made between technical innovations and price. The performance analyst must understand and consider this trade-off rather than treating price as a unique category and technical innovation as another unique category. But stability of employment or economic security is also traded off against other costs, possibly even against technical innovation. Price, quality, innovation, mobility, security, opportunity--all represent elements which have a claim on the income and energy of the firm, and somehow an adjustment is made by the firm in allocating its scarce resources and energies. The analysis and ultimately the evaluation of such trade-offs become the major concern of any performance analysis, instead of the performance analyst's having a preconceived set of values arranged in some hierarchical listing against which the action and behavior of the firm are measured.

Trade-offs are necessary because of the contradictory nature and incompatibility of the results of some courses of action by the firm. Goals are always competing with each other, because each course of action requires the limited energy and resources of the firm to be expended to achieve the goals in question. Therefore the performance criteria become, in a sense, value judgments rather than absolutes. To the degree that the analyst understands the market, the social requirements, and goals, his value judgments are likely to be in accord with social values. To the extent that his value judgments are peculiar and unique to him, performance criteria are not necessarily good guides to judgment. But they might very well be, because his conception of appropriate or inappropriate behavior may be more sophisticated; and ultimately they may be more socially desirable once such goals are made known to the social leaders and makers of public opinion. The role of the intellectual in value formation is too well known to require discussion.

There is little reason to believe that a choice among alternative market structures does not involve a series of trade-off decisions as well. This is particularly true when it is recognized that noneconomic objectives motivate individuals as much as if not more than purely economic ones when it is realized that externalities are an inherent feature of any economic system.

Factor (Resource) Mobility

Deeply interwoven into the theory of atomistic market structures, but often not teased out by analysis, is the concept of factor (land, labor,

capital, talent) mobility. Indeed, this is the crux of the whole theory. It assumes that labor, and by labor we mean individuals, will and can seek employment in those occupations and geographical areas where wages are highest. It assumes that capital will and can flow into uses and regions offering the highest return. It assumes that knowledge of these opportunities is widely disseminated. It is through this process that the objective of factor price equalization is achieved and the price of a product or service minimized and also equated at the margin.

Obviously, the question is: does this actually occur under an atomistic market structure, and if it does do we as a society want it to?

Charles P. Kindleberger, in discussing the growth of the national corporation in the United States during the nineteenth century, notes that:

The use of the national corporation provided a new institution alongside the imperfect factor market, which worked toward factor-price equalization, and economic efficiency. Where capital failed to move easily to other cities, national corporations established financial offices and raised capital in New York. Where labor failed to move to the high wage areas in the north and east, corporations brought capital to labor in the south and west...owing to the immobility of labor and land and to barriers to the full movement of capital. Factor markets by themselves were inadequate to produce the efficient optimum implied by equality of factor prices. The national corporation provided an economic institution, unforeseen by the classical economists, which, while it carried the threat of monopoly, brought the United States closer to the classic competitive world. To achieve this result it may have been necessary to maintain a strong antitrust movement to ward off the evils of monopoly while moving toward the

blessings of greater factor mobility.¹

The Structuralist-Performance Debate

Galbraith, among others, has chided those who maintain that the present level and mix of output can be maintained under a market-dominated economic structure comprised of a large number of firms.

He notes that:

The modern large corporation and the modern apparatus of socialist planning are variant accommodations to the same need. It is open to every freeborn man to dislike this accommodation. But he must direct his attack to the cause. He must not ask that jet aircraft, nuclear power plants or even the modern automobile in its modern volume be produced by firms that are subject to unfixed prices and unmanaged demand. He must ask instead that they not be produced.²

Yet, in essence, this is what the structuralist-performance debate is all about. It breaks down into corporate control, or escape from the market, and market control over the corporation.

The structuralist position is attuned to the latter control. Its goal is to enforce the discipline of the market upon corporate entities and prevent individual units from influencing the market. This, of course, is quite possible. One merely increases the number of firms. The implicit

1
Charles P. Kindleberger, American Business Abroad (New Haven, Conn.: Yale University Press, 1969), p. 34.

2
John Kenneth Galbraith, op. cit., p. 44. The present authors accept the wording of Galbraith, e.g., "apparatus of socialist planning," and "unmanaged demand" as attempts by that fluent author to attract and hold his reader's attention. This approach may lead to exaggeration in the minds of the unwary reader.

assumption, rooted in the aforementioned traditional economic theory, is that performance will improve. This means that prices will fall, output will increase, and resources will be optimally allocated.

In contrast, the performance school questions the realism of the assumptions which underlie the structuralists' position and which lead them to conclude that performance, as defined above, will improve. Instead, the emphasis is directed toward measuring the performances of a structure in achieving preselected goals. At the risk of oversimplification, it may be said that the structuralists attach an unchanging value to an abstract market structure hierarchy. In contrast, the performance school accepts no unique hierarchy but rather a hierarchy of goals determined by the community to which a structure which most adequately attains these goals is instituted. If the goals can best be achieved by an atomistic market structure, the performance school would fully accept this arrangement. If they cannot, however, enforcing this type of situation is deemed irrational.³

Conflicts

Assuming that the structuralist school automatically accepts the ideal norm of an atomistic market, and the performance school would accept this norm if it proved best suited to attaining the objectives of the community, there would be no conflict if such a situation was indeed the case. The

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A great deal of literature exists concerning these two schools and anything between and outside them. Two articles which summarize the issues in terms of antitrust laws and policy are Charles E. Mueller, "The New Antitrust-- A 'Structural' Approach," Antitrust Law and Economics (Winter, 1967), pp. 87-103, and Robert L. Knox, "Workable Competition and Public Policy," Antitrust Law and Economics (Spring, 1968), pp. 41-80.

dispute, then, once the community goals have been set,⁴ resolves around two issues.

The first is what or what does not constitute a close approximation to the theoretical norm. The second is whether the theory or mythology conforms to the reality or the experience of the day, and not to a distant past or an obsolete or perhaps slightly frayed intellectual philosophy.

Three major conflicts between theory and reality have already been mentioned: economies of scale, factor mobility, and nonmonetization of resource use or misuse (externalities). To these may be added the concepts of risk, technology, organization, and planning.

Numerous definitions have been attributed to the concept of risk. Popularly, it is associated with the probability of success or failure. A more adequate definition is that risk is the variation around a central tendency. It is the variation of risk and, even more, the implication of this variation that is important. If all real factors of production were completely mobile and divisible, and if they adjusted instantaneously to shifts in demand, then the incidence of risk would be reduced, and hence its range (variable) would fall. The significance of risk would be less important than if these conditions were not met.

4

This, in itself, is no easy task, and it explains why we do not begin to attempt any normative ranking of goals. Three positions emerge here. The first is that economic performance from the consumer's perspective should be the sole evaluation criterion of market structures. The second is that social structure criteria should be the determining evaluation factors of market structure. And the third, of course, is a conglomeration of both of the first two. See O.E. Williamson, "Allocative Efficiency and the Limits of Antitrust," American Economic Review (May, 1969).

For example, if the factors--plant, equipment, labor--required to product jet aircraft were well suited to the production of steel or some other item and were instananeously capable of being shifted to such production, then a shift in the demand for jet aircraft to some other product would not be as serious as if these factors had no such capability and remained idle.

Second, the significance of this variation for each firm depends upon its ability to survive the variation or experience deviating from the central tendency. A \$1 million miscalculation or variance from central tendency is substantially more important to a firm with sales of \$2 million than it is to a firm with sales of \$2 billion.

This seemingly obvious statement contains two important implications. The first is the probability of success necessary for entry or production of the product, and the second is the risk aversion bias that enters into the required rate of return. It may well be that large firms are necessary in order to implement innovation or meet demands for highly cyclical products requiring huge capital outlays for plant, equipment, etc. It may well be also that the risk aversion premium for these firms is smaller than for other firms with respect to this particular type of investment.

Technology, organization, and planning are all interwoven into this concept of risk and the implications of its ever occurring. The distinction between the probability that an event will occur and what its occurrence means is subtle yet crucial to an understanding of concentration or bigness; and it may well account for the motivation towards vertical integration and its continual emphasis in planning and organization. There are other explanations

for planning besides that which views corporate planning as dictating the market, although the two may well exist currently.

Often cited as evidence of larger than necessary corporate entities-- and hence proof that technology does not require firms the size of General Motors, Ford, or Chrysler--are engineering studies which conclude that either manufacturing economies of scale can be obtained from smaller plants, or present operations exceed the minimal size necessary to achieve the economies.⁵ For these economies to be obtained, however, the plants must be built. Furthermore, they must be in operation, and they must operate at or beyond the level required to achieve the savings attributed to volume and the spreading of capital costs.

The other major area of conflict between the structuralists and the performance school emanates from disagreements over two questions. What constitutes the relevant product and geographic markets? and what constitutes a close approximation to the behavior predicted under an atomistic market structure?

The definition of the relevant product and geographic markets is crucial for the application of the structuralists' theory. One of the underlying assumptions of the atomistic market structure theory was that products were identical. Since the assumption is completely unrealistic,

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See Joe S. Bain, Industrial Organization (New York: John Wiley & Sons, 1968), pp. 189-200.

at least among consumer durables, even the structuralist must depart from pure theory at this point. Now the question is no longer whether or not to depart, but by how much. Is the product a service transportation? Is it an array of consumer durables? Is it an array of luxury expenditures?

It is not inconceivable that this broad definition of product and geographic markets is the more idealistic one. If this hypothesis is correct, the performances of large-scale industrial units would not differ greatly from the market behavior hypothesized by the atomistic market structure theory.

The fundamental question is whether alternative market structures in the automotive industry will exhibit differences in performances with respect to the attainment of the above goals. The next question is then, can a given structure be modified through external constraints to achieve these goals better?

The Path of Analysis

Prior to discussing the market behavior and other aspects of the auto industry's performance, an examination of the techniques used to measure concentration, profitability, and economies of scale is undertaken. The objective of this examination is to clarify precisely what these techniques and statistics say and do not say with respect to the performance of an industry.

From here the discussion moves on to a consideration of the vertical aspects of concentration and the implications of size and vertical

integration for the remainder of the industry as well as for the consumer and the community in general.

This is followed by an analysis of the automobile manufacturers' behavior in the end-product market. Emphasis is directed toward the industry's performance with respect to meeting changing consumer demand through its product policy.

The fifth chapter examines the externalities inherent in alternative market structures. Particular attention is focused on the automotive industry as it exists at present and its relationship to the overall goals of the community.

We have arbitrarily chosen two sets of goals as ideals in performance. One set is market oriented, the other consists of externalities.

A. Market goals

1. Reasonableness (a surrogate for minimization) of product price, as a policy consideration
2. Reasonableness (a surrogate for maximization) of output as a policy consideration
3. Responsiveness to consumer demand, including dissemination of appropriate and adequate information
4. The use and creation of new and effective technologies
5. Concern with interests of owners and employees

B. Externalities (nonmarket goals)

1. Opportunity for new entrants into the industry
2. Opportunity for upward mobility of industrial personnel
3. Stability of employment and output

4. Conversion of resources and minimization of untoward (dysfunctional) externalities
5. Observance of the letter and spirit of public policy

Together these goals are a large part of what we may consider the public and consumer welfare.

Our argument is ultimately concerned with the possibility of feasible market structures other than the existing one. We believe this affords a gateway to studying the automotive industry in more detail and with a greater empirical base of alternative performance possibilities.

CHAPTER II

PRICES, PRODUCTIVE EFFICIENCY, AND PROFITS

Introduction

Traditionally a great social concern regarding the performance of firms in concentrated industries is with the level of output and prices. Quality is less easy to analyze than prices and production, which are quantifiable variables and hence easier to manipulate operationally. The price-output case of a pure monopolist is most easily understood. By restricting output below competitive levels, the monopolist can cause the price of his product to rise and thereby increase his total profit, given certain conditions of demand elasticity. The lower output and higher price provide the consumer of the product with the option of either paying the higher price or choosing a less useful or desirable substitute. Thus, the monopolist makes his profit by forcing the consumer to accept less for his dollar than would be true in a competitive situation. Not only is the distribution of purchase power distorted from the competitive, efficient ideal, but the allocation of resources in the economy is similarly distorted.

The monopolist (total or quasi) can protect--and improve--his position in two ways. He can erect barriers which prevent or increase the cost of introducing substitute products, thus countering the attraction to potential competitors. Alternatively, if he is a quasi-monopolist, he may induce his rivals also to restrict the supply of their substitutable products.

Profit, of course, is a driving force of a free enterprise economic system. In particular, the hope of at least temporary monopolistic profits motivates each firm's attempts to develop a product that will prove more desirable to the consumer. Thus, each successful entrepreneur may be (or hopes to be) a monopolist for a time, because of the brief uniqueness of his product. It is not the profits of this short-run monopolistic kind, or even persistent profits due to a sequence of successful innovations, that runs counter to the free enterprise system, but rather profits artificially sustained through the use of barriers to entry or collusive agreements.

In our society it is difficult to maintain effective explicit agreements to limit output or restrict alternatives. Such overt infractions are always subject to legal action and may even fail because of inability to secure interfirm compliance when such is required for a successful, artificial restriction on new entry. However, in a highly concentrated industry in which each firm anticipates to some extent the output and innovation decisions of its rivals, restriction of output and limitation of alternatives may occur without explicit agreement. Indeed, economic reasoning yields little that is definitive about the behavior of rivals in these circumstances. But, other things being equal, we should certainly prefer less concentration as a matter of policy. Other things are not always equal, however.

In this chapter, we shall consider the relation between industrial structure and price performance. In the context of the automotive industry, we will examine two basic questions: First, the relation between productive efficiency and industrial structure, and second, profit as a measure of competitive performance.

Level of Prices

Two rather naive approaches may be taken to studying the level of automotive prices. The first is to compare auto prices to the prices of other products which compete for the consumer's dollar. The other is to estimate the effect of entry barriers on automotive prices, assuming that automotive firms collude to maximize total industry profits.

The most common means for a comparison of prices are the indexes prepared by the Bureau of Labor Statistics. Tables 2.1 and 2.2 show these price indexes, both wholesale and retail, for a few selected product categories over the period of 1958-68. Automobile prices in such indexes fare quite well in comparison with the others, household appliances being the only category consistently lower at both wholesale and retail levels. Similar figures were presented at the 1969 Senate hearings by Thomas C. Mann, President of the Automobile Manufacturers Association, as evidence of competition in automobile pricing. He testified:

Ultimately, competition in price or in anything else is of value because of what it does for the consumer....The price index for new cars is among the lowest of the major components of the index. If I may ad-lib here and say that I think a great many of the problems of the dealers are the same that the manufacturers have, namely, a very, very intense competition and low margins of profit per unit.

While the accuracy of such price indexes may be questioned on several counts, we are more concerned with their relevance to price performance. The point was made by Dr. Mark B. Schupack in his comments at the

Table 2.1

| Year | Motor Vehicles and Equipment | Motor Vehicles | Household Appliances | Other Household Durables | Machinery and Equipment | Metals and Metal Products | Petroleum Products | Appliances | Processed Food & Feeds | Steel |
|------|------------------------------|----------------|----------------------|--------------------------|-------------------------|---------------------------|--------------------|------------|------------------------|-------|
| 1958 | 100.3 | 100.3 | 99.8 | 100.8 | 100.0 | 99.1 | 97.0 | 99.7 | 102.5 | 99.9 |
| 1959 | 102.5 | 102.5 | 99.7 | 102.1 | 102.1 | 101.2 | 96.5 | 100.4 | 99.9 | 101.8 |
| 1960 | 101.0 | 101.0 | 97.0 | 104.3 | 102.9 | 101.3 | 97.6 | 101.3 | 100.0 | 100.6 |
| 1961 | 100.8 | 100.6 | 95.2 | 104.1 | 102.9 | 100.7 | 99.3 | 101.0 | 101.6 | 100. |
| 1962 | 100.8 | 99.8 | 94.0 | 105.9 | 102.9 | 100.0 | 98.2 | 101.5 | 102.7 | 99. |
| 1963 | 100.0 | 99.0 | 91.8 | 106.3 | 103.1 | 100.1 | 97.2 | 101.9 | 103.3 | 99.1 |
| 1964 | 100.5 | 98.8 | 91.3 | 107.6 | 103.8 | 102.8 | 92.7 | 102.8 | 103.1 | 100.5 |
| 1965 | 100.7 | 98.4 | 89.2 | 108.9 | 105.0 | 105.7 | 95.9 | 103.7 | 106.7 | 101.6 |
| 1966 | 100.8 | 97.8 | 89.1 | 111.6 | 108.2 | 108.3 | 99.5 | 105.0 | 113.0 | 102.5 |
| 1967 | 102.2 | 98.8 | 90.2 | 116.9 | 111.8 | 109.6 | 102.2 | 106.8 | 111.7 | 103.6 |
| 1968 | 104.9 | 101.0 | 92.2 | 124.9 | 115.2 | 112.4 | 100.3 | 110.3 | 114.1 | 105.5 |

Source: Bureau of Labor Statistics Handbook, 1969, Table 117 "Wholesale Price Index Annual Average," p. 313.

Table 2.2

(1957-59 = 100)

| Year | All Items | Food | Housing | Apparel and Upkeep | Transportation | Medical Care | Autos * (New) | Appliances* |
|------|-----------|-------|---------|--------------------|----------------|--------------|---------------|-------------|
| 1958 | 100.7 | 101.9 | 100.2 | 99.8 | 99.7 | 100.1 | 99.6 | 99.4 |
| 1959 | 101.5 | 100.3 | 101.3 | 100.6 | 103.8 | 104.4 | 103.9 | 99.5 |
| 1960 | 103.1 | 101.4 | 103.1 | 102.2 | 103.8 | 108.1 | 102.5 | 98.8 |
| 1961 | 104.2 | 102.6 | 103.9 | 103.0 | 105.0 | 111.3 | 102.5 | 96.5 |
| 1962 | 105.4 | 103.6 | 104.8 | 103.6 | 107.2 | 114.2 | 102.1 | 93.5 |
| 1963 | 106.7 | 105.1 | 106.0 | 104.8 | 107.8 | 117.0 | 101.5 | 91.5 |
| 1964 | 108.1 | 106.4 | 107.2 | 105.7 | 109.3 | 119.4 | 101.2 | 90.0 |
| 1965 | 109.9 | 108.8 | 108.5 | 106.8 | 111.1 | 122.3 | 99.0 | 87.1 |
| 1966 | 113.1 | 114.2 | 111.1 | 109.6 | 112.7 | 127.7 | 97.2 | 84.4 |
| 1967 | 116.3 | 115.2 | 114.3 | 114.0 | 115.9 | 136.7 | 98.1 | 83.8 |
| 1968 | 121.2 | 119.3 | 119.1 | 120.1 | 119.6 | 145.0 | 100.8 | 84.8 |

Source: Bureau of Labor Statistics Handbook, 1969, Table 109 - "Consumer Price Index; All Items and Major Groups, U.S. City
 range," p.283.

Source: Table 114 (1.294).

Senate hearings of the preceding year:

Prices of automobiles have declined relative to the consumer index. This may represent price declines due to competition, but it may also represent declines due to the particular capital-labor combinations used in the production of automobiles. Auto production is very capital intensive. Costs for capital equipment may have been going down recently due to technological improvements in the machines and the machinery industry. This will greatly increase labor productivity and call for a price decline. The question is would the prices have gone down even further had there been different competitive conditions in the auto industry.

The potential effect on automotive prices of noncompetitive conditions in the industry can be calculated from estimates of the strength of entry barriers and of the industry price elasticity representing the relation between changes in output and the prices set.

The entry barrier may be measured and hence evaluated by the size that a new firm must attain for success. While this is closely related to the question of economies of scale, which we will deal with later on, for present purposes we will accept Lawrence White's estimate that an annual output of 400,000 units is required of an automotive firm. Other estimates range from 200,000 units to 600,000 units.¹ It may be assumed that the firms of the automotive industry, even if acting in complete collusion for total profit

1

Lawrence White, "The American Automobile Industry in the Postwar Period," unpublished Ph.D. thesis, Harvard University, 1969. Also see Joe Bain, Barriers to New Competition (Cambridge, Mass.: Harvard University Press, 1956), pp. 244-45; or Administered Prices: Automobiles, Report, together with Individual Views of the Subcommittee on Antitrust and Monopoly of the Committee of the Judiciary, U.S. Senate, 85th Cong., 2d Sess., Nov. 1, 1958 (Washington, D.C.: Government Printing Office, 1958), pp. 13-16.

maximization, would not restrict output below this entry condition, given the likely level and elasticity of demand.² The effect of an industry's restricting output by 400,000 units, about 5 per cent, can be calculated from the price elasticity of industry demand. Estimates of this range from -.6 to -1.5.³ Conservatively using the figure -2.0, a 5 per cent reduction in output would produce a 2.5 per cent increase in prices, about \$71.00 for the average 1968 car. This figure may or may not be considered excessive, depending upon one's viewpoint. It is here suggested as an upper limit, calculated under idealistic assumptions regarding joint profit maximization resulting from keeping one new competitor of the smallest

2

Automobiles and trucks require forward and backward linkages, e.g., roads, service stations, social connections, etc. This distinguishes them from, say, diamonds or antiques, whose value is almost entirely determined by society.

3

The elasticities reported are average figures. Point elasticity at high output will be higher than average, and it is for this reason that we consider -2.0 conservative. For a list of the studies of demand for new automobiles and a summary of the findings, see: Lawrence J. White, "The American Automobile Industry in the Post War Period," unpublished Ph.D. thesis, Harvard University, 1969, p. 134.

reasonable size out of the market. Most important, as with comparisons of price indexes, the discussion neglects the effect of industry conditions on productive cost.⁴

4

A different way of calculating the potential price effect of noncompetitive structure within the industry is to consider the difference between actual profits in the industry and what may be considered normal. Average annual return on assets (net income before taxes, plus interest divided by book value of total assets) for the four major producers during 1960-1969 was 21%. If, for example, 15% is considered to be normal, then the remaining 6% might be attributed to noncompetitive conditions. This amounts to about \$103 per car.

Not only does this approach require an assessment of normal return, but also it neglects distribution of profit among firms. A more realistic discussion along these lines will be developed later in this chapter.

Productive Efficiency and Economies of Scale

In considering the issue of price-output performance, it is important to recognize that price is the sum of cost and profit. Thus the reduction of cost may have an impact on prices, as would the control of profit. The sheer size of costs as compared to profits leads one to consider the former, in the first instance at least.

Costs are determined by a great number of characteristics of the firm, including the nature of the plant and equipment used, capacity, methods of production, skill of labor, factor prices, current technology, and the administrative organization of the firm. These and other such characteristics (exclusive of factor prices) will here be called "factors of production." The precise way in which they are organized and utilized by the firm will be called the "productive factor mix." In addition, costs are significantly influenced by the actual volume of production. Indeed, if we consider factor prices to be fixed, we may think of costs as determined by productive factor mix and volume (supply and demand).

Any firm motivated by profit will seek that factor mix which minimizes costs, although this motive may be less imperative under noncompetitive conditions. Indeed, few critics would suggest that the automotive industry has been remiss in adopting cost-reducing innovations. This is not to say that all the firms are equally successful in attaining the goal. The choice of factor combination must take into account the considerable short-run fluctuations in automotive demand. Choice of capacity, for example, must balance the high cost of underutilization during periods of low demand against lost revenues when demand is high. Thus the anticipated distribution

of demand conditions facing the firm is more important than any particular year's volume when a selection is made of relatively inflexible (fixed) productive factors. We shall use the term "efficiency" in reference to the extent that a firm is successful in achieving the optimal factor combination for its average volume.

The optimum factor mix depends upon the current state of the arts of production and management. Of greater importance for us is the fact that it also depends upon the average volume of production. Economists often speak of the minimum optimal plant size that allows the realization of all significant economies of scale.⁵ This concept is based on a rather narrow definition of the technology of production, and tends to neglect or underestimate economies of scale that might be realized in supply, administration, and distribution.

An examination of the experience of automotive firms indicates a strong positive correlation between average volume of production and the stability of demand, measured by the coefficient of variation of annual volume. Thus, increasing scale would seem to allow better utilization of productive capacity. The effect of scale may be attributed in part to the advantages of a widely diversified product line in the face of unpredictably changing consumer preferences. Related to this are economies of joint

⁵ Cf. Bain, Industrial Organization. The minimum optimal plant, the yardstick of the discussion, is a plant which, if its size were increased, would not enjoy any additional advantages in unit cost. If its size were decreased its minimum average cost would rise. The advantages of large-scale sales promotion and large-scale distribution are discussed in a fashion which is seemingly built around the minimum optimal plant.

production, supply, and distribution--all closely related in the automobile industry. For these and other reasons we believe it necessary to study the operations of the entire firm in analyzing economies of scale.

In many industries it is necessary to strike a balance between cost-reducing economies associated with large-scale firms and the competitive pressures on profits generated by many smaller-scale firms in a less concentrated industrial structure. Arthur Burns makes this point in discussing the effectiveness of the antitrust laws as based on economic theory. He states that:

...theory is internally contradictory in some instances: The lowest cost may be achieved only by firms so large that they are too few to behave competitively. The choice must be made between (1) firms of the most efficient size but operating under conditions where there is inadequate pressure to compel the firms to be efficient and pass on to the consumers the benefits of efficiency and (2) a system in which the firms are numerous enough to be competitive but too small to be efficient. ⁶

The Economics of Costs and Returns

In discussing the economics of costs and returns, it is customary to assume that the cost function in its relevant range is rising. Probably because of the ease and persuasiveness it gives to teaching and abstract analysis, this conception has become encrusted with the sanctity of

6

Arnold Truman, Arthur R. Burns, et. al., "The Effectiveness of the Antitrust Laws," in Edwin Mansfield, Monopoly, Power, and Economic Performance (New York: W.W. Norton & Co., Inc., 1964), p.129.

convention. Yet, as early as 1926, Peiro Sraffa⁷ in his "The Laws of Returns under Competitive Conditions" built a strong case for the realism of an economics of decreasing costs or an economics of disequilibrium. Most economists today would agree that there is, in fact, a compelling case for the consideration of decreasing cost implications for many industries.

Sraffa stressed consumers' industries. His language and reasoning are somewhat tortured, but the thrust of the argument is clear. He attacked the notion of the fixity of a factor that is necessary before diminishing physical returns or increasing of costs can obtain. He brought in the question of external economies, which arise because of the actions of a whole industry. They are subsequently reflected in lower (or changing) costs for a particular firm within that industry. He concluded a section of his argument by saying, "It is necessary, therefore, to abandon the path of free competition and turn in the opposite direction, namely, towards monopoly."⁸

7

Peiro Sraffa, "Laws of Returns under Competitive Conditions," Economic Journal (Dec., 1926), pp. 535-50.

8

Ibid.

Inadequacies of Statistical Cost Analysis

Statistical estimation of economies of scale has been discussed in detail by Johnston.⁹ One basic approach in the estimation of optimal scale is to analyze a particular firm's cost of production as its scale has varied through time. Observed costs are adjusted for the effect of changing prices of productive factors. The influence of short-run variations in output may be reduced by averaging observed experience over several time periods. Graph 2.1 depicts the result of such an analysis of General Motors over the period 1960-68 utilizing aggregate cost data obtained from company annual reports, and adjusting for the price level of labor, raw material, general and administrative expenses, and depreciation. The figures are 3-year central averages.

Over the period 1961-64, significant increases in volume are associated with decreasing average costs, while between 1964 and 1967 volume is relatively stable, but adjusted unit costs rise rapidly.

Graph 2.1 may be interpreted to indicate that General Motors has experienced significant diseconomies of scale since 1964. However, a more plausible explanation would seem to lie in changes in the nature of the products and the product mix. During the period from 1961 to 1964 simple compact cars were popular. In the later period the average car built by General Motors became larger and more complex. This change would be reflected in the average unit costs. Thus success of a time series

9

John Johnston, Statistical Cost Analysis (New York: McGraw-Hill Book Co. 1960).

analysis seems to require a spread of long-run output levels without significant changes in the products or the product mix. The facts of life in the automotive industry do not favor such an approach. Graph 2.1 then may provide historical or experiential insights but it evades and even blurs the analytic proportions that are of interest.

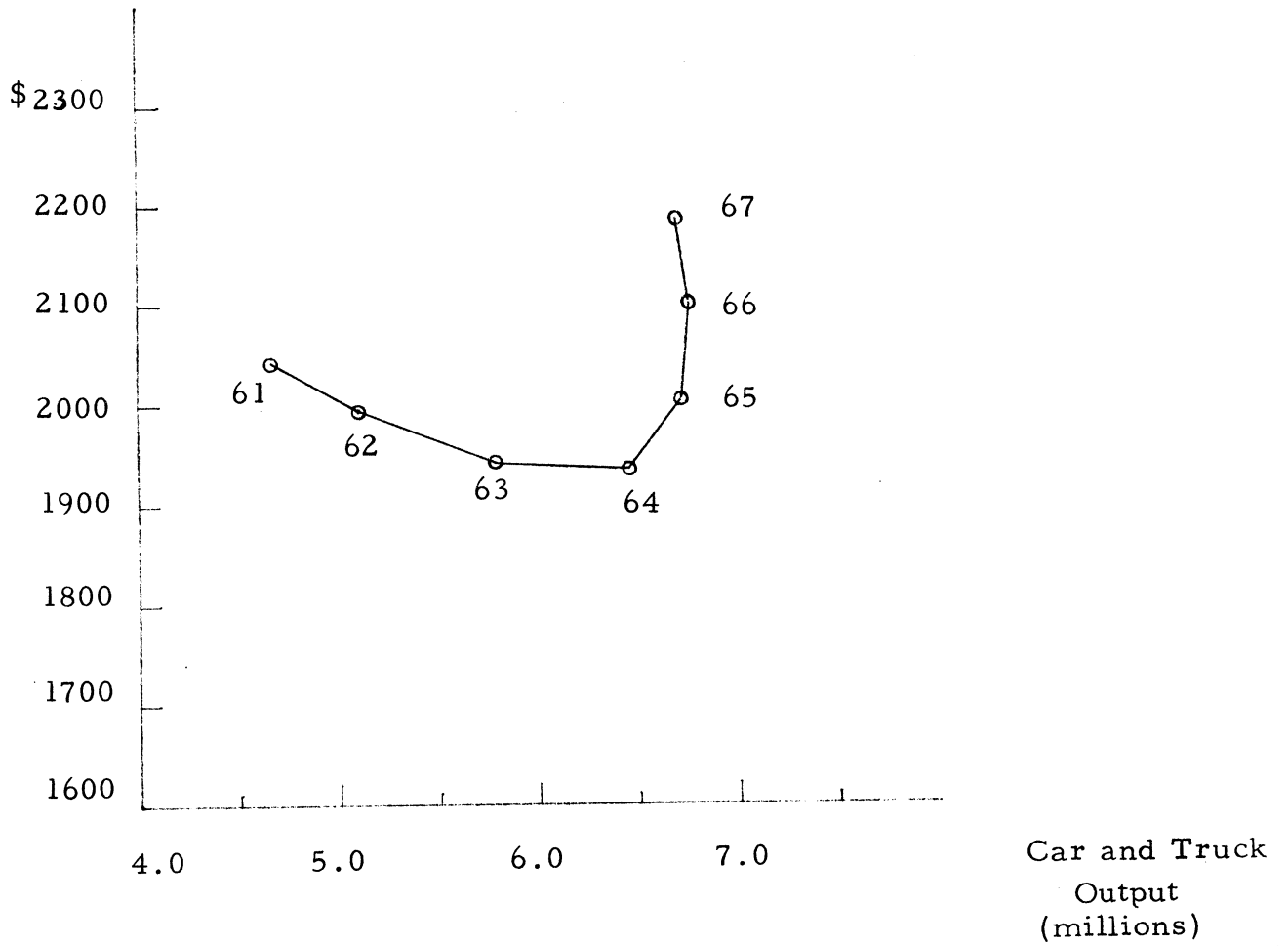
An alternative to time series estimation is the use of interfirm comparisons. By identifying costs incurred over a period by each of several firms operating at different scales, it might be possible to identify the economies of scale.

Costs incurred in the automotive activities of each firm are not readily available. However, the revenue derived from automotive activities may be estimated from known volumes of production and wholesale prices. For our purposes it may be appropriate to assume that the ratio of revenue to costs for automotive activities is the same as for nonautomotive activities for each firm. With this assumption, a firm's aggregate cost data, available in annual statements, may be used to estimate the unit cost of automotive production for each firm. These cost figures are given in Table 2.3.

The differences in unit cost thus derived must be analyzed carefully. Although the average unit cost seems to increase with increasing scale, and hence to indicate diseconomies of scale, this may be explained by differences in the product mix among the firms. General Motors, for example, has a higher proportion of its car production in the highest price classes than American Motors has, and so the average cost of General Motors production

Graph 2.1
Average Adjusted Unit Cost of
General Motors, 1961-67

Unit Cost



is higher. This effect is indicated by a comparison of the average price of automotive output of each firm in Table 2.3. Indeed, the unadjusted cost data of Table 2.3 are not inconsistent with the hypothesis that General Motors produces comparable cars at a lower cost. Thus, aggregate unit cost figures taken alone provide little direct insight into any economies or diseconomies of scale.

Because the vexing problem of comparing cost behavior seems to stem principally from incomparable product mixes, it is natural to attempt to compare the cost of specific products. Unfortunately, data pertaining to the direct cost of particular products are not available. Moreover, such analysis would provide little insight into economies associated with indirect (joint) costs, which can only be arbitrarily assigned to particular products. In the automotive industry such indirect costs are very significant, not only because of the extent of the joint development, supply, production, and distribution, but also because of the very considerable overhead cost associated with capacity that is not generally used but is required by the vagaries of demand. Thus a product-by-product comparison of costs is impractical, because of data limitations on direct costs and because of the preponderance of indirect costs.

Even if significant differences in unit costs of comparable products do exist among the automotive firms, they may not be due entirely to scale. It may well be, quite apart from scale, that the several firms are not equally successful in achieving the optimal factor mix or the potential economies of their scale. That is, all automobile firms may not be

Table 2.3
1960-69, Performance Data

| | GM | Ford | Chrysler | AMC |
|--|---------|---------|----------|---------|
| Average annual volume (1,000 units) | 6,054 | 3,955 | 1,774 | 397 |
| Average unit price ¹ | \$2,630 | \$2,482 | \$2,472 | \$2,185 |
| Average unit cost ² | \$2,181 | \$2,245 | \$2,330 | \$2,138 |
| Average unit profit before taxes | \$ 449 | \$ 237 | \$ 142 | \$ 47 |
| Standard deviation | 35% | 70% | 67% | 141% |
| Coefficient of variation | 8% | 30% | 47% | 300% |
| Average annual return on assets ³ | 28.1% | 14.8% | 10.5% | 7.8 |
| Standard deviation | 5.3% | 5.0% | 5.3% | 13.8 |
| Coefficient of variation | 18.9% | 33.8% | 50.2% | 176.9 |

¹
Constructed on the basis of Ward's "Model Year Car Production by \$100 Groupings," Ward's Automotive Yearbook.

²
Computed (assuming constant ratio of revenue to costs for automotive and nonautomotive operations) by taking the ratio unit price computed above to total revenue (per unit) from all operations, and multiplying by total costs (per unit) from all operations.

³
Net income before taxes, plus interest, divided by book value of total assets

Sources: Company annual reports and Ward's Automotive Yearbook.

equally efficient in each operational phase. In the automotive industry we can have no recourse to the large samples generally considered necessary for successful cross-sectional analysis.

For all these reasons, effective direct econometrical measurement of economies of scale in the automotive industry seems impossible. However, we believe that the general level of a firm's profits provides an indication of its economic advantage and can provide insight into scale economies.

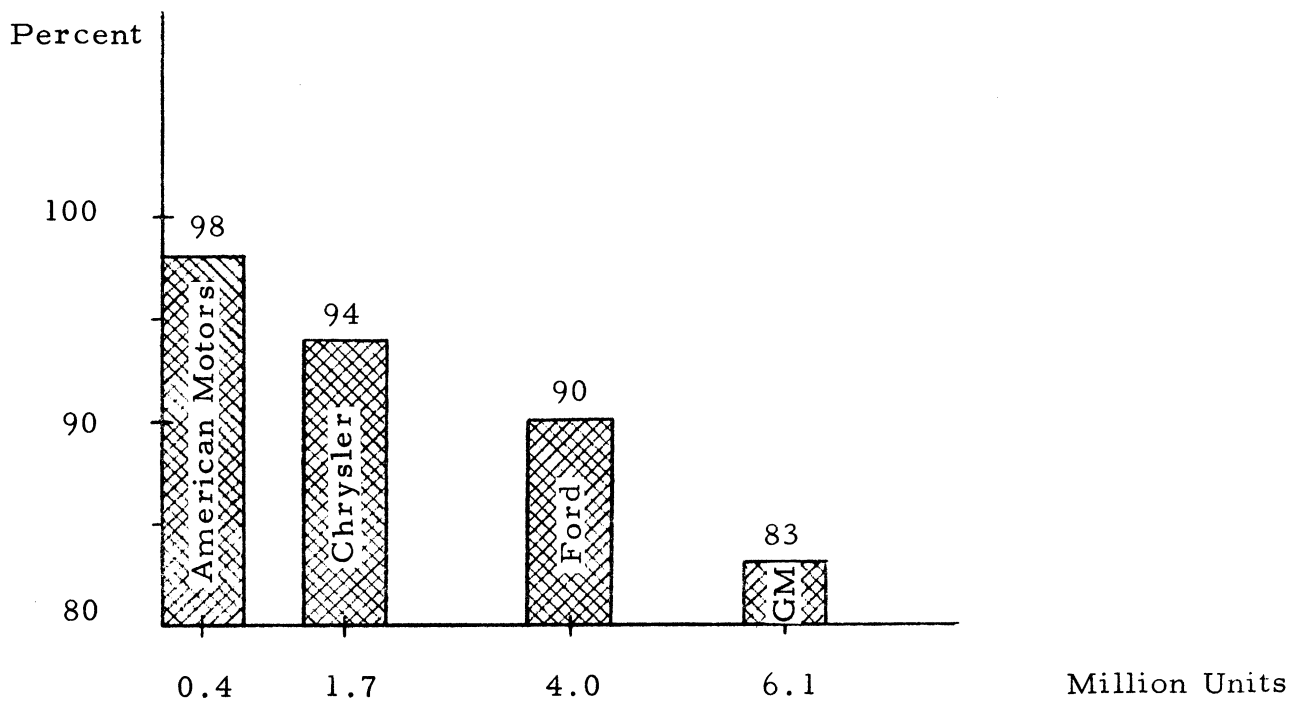
Profit Levels and Cost Economies

Let us consider again Table 2.3, which provides estimates of the average cost and profit per car of each firm. We have emphasized the difficulty in interpreting these average cost figures because of the need to allow for differences in each firm's product mix. It may be satisfactory here for our purposes to assume that price is a fair measure of the value that the consumer attributes to a car, even though the figures we are using are wholesale list prices. Thus we shall consider that two cars which are of equal price are of comparable value. Let us temporarily assume, in addition, that each manufacturer's profit rate per unit is uniform on all of his cars; that is, profit as a percentage of wholesale list price is assumed to be constant from car to car for each of the firms. We do not put these assumptions forward as necessarily realistic, but only to help us develop certain concepts which we feel to be valid in their ultimate formulation, independent of these assumptions.

Now let us consider cars of comparable value manufactured by different firms. The cost of each car is, of course, its wholesale price minus the manufacturer's profit. Under our assumptions, the prices for comparable cars are equal among firms, so that differences in profit rates reflect differences in costs. Thus, for example, the cost to American Motors is more than 98 per cent of its wholesale price, but the cost to General Motors of a car of comparable value is only about 83 per cent. These comparative cost figures are illustrated in Graph 2.2.

Several possibilities may be suggested as explanations of these cost differentials. As previously mentioned, differences in cost may be due in part to economies of scale and in part to efficiency, i.e., the degrees to which firms select their optimal factor mix, given their scale, and thus realize their potential economies of scale. It is even conceivable that diminishing returns are masked by greater success of larger firms in achieving their optimal factor mix; i.e., the technology is different for different-sized firms. Moreover, it may be that the larger firms, by taking advantage of their great size, which gives them superior bargaining position with factors of production, may achieve cost savings not available to the smaller firms. The market power of the United Auto Workers makes this position slightly suspect where labor costs are concerned. The latter question will be explored further in the next chapter. We will, at present, assume that this is not so significant as to preclude the examination of other possibilities.

Graph 2.2
Cost as a Percentage of Wholesale Price



It is of course possible, on the other hand, to explain profit differentials by differences in prices of products having comparable value. As we have discussed previously, higher prices may quite properly reflect success in design and innovation. It is not our purpose to review the record in this regard. Moreover, there may be economies realized by the automotive dealers which are extracted to some extent by the producer in the form of higher wholesale prices.

Of course, one explanation of price differentials is that they occur through monopolistic pricing power and behavior. Although such behavior may take many forms, it is enough to consider limitation of output and assume that no one firm has any special advantage in pricing vis-à-vis the other firms. If, as appears to be the case, individual automotive firms are free to design and innovate without restriction, so that there are no intra-industry barriers to the introduction of substitute products, then such a pricing policy cannot be carried out by any one firm for its own benefit. It would require the explicit or implicit collusion of all firms in the industry. Although the general level of prices would be affected, it is not clear that price differentials among the different firms would obtain for comparable cars.

Our assumption of uniform profit rates among all models of each firm has enabled us to compare the cost of cars of comparable value, without worrying about differences in product mix. If this assumption is not valid, then the high profitability of General Motors might be due to a higher than average proportion of sales in the more profitable car classes.

Such an explanation does not seem plausible in toto because of the rivalry within the industry, but in our opinion it may have a partial validity.

Because of the importance of indirect costs, however, profits cannot meaningfully be attributed to particular models. Nevertheless, we could consider an aggregate measure of profits, such as rate of return on assets. In doing so, another problem can be overcome, in part, in using unit profit rates as a measure of productive efficiency and economies of scale. Differences in profit per unit might possibly reflect differences in degrees of vertical integration. Since GM is vertically integrated to a greater degree than AMC, for a given rate of return on assets GM must maintain higher per unit profitability. The degree of vertical integration is a variable in the determination of optimal factor mix, hence it must be recognized explicitly as a variable leading to efficiency and profit differentials.

Table 2.3 indicates significant differences in the rate of return on assets of automotive firms. As discussed above, these may be the result of differences in costs, temporary monopolistic profits due to design and innovation, or monopolistic profits from the exercise of market power. Since there are apparently no significant intra-industry barriers to the introduction of substitute products, it seems unlikely to us that these differentials are due to the relative market power of any one firm. It is, of course, true that collusion can lead to many untoward goals, but it is hard to imagine an industrial discipline effective and persistent enough

to support such a discriminatory distribution of the proceeds. This is particularly true if the collusion is implicit. We feel it more likely that differentials in returns reflect differences in costs (performance) among the firms.

Structure, Control, and Price Performance

One explanation, plausible to us, of the profit differentials among firms in the automotive industry is that they are due to significant economies of scale. If indeed this is the case, the industry might be considered a natural monopoly. Economic theory suggests that natural competitive pressure would induce growth of the largest, most efficient firm at the expense of its competitors, the result being greater size differences, until all competitors were eliminated.¹⁰ This may well explain the high degree of concentration in many industries, including the automotive industry. But once a high degree of concentration is reached, competitive pressures no longer exist in the same form, and the monopolistic structure may not be inevitable; rather we find autonomous (oligopolistic) structures. We cite again our inability to predict the behavior of an unrestrained autonomous industry.

Although an industry's average unit cost can be reduced through the elimination of high-cost or less efficient firms, such a policy must be

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See Sraffa,

balanced against the disadvantages of higher concentration. Undoubtedly the automotive firms themselves recognize constraints against significant increases in concentration in their industry. Indeed, degree of concentration receives a great deal of attention by critics of the automotive and other autonomous industries. To the extent that the firms wish to avoid criticism of concentration, they should restrict output, simply because concentration ratios would then be lower, at least among the largest firms.

One may then ask what level of prices is appropriate in the automotive industry. Under the constraint of not increasing concentration, the answer seems to be deceptively simple. The prices must be just high enough to provide satisfactory profits over the long run to all firms in the industry. The costs of the least "efficient" or highest-cost firm then determine the price level of the industry. Any higher price would clearly be excessive, and any lower price would result eventually in greater concentration among the remaining firms.

By a satisfactory profit we mean that level of long-run profit just sufficient to keep the firm in operation. This concept, essential for any evaluation of the performance of an autonomous industry, is extremely difficult to measure. Among other things, appropriate allowance must be made for risk and inflation. For example, with regard to risk, the high variability of automotive profits, reflecting the great variation and uncertainty in demand, should be considered. All other things being

equal, the average rate of return ought to be higher in an industry where there is greater variability.¹¹

Correlation of Concentration and Profit

Various interindustry comparative studies have found a correlation between concentration and return on capital. These have been cited in various reports and testimonies as providing some confirmation of the adverse effects of persistent concentration on output and prices.¹² It is generally recognized that such studies as we have already discussed must make due allowance for risk. The effect of industry structure is probably not so often considered.

In certain industries a high degree of concentration is appropriate because of the large scale required for economical operation. Under competitive pricing conditions, differences in the scale of the firms of such an industry will result in differences in their rates of return. If the level of prices in the industry is sufficiently high to provide a normal rate of return to the less efficient firms, then the average yield in the industry will necessarily be greater than the norm. In such an industry this divergence between average yield and the norm is further exaggerated if the less efficient firms are also riskier. In an industry with less

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I.N. Fisher and G.R. Hall, "Risk and Corporate Rates of Return," Quarterly Journal of Economics (Feb., 1969), pp. 79-92. Fred Arditti, "Risk and the Required Rate of Return on Equity," Journal of Finance (March, 1967), pp. 19-36.

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See for example the report of President Johnson's Task Force on Antitrust Policy, the Neal Report, p.6. For an opposing view on the same problem see the report of President Johnson's Task Force on Productivity and Competition, the Stigler Report.

concentration, competition will tend to equalize the efficiency and hence the return of firms. Average yield per firm in the industry may be close to the norm. Thus the comparatively larger average yields in concentrated industries may be an indication not so much of excessively high prices, as of divergence in yields associated with economies of scale.

Summary and Conclusions

In this chapter we have attempted to formulate some issues pertaining to the price performance of the automotive industry. Prices, of course, are composed of profits and costs. The influence of monopolistic structure on profits is fairly well understood. Concentration may also be significant in reducing costs. This creates the problem of trading the advantages of concentration in relation to cost against its disadvantages in profit (as a measure of monopoloid tendency). For this, empirical measurement of economies of scale is essential. However, studies of the productive process alone are inadequate, and econometric analysis of aggregate data is fraught with difficulties. Of course, profit levels themselves indicate differences among the firms. While such profit level differentials might result from a variety of causes, including economies of scale, it does not seem reasonable to attribute them to monopolistic limitation of output. Thus an association of higher profits with greater concentration need not indicate monopolistic profits.

If, indeed, profit differentials are due to economies of scale, then in principle a monopolistic structure would lead to greatest efficiency. There

are, however, good reasons for preferring a less concentrated structure. In this case, the efficiency of the smallest firm defines the appropriate level of prices. Of course, various modifications of structure or regulation may increase the efficiency of the smallest firm and hence allow lower prices. This concept seems to be essentially true even if profit differentials are not so much due to scale as to attained efficiency or innovative success.

This still leaves the problem of ensuring that price levels are not so high that they provide excessive profit even for the least efficient firm. The choice seems to be between relying on competitive structure or regulation. The use of structure requires, we emphasize again, that a balance be struck between the disadvantages and advantages of concentration. For this we need much greater understanding of the behavior of autonomous industry. On the other hand, regulation of prices and profits is undesirable.

While this chapter has emphasized price-cost performance, many other equally important performance issues must be considered. The following chapters discuss some of these.

CHAPTER III

THE VERTICAL ASPECTS OF CONCENTRATION

Vertical Integration in the Automotive Industry

A substantial degree of vertical integration exists among the major end product manufacturers in the automotive industry. The consensus is that General Motors is the most highly integrated, followed in order by Ford, Chrysler, and American Motors. Given the manufacturing or assembly nature of the industry, the integration ratios given below do not seem extremely high.¹

¹ See Robert Crandall, "Vertical Integration and the Market for Repair Parts in the U.S. Automobile Industry", Journal of Industrial Economics (July, 1968), pp.212-34. Vertical integration is difficult, if not impossible to measure in any absolute fashion. Primary goods producers will appear as more integrated than firms specializing in assembly, if $\frac{\text{Value Added}}{\text{Sales}}$ is used as the measure of integration, for example. The reason is that the sales values must be relatively larger than value added if any components or parts are bought by the assembler. $\frac{VA}{S}$ for a supplier may equal 1, but the same amount of value added divided by sales twice as large (the assembler buying 50% of value of its output) gives a ratio of 1/2, even though the value added of the assembler was identical with that of the supplier. Cf. Crandall, ibid., p.70; also M.A. Adelman "Current and Statistical Measurement of Vertical Integration" in Business Concentration and Price Policy (Princeton, N.J.: Princeton University Press for the National Bureau of Economic Research, 1955), cited in Crandall, ibid. Gort also argues that as the final product is approached in the production sequence, the "embodied" labor becomes relatively more important, so value added falls relative to the price of the semi-finished product. The data shown by Gort for durable manufacturing industries in 1954 are not out of line with the 1968 data presented here, for the Big Three. Michael Gort, Diversification and Integration in American Industry (Princeton, N.J.: Princeton University Press for the National Bureau of Economic Research, 1962), pp.79-82.

A comparison of the percentage of sales dollars which each firm pays to suppliers for materials and services tends to support this view. For example, in 1968 the respective figures were 46% for General Motors, 57% for Ford, and 57% for Chrysler.² Total or partial production of at least the following items is carried on by one or more of the three major firms.³

| | | |
|----------------------|----------------|----------|
| Engines | Gears | Clutches |
| Transmissions | Wheels | Brakes |
| Valves | Power Steering | Plastics |
| Upholstery | Carburetors | Frames |
| Electrical equipment | Glass | Steel |

The motivation for this vertical integration, although ultimately arising out of a desire for firm perpetuity and profitability, can be attributed to a number of more specific concerns and production considerations. Among these are:

1. Manufacturing economies of scale
2. Dependable sources of supply
3. Quality control
4. Production scheduling
5. Product development integration
6. Entry into the replacement market

Within the automotive industry, the benefits of vertical integration are not taken lightly. Nevins and Hill, in discussing the competitive

² These figures were obtained from the 1968 annual reports of the companies.

³ Lawrence Jay White, The American Automobile Industry in the Postwar Period (unpublished Ph.D. dissertation, Harvard University, 1967).

position of Ford Motor Company around 1948, note the feeling within the company that it was too dependent upon suppliers. In contrast, General Motors was manufacturing its own bodies, stampings, axles, etc. To become more competitive with General Motors, it was decided that Ford had to gain greater self-sufficiency.⁴ Chrysler Corporation has had a specific policy of increasing its degree of vertical integration, as evidenced by statements in its annual reports.⁵

The contention may be made that in the absence of substantial savings in actual production cost there is little justification for vertical integration. This admittedly extreme position, however, fails to recognize two crucial ingredients in an efficient and successful assembly process. First, the assembly parts must be continually available at the place of assembly; and second, it would be most desirable to have them fit together both mechanically and technologically. Manufacturing economies rise not only from the production of a specific item but also from the possibility that an integrated production process can perform a series of successive tasks more effectively than if they were done by individual firms. These successive tasks may or may not be technologically complementary. For those which are not, economies may

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Allan Nevins and Frank Ernest Hill, Ford, Vol. III, Decline and Rebirth: 1933-1962 (New York: Charles Scribner's Sons, 1963), 340.

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Chrysler Corporation, Annual Report, 1965.

arise out of reduced inventory requirements, coordination of output, and product development integration.⁶

Clearly, however, not all vertical integration is necessarily either economical or desirable. Whether it is depends upon the complementarity of the processes and also upon whether the production of the eventual end product will require enough of the components produced to permit an optimum production scale.⁷ Furthermore, from the viewpoint of the firm, if its backward market power is such that it is capable of obtaining monopsony or oligopsony profits from its suppliers, then the motivation for vertical integration may be reduced if not eliminated. This situation, it would seem, supposes that the exploited firms do not have the alternative of entering a more lucrative market--or, even if they do, that the reduced profit level is still sufficiently high to discourage exit.

Market Performance Issues of Vertical Integration

Some of the salient market performance issues of vertical integration are:

1. To what extent, if any, does vertical integration reduce the cost of the end product?
2. What effect does vertical integration have upon the profitability and competitive position of independent firms?
3. To what extent does vertical integration foreclose the opportunity for new entrants into the supplies sphere of the automotive industry?

⁶ See Joe S. Bain, Industrial Organization (New York: John Wiley & Sons, Inc., 1968), pp. 177-80.

⁷ Ibid.

4. To what extent does vertical integration by the end product firms contribute to the erection of artificial entry barriers which must be overcome by potential entrants into this manufacturing activity?
5. What effect does vertical integration into replacement market activities have upon that market's performance?

Economies of Vertical Integration

The justification for vertical integration probably lies in the relationship between various manufacturing and assembly operations. The planning and technology required for the eventual final product are major concerns. Economies of scale, by themselves, may not be sufficient grounds for permitting vertical integration by already large industrial units. Such economies might be achieved just as well by firms independent of the final product manufacturer, but which are also characterized by a concentrated market structure. The assumption here is that two moderately concentrated industries are better than a single highly concentrated one.

With respect to the automotive industry, the sort of questions that arise are: "Why is it necessary for General Motors [or Ford, etc.] to manufacture their own spark plugs, speedometer cables, batteries, engines, or any other item internally?" "Does the consumer benefit from such activity?"

Before the end vehicle firms can assemble an automobile, they must design and engineer it. The quality and performance of the vehicle are as dependent upon the early stages as they are upon the actual assembly process. In engineering the vehicle, the firm can either

design and specify its own components or accept what has been designed by independent firms. If it selects the first alternative, it then has the option of manufacturing that item internally or special ordering it from independent firms.

Which path it follows may well depend upon how closely each component must be engineered to complement the remainder of the components. As the interdependence of components--e.g., transmission and engine--becomes such that they must be designed as a unit or a system with little tolerance for error, control over the entire engineering process becomes mandatory. On the other hand, there seems little rationale by such reasoning for the internal design and manufacture of batteries or radios.

It should be pointed out that the issue of engineering innovation is not being cast aside by assuming that independent firms may advantageously manufacture major components. The end product firms have a choice among the potential suppliers. A vested interest in a particular technology among the end product firms resulting from continual investment in such a technology would probably be less than under the present structure. Full utilization of investment would also be not difficult if contracting out were eliminated.

Manufacturing economies of vertical integration may and probably do arise from the complementarity of production processes, the reduction of inventories, etc. Such considerations have been extensively discussed in the recent past. The debate is not over the possibility of their existence, but rather over their actual existence. But the resolution

of this kind of issue lies well beyond the scope of this chapter.

The Effects of Vertical Integration upon
the Opportunities and Profitability of
Independent Firms

In the Brown Shoe case, the majority position of the Supreme Court was that "not only were [economic] efficiencies no defense but a showing that a merger resulted in efficiencies could be used affirmatively in attacking the merger since small rivals could be disadvantaged."⁸ The performance issue on trial was not which market structure minimized cost at a point in time, but rather which market structure maximized the business opportunities available for other firms--both new and existing ones.

A not uncommon point often made about vertical integration is that by definition vertical integration reduces the number of firms in the economy. This may or may not be altogether true. If vertical integration does indeed result in production economies which are reflected in lower prices, and so in better use of resources, then both income and resources are freed for other uses.

This knowledge, however, may be cold comfort for the firms immediately supplying a large highly integrated buyer. Where an end product firm produces a portion of its component assembly requirements internally, the absorption of the cyclical variability in component requirements resulting from variability in final product demand may well fall upon the

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O.E. Williamson, "Economies as an Antitrust Defense: The Welfare Trade-Offs," American Economic Review (March, 1968), p. 19.

outside supplier . If the end vehicle firm should seek to stabilize its manufacturing activities and labor force requirements , it would not be unrealistic for the firm to produce internally that volume of components consistent with an optimal scale plant, while purchasing the residual requirements from an outside supplier . Such behavior would tend to amplify the cyclical economic patterns ordinarily characteristic of the industry for the supplier firms .

However , to this observation must be added the notion that the large firms can not ignore long-run supply considerations . A short-run purchasing policy which seriously jeopardizes the outside supplier base , either through a contraction in the number of suppliers or in an unwillingness of suppliers to provide components during an expansionary period , may well adversely affect the future performance and investment requirements of the end product firms . Consequently a condition may obtain which would tend to dampen the cyclical swings for the supplier .

Profitability of the independent suppliers may also be affected by the mere threat of vertical integration . W.J. Baumol has contended that "large capital holding firms have the option of competing with smaller enterprises , but smaller firms cannot always reciprocate." ⁹ What Baumol postulates is an investment opportunity schedule in which the

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William J. Baumol, Business Behavior, Value and Growth (New York: Harcourt Brace and World, Inc., 1967), p. 35.

rate of return on investment is directly related to the size of the investment. The crucial assumption is that the larger firm has a greater ability than a smaller firm not only to obtain capital, but to do so at a lower cost. So long as the smaller firms earn a rate of return equal to or below the opportunity rate of the larger firms, entry by the large firm into their manufacturing activities is unlikely. More significant, however, is the implication that new investment opportunities closely related to a specific industry operation which promise high rates of return will be incorporated into the activities of the larger firms.

To the extent that supplier firms face the same production cost characteristics as the end product firms, they may be able to continue selling components to the end product firm if the suppliers are willing to accept a lower rate of return on capital. For the outside supplier to earn a greater return on investment employed in component production than that earned by the end vehicle firm, however, may require that the supplier possess special skills or patented processes.

An issue which should not be overlooked in a discussion of profit restriction originating from the threat of vertical integration is that, even under a completely atomistic market structure, profit restriction eventually occurs through the entry of new units. What emerges as at least one aspect of the profitability issue, then, is the question of which is more desirable: to have the profitability of suppliers controlled by entry and exit--as it is to some extent under the present structure; or to have it controlled by an alternative mechanism like the threat of vertical integration by the end product firms. No one will deny that the implications of each method may

differ substantially. The point is that the threat or possibility of vertical integration is a factor which prevents an "unnatural" level of profit from emerging in an atomistic subsector of an industry. The issue of the number of firms still remains.

Crandall has noted that the profitability of independent component manufacturers has consistently been less than that of the end vehicle manufacturers in recent years.¹⁰ On the surface, this fact is consistent with both Baumol's thesis and the contention that the assembly firms (the buyers) do exert monopsony power. Two items about this observation, however, are worth noting. The first is that the index of automotive assembly profits is heavily influenced by the inclusion of General Motors. The second is that recent years have been noteworthy for the efforts of Ford, and even more of Chrysler, to increase their amount of internally produced components.

Table 3-1 compares the rate of return on net worth for the Big Three and the major suppliers during the last decade. It is Ford, Chrysler, (and A.M.C.) which purchase the greatest percentage of the components they use from external sources. Quite possibly there are economies to be gained by integrating, which are not readily apparent under a non-integrated structure.

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R.W. Crandall, Vertical Integration in the United States Automobile Industry (unpublished Ph.D. dissertation, Northwestern University, 1964), p. 1.

TABLE III-1

Return on Net Worth for
Assemblers and Component Manufacturers
(In Percentages)

| Year | G.M. | Ford | Chrysler | Auto Parts Manufacturers |
|------|-------|-------|----------|-----------------------------|
| 1968 | 17.75 | 12.67 | 14.07 | 14.57 |
| 1967 | 17.57 | 1.83 | 10.92 | 11.54 |
| 1966 | 20.55 | 12.98 | 11.12 | 15.58 |
| 1965 | 18.51 | 15.65 | 14.75 | 15.01 |
| 1964 | 22.83 | 12.61 | 19.05 | 13.61 |
| 1963 | 22.35 | 13.14 | 17.55 | 12.62 |
| 1962 | 21.94 | 14.06 | 8.50 | 11.08 |

Source: Moody's Industrial Manual, 1968.

Alternative Investment Opportunities and
the Tendency Toward Monopoly in
End Vehicle Production

Is it realistic to assume that General Motors or any other end vehicle firm would attempt to obtain 100 per cent of the vehicle market? If complete domination of a market minimizes cost and maximizes profit, the ideal of monopoly seems reasonable as an assumption of the goal of a firm, independent of legal constraint.

Immediately the questions of monopoly and, more realistically, tendencies toward monopoly arise. Besides any externally imposed barrier in the growth of General Motors (whose name we use because it is the largest firm in the industry) a barrier imposed by government policy, we hypothesize that even without the antitrust constraint General Motors would probably not find it advantageous to control the entire market, because of business reasons. In short we are denying the ideal of the monopoly goal. In making this conclusion we take no account of the political, social, and legal realities; the profits forgone by a price war designed to wipe out competitors would take years to recoup. G.M.'s current shareholders would suffer and probably react against a management which placed future income, and in the distant future at that, so far above present income.

This argument is not to deny the role of antitrust as a specific against an untoward role by a single firm--defining untoward as the extension of market power to the point where the single firm dominates

or controls an industry with respect to price and output. The immediate business restraint, one would urge, is that part of the effectiveness of General Motors lies in the fact that it produces internally a large amount of its component requirements and that these may be under a condition of decreasing costs. Thus to enjoy the advantages of cost declines, output must be very large to spread overhead and utilize the control in place. But the advantages of decreasing cost are not unique to G.M. Other firms, too, enjoy cost advantages over G.M. on some components. Therefore, market sharing permits the dissemination of decreasing cost outputs to the whole industry, benefiting each firm to a greater degree than monopoly would do.

The real situation is even more complex, for not only can (and in fact probably do) the advantages of cost decreases for increased output spread themselves over the entire manufacturing industry, especially for the Big Three, but suppliers too enjoy economies of scale and specialization. The result is a network of advantages, possibly concentrated in one firm--G.M.--but present in many firms which manufacture both the final product as well as components and parts.

It is conceivable from this standpoint to view the entire industry as a single firm in which many divisions supply and buy from each other. If the yield on components is greater than the yield on finished products, it is to the firm's advantage to restrain its output of finished vehicles from going beyond what its sheer market status would permit.

Furthermore, the opportunities for investment by G.M. are not restricted to the automotive industry. Both automotive parts and finished vehicles make up but one segment of G.M.'s possible investment activities. It can and does invest in activities which require the know-how of General Motors executives and labor force--the know-how is not restricted to production but extends into marketing, advertising, and engineering skill. G.M. has the capacity to take advantage of these opportunities and it, along with its automotive competitors, has done so. General Motors is in essence a multi-product firm. So are Ford and Chrysler. The multiplicity of products--many classes of cars, parts and components, and unrelated products--is not accidental, unless industry and managers have suddenly become bereft of their traditional economic motivations.

Given the size of G.M. with its market power, it becomes reasonable for its smaller competitors--Ford, Chevrolet, and to a lesser extent American Motors--occasionally to diversify their activities into nonautomotive fields rather than waste their substance competing with each other, and with General Motors, in fields where all are already entrenched and enjoy market advantages.

Now, let us assume that by law, or a magic wand, the industry is somehow divested and that there are ten or twelve firms, none of which produces more than 8 or 10 per cent of the vehicular market. Further, let us assume that each of the firms is made up of plants which are at least the minimal optimum size or larger. Let us examine, reflectively, what the situation is likely to be.

In such a circumstance there would be no dominant firm. If the firms in the new industry enjoyed decreasing costs, however, there might very well develop a market stratification in which some firms would produce particular models, let's say sporty cars, and other firms other types of cars, let us say stodgy cars, while still other firms would go in for small cars or for very large cars, etc. There would be an avoidance of competition (and hence of risk) to gain the advantages of economies of scale. Insofar as possible, one might assume, the firms would once again produce and sell components and parts to each other to take advantage of decreasing costs.

But the circumstance of the firms--in a sense, pooling their component and parts business whilst respecting each others' claim to a given kind or character of market--may lead to a series of monopolies. To be sure such a monopolistic set would in all probability be highly unstable. At the margins of price or of styling, firms would compete and would attempt to move into markets hitherto reserved for competitors. To the extent that the consumer may be induced to buy one class of car in preference to another, advertising costs would be appreciable.

The question is, would such costs be higher in this instance than they are with only four firms, one of which is dominant?

One cannot answer such a hypothetical question about a hypothetical situation with any degree of sureness. However, it would seem that the institutional advertising aspects of each company in the four-firm situation would be lacking when there are a dozen firms. Hence it would be wrong to assert that advertising costs per car would necessarily rise. Advertising would be necessary to maintain the sheltered markets, but too big an advertising budget would also be an instrument for destroying the shelter of twelve distinct markets, if some such expenditure induced sufficient buyers to buy enough of some of the firms' products to cause increases in output, hence investment, hence diversification, hence a price war.

It would be most unlikely that all twelve cars would be identical or even nearly so. If such an untoward situation arose, there would in effect be twelve divisions of a monopolistic producer with possibly no attempt at innovation, style changes, or extensive quality control. Indeed, if the automobile industry consisted of a number of firms whose products were identical or nearly so, any incentive for change and improvement might be sadly lacking. Each firm might ask why it should attempt innovation when innovation would only break up the condition of cozy market sharing. If, however, a single firm did attempt innovation, this would upset the applecart, and the process of innovation and technical change would undoubtedly spread through the industry. Under these circumstances the more aggressive and more effective firm would secure a bigger share of the market. Its limitation would be, of course, the ability to buy (or produce) at least some of its parts at lower costs. Again, a kind of

accommodation would occur .

Would this accommodation be exactly like the present circumstances ? This question cannot be answered with any degree of finality. Surely, however, some kind of accommodation would occur in which the most aggressive and most resourceful firm would grow larger and would possibly, insofar as the law would allow , merge with complementary firms . The process of adjustment in the industry would be costly from the social as well as the internal viewpoint. Unemployment might occur as firms found themselves unable to compete. Advertising costs would rise. Because of instability in the industry, consumers would not be sure of services, repairs, etc. Under these circumstances it is not likely that the consumer would benefit.

If there obtained a system of a great number of producers , none of which were dominant, selling through distributors who directly or indirectly provided services, and of course, if innovation were maintained, the consumer would presumably be better off. The presumption rests in the continuance in some manner of economies of scale. However, innovation and technological improvement would be unevenly distributed. This circumstance might lead to more or less chaotic or at least unstable conditions in the short run; the effect in the long run would not be too unlike present conditions .

Vertical Integration and the Barrier-to-Entry Question

In the literature concerned with industrial organization, discussions of the conditions of entry rest upon the distinction between (1) the firms

already established in an industry, and (2) potential entrants, i.e., firms not already established as new automotive industries, which under appropriate circumstances might, by building new plant capacity, enter the automotive industry. The condition of entry "is then defined as the 'disadvantage' of potential entrant firms as compared to established firms, or conversely, the 'advantage' of established over potential entrant firms."¹¹ Ultimately, of course, the condition of entry is that the potential entrant believes he can succeed in the market.

To the extent that vertical integration achieves economies of some nature, it also becomes necessary for a potential entrant to integrate to substantially the same degree as the existing firms if the potential new firm is to compete effectively. Not only does this integration require capital, but, perhaps more importantly, it requires management skill, coordination, a labor force, and an extended lead time to put the entire operation "on stream."

Where vertical integration is not accompanied by economies, a potential entrant is precluded from minimizing his initial capital outlay and production requirements. A source of supply for his component requirements is nevertheless available from independent firms. This situation can possibly be characterized as an artificial barrier to entry. While existing firms (final manufacturers or suppliers) may be willing to sell components to the new entrant, the conditions of sale may be dependent upon or vary with the threat posed by the new entrant.

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See Joe S. Bain, p.252.

However, the sale of components among the major end vehicle manufacturers themselves is not an unusual condition within the automotive industry. In testimony before the U.S. Senate, a General Motors representative, discussing the availability of scarce resources to other manufacturers who wished to make automobiles, stated:

There are also no barriers to entry due to scarce resources. General Motors sells to other automobile manufacturers components such as engines, transmissions, bearings and electrical equipment. All necessary components are readily available to prospective entrants from other suppliers, and have been articles of commerce sold to all comers for years. ¹²

Clearly, a production cost function which exhibits, for these components, increasing returns to scale provides a rational basis for the above cited activity. If each end vehicle firm were to produce all components internally, the total production cost for all firms would be greater than if one firm "specialized" in the manufacture of some components and supplied them to the other end product firms.

Which end product manufacturing firm becomes the supplier may be closely related to the respective internal requirements of each of the firms. The manufacturer with the largest internal requirements will also be the manufacturer who would experience the lowest internal costs, if the component were independently produced by all major firms. Therefore, he

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The Automobile Industry: A Case Study of Competition, statement by General Motors Corporation, Select Committee on Small Business, October, 1968.

would probably also be in the strongest bargaining position with respect to any decision on price or output allocation concerning this particular category of commonly used items .

What is crucial in any discussion of entry conditions is to distinguish between artificially imposed barriers and natural barriers . Conceptually it is not too difficult . First, some of the barriers to entry , as noted , are implicit in the economic and business situation of the markets of the established firms , and thus in the possible markets of the potential entrant firms . A great deal of unused capacity in the industry , managerial or labor shortages , patents or know-how peculiar to the established firms , unwillingness of the capital market to supply funds for a given industry , and other conditions or circumstances which are part of the fabric of the situation may constitute barriers to entry . These may be classified as "natural." ¹³ Artificial barriers , however , from the social point of view , are quite different . We should here include the per se illegal restrictive considerations of collusion , conspiracy , and arbitrary factors

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In general , Bain notes three types of barriers to new entry : (1) "Product differentiation advantages of established over potential entrant firms ." (2) "Absolute cost advantages of established over potential entrant firms ." (3) "Advantages of established over potential entrant firms due to economies of large-scale firms ."

of market control of the established firms, whose aim is to keep out either a particular potential entrant or all potential entrants. In such cases the notion of barrier is akin to the notion of a restraint on a new entry by "artificial" or illegal and surely antisocial means.

Product differentiation, market segmentation, price policy, and other legal or presumably legal techniques of limiting new entry might also obtain. These are, in a sense, somewhere between the implicit market "nature-of-things" restraints on entry, and the explicit or, as we have classified them, per se inhibitions on entry.

The point we are making is that the word "barrier" in the concept "barrier to new entry" of itself, need have no honorific implications, although it might have such honorific implications. The observer must determine and, one presumes, ultimately the courts must determine whether the barriers are implicit in the market, i.e., the economic situation (natural), or whether they are explicit, per se, and hence improper and illegal (artificial) restraints. Somewhere between these two extremes lies a possible set of cases and conditions which, from the viewpoint of law and social policy, must be judged in the light of the particulars of behavior and intent. We are primarily concerned with the implicit shadings of the spectrum.

On the surface it does not appear that a new firm would be successful in benefiting the consumer unless it could, soon after entry, compete successfully. In the short run the firm would have to supply itself with a labor force, with component suppliers, with outlets, with service arrangements, with a public acceptance, and with all the other

elements which make for successful business. This is not to say it can't be done and hasn't been done. At one time the automobile industry probably consisted of as many as thirty firms which, for one reason or another, failed or merged. The result is the so-called "Big Three." Yet by 1959 American Motors did manage to find a place in the industry, albeit a small one. Foreign cars also succeeded in wresting as much as 10 per cent of the market from the American automobile industry. (See Table 4.3.) From the economic point of view, the intrusion of Japanese and Western European automobiles into the American market indicates several interesting hypotheses with respect to entry barriers and allows some novel points of view.

First, from a broad global viewpoint the entry of foreign cars into the American market--not only the pre-World War II expensive foreign cars, but also the relatively cheap postwar cars--indicates a diffusion of technology in the manufacture of automobiles, an international diffusion which may be related to industrial sophistication in both organization and production. Such know-how, which is a combination of the organization and production aspects in automotive production, can also be found in other industries. National and hemispheric constraints in industry are no longer so significant as they were prior to, roughly, World War II.

A second consideration has more direct bearing on the automobile industry: the sale of foreign cars in the United States indicates that the automobile industry, in its broad sense, might properly be viewed as an

international rather than a peculiarly American phenomenon, plus a British phenomenon, plus, etc. Any discussion of the American automobile industry, by our definition, includes cars made abroad but sold in the United States.

The industry, then, is by definition international. Nevertheless, the distinctions between compacts and larger cars, and between cars of different price categories, tend to insist upon or at least justify our treating as quite differentiated products the several classifications which both producers and consumers impose on or require of the market. These classifications are, as we suggest, price and size classification.

A third point is that the ability of Volkswagen, Toyota, and other foreign cars to make their mark on the American scene indicates a probable tendency to exaggerate the barriers to new entry into the American market. The successful entry of foreign cars into the American market has been accompanied by, or rather preceded by, the successful production and sale of these cars in markets other than the American market. The penetration into the American market was preceded by a sales know-how, an inventory supply, adequate financing, some knowledge of alternative distributive techniques, and other insights and experiences. In brief, the successful incursion into the American market was preceded by an experience and history which made success in the United States plausible.

A fourth point is that the penetration of the American market by foreign automobiles has to a large extent been accompanied by their penetration of other markets. South America, Canada, Asia, Africa,

indeed the whole world have become the recipients of Japanese and European products , as has the United States . This seems to imply that , if the preparations are proper and adequate , entry barriers can be overcome .

Vertical Integration and the Price
for End Market Components

It is widely recognized that the assembly firms are charged a substantially lower price for replacement components than are wholesalers or others . For example , Crandall notes a 1948 F.T.C study which shows that the assemblers paid \$6.36 for 6:00 x 16 tires while others were charged anywhere from \$7.78 to \$11.16 .

This difference may be explained by savings in distribution and other costs . It may also be explained by monopoly power and perhaps downright price discrimination . Whatever the reason , it exists . It is interesting to speculate as to the effect that an increase or diminution in vertical integration by the assemblers could have upon these price differences . From the consumer's perspective , the object is to minimize the price he pays for both the end vehicle and the replacement parts .

Under the present structure , the supplier may be attempting to recoup from his sales to the final assembly firm the price reductions he has granted or been forced to grant . The replacement part buyer may well find himself paying a higher price for component parts than under some

other end product firm structure. As one effect, however, it can be argued that the price of the end vehicle is less because of the low relative cost of externally produced components entering into it.

Whether such reductions are absorbed by the end product firms or are in fact passed through in the price of the final vehicle is almost impossible to answer. If monopsony power is being exerted by the assemblers, then increasing the number of assemblers would tend to reduce its force. The result may be lower end vehicle prices and lower replacement component prices.

An increased level of vertical integration even with attendant cost savings might still permit the end vehicle assemblers to manipulate the price of replacement items, and of the end vehicle itself, in such a manner as to maximize corporate profits. The resulting prices, while permitting increased profitability, might be the same as or less than those under the present structure, if substantial manufacturing economies of some nature were involved.

The Condition of Few Buyers

The few manufacturing purchasers in the automotive trade buy their component requirements from either a few sellers (resulting in bilateral oligopoly) or from many sellers (resulting in oligopsony). In either case, these few buyers have less information and certainty about the nature of the supply function they face than either a single buyer (a monopoly situation) or many buyers (an atomistic market structure) would have. When many buyers exist, the action of one will not affect the market. When only one buyer exists, he is also the industry and knows what supplies he can

command.¹⁴ Imperfect competition is keener and more ruthless than pure and perfect.

Keen competition, in combination with the alleged tendency of concentrated industries to respond to changing demand conditions primarily through quantity rather than price adjustments, seems to imply that the concentrated firms would be powerfully concerned with maintaining potential supply sources to meet an expanded demand.

For example, Meyer and Kuh note:

...recent thinking on oligopolistic price theory has tended to the view that industrial markets are equated primarily by quantity movements--both long and short run--rather than price movements.... Failure to rely primarily on quantity adjustment implies willingness to be priced out of the market, or, equally, acceptance of an increasingly smaller share of the market.¹⁵

And the late, celebrated J.M. Clark has remarked:

...this situation [where buyers are large and few] tends to cause sellers' competition to be the more immediately active force, but buyers' competition in the ultimate sale of their product would, if effective, impel them to maintain their volume of demand for the means of production they need if they are to hold their market position.¹⁶

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See Walter J. Mead, Competition and Oligopsony in the Douglas Fir Lumber Industry, University of California Press, 1966, p.162.

15

J.R. Meyer and Edwin Kuh, The Investment Decision, Harvard Univer Press, 1959, p. 194.

16

John Maurice Clark, Competition as a Dynamic Process (The Brookings Institution, 1961), p.392.

These observations seem consistent with the patent licensing policies of large firms and the behavior of their prices through differing aggregate demand conditions. (See Chapter II.) A recent study on the domestic licensing practices of 165 manufacturing companies reported: ¹⁷

The licensing of supplier companies to secure sources of materials, components, or equipment for their own use is an important element in the licensing programs of many manufacturing companies, including several in the motor vehicle and aircraft industries.

One company, for example, became a licensee for a patented product because a customer wanted to be sure of more than one source of product supply.

To this notion of the acute concern over source of supply must be added the allegation that concentrated industries through a process of joint profit maximization, either implicit or explicit, establish prices which will not yield a return to the small supplier that is greater than the return to those representing the concentrated sector of the industry. Instead of the product price's being an independent market factor set by impersonal forces, it becomes a function of a target rate of return

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Enid Baird Lovell, Domestic Licensing Practice National Industrial Conference Board, 1968, p.21.

acceptable to the concentrated sector. ¹⁸

What seems to emerge from at least these two notions is that, barring vertical integration, a trade-off between economic security and profitability is not unusual.

When we speak about economic security, we are comparing the security risk for a given economic activity under alternative market structures. We are not comparing the economic security of an auto parts manufacturer to that of an unrelated manufacturing or commercial enterprise. Factors which contribute to the economic security are the technological assistance received by the supplier, the concern of the concentrated firms in maintaining a source of supply, and the possibility that suppliers to large concentrated firms have an advantage in securing debt financing because of their relationship with the large firms.

The factors which may restrict profitability are the negotiating strength of the concentrated firms, the dependence of these suppliers on a few firms, and the continual threat of vertical integration. In addition, the supplier firm's profits may also be adversely affected by the cyclical output patterns transmitted to the suppliers through the reactions of the end product firms to changing demand conditions, by

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This concept of joint profit maximization invariably arises in all writings on oligopoly. However, it is interesting to note a comment of Harper in Price Policy and Procedure about external pricing considerations: "As a testimony to the important role that suppliers play in price making, it is occasionally necessary for a firm to attempt to negotiate prices with suppliers for the express purpose of keeping the prices of the goods or services supplied at a level that will permit the firm to price its offerings at a given price."

competition in the replacement market, if the component is sold externally, and by situations where the end vehicle manufacturer also manufactures a portion of his requirements internally.

The Performance Trade-offs

Clearly, at a given point in time, the minimization of product cost need not be consistent with the objective of maximizing the number of firms in an industry. Is it conceivable that even a concentrated sector of an industry might actually increase the opportunities for the emergence of additional economic units in some other industry sector, or increase the economic security of these sectors?

What remains, of course, is the constraint of a point in time. This immediately raises the issue of the vertical effects of concentration upon technological development, responsiveness to consumer demand, product innovation, and resource mobility. The market structure which permits a very efficient type of production to occur at a point in time may also be the most static and inefficient through time. The contrary also has logical validity.

Summary

From the set of hypothetical models and conditions that we have examined in this chapter, no definitive conclusions based on induction are possible. However, we have built our assumptions on what we consider reasonable grounds, which is to say approximations of reality, simplified, to be sure, but still operational.

Vertical integration is a mark of durable consumer industries, and the automotive business is no exception. Vertical integration, given the multiplicity of parts and components, need not result in untoward oligopolistic control; but it may result in a rational distribution of effort to take advantage of decreasing cost situations. The same logic negates the idea that in the absence of legal restraint it would be advantageous for one firm to monopolize the assembly or final product sector of the industry.

Furthermore the complexity of the production items and components makes a "division of effort" or specialization in the entire industry a possible pattern. This accords with experience. Divestiture of the firms of the industry into much smaller units might detract from consumer benefits because of the quietus it could place upon new technology and innovation.

The upshot of the analysis is this: the argument that more competition automatically and inevitably enhances consumer welfare is without a necessary foundation and has no necessary validity. The models we have adduced are simplistic but not unrealistic. The conclusions are logical

rather than necessarily realistic. However, the case for competition as a unique and always sure guide to consumer welfare is suspect.

Increasing returns to scale and specialization become powerful analytic tools in suggesting alternate structures to pure and perfect competition.

CHAPTER IV
THE NATURE OF MARKETING
PLANNING IN THE AUTOMOTIVE INDUSTRY

Introduction

A concentrated market structure carries with it the possibility that the member firms of the industry may make marketing decisions centered on self-interest largely untrammelled by a strong restraint resulting from the forces of demand. This is a basis for the theoretical attack on concentration and oligopoly. In contrast, businessmen often, even usually, maintain that regardless of structure their decisions are designed to meet the demands of consumers, within the constraints imposed by the competitive forces of the market and technology. The issue is market power, that is, the extent to which the market is controlled by the actions of firms in the concentrated industry rather than controlling by its own power. In brief, the question is, where does power lie? In the impersonal forces of the market, or in the decisions of the manager of the concentrated industry? We shall examine this question for the automotive industry.

The concept of market power that we shall use is derived from Douglas Dowd's definition of that term:

...the ability to control or influence, to make decisions in one's own terms and to significantly affect, influence, or control decisions of others on matters relevant to the holder of power.¹

¹ U.S. Congress, Senate, Select Committee on Small Business, Role of Giant Corporations, Part 1, Automobile Industry, Hearings, before Subcommittee on Monopoly, 91st Cong., 1st sess., 1969, p. 522.

Dowd's statement incorporates the classical view that market power results when a firm faces a sloping demand curve, and this circumstance is used to the peculiar advantage of the firm. We do not argue or assert that the automobile firms do not possess market power in this classical sense. They do establish prices, rather than their being automatically set in the market place. In accordance with earlier discussions, however, likely alternative structures of the industry would revert to an autonomous situation, because the classical world of pure competition could not obtain, given the scale requirements of manufacturing and distribution. The broader issues regarding influence that are embodied in Dowd's statement are what generate most of the controversial discussions between the industry and its critics.

Accepting Dowd's concept of market power, we would agree that large firms like General Motors have the ability to influence the market place. But it is also obvious that the market place, i.e., consumers and intra-industry members, do exert influences on large firms. Ideally we should compare the extent to which there is a balance of power between the market place and the decisions of any large firm. Economic theory has provided an extreme point on such a scale--pure competition, meaning no firm's possessing market power. But theory has been less helpful in defining the attributes of industry on the scale between pure competition and total monopoly, where the restraint on the single firm comes from demand, if we neglect cost constraints.

The honorific implications of the word "oligopoly" are enormous and tend to predetermine the policy conclusion. The word combines parts both of oligarchy and monopoly--two words unpleasant to the western ear.

More important, existing theory does not provide any analytic tools of discrimination to evaluate the performance of intermediate points, in terms of consumer welfare. In our opinion the simplistic notion that there is a direct relation between market share (structure) and market power (the extent to which a firm can exert control over the market rather than being controlled by it) is not satisfying. Even if such a relation could be established, there need be no definite relationship between market power and performance.

The major performance issue with which we shall be concerned is the variety of product offerings and the speed with which these products respond to changes in consumer demand. As was discussed in Chapter I, an ideal of the competitive market structure model is to achieve rapid response to changing demand conditions. Economists specializing in industrial organization theory would predict that the speed of response and the variety of products offered to consumers vary inter alia with the number of firms in the industry. This prediction necessarily requires anticipating the behavior patterns that will be followed by firms in a new structure if alternative models are to be compared. If there were clear evidence of the speed-of-reaction syndrome shown in studies of other industries, the credibility of the theory would be strengthened.

One of the research results that have been observed in many studies of organizational decision-making behavior is that the perceived risk and estimates of profitability are jointly considered in any decision, and this joint consideration affects the length of time required to make a decision.

Such results lead one to argue that automobile firms in arriving at various product decisions--for example, to introduce various lines of small cars--are moved by considerations additional to structural ones.

We shall argue that economic theory is not sufficiently encompassing to allow a complete prediction of future marketing behavior with its resulting performance under alternative marketing structures. To support this argument we shall discuss certain aspects of product planning behavior of the automobile industry by contrasting the viewpoints of the spokesmen of the industry with those of its critics.

In view of the performance criterion of responsiveness, the concept of planning gains significance. The theme of the 1968 Senate hearings was provided by the question, "Are planning and regulation replacing competition in the new industrial state?"³ These hearings were apparently influenced to a marked degree by the writings and testimony of the ineffable Professor John K. Galbraith, who claims that the market planning activities of large firms have replaced the operations of the market place. This position is based on the assumption that the plans of a firm in an atomistic competitive situation would not have any impact on the market place. This does not mean, of course, that such a firm would not be required to plan. All economic units, whether atomistic in size, or monopolists, are required to plan; in other words, they must try to assess and prognosticate demand functions and respond to them. Because the plans of firms in an

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U.S. Congress, Senate, Select Committee on Small Business, Planning Regulation, and Competition: Automobile Industry, Hearings, before Subcommittees, 90th Cong., 2d sess., 1968.

autonomous industry do have an impact on the market place, the performance issue turns on the effectiveness of planning in the public interest as influenced by industry structure.

There is of course the likely possibility that the same or similar market data may support alternative hypotheses of decision-making behavior. If this is the situation, then there is a need for further research to improve the predictive ability of existing theory. We freely recognize that further analytical research is needed, but we hope that some insights will flow from this discussion.

Product Planning Issues

Product Lines

Before asserting that the present structure of the automobile industry is slow in reacting to changing consumer tastes, or that it influences the changes and therefore stifles product development, it might be helpful to examine the sales statistics of the industry. On the basis of sales data available about the industry, a graph of historical sales by product classes is reproduced in Figure 4.1; sales are shown by price classes in Table 4.1. The data illustrate that there have been fluctuations in consumer demand between price-product classes. In addition, there have also been fluctuations in the year-to-year level of sales shown in Figure 4.2. These data indicate that market changes do occur, although what would have happened in a different market structure is, of course, too speculative a question for serious comment.

That there can be conflicting interpretations of these same data with respect to time reaction in meeting demand changes is reflected by the quotation presented below. In a 1968 report by General Motors, it was stated that:

Changes in customer demand have produced significant shifts in product composition.... While a small car has long been offered by some U.S. manufacturers, the increased popularity of imported cars in the late 1950's led more U.S. producers to design and offer cars in this size range. These domestic compact cars met with customer acceptance and accounted for almost 21 per cent of new car sales in 1961. In 1960, however, producers had begun to test the market for a somewhat larger car, an intermediate, still well under the standard-size cars. Customer demand favored these cars and by 1966 the intermediate-size cars accounted for about 25 per cent of all new car sales, while the domestic compacts fell to less than 9 per cent. Foreign cars, which accounted for 10 per cent of all new car sales in 1959, lost competitive favor until 1962 but have gradually regained their position. Since 1963, there has been a surge of customer interest in domestic specialty cars.

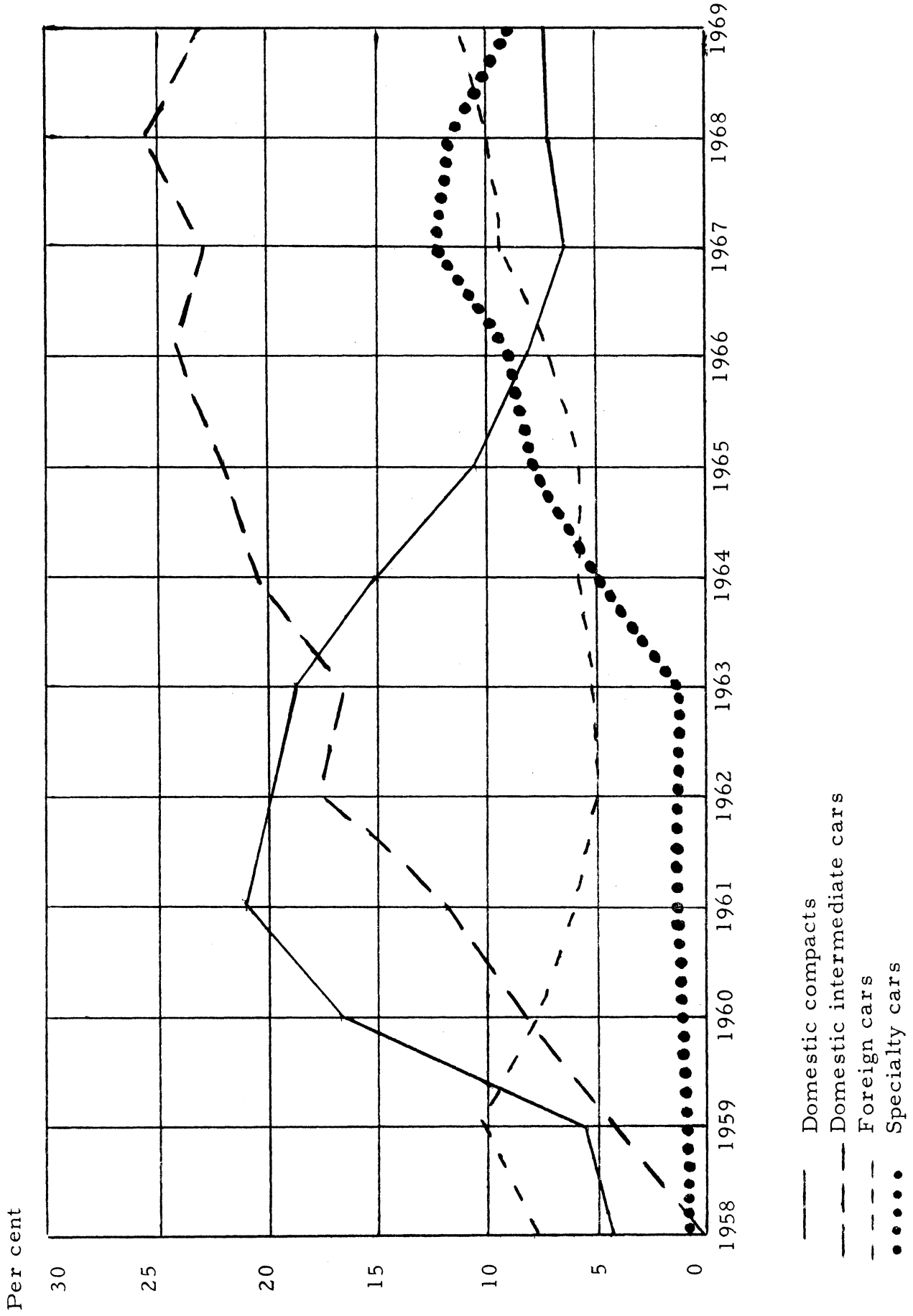
The customer--rather than any manufacturer, American, or foreign--determined these trends. In varying degrees, some manufacturers succeeded in anticipating the changing customer preferences. No producer⁴ could ignore them. None could control them.

In a recent review of the automobile industry policy William G. Shepherd states:

The three firms were also able virtually to withdraw from the small-car field during the 1964-1969 period. In view of the greater profitability of the higher-price lines, a

4

Ibid., pp. 645-46.



Sources: Data for 1958-68 from Ward's Automotive Yearbook. Data for 1969 from Automotive News Almanac, 1970.

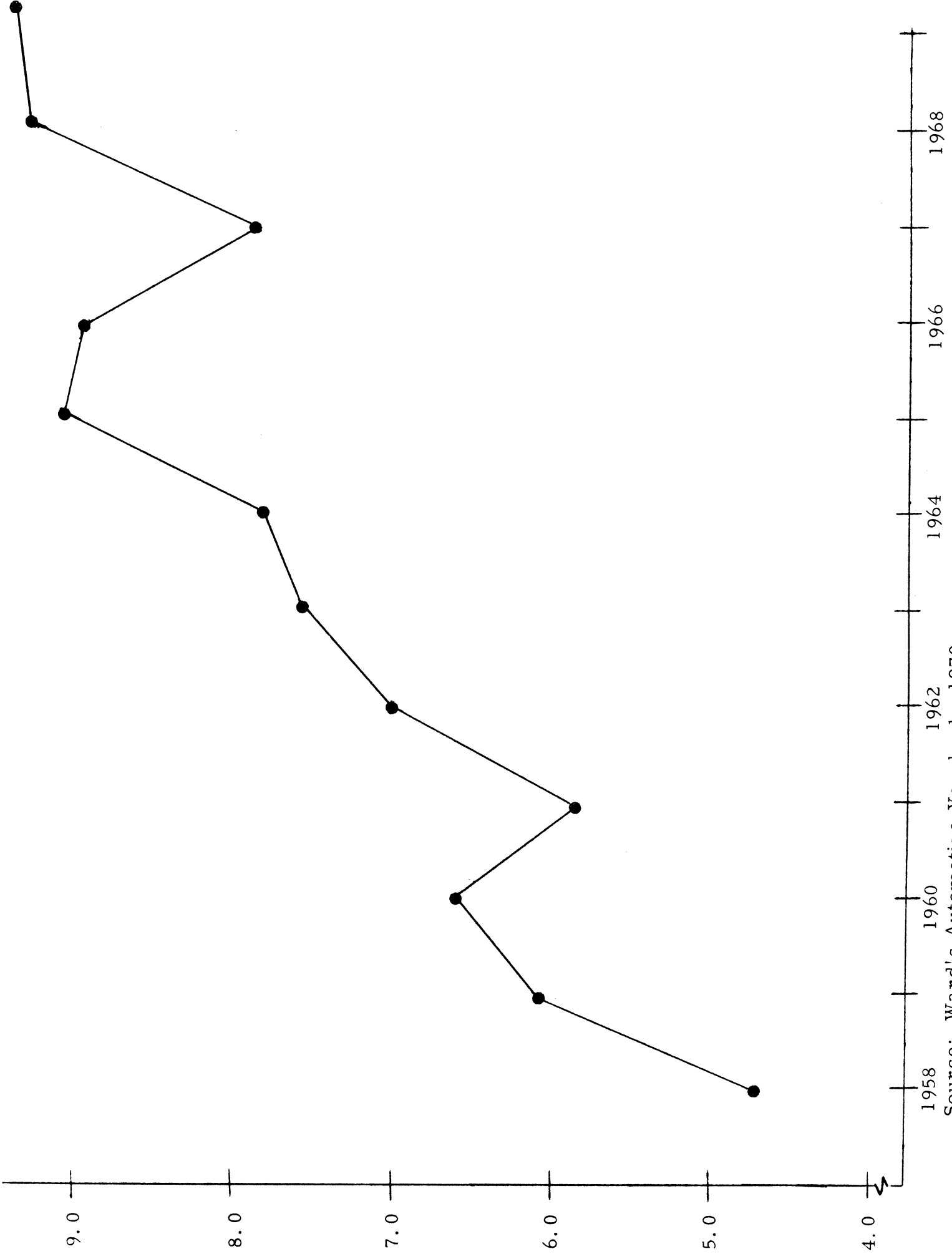
Table IV - 1

Percentage of Production Accounted for
by Price Groups

| <u>Price Group</u> | <u>1965</u> | <u>1966</u> | <u>1967</u> | <u>1968</u> |
|------------------------|-------------|-------------|-------------|-------------|
| \$1801-2000 | 5.6 | 3.0 | 1.5 | 0.6 |
| 2001-2200 | 13.8 | 7.0 | 4.9 | 3.5 |
| 2201-2400 | 21.0 | 23.1 | 14.6 | 5.6 |
| 2401-2600 | 22.6 | 17.5 | 20.7 | 20.9 |
| 2601-2800 | 16.1 | 20.6 | 26.3 | 22.1 |
| 2801-3000 | 7.6 | 12.3 | 12.1 | 20.1 |
| 3001-3200 | 5.3 | 5.8 | 6.6 | 10.3 |
| 3201-3400 | 1.2 | 2.3 | 3.4 | 5.0 |
| 3401-3600 | 0.2 | 0.4 | 0.8 | 2.3 |
| 3601-4000 | 2.5 | 2.0 | 2.2 | 1.1 |
| 4001-and up | 4.1 | 6.0 | 6.9 | 8.5 |

Source: Ward's Automotive Yearbook, 1966-69.

Millions



1958 1960 1962 1964 1966 1968
Source: Ward's Automotive Yearbook, 1970.

monopolist would rationally focus its production and sales effort on them, even if it entailed some loss of sales in the lower-price lines. This is what the leading firms, and particularly General Motors, have indeed done until the turnabout announced for 1970. But, absent shared-monopoly behavior, the other leading firms would be expected to enter and exploit the low-price market fully as a means of establishing a market position from which to broaden their lines. If one of the leaders were hardpressed, it would have particularly strong incentives to exploit the lower-price market, if only as a means of survival; and yet none has.

In effect, Ford and Chrysler have jointly chosen during much of the 1960's (as they did in the mid-1950's) not to break the shared-monopoly ranks through innovation into the low-price markets. Instead, with General Motors, they largely abandoned it to imports. The effect of this can be seen in the balance of trade in automobiles between the United States and the rest of the world. Imports have risen markedly in comparison with exports during the past five years, as they did in the 1950's before U.S. compacts were developed. During 1968, imports rose to over 10 per cent of domestic sales. It has taken such sharp inroads to draw a response, finally and belatedly.

In the discussion of the development of small cars Lawrence White concluded an argument by stating:

A number of industry characteristics become clear from our account of the small car episode. (1) Consumer tastes appear to have changed comparatively rapidly, away from large cars after 1956, away from small imports after 1959, and back toward small imports after 1962. (2) Recognizing these trends, making guesses about their future paths, and ordering the appropriate tooling in a minimum amount of

time presented major problems. It was never possible for the Big Three to appear instantly with a small car the month after a swing toward small cars developed.⁽³⁾ Nevertheless, it appears that the Big Three generally were sluggish in entering the compact car market in the late 1950's and the sub-compact car market in the late 1960's beyond the recognition and tooling lags. Room-for-all considerations explain a part of this sluggishness; fears of diluting existing sales explain a part; the historical legacy of the phantom small car boom immediately after the war explains a part. One would have expected smaller, leaner, hungrier firms to have reacted faster, taken greater risks, as Studebaker in fact did for the 1958 and 1959 model years.⁶

An advantage of White's analysis is that he explicitly recognizes the constraints imposed by changing consumer demand and technology. More important, however, he clearly sees the issues regarding the relationships of structure and performance of the industry. The question of concern to us is the extent that the auto industry might be a "sluggish oligopoly" and what it implies. This is the central issue to be examined by looking at a number of criteria and modes of behavior.

Number of Models

Another issue related to the responsiveness of the automobile industry to changes in consumer tastes is the number of models and options offered by the industry. The variety available even within a product line has been the basis of both criticism and defense of the auto firms.

White has observed that:

A supplementary strategy to that of rapid model change has been one of the model

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Lawrence J. White, The American Automobile Industry in the Post War Period, (unpublished Ph.D. thesis, Harvard University, March, 1969), p.251.

proliferation--the production of a wider selection of models to entice consumers into replacing their cars sooner and trading-up to something more glamorous. This has come about partly through the provision of more optional extras (e.g., bucket seats or power steering) that can be installed on standard cars and partly through the production of additional models as standard (though often it is just extra trim that designates one model from another). Greater assembly line flexibility...and better inventorying practices have been the technological advances behind the proliferation. And greater overall volume in the market has also been an important factor here, preventing economies of scale from being eroded away.⁷

In the General Motors paper cited above it was argued that:

The competitive challenge has been to provide cars tailored to the individual needs and desires of the customer while retaining the economies of mass production and distribution.

The new car buyer now can select from a significantly greater array of new car offerings, particularly in the lower price range...

In short, the appeal of new cars has been substantially broadened...This catering to personalized or individual choice, by an industry geared to mass production, is an industrial accomplishment that rivals the basic concept of mass production itself.

Along with the steady increase in variety, the modern automobile is a machine of great versatility...No other means of transportation can do so many jobs, so well, so cheaply and so reliably.

7

Ibid., p. 270.

8

1968 hearings, op. cit., p. 683.

The multitude of product offerings is relevant to questions of both demand responsiveness and resource allocation. The number of models offered per year in the postwar period is shown in Table 4.2. Clearly there has been an increase in the number of models, but there is no evidence available to indicate that this has necessarily increased costs. White observes from his extensive study of the industry that innovations in production technology have probably prevented any diseconomies from occurring here.⁹

Although the evaluation in a broad social sense of the performance of the industry concerning the number of models is indeterminate, the critical role of product differentiation and its effects on consumer demand and product planning is underlined. We will discuss these before reviewing the issues of styling changes.

Consumer Demand and Product Planning Issues

Two aspects of the automobile purchase decision are notable in the present context of product planning issues:

1. The automobile is but one of a number of alternative forms of transportation. In this vein, the automobile purchase decision is made in the context of total consumer outlays for transportation, and the automobile competes with these alternatives.
2. The outlay for an automobile represents a relatively large proportion of the total disposable income for many people. For

9

White, op. cit., p. 272.

Table IV - 2

Number of Models Offered

| <u>Year</u> | <u>Number of Models Offered at End Of Model Year</u> |
|-------------|--|
| 1949 | 205 |
| 1950 | 243 |
| 1951 | 243 |
| 1952 | 224 |
| 1953 | 210 |
| 1954 | 240 |
| 1955 | 216 |
| 1956 | 232 |
| 1957 | 245 |
| 1958 | 263 |
| 1959 | 239 |
| 1960 | 244 |
| 1961 | 260 |
| 1962 | 296 |
| 1963 | 336 |
| 1964 | 336 |
| 1965 | 348 |
| 1966 | 368 |
| 1967 | 370 |
| 1968 | ... |
| 1969 | 365 |
| 1970 | 374 (at issue date of <u>Almanac</u>) |

Source: Automotive News Almanac.

this reason, the purchase decision is made in the light of alternative discretionary expenditures. When we couple this "price tag" factor with the postponability inherent in decisions to purchase consumer durables, we recognize that the automobile competes with a wide variety of other goods and services for the consumer's purchasing dollar. These goods may range from education and vacation trips to other durables, and they interject a subtle but intense degree of competition into the market.

The importance of these elements can be seen in the following brief discussion of demand characteristics in the industry.

Demand Characteristics

Income and income expectations are prime factors in determining
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the demand for new automobiles. It is quite possible, however, that income elasticities vary over product classes, so that income shifts affect different manufacturers differently. It is also possible that availability of credit is an intervening variable between income changes and the demand for automobiles. The income variable, however, most probably affects the postponability of purchase and competition between new and used cars.

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See for example, Gregory C. Chow, Demand for Automobiles in the United States (Amsterdam: North-Holland Publishing Co., 1957) or Daniel B. Suits, "The Demand for New Automobiles in the United States, 1929-1956," Review of Economics and Statistics (November, 1958).

A second major determinant of demand lies in consumer tastes and preferences. The possibility of changing buyers' views regarding automobiles in general, the movement of demand over different price, style, and size classes, all may have an impact on the market share of a given producer. Volkswagen might serve as an illustration here. Some might argue that the VW's success and growth are predicated primarily on a shift of consumer preferences as revealed by the novel concept of the automobile for a sizable market segment. Tastes also play a significant role in determining the degree of brand loyalty enjoyed by a particular manufacturer.

Foreign competition has had significant effects on consumer tastes in recent years. For a fairly long period, the American automobile industry was relatively immune to the competition from foreign impacts. This situation has changed, as the Table 4.3 indicates. After 1957 market penetration was changed. American industry faces competition from imports, both from specific makes of cars, as well as in the more general context of the innovative features of foreign cars. This has, of course, been one of the stimuli for domestic manufacturers to increase the variety of products they offer.

Another distinguishing feature of demand for new automobiles is the existence of a sizable stock of cars in use, and the consequent possibility of postponing purchase. Postponement is unique to the consumer durables sector. To some extent the variables of disposable income and credit availability may be said to work through the intervening

Table IV-3

Imported New Car Sales as Percentage
of Total New Car Registrations

| Year | Units | % of U.S. Total |
|------|---------|--------------------|
| 1967 | 780,579 | 9.33 |
| 1966 | 658,123 | 7.31 |
| 1965 | 569,415 | 6.11 |
| 1964 | 481,131 | 6.00 |
| 1963 | 385,624 | 5.10 |
| 1962 | 339,160 | 4.89 |
| 1961 | 378,160 | 6.47 |
| 1960 | 498,785 | 7.58 |
| 1959 | 614,131 | 10.17 |
| 1958 | | 8.13 |
| 1957 | | 3.47 |
| 1956 | | 1.65 |
| 1955 | | 0.82 |
| 1954 | | 0.59 |
| 1953 | | 0.50 |
| 1952 | | 0.70 |

Source: Ward's Automotive Yearbook, 1968, p.159.

variable of existing stock. These complex relationships are highly influential in decisions to purchase new cars. ¹¹

White argues that the demand for new automobiles is primarily a replacement demand, with a relatively small group doing most of the new car purchasing. ¹² Huang has disaggregated the stock effect into taste, inventory, and trade-in effects to help explain the impact of stock on the new car purchase decision. ¹³ The essential point is that the existing level of automobile ownership, representing a stock of transportation services, exerts a pronounced effect on new car sales.

Used Car Effects

There is no other durable consumer goods industry where the used product market is more effectively organized than in automobiles. Industry spokesmen have cited the used car market as a constraint on decisions made in marketing new cars. For example, a statement by General Motors contends that:

The sellers of new cars are subjected to further competitive pressure from the presence of used cars in highly active markets. This requires contributing product improvements by new car manufacturers and effectively limits new car prices.

11

Ibid.

12

White, op.cit., pp. 135-40.

13

David Huang, "A Microanalytic Model of Automobile Purchase," Research Monograph No. 29, University of Texas, 1964.

...The availability of used cars increases the range of product choice for the customer and influences the entire structure of car prices.

...There is a substantial area of price overlap between new and used cars. ¹⁴

Evidence on the importance of the used car market in relation to car buying decision is mixed. In a number of studies, new and used car buyers have been somewhat sharply segmented, from which some have inferred that they represent relatively distinct rather than overlapping groups of purchasers. ¹⁵ This would support the view that the competitive overlap between new and used cars is minimal except as price ratios change and the income variable shifts.

On the other hand, there is evidence that buyers recognize the existence of used cars as an alternative to new car purchase. The extent that car buyers consider both late-model used cars and new cars has been examined explicitly. Data collected in the April-May, 1970 survey of consumers conducted by the Survey Research Center of the Institute for Social Research at the University of Michigan are impressive. Of the 212 respondents who recently purchased new cars, 15.1 per cent had also shopped for late-model used cars as an alternative to the car they finally bought. Of the 266 families who recently bought used cars, 22.2 per cent had shopped for new cars as a buying alternative.

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1968 hearings, op. cit., pp. 653-54.

15

See for example Huang, op. cit. and William Peters, "Variation in Consumer's Buying Behavior," (unpublished Ph.D. thesis, University of Michigan, 1968).

Respondents who indicated that they planned to buy a car in the next twelve months also stated that they often considered both new and used cars as alternatives. Of the 120 families who said they planned to buy a new car, 20 per cent said they would also look at used cars. Of the 107 families with plans to buy a used car, 25 per cent said they would also consider a new car. All of this suggests market overlap on the demand side.

The effect of the stock of used cars on demand is certainly influenced by factors like use characteristics--miles driven, for example. A segmentation of the market on such a basis would be useful in analyzing the demand variation and hence the risk element. The alternative of extending the use life of the existing stock probably injects a large degree of potential instability into yearly new car sales. In general terms, the age of the stock and its distribution among owners with varying trading behavior characteristics probably affect producers' market shares because of different brand loyalty characteristics.

Styling changes, as a basic decision variable, may be decided on in an attempt to combat the decision to postpone purchase. If the consumer can be induced to replace every three years rather than every six years, twice as many new cars can be sold. A basic demand characteristic of the industry might well be uncovered in an analysis of how effectively style changes induce changes in trading behavior. Some critics of the industry, moreover, have considered yearly style changes to be motivated by the desire to induce more frequent trade-ins of the existing stock of automobiles.

In their view, rapid and extensive style changes serve to differentiate new cars from used cars to the point that used cars cease to be an appealing alternative to a great majority of potential purchasers.

Styling Issues

One of the most criticized aspects of the automobile industry is the emphasis on styling. Critics contend that resources used to produce and promote styling changes are wasted and out of line with optimization of consumer welfare. For example, Richard Caves states the issue in the following terms:

Are we better off because my fenders are upswept and yours downswept, if neither style affects the car's performance, while each required the use of scarce resources to devise it? No doubt we are both somewhat happier than we would be with a colorless uniformity. But that is not the question. The real issue is whether we feel enough better off as a result of a dollar's worth of product differentiation to forgo willingly an extra dollar's worth of real goods. ¹⁶

The replacement market characteristic of the automobile industry rewards a product strategy that induces the consumer to replace faster.

Styling changes not only have the effect of increasing replacement by consumers "loyal" to the firm, but they can be used competitively to attract customers away from rivals. If a firm attempts to maintain a style for several years, an element of risk is introduced. An unsuccessful

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Richard Caves, American Industry: Structure, Conduct, Performance, (2d ed; Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967), p. 105.

model, besides decreasing present sales, will have the serious long-term consequences of a loss of "loyal" customers. These same results can also occur, simply from the firm's lagging behind its rivals in styling behavior. Consumers wishing a new model will be inclined to switch to a "new-looking" model of a rival, rather than the same "old-looking" model of the one firm.

One may attribute styling behavior to an attempt to persuade the consumer that the economic usefulness of his car has decreased before the decrease of its actual physical usefulness. Engineering and technological advances tend to counteract such logic of triviality unless a persuasive cure for safety and antipollution can be made as a breakthrough. Technology as a basis for reordering demand has its problems, however: the research and development expenditures might prove to be very great; and the results, uncertain at best, lack the necessary consistency for planning purposes. The consumer without technical sophistication may be unable to evaluate or appreciate many of the results. White then concludes that the preferred strategy is more superficial. He speaks of:

...frequent styling changes, coupled with some moderate engineering changes, to create the image of a new and different (and improved) product each year. This approach has advantages, in that there is no uncertainty over the ability to develop new designs (the risks lie instead in the desirability of these designs compared to rivals' designs) and there is no requirement of consumer technical sophistication, only the desire (inherent

or created) by consumers either to be the first one on the block to own the new cars ...or to keep up with the Joneses. ¹⁷

The question is, of course, whether the expenses used in styling changes are such that significant price decreases would result from making no styling changes. White again provides some data clarifying this question by noting that the tools and dies used in stamping must be replaced every 400,000 units, even without styling changes. He then concludes that the relevant costs to be considered are merely the costs of design, ¹⁸ which he estimates to be about \$130 per car--not a very significant amount.

Whether the consumer's desires might be better served by using these resources to develop technological advances is another question. White notes that the truck industry has a much better record than the passenger car industry for developing such improvements; and he cites the fact that automatic transmissions, power steering, and power brakes first appeared on trucks and buses. An important factor, however, is the type of buyer served by each industry. Truck buyers have a much greater degree of technological sophistication than car buyers and thus are better able to appreciate these advances. It is doubtful that the automobile buyer would appreciate any but the most fundamental technological improvement. The consumer is surely more responsive to styling changes than to minor technological changes, and hence styling is more likely to satisfy his whims.

17

White, op. cit., p. 265.

18

Ibid., pp. 45-52, 272-74, 353-54.

Some possible advantages of the annual styling changes have not been recognized, or at least discussed adequately in the literature. One of the major advantages is that it encourages manufacturers to introduce product improvements (including technological ones) more rapidly. A new model that is introduced in the fall embodies more changes than merely a different styling. This has great social implications, because as safety and performance improvements are added to the automobile the result one hopes for is that the cars now on the highway which do not have the desirable features will quickly be replaced.

Another aspect related to the product changes made by the automobile manufacturers concerns the issue of the reliability or performance of the automobile over time. If it could be shown that the performance of the automobile decreases fairly rapidly over time, this would reduce the holding time of existing or old car ownership--a result which would have a high negative social cost. Our examination of the literature has not, however, provided any evidence to support the hypothesis of decreased useful life of automobiles. The study of White indicates that there is an increase in the scrappage rate of cars, but this does not validate the reduced quality theory.¹⁹ Other factors that would affect the increased scrappage rate would be the income changes of consumers, increased turnpike speeds, high costs of repair, etc. High costs of repair are probably closely related to the shortage of trained mechanics, and

19

Ibid., pp.257-63.

therefore the increased labor costs, rather than the increased costs of repair parts.

Product Differentiation

Some economists believe that buyers' ignorance plays an important role in the development of product differentiation via styling changes.

For example, Edward S. Mason states:

It is clear that if consumers were able accurately to judge the merits and serviceability of competing products, and utilized this knowledge in economically rational choices, price differences would more closely reflect quality differences than in fact they do. However, with the enormous increase in the number, variety, and importance of synthetic and highly fabricated products, for which the ingenuity of American enterprise has been responsible, an acquisition of the required degree of knowledge is difficult, if not impossible. Consumers' ignorance has opened up a wide field of economic opportunity for methods of non-price competition of dubious merit. 20

One result of this lack of sophistication on the buyer's part is the development of "brand loyalty." Joe Bain comments:

The automobile buyer's typical state of relative ignorance about the properties of what he buys is related to a second important basis for product differentiation in the market--the dependence of the buyer on the established reputation of the manufacturers for producing automobiles of high quality, dependability, and durability. Purchasing this large and complex mechanism very infrequently, so that he has a very limited chance for trial and error experiments, and spending a great deal for each unit purchased, the buyer is prone to depend on the long-established reputations of given products

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Edward S. Mason, "Wasteful vs. Useful Non-Price Competition" in Jules Backman, Price Policies and Price Practices (New York: Ronald Press Co., 1953), p. 117.

and their sellers as his insurance against making a mistake. Thus each of the Big Three, and to a lesser extent American Motors or Volkswagen, tends to have the allegiance of a "loyal following" of automobile buyers who prefer a particular seller and product for the reason noted, and who buy on faith in its reputation. ²¹

What is implied is that the "impartial observer" would like to change the basic nature of consumers--i.e., make them more aware of price and technical features. Such value judgments are noble but have little to do with industry structure as a phenomenon.

Professor Kaysen has suggested that institutions of professional critics be established to pass on such matters as whether a new car ought to be introduced. ²² It is true that each of us has different tastes and therefore finds certain styles and models of cars unappealing, but it is questionable whether an institution of professional critics attempting to impose their tastes upon the national economy would create more consumer satisfaction than has hitherto existed. By offering a large variety of models and options to consumers so that the choice can be made in the market place the industry caters to consumer demands.

Unfortunately, it is easy and tidy to assume that any product capable of not being classified as a graded commodity is consciously developed by a firm in order to reduce the price elasticity of demand.

²¹ Joe S. Bain, Industrial Organization (New York: John Wiley & Sons, Inc., 2d ed., 1968), p. 242.

²² Carl Kaysen, "The Business Corporation as a Creator of Values," in Sidney Hook, ed., Human Values and Economic Policy (New York: New York University Press, 1967), p. 218.

For example, Leonard states:

Product differentiation adds to the variety of consumer choice; some people buy economy, others buy quality. But product differentiation is not achieved without costs, including investment in research and development, production costs, sales promotion and advertising expense, and a higher rate of product obsolescence. It may also lead to neglect of important consumer values, e.g., safety in cars. ²³

This is an example of the confusion between product differentiation and market segmentation. Market segmentation is what adds to the variety of consumer choice and is obtained through increased costs such as product development and production costs. The goal of market segmentation is to identify consumer segments--e.g., those segments which place higher values on safety features than on other features--and to respond to them. Product differentiation is more properly identified with certain aspects of sales promotion and styling. The goal there is to maximize product visibility within a particular segment or group of segments. For example, advertising such as "GM--Mark of Excellence" is an attempt to differentiate the firm across all market segments. An advertising theme like "The Little Rich Car" is designed to achieve differentiation within a narrower market segment. If some market segment prefers an unsafe car, then government regulation is the mechanism of prohibiting it, although industry foresight to prevent government restraint is,

23

William N. Leonard, Business Size, Market Power, and Public Policy (New York: Thomas Y. Crowell Co., 1969), p. 39.

of course, part of the decision problem. The issue becomes sharp, not in gross measures but in more subtle and novel problems. Hindsight and experience make the past--of a society or an industry--seem shoddy or ideal, out of all proportion with the reality of the time. ²⁴

Product Planning Constraints

Automobile product offerings are probably not responsive to the particular tastes of all consumers at any single point in time. The automobile manufacturers recognize this. For example, Ralph Miller of General Motors stated:

...General Motors faces a very wide heterogeneous mass market. We also offer a wide array of products, but it would be foolish to pretend that we (or our competitors) offer exactly the product most desired by each and every single consumer. In fact, the constraints of manufacturing and distribution dictate that virtually every sale is going to involve some compromise on the part of the consumer. The marketing task is to array our products in such a fashion that those compromises are held to a minimum. ²⁵

Automobile firms appear to maximize product characteristics that will appeal to the broadest consumer segments, within a predetermined selling-price constraint. In this stage of the process, many trade-offs must be made in the design, so that the model will be profitable at the specified price.

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White, op. cit., p. 279.

25

Ralph L. Miller, "Operations Research Models for Marketing Automobiles," address presented to the Industrial Mathematics Society, Oct. 17, 1968, p. 6.

Two elements are important to the understanding of the situation. First, consumers use many criteria in judging a car. Second, these criteria are weighted differently because of many factors originating both outside the industry as well as internally as a consequence of competing strategies. Not only must product planners attempt to estimate the weightings for the criteria of various market segments, but they must also forecast these factors for two or three years in the future because of the length of time required to design a new model.

Time is an important element of decision making. For example, Joseph Bower states that

...the time span of any of the sources of information available to a manager is much shorter than the time span he would like to take into account when planning major economic commitments.²⁶

It is not correct to assume that a firm can draw from its vast array of market research tools and reduce the uncertainty of changing consumer tastes to a negligible level. The results of market research provide only limited information. As Margolis points out, "Knowledge of the future operations of the market within which the firm must operate is so limited that the little knowledge added by predecision research is of relatively slight value."²⁷

26 Joseph L. Bower, "Planning within the Firm," Harvard University, 1969, p. 8.

27 Julius Margolis, "Sequential Decision Making in the Firm," American Economic Review (May, 1960), p.528.

There are, of course, many examples of firms both past and present which have made market errors resulting in major financial losses. The 1970 model year of the automobile industry will be remembered as a year when the firms failed to anticipate the switch in consumer preferences to smaller economy cars. Conversely, accurate prediction of a counter movement in consumer preference would be rewarded. The potential for market shifts after a firm is "locked in" to a decision is an important aspect of the risk in the automobile market.

Sales figures by product and price classes seem to indicate that competition is homogeneous within a price-product class. Thus, if all the compact cars have similar features and similar prices, one may assume that competition does not exist. It is more realistic, however, to assume that consumers shop across product-price classes, and that within a price-product class there is heterogeneity.

Ralph Miller, using General Motors data, showed in 1968 that less than 18 per cent of the persons considering a compact car would choose a compact car of another make, if they could not make a suitable deal--trade-in and price concession--on their choice of make.²⁸ Thus, from these data it appears that more than 80 per cent of the competition for a compact car, which is a specific product class, came from outside the product class. This illustrates the philosophy of competition which must be used when marketing automobiles: "two makes are competitive only to those consumers

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Miller, op. cit., p. 25.

giving them simultaneous active consideration."²⁹

This view of competition is quite different from looking only at products with similar physical and price characteristics. This is why active competition takes place across product-price classes. The firms' strategy is to introduce a new model with its own product characteristics, but at a planned market price. This strategy has been followed in all of the new makes introduced in recent years. The decision to present a new model carries with it the decision that the model will be in a certain price range. Prices of competing models are the same because they are designed to be that way.

To the extent that automobile manufacturers produce a variety of makes under separate divisional structures, and a variety of models within a line, each individual product faces some competition from others produced by the same firm. There is probably an attempt to use workable market segmentation in order to reduce to a minimum this competitive overlap. While styling and price class differentiation may be extreme, the natural linking of various makes under the single corporate name in the minds of buyers might well tend to weaken such distinctions. This linkage also has advantages to the manufacturer in that a generic brand loyalty can influence the buyer as he moves up from one price and size class to another.

Not all the product lines of a single manufacturer are widely separated in terms of styling or price. Obviously, as the disparities are minimized, intrafirm competition is increased. In cases where a firm attempts to prevent an industry competitor from capturing a sizable portion of a

particular market segment or subspace, intrafirm competition may well be increased.

Little formal investigation into the intrafirm competition has been undertaken. Its existence adds a facet to the decision-making behavior of firms in the industry. In terms of the ultimate questions of industry structure and performance criteria, such a subtopic is concerned with the responsiveness of firms to changes in consumer tastes. For instance, does the factor of intrafirm competition in large firms encourage a wider range of products and prices to compensate for buying uncertainty? Intrafirm rivalry to increase or maintain market share may act as a stimulus within the limits of cost constraints. The whole emphasis in the theory and practice of marketing is to maximize consumer welfare within the constraints imposed by the system. The analytic force should be on the constraints, not only on the goals of a so-called single business entity.

Effect on Internal Allocations

Almost all of the economic discussions about the automobile industry emphasize the size of the firms and imply that there is a single decision-making entity for the automobile industry. This is a simplification, for no entity can be viewed as a single decision-making unit. Rather, firms must be viewed as elaborate, complex systems which operate by incentives. It is such systems which allocate decision-making authority to various individuals, e.g., advertising expenditures, product line expansion, etc.

As Bower has pointed out:

...the results of business decisions viewed from the outside look a lot more convincing because offsetting mistakes, delays, corrections, and crash programs even out some of the unbalanced effects of imperfect decisions made under great uncertainty that radically affect the careers of individual managers. ³⁰

The work of such well-known business analysts as Adolf Berle and Gardiner Means asserts that the decisions of a firm are made by a small group of controlling managers who have the power to select their successors. ³¹ The difficulty in supporting charges against corporations on the basis of this 1932 research is that it tells only a partial story. Results of current research indicate that there is a great deal of decision-making influence at the lower levels of an organization. ³² (Galbraith's rather naive model which seems to imply that a firm makes one product is beside the point here.) ³³ Clearly a large firm is able to reduce its market risk because of multiple product lines. Analysis of the size of an individual firm

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Bower, op. cit., p.10.

31

Adolph A. Berle and Gardiner C. Means, The Modern Corporation and Private Property (New York: Macmillan Co., 1932).

32

See for example Yair Aharoni, The Foreign Investment Decision Process (Cambridge, Mass.: Harvard University, 1966); Joseph L. Bower, Managing the Resource Allocation Process (Cambridge, Mass.: Harvard University, 1970); H. Paul Root, "The Use of Subjective Probability Estimates in the Analysis of New Products," University of Michigan, 1969.

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Galbraith, op. cit.

hides much information necessary for understanding the extent to which a firm plans and controls the outcomes of its decisions at many levels of authority.

Imagine a meeting of corporate managers before the beginning of a model year to decide on a strategy for the ensuing period. They must take into account such exogenous factors as anticipated size of disposable income, new family formations, demographic changes, possible behavior of competitors--including foreign competitors, and all the other elements which provide the setting for decisions.

Having forecast potential demand, they would then allocate resources to the various automotive divisions, always understanding that they may change the allocations as the circumstances require. This is an exercise in market strategy, since different divisions are attempting to secure some assurance of a greater share in the resources of the parent company. If a division, or the divisional managers, considered the circumstances for the sale of a given division's product to be less propitious than in the past (given responsiveness to advertising and reasonable changes in the models), then presumably a smaller share of the firm's resources than the slack division previously enjoyed would be allotted to it. Nevertheless there is, in effect, a bargaining process which allocates resources. If the decisions were made in the light of costs and returns, however, with no maximum monopoly profit as a possible goal-- there are rivals ready to take advantage of price and product disadvantages or mistakes--the consumer is at least somewhat protected by the operation of simulated market forces internal to the large firm. To be sure, the simulated market is not the real

one, but it operates in the direction of the real one, or at least the direction in which the opinions and educated guesses of the managers envisage the real one to be moving.

According to the purely technical sense of economic theory, this intrafirm process amounts to a species of market allocation with competition. It represents the same type of market allocation that a family engages in when it decides whether to buy a new house or a new car, move to a different neighborhood, or send a child to a private or public school. The process is an internally determined kind of resource allocation. The difference, of course, is in the effect of size: the family is atomistic, the auto firm a member of an autonomous industry.

So long as there are no other reasons, such as collusive or monopolistic behavior, for causing divestiture of a corporation than the internal resources allocation which divides the market between the firm and its competitors in the light of possible consumer and competitor reaction, the case for divestiture seems weak. Such internal allocations as we have imagined reflect market anticipations rather than market control.

In our view, product planning in the automobile industry is keyed to the fact that consumer tastes may change rapidly and substantially. Such a change might be a fundamental shift in the consumer's basic perception of the automobile. In a narrower sense, changes in taste regarding styles, sizes, and price classes may occur. The elements of demand that affect risk lie in the relation between market changes and the firm's ability to predict and respond to such changes. It might be argued that the development of multiple makes and styles by a single

producer is fundamentally a hedging operation promoted by the desire to gain a flexibility which would allow the producer to be in the segment or class (size, price, style) into which demand is shifting.

Summary

Responsiveness to a changing environment is a widely accepted performance criterion for viable organizations. Responsiveness to changing consumer demand is a corollary to this for industrial organizations in particular. The ability to adapt ordinarily involves planning, and we have here attempted to hypothesize planning by automotive firms with regard to the products they offer. Because of the nature of the industry as it exists, the issue of market power pervades discussion of almost all activities engaged in by the manufacturer.

We have examined some of the determinants of automobile demand-- income, tastes, existing stock of cars, etc.--and the implications of these factors for competition both among and within the manufacturing firms. Finally, several of the issues growing out of product planning have been outlined to illustrate the conflicting views as well as to underline the need for additional research. Evaluation of the firms' responses to changing consumer preferences is complicated by the inadequacy of existing definitions of product classes and market segments, and by the tendency to fall back on primarily economic arguments, ignoring the findings of studies of organizational decision making. Charges of model proliferation and wasteful styling practices have been brought against the auto makers. Such behavior, it is said, leads to inefficient allocation of resources and

less than optimal attention to consumer welfare. On the other hand, the manufacturers point to the multiple variations in buyers' behavior and to studies suggesting that costs are not significantly increased by existing product policies. Certainly such issues as these cannot be resolved on the basis of economic analysis alone; they require the application of behavioral research before a reasonable evaluation can be made.

One can hardly expect that any change in the structure of the automobile industry could, or in fact should, encourage firms to make decisions contrary to the standard concepts of managerial economics. For example, it has been demonstrated that risk reduction, or the attempt to minimize uncertainty, is a recommended practice followed by firms. If then an automobile firm recognizes the possibilities of a change in consumer demand, a low-risk strategy would be to react to that trend with changes in the marketing strategies for existing product lines rather than to attempt crash programs to develop new product lines, as recommended by critics. Risk-reducing behavior might be further reinforced if there were a larger number of firms in the industry, each having a smaller product line. Yet the result might be either an increase in prices to offset increased risk, or a high failure rate of firms because of the increasing costs and increasing risks. The past history of the automobile industry tends to support the latter outcome. The business failures of the minimal-size firms might create more serious economic consequences than the present situation. We are not attempting to raise the "second-best" argument here, but rather to raise doubts concerning the degree of predictability of existing

theories. We would opt for further economic research that at least recognizes the results available at present from the behavioral theory of the firm and managerial economics.

CHAPTER V

EXTERNALITIES IN AN AUTONOMOUS INDUSTRY

Goals and Their Achievement (Technology and Externality)

In every society a community-wide, generally accepted bundle of goals exists. For example it is generally agreed in the United States that more income is better than less, that more education is better than less, that the public interest is more important than private interests, etc. Interpretations of the goals differ among different people and elites, and none are absolute. The different emphasis and significance attributed to these goals by different individuals and groups provide the tensions which maintain the dynamism of the society. The various means to gain these varied goals may be defined as acceptable behavior and reflect the mores of that society. In business, love, or academics one can often get away with a "fast one" if he does it with grace and gentility. Politically, this is also true. If it is repeated often enough to gain acceptability, the fast ones become part of the mores and may even become a norm.

Law and law enforcement are the formal ends and means; but the informal, extralegal means and ends often prevail. These extralegal behavioral modes and goals are sometimes at odds with the formal ones. Yet, a substantial divergence between actual and approved (legitimized) means and ends is socially unacceptable. If a judge releases the son of

colleague on a technicality, even though the charge is serious and fairly well substantiated, the community is up in arms. On the other hand, when a speeding ticket is "fixed" the community, if anything, sympathizes with the speeder. The story of prohibition in the 1920s and 1930s is a national mythology; marijuana may well be the alcohol of the 1960s and 1970s. Similarly, the conventional (and legal) attitude toward the stock market and purchases on margin, minimum wages, social security, "upstream" loans, mergers, and profit retention has changed mightily in a generation. Certain kinds of behavior among the youthful are less shocking now than ten years ago, and some are even reflected in adult behavior--a modern application of the saying, "And a child shall lead them."

The salient point is that the changes continue and call forth new adjustive behavior, which in itself generates new changes. The perceived reality of today becomes next week's mythology and next year's forgotten past. The interaction of technology, education, philosophy, literature, indeed all the abstractions of social behavior and value, is constantly changing perceived experience; and these changes in turn set in motion internal adjustive changes by both the individual and the society.

Economic Behavior

The perceptions of the economic performance of a society have two important dimensions. They are: (1) the externalities, or the effects of economic action on those outside the firm, e. g., other firms,

buyers, sellers, the political and social systems, and (2) the requirements of technology. Technology may be viewed as the generator of industrial change, while externalities may be viewed as its consequences.

Externalities may be defined as the benefits or detriments of a particular market, economic structure, or transaction which do not immediately enter into the market price, or for which no direct private individual cost is incurred. Externalities have typically been discussed in terms of costs and returns. If the costs of pollution control are less than the benefits, then it is worth while to correct the pollution. If, on the other hand, the benefits of controlling this disbenefit are less than the costs, the issue becomes a public one.

Technology and externality may restrain and support each other. The primary economic thrust of industry is through its technology and the subsequent effect on product or service cost, availability, and quality. Social and financial costs are the effective restraints on technology. These costs include the private, money costs to the firm and the external costs of the technology (sometimes called social costs), that is, its influence upon the life, culture, and environment of society. But what is the cost-benefit tradeoff, and how are the effects distributed?

A firm or industry might refrain from using a technology because of its external effects: it causes unemployment; it makes people ill; it is a pollutant; or it is noisy. Such considerations are coming to be more relevant in economic analysis--and public policy--than in the past. That the product is of low quality or illth (in Riskin's vocabulary) is also a challenge to industry, because of the industry's own values,

or the values it faces in the market of political and social ideals .

(Air and water are no longer free goods , in fact.)

Ideology and Behavior

The reformer or the cynic , and reformers are cynical about the ideological purity of business , would rely on law to restrain the offensive business action. Yet, in the long run, informal or moral restraints are probably the more effective. Ideologies , legitimated by law, convention, or custom, are not so unbroken a unity that any fracture like contradictory values destroys the structure. Values and behavior patterns are complicated, often contradictory, and sometimes even unrelated to each other; but just as often they are also complementary, supportive, and related. The ethic or morality of dog racing or watering whiskey has little to do with the care of children or the indigent; administering prices may or may not be related to producing a fine product; mergers may or may not adversely affect the consumer. These actions each employ independent values. Actions must be judged on their own merits in the context of a broad value system.

The specific evaluations we make , although having an ideological core, do not reflect a single ideology. The view is microscopic, or often microeconomic. Yet quite different conclusions of ideological legitimacy or social value might be adduced if the other dimensions

were added, by reflections or experience, to the social experience triggering the response.

Ideology and the Evaluation of
Large-Scale Industry

It is the wider and more complex context which is necessary if the externalities of large-scale industry and the benefits forgone are to be ideologically tested and legitimation affirmed. The microeconomic system, the structural approach, is only part of the analytical mechanism and value system which is available or useful in economic evaluation. Our contention is that widening the scope and multiplying both the tools of analysis and the questions raised yields interesting and more relevant results.

What is needed to structure an evaluation of large-scale industrial organizations is a criterion or a set of criteria which could--given the objectives of society--be employed to justify or refuse legitimation of large-scale economic and business activity. This involves a more permissive, or perhaps more complex, view than the strict microeconomic structuralists would take towards the means by which the values and ends of society are accomplished.¹ However, if we are to

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Herein is one major criticism of the structuralist school, which includes such able and resourceful economists as Milton Friedman, George Stigler, and indeed the so-called Chicago School.

retain any semblance of order and equity in the system such a permissive or complex view cannot and must not countenance conspiracies, market-sharing agreements, or other such joint and collusive actions. Our view is not inconsistent with a belief that competition is effective. While possibly hurting some competitors, competition usually points toward the rational allocation of resources and consumer welfare defined in some acceptable and operational fashion. Our conception of competition, however, countenances as "normal" various degrees of imperfection, i. e., industries as autonomously organized.

How firms get to be large and strong may be as important as what they do with their size and strength. What large firms do with their size and power may well be directed towards their desire to remain large and strong. This latter activity brings to the fore questions of the creation and maintenance of barriers to new entry. Behind this activity lurks the relationship of economic efficiency and size.

There is no reason to believe that size in and of itself is beneficial to a society which historically has been conditioned to rely upon impersonal competition as a counterweight to the "benevolence" of the butcher, baker, or auto maker. Competitors striving to improve and increase their output and to decrease their prices are congenial to the traditional values and mythology of our economic society.

Consequently, we have two behavioral problems. One is entry and the other is size. The two are obviously not unrelated. If size constitutes a barrier to new competition, but concurrently encourages efficiency which promotes consumer welfare, public policy has the

problem of deciding whether size--or what degree of size--is a sufficient condition for legal restraint in a given circumstance.

Alternatively, if size constitutes a barrier but is not accompanied by added efficiencies contributing to consumer welfare, then size surely becomes suspect from a public policy viewpoint. The social, legislative, and judicial tasks are to discover if there is any necessary relation between business efficiency and consumer or public welfare.

It must be made clear that the relation between the size-welfare tradeoff is not always easily amenable to the analysis of economic theory, a set of tools which has concerned itself more with the process of production alone than with the whole process that includes purchasing raw materials, filling requirements for components, and the design, manufacture, assembly, and distribution of the final product. Separate and uncorrelated discussions of supply, production, and distribution can be found not only in the ordinary textbooks but also in the excellent ones. For example, Boulding discusses the "effects of uncertainty" in writing about the derivation of supply curves from cost curves.

By uncertainty he means a situation in which the cost and revenue functions are neither certain nor known--not a rare occurrence in the experience of most firms and industries. As is necessary in his discussion, Boulding limits himself to the effects of uncertainty on prices and revenue. The argument is conceptual rather than operational. The assumption of an institutional setting between production and sales and on institutional and technical setting between production and the purchase of components would have made the argument, if not more realistic, at least a little broader and therefore more relevant to the factual realities of business experience.

Baumol defines the various degrees of monopoly power to be found in industry; and in a fashion which can only be considered brilliant he discusses the ways that a firm's output and pricing policy might react to the possible countermoves of his competition.² Although the analytical arguments³ again assume that the alternatives available to the firm are constrained by some undefined competitive force, the institutional

2 William J. Baumol, Business Behavior, Value and Growth (New York: Harcourt, Brace and World, Inc., 1967).

3 Ibid.

structures connecting the firm with the suppliers, on the one hand, and with the selling outlets, on the other, are not explicitly considered. Yet in the analysis of production and pricing these institutional constraints may well be of major significance. For theoretical and analytical purposes, the Boulding or Baumol approach of abstracting from some broad generalization is justified. When a process of actual behavior is in question, however, the general or nonspecific approach is ordinarily too abstract to yield much insight into business policy.

An investigation beginning with the supplier, and including manufacture and finally the seller is necessary for a thorough analysis that emphasizes the efficiency-welfare tradeoff. There is an implicit interrelation between the purchase of components and raw material and the assembly, manufacture, and distribution of the final product. This relationship can neither be denied nor neglected. The economies of purchase, manufacture, assembly, sale, and distribution all interact upon each other. The whole productive unit, with its diversification often going beyond the corporate level, is more significant than a concern centered on the abstracted manufacturing aspects of corporate activity.

Effectiveness and Efficiency

Big and efficient distribution may affect the scale of production in such a way that plants larger than the minimum size for optimal manufacturing costs become desirable for business success. A related process also operates. Bigger production units which are efficient often

make large-scale distribution mechanisms a more effective business tool than less complex and smaller distribution mechanisms. Hence total economic efficiency, as a matter of both consumer and producer welfare, requires bigness and balance between production and distribution mechanisms. What we are proposing is that a distinction be drawn between corporate (production-distribution) effectiveness and narrow manufacturing efficiency. Less well-endowed or smaller firms may be driven to the wall or forced by the realities of market rationality to adjust their price-output decisions to those of the dominant firm. Such a situation may be potentially harmful to the consumer. On the other hand, prices may be set, in effect, by the smaller firms, as we have argued in Chapter II.

The crucial question is what constitutes an effective, efficient market. Although competitors' freedom and opportunities are restricted, the result need not be distasteful and harmful to consumers. Organizations, like individuals, seek to obtain some objectives, however vague or intractable they might be.

Successful managers and strategists of the firm determine policies which maintain good relations with shareholders, consumers, the public community in which the plants are located, and the community as a whole. Labor relations must be satisfactory. Working conditions for both labor and management must be harmonious, but perhaps sufficiently unstable at all levels of the firm so that at least some individuals with drive may realize their potential.

Goals as Subjects of Public Policy

The foregoing enumeration of possible goals and subgoals of the firm could be extended. It is limited only by the imagination of the commentator. Yet the goals of the firm are the basic subjects of public policy. Like the goals of the firm, the goals of public policy are also multidimensional.

For a society to prohibit certain behavior because it may be the means of creating social impropriety adversely affecting consumers, government, or competitors implies some definitive values that are held by the government as ideals. These values, being multidimensional and often conflicting, require that the goals of policy fall into some hierarchical arrangement with the greater good being more important than the lesser (following Saint Thomas, the Angelic Doctor). The ultimate objective of public policy (after the preservation of the state itself) is generally conceded to be some conception of consumer welfare or interest. This objective, of course, requires careful defining in any specific case. In reality industrial behavior does not result in providing either social benefits or disbenefits, but not both. Rather, some segments of society may be benefited at the expense of others. The level and distribution of benefits may be different under alternative types of behavior.

Yet by admitting the welfare possibility of autonomous industry we admit the necessity of regulatory government. The tradeoffs between consumer welfare, the size and outreach of government, the political and economic power of unions ,and industry barriers to new entry are

difficult but necessary adjustments between the political, social, and economic marketplaces. The issue becomes even more complicated when questions of upward social mobility, distribution of income, and the use of new technology are added to the tradeoff considerations. The significance of advertising, the social and economic implications of self-investment, the tax policy of the United States, and a host of other questions involving public policy ultimately affect the policy of the firm by trickling down from legal, legislated, and government administrative policy.⁴

Even though the present world is not the best of all possible worlds, within rather broad limits, it does meet the social need. Improvement in the social behavior of the industry probably requires: (1) strong willingness by consumers to abstain from buying if their values are not met; (2) government intervention with respect to safety and quality standards; and (3) active participation in the market by the firms within the industry. Price, quantity, quality, and innovation are all implied as changing variables.

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Stability, as an ideal public policy, should not be taken too seriously. In its ultimate sense stability implies an equilibrium with no new technology and no permitted changes in taste. Yet one of the values of American society is that technological improvement and changes in tastes must satisfy the people involved rather than the government.

Externalities

Each man and each society is a prisoner of ideology and values. The quality of the prisons may differ through time, but neither men nor societies can ever escape their inherent values and ideologies. At best a man or a society can move from one prison to another. Similarly, externalities are inherent aspects of an economic system. Their ideological implications, however, are often hidden.

Externalities can be either desirable or undesirable. Pollution of air and water, as well as other forms of environmental pollution are generally considered undesirable. There are, however, beneficial externalities with which we shall be concerned, the disfunctional ones being a major topic in popular discussion and debate. These may take the form of direct benefits and be available freely, or be in the form of consumer or producer surpluses.

What seem to be neglected in popular discussion are the situations in which total resource costs are less than total benefits, measured in some acceptable fashion. One can imagine a situation in which a firm for one reason or another acts as if it were consciously providing an externality by undertaking to supply social benefits--for example, a beautiful lawn or park or attractive architecture without cost to the public.⁵ Externalities--goods and services not required by the market and not paid for--may be either beneficial or detrimental to the recipient. Smoke and hydrocarbons in the air, unsightly piles of junk, noise, water pollution

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Some free goods may be provided as part of a "goodwill" or image-building program. Insofar as these are conscious acts they partake of planned action to the firm but are externalities to the receiver.

clearly are what we might call detrimental or negative externalities . On the other hand, there are positive beneficial externalities , e.g. , upward mobility of labor due to technical innovation and learning of social and mechanical skills . These are generally beneficial to recipients although no price is charged . Thus , we may have beneficial externalities and detrimental externalities , or positive and negative ones .

Besides being either beneficial or detrimental, externalities can be classified according to whether they are internal to the industry or go beyond it. Externalities affecting the industry might arise from vertical integration of an industry, or from close vertical contacts between supplier and buyer which cause technical knowledge to be more widely diffused than it otherwise would be and thus reduce the cost of such technical diffusion. Insurance of a continued business relationship between supplier and buyer may be beneficial to both. On the other hand, these industry externalities may work hardships on the suppliers, if the buyers require as a condition of continuing their purchases more than a normal discount, or special services not normally supplied without a cost in the market.

Among the external effects of economic activity which leave their mark outside the defined industry are negative externalities, like water pollution, which are felt by people entirely unconnected with the industry. But scientific and technical advances may provide benefits unrelated to the costs incurred by the buyer, and they may affect many people besides the buyer. For example, technology which reduces the incidence of an infectious disease is a benefit because fewer people are exposed to carriers of the disease; and so it is an externality.

Consumer and Producer Surplus

In industries like the automotive which enjoy decreasing costs, competition will limit the number of firms. Given this condition, the traditional theoretic notions of equilibrium are not really appropriate. Rather, some notion of stability resulting from market sharing obtains. Yet the very absence of pure and perfect competition (with its implied upward sloping cost curves) creates the phenomenon of producer surpluses. Consumer surpluses also arise insofar as some buyers would be willing to buy above the market price. It must follow then that the social surpluses are greater, if prices are lower, than they would have been with a greater number of less efficient firms--i.e., if the industry cost function is declining. In an industry which has an elastic demand for a broad range, consumer surplus is likely to be greater than for an industry whose demand curve, as prices fall, is less elastic for a wide range. The automobile industry--though not by its own doing--seems to have an elastic demand curve.

That the automobile industry has provided so large a number of automobiles, almost regardless of price, surely indicates that, compared with that in other consumer goods industries, the consumer surplus for the automotive industry is large. Indeed, the consumer surplus is so large that the externalities caused by the overwhelming number of cars on the roads are generally considered to be negative. Overcrowding of highways, air pollution, and ubiquitous junkyards result both from the demand for autos and from their supply. On the surplus side, however, the social value of a police car or ambulance, for example, is clearly in excess of

the price.

The automobile industry is a joint cost industry. It is joint cost with respect not only to the output of a single producer but also to the output of the entire industry. By this we mean that because of decreasing costs in the manufacture of components the industry has adopted a division of labor within itself: General Motors sells to Chrysler; Chrysler sells to Ford; Ford sells to General Motors; and so on. In addition, each firm uses specific or "captive" suppliers as well as inter- and intra-industry suppliers.

Chapter III shows that with decreasing costs for the manufacture of components each firm tends to produce those components which it can produce most efficiently. Firms import and export, that is, sell to and buy from each other. The whole industry and its suppliers compete in the sale of the final product and act jointly in the production of final products. Little else could be expected with decreasing-cost industries; otherwise there would be the instability caused by price wars. In such a case one result might be monopoly; another might be a follow-the-leader situation, which is a variant of monopoly, but with reduced profits, less consumer welfare, and an increase in government intervention.

Although one hears that there is, in effect, a follow-the-leader situation, with General Motors as the leader, the data on price and even output do not support so simplistic an interpretation. In particular lines General Motors does not always maintain "its" market share. Neither is GM impervious to the design and structural changes of the lesser companies. The prices charged to the distribution network do not seem to be related to the ultimate retail price in any simple fashion. Distributors have a fairly wide leeway in adjusting or bargaining with the consumer.

Trade-in values, pricing of accessories, and discounts make consumer price data difficult to come by with any certainty. Furthermore, dealer discounts vary throughout the year, thus further confusing price measurement.

Transportation Policy

Our contention is that the goals--and hence the activities--of a going firm are multidimensional. Any major goal we chose would be entwined either with a long-run policy designed to maintain income and perpetuity⁶ for the owners, or with the short-run alternative of making the firm attractive for merger or acquisition. We can neglect the latter consideration for the principal part of the automobile industry. The era of auto mergers in which companies lost their identities is past. The reverse is now true. Auto companies tend to acquire other firms. Therefore, perpetuity comes to be the most realistic long-run goal of the automotive company.

Just as the goals of industry are multidimensional, so the goals of individuals and collections of individuals are multidimensional. Few people are solely concerned with their income position in their political

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By perpetuity we mean the assurance to the owners of income derived from assets over time, regardless of the form of the assets, or the name of the company. Claims on the income, i.e., evidences of ownership, must be salable.

decisions. If their own immediate income were the only concern of groups and individuals, the whole artistry of public life--schools, hospitals, welfare, laws upholding desegregation, and equal rights, building codes, public recreational programs--would be entirely different from what we now have. For better or worse we are members of communities, and often and persistently we are attentive to community benefit. The ideologies which underlie our behavior do not derive from a course in sophomore economics.

For the corporation, perpetuity is secured through other means than only economic ones, even though the economic consideration--that is, profitability--must be assured and maintained. Perpetuity implies obtaining and keeping a high level of management skills, labor skills, consumer acceptance, and community acceptance, that is, general good will. In other words, after the firm has achieved a certain status in the industry it can no longer concern itself only with price and output relationships. Of necessity, it must consider other dimensions of behavior which management believes will make the firm more secure in the governmental eye and in public opinion.

Those who argue that the purpose of business is business, that management is really a trustee of the wealth of the investors are talking sense. But the interpretation of the trusteeship must be a broad one, especially for large-scale autonomous industry. The conservation of assets and their growth require a stand which has wide approval from many segments of the public. This stand need not be--and indeed should not and cannot be, as a long-run phenomenon, wasteful of the assets or income

of the owners. Rather it must be protective. Mistakes are made, of course. After all, the market is an arena for experiment if it is anything at all. Nevertheless one is (reluctantly in our mind) still forced to the position that if large-scale, autonomous industry is to survive without close government directives, it must act in a quasi-public policy role as well as in a market role.

Earlier we commented that the automotive industry may be viewed as a single firm with a marked division of labor and degree of specialization. The implication is that the industry must take a certain stand and act in a certain common manner. This commonalty appears not only in such mundane market matters as styling but also in protective devices, safety devices, attitudes towards legislation, and attitudes towards consumers--expressed, for example, in warranties. In other words, there is a competition among the disparate parts which causes the industrial unity to have an internal coherence without overt (or covert) collusion. The force of competition and the accruing externalities extend beyond Adam Smith's "invisible hand" in this strange arena of decreasing costs and heavily capitalized industries. Action may be collective.

Satisfaction, however, is always individual, for collective goods are ultimately individual services.

This concept raises the question of the number of automobiles. The number of cars on the road, in and of itself, is not significant, but the implications of number are. It would be folly to ask the automobile industry, however kindly, to restrict its output because the roads are clogged. Such voluntary restraint would not only be illegal in the light of antitrust policy and common law, but would also flout the motives by which managers conduct their affairs. Yet one of the arguments for competition as opposed to oligopoly or autonomous industries has been that such industries tend to restrict output while competitive industries do not. Given a technical organization, the converse is true. We have too many automobiles. The road system can scarcely support them. The air can scarcely support the pollution caused by the internal combustion engines. Parking has become impossible. Parking structures consume resources which might have had more desirable uses from a communal perspective. Restriction of output as an ongoing industry policy, then, is not a realistic problem of any importance. Since the market is geared to increasing output, the only agency which might legally try to restrict output generally is obviously the government, acting for the entire society.

Effectively restricting the number of automobiles may be accomplished by limiting their use. This is the solution which is most generally discussed in the United States. Such ideas as substituting bus travel for auto travel within urban areas--either through limitations

on parking, or by making fees for parking or taxes on automobiles and parking places extraordinarily high--would restrict the use of autos. It is possible that such restrictions on use might, in their turn, restrict the purchase and hence the output of automobiles.

A transportation policy to provide cheaper alternative means of transportation through either raising the cost of automotive transport or reducing the cost of other kinds of transport and vastly improved service in and between cities has also been considered. As a nation, however, we have not been successful in the general subsidy approach (vide agriculture and ocean transport). Another alternative would be for the federal government to restrict the output of automobiles. Here again, the actions can be either direct or indirect. The direct approach would be to apply quotas; but this is most unlikely with the American economic philosophy what it is. A more probable approach would be the levying of differential taxes. If the excise taxes or the use taxes on automobiles were raised to extraordinarily high levels, the purchase of automobiles would eventually decline and so would output. Alternatives would be to increase the taxes on components, gasoline, and oil, or even to charge user taxes on roads.

This discussion goes far beyond the scope of the automotive industry, however. It is a general transportation problem, not an automotive problem, within the jurisdiction of the government, but not of industry. The government simply cannot abdicate its responsibility in transport policy any more than industrial firms can, in our opinion,

avoid intervention in social areas as a matter of self-interest.

Integrative Efficiencies of the Market

A concept somewhat analogous to externality is that of integrative efficiencies of the market. Imagine a vertical activity path in which the product is sold as it proceeds up the production ladder. At each stage of its movement buyer and seller meet; commissions are charged; packaging performed; and other selling and buying activities occur. Now let us imagine the firm integrating these activities. The costs, or at least some of the costs and mark-ups involved in moving the goods from the lower to the higher levels of activity, are less than if the goods were bought and sold at each step in the process.

Clearly there is an economic advantage in such vertical integration. Opportunity for it may exist if suppliers supply the whole run of their product or an appreciable part to a buyer, and the buyer exercises qualitative and specification controls at the point of manufacture. Under such an arrangement the product is standardized. If the standards are changed, notice and advice pertaining to the exact changes required and how to accomplish them is given to the supplier. In the case of integration flowing from an extraordinarily close relation between supplier and buyer, the integrative efficiencies may exceed the efficiencies of the free market which is guided by competitive prices.

This may be true not only for the sale and purchase of commodities but also for labor-management relations. Unions, in a sense, structure the labor market by classifying people in accordance with the skill

requirements of management. Wage differentials, once agreed upon, are maintained, rather than making out-of-line adjustments for persons of particular skill. Frequent and regular grievance meetings are held to iron out difficulties so that both management and labor benefit by the integrative results of the trade union contract. That union wages are persistently raised more than nonunion wages is debatable. There is a strong presumption on the part of those who have studied the problem, however, that while unions may initially raise wages above the level of nonunion wages, the wage adjustments of the unions are no greater--and are probably less--than the upward wage adjustments of nonunion labor.

If the bargaining of Big Labor and autonomous industries actually results in more efficiencies than in a more fragmented system, then Big Unions may conceptually be regarded as divisions of--or at least sectors of--autonomous industry which are more adjustive than competitive within that industry.

Economic Security and Mobility

The productive mechanism requires people. Insofar as the people employed enjoy more satisfactions related to income, interest, attractiveness, prestige, and comfort than some alternative system might supply, the people as employees enjoy an externality. Insofar as the earnings, interest, attractiveness, prestige, and comfort of industries are generally comparable within a given social system, we can neglect cross-sectional notions of externality. Comparisons of externalities then become temporal.

In the present situation, however, all firms, industries, and markets do not provide identical benefits to those who are concerned with producing and distributing services. Firms, industries, and markets which provide a more attractive setting, in its broader sense, may be assumed to create greater beneficial externalities for the work force than those firms which would provide a lesser set of benefits. Conversely, those firms which provide less than an average or modal benefits may be assumed to provide negative externalities to their employees. An industry or firm which provides greater than average ease of entry, upward mobility, social mobility, and special family protection is providing surplus externalities. If however, the net of the externalities is no greater than the average, the firm, market or industry in question has no advantage. Firms, markets, or industries that provide unique surplus externalities would be considered positive. Conversely if other firms, industries, or markets supply less than average or modal external values, they would be considered as supplying negative externalities.

Payment for surplus externalities may come from the consumer

in the form of higher prices than otherwise would obtain, or from some surplus of the producer. Although the latter seems probable in a decreasing-cost industry, the consumer surplus should be considered. In the automotive industry one should not be surprised if both consumer and producer surpluses were appreciable.

This is a cross-sectional kind of analysis. We are not concerned with the question of whether one social system is better than another, or if people were happier in the past than they will be in the future. The dynamics of our system involve merely adjusting and changing the situation of a firm, a plant, or a market from one position to another within the cross-sectional spectrum.

In accordance with Parkinson's law, we should argue that as the size of an operation increases, overhead increases. This increased overhead for a single firm may nevertheless be smaller than the overhead of a larger number of smaller units producing a given output. These are integrative efficiencies which make the case for vertical integration. It would follow that the social structures of fewer, larger units would be differently organized from the social structure of many smaller units. Such new, larger organizations (with growth in overhead) provide opportunities for job entry to many persons who are chosen rather impersonally by the larger organization as administrative officials. The smaller the organization, the more likely it is that the choices will be based on friendship, blood ties, or even pure chance. The larger the organization, the greater the likelihood that some organized, objective system of testing, placement, or hiring will be employed.

Chance plays a smaller role, and some concept of equality of opportunity becomes more operative. The art of personnel selection and training rests on the above kind of argument insofar as many large firms are concerned.

A stereotype of the American executive is that he works extremely long hours, carries the burdens of the company on his own shoulders, and is, in effect, a prisoner of his firm. This would indicate, in a rational analysis, that the firm is inefficiently operated, that the successful businessman doesn't know how to delegate authority, that organization is lacking, and possibly that there are in the world too few people to carry on the task which the business requires. The doctrines of the indispensable man or the necessarily poor organization are, of course, not acceptable doctrines. The extension of job opportunities would benefit the newcomers as well as the overburdened.

Another aspect of the integration of large-scale industrial activity, of economic security, and of both economic and social mobility is the role and character of union organization within these activities. In the United States large unions are related to large-scale industry. The two go together almost as complements. To be sure, one can find instances of large-scale firms without large-scale unions, e. g., IBM, and one could find instances of large-scale unions without large-scale industries, e. g., The United Mine Workers of America in the coal mines and the International Brotherhood of Teamsters and Warehousemen in the trucking industry. But large-scale manufacturing industry--e. g., steel, automobiles, and electrical appliances--is generally related to what

Galbraith has dubbed the countervale of large-scale unions to large-scale management. In the case of electrical appliances, where there is one large union and a multitude of smaller unions, the smaller unions have begun to act jointly so as to act, in effect, as a large union. In the case of the building trades unions, which are moderately decentralized, the growth of large-scale contractors has led to more cooperative activities among the tradesmen. The large-scale Teamsters Union seems to be in the process of imposing large-scale activity on the trucking industry. It then follows that large-scale industry does provide an externality not only to labor in general, but also to unions' organization and their effectiveness with respect to the services they provide to their members.

This assertion must be considered and tested whether or not one is sympathetic to the purposes and practices of unions. Unions are an existing institution. Although the fact is often overlooked, the union movement provides upward mobility for young men without property, and often without education. This is a significant externality which provides an opportunity for strong men to express their personalities in other ways than through business, the arts, politics, or indeed revolution. Part of the social stability of the United States, from the political and general social point of view, may well be related to the confined and constrained instability in union-management, bargaining, and industrial relations. Careers for both well-educated and less educated young people, on the management and union side, are assured through the institutions of large-scale industry and large-scale unions.

Since the goals of business are multidimensional, and perpetuity of the firm is the fundamental goal, the greater the probability of perpetuity implied by a corporation the greater the external benefit to the owners of the corporation. To be sure, the activities of firms, provide internal as well as external benefits. The comparison is not between internal and external benefits, but between benefits which each competing firm or industry offers to consumers, labor, and owners in the market generally.

CHAPTER VI

EPILOGUE

We have now come to the end of a conceptual study of the automotive industry. A major concern was to construct a framework by which to study the industry's performance. This framework in part consisted of structural criteria, and in part of social and economic (market) goals and externalities. The market goals were largely related to consumer welfare, the externalities to the welfare of society as a whole. The industry was viewed as an economic activity or process extending from the suppliers through design and manufacture to distribution.

Our purpose is neither to find fault nor to award praise. Rather we are concerned with developing some analytical and synthetic propositions about the automotive industry and some propositions which might be of interest in any discussion of performance.

Consumer demand and technology are taken as given conditions in our study; and, whilst recognizing that both are subject to some control by industry, we nevertheless assume that ultimately they are both independent of manipulation and control. Granting that the social goals of an industry and its market goals are many and complex, we attempt to concentrate on welfare. Our conclusions regarding the

achievement of consumer welfare by the industry indicate that, at a fairly abstract level of conceptualization, more beneficial performance is not likely to occur if the number of firms of the industry were doubled or were increased even more. On the other hand, it is possible that some untoward--even disastrous results--might occur if the number of firms increased but the actions among competitors were so directed that they resulted in protected markets, not technologically oriented.

Our discussion of untoward externalities seems to indicate that the control of such external benefits requires government policy, plus an awareness by the industry of its long-run interests. When the industry is aware of its long-run interests, it should act to correct the untowardness of any detrimental externality so as to avoid restrictive legislation. On the other hand, from the public point of view the very size of the industry makes it a force whose actions cannot be hidden and are therefore subject to public criticism and debate.

Further study of the automotive industry as a process would be useful, both from the point of view of public policy and industrial policy. Long-run considerations of supply and demand as well as short-run considerations would improve our knowledge of pricing, output, and intra- and interfirm policy. A deeper look at the problems in the end product market would improve our understanding of the effects of product differentiation and market segmentation. Such a study in turn would improve our knowledge of the meaning and implications of market power.

More intensive analysis of supply-manufacture relationships would be of value in explaining the industrial process and its attendant investment and pricing policies.

If these areas were analyzed and understood more fully, the knowledge would make possible a fuller and more satisfying analysis of the economic and social implications of alternative degrees of concentration. Concepts of barriers to entry, the minimum optimal size of plants, the fuller meaning of economies of scale, and other relevant considerations need to be more fully exposed and analyzed so that all findings can be synthesized for a better understanding of the automotive industry and its role in the American economy.

Some reflective conclusions follow:

--The study might properly be entitled "Reflections on an Autonomous Industry." The investigation we were engaged in is essentially conceptual. Information and data have largely been used to illustrate concepts and logical possibilities. In brief, then, we have reflected on how an autonomous industry--automobiles being the case in point--might operate within the constraints of satisfaction of profit goals plus the attainment of a series of other goals. All the goals put together give us a final goal which we have called perpetuity or the ideal that each firm in the industry would maintain itself--or better still maintain its assets and its earning capacity--in some form, either through continued existence as a self-contained firm, or

through merger, acquisition or other extension. The ultimate objective, however, is for the assets of the enterprise to remain productive. Although this view of a firm limits the application of traditional economic theorizing, which by and large considers only profit maximization, it does not dispose of economic theory as a useless exercise. Traditional economic theorizing becomes one analytic tool among many.

--It follows that pure and perfect competition is not necessarily a good first approximation of an autonomous industry, or indeed of any industry which has multiple goals. In the automotive industry, market requirements are national or even international in scope, and economies of scale to be sufficient require great size. The resulting size of the industry and of each firm makes irrelevant the pure and perfect competition argument and so strengthens the need for the imperfect competition analysis. Nor is pure and perfect competition a necessary first step in the analysis of imperfect competition. Our contention is that one can start with the assumptions of imperfection without engaging in the logical exercises--some might call them acrobatics--of pure and perfect analysis.

--The automotive industry, or better still each firm in the industry, engages in product differentiation and market segmentation as a protective hedge against competitors. This protective hedge is designed to secure high coverage in the automobile market. The concepts of product differentiation and market segmentation have resulted in the present situation in which each of the major firms of the industry is split up into divisions, which act to a large degree as separate firms competing within the parent firm and competing as well among the larger corporate entities. The conceptions of product differentiation and market segmentation have gone so far that to assure market coverage each division further segments its market and differentiates its product into a whole series of units which are partially competing and partially not competing.

--The automotive industry is international in its scope, which is to say each firm sells in the national market; but this market is also international, since foreign cars are sold in the United States, and American cars are exported. Geographically, the automotive industry may be considered world-wide in its scope; and technically its range extends from the manufacture of parts and components to final sale and often servicing of the product,

the total activity thus comprehending the design and manufacture of parts, components, and final products. This latter point regarding parts and components is significant. Because rationally the industry follows the law of competitive advantage, technical and cost considerations play an important role in determining questions of make-or-buy or make-and-buy or make-and-sell.

-- In addition to the principle of competitive advantage, the concept of alternative investment opportunities is significant in an analysis of the industry. In other words, the decision to manufacture parts and components or invest in other industries is determined inter alia by the profitability of each activity. The concept of alternative investment opportunities places a severe restriction on any single firm's "controlling" the entire industry or great sectors of it, although it does allow for the possibility that particular submarkets might be dominated, or at least largely supplied, by a given division of one of the large firms.

--The automotive industry is one of decreasing costs in the short run. That is to say, within a broad and relevant range of output, costs per unit of output tend to decline as output is increased. This fact, like those we have commented on above, reduces the application of orthodox theorizing to the automobile industry. The analysis of the process and the synthesis of structuring the industry, in our opinion, do not respond to the traditional analytical and structuring devices which typically, if not always, presuppose increasing costs and the production of a single product. Multiple-product production resulting from the heterogeneity of demand and decreasing costs--when added together--make traditional theory insufficient in and of itself.

--Multiplying the number of firms in the automotive industry by some number like three or four would not, in our opinion, necessarily improve consumer welfare through competitive price cutting or technological improvement. Rather, such multiplication of firms might, or conceivably could, result in worsening the consumer's position and restraining technological improvement. Indeed, it is not impossible that under certain conditions multiplying the number of firms might result in a number of mini monopolies which, because of market forces, would by mutual consent impose restraints on competition and

technological improvement. Such an outcome would, of course, be to the detriment of the consumer. The possibility of such untoward results flows from the current nationwide market, the economies of scale, and the decreasing costs which are attendant upon production in the automotive industry. The ramifications of the argument become even more challenging when one considers parts and components as well as vehicles.

--Given the actual and potential externalities, whether good or bad, of the automotive industry, it is probably socially desirable that the ultimate control of such externalities through regulation of standards and business practices rest in the hands and power of government. Unless the government has the ultimate authority to regulate and control industry, public policy goes by default to private industry. This, we contend, is or would be unwise. Industry, however, including the automotive industry, as a potential risk-taker and risk-avoider motivated by the ideal of perpetuity as we have defined it, has a practical and moral obligation to its owners to anticipate as far as possible public or government regulation. Actions to avoid the financial risks and restraints attendant upon anticipated government regulation are part of the decision-making concern

of industry. This is not to assert that the purpose of industry is a blind and greedy search for profits, but that market forces are significant in considering industrial behavior, and in a sense the government sets some of the rules of and constraints on behavior. Insofar as a firm or an industry can avoid the restraining hand of government by behavior which satisfies consumer welfare and public policy, wisdom is the better part of valor. On the other hand, giving industry the authority to make policy, unrestrained or imperfectly restrained by government, is antithetical to accepted ideas of the competitive market and independent government. Competition in this sense does not mean pure and perfect competition; it means that firms must match each other in the price and quality of their products, whilst satisfying conceptions of welfare and appropriate behavior as laid down by superior authority--namely, the government.

--The interests of labor and the public are probably better expressed when firms in the industry are large than when they are small. It is well known that in the main that the nature, power, and functions of unions reflect the nature, power, and functions of the employing industry. Generally speaking, a large-scale powerful union could hardly exist

in a small-scale industry. Exceptions occur, of course--for example, the building trades unions and the Teamster's Union--but these two industries are quite different from manufacturing industries. With respect to the public interest, small-scale firms are likely to be exceptional institutions requiring and seeking--and often receiving--community protection and special benefits, thus disrupting the ideal conditions of allocation of resources and freedom of exchange. On the other hand, large-scale firms more rarely receive special protection from small units of government. Large-scale firms are more likely to have to face large-scale government and large-scale unions. A kind of second-best arrangement results, that is, second best to the ideals of pure and perfect competition, but the best that can be achieved.

--Large-scale autonomous industries like the automotive industry cannot "control" their markets of sale. Competition among large-scale firms, and indeed among divisions of large-scale firms, may be and often is keener than the competition of firms in pure and perfect competition, where the ideal is merely to meet market price and quality. Ultimately decisions to buy or not to buy rest with consumers; less finally the conditions determining which particular brand or model to buy

and in what price class depend upon consumers and also upon what is available in the market--on the competitive stances of the various firms and divisions of firms in the market. A pure monopoly can regulate either its output or price, but not both. In an autonomous (oligopolistic) situation where the products are somewhat interchangeable, that is, where product differentiation is not absolutely rigid, each competing firm and division must keep a weather eye out for its competition and potential competition. This creates protection for consumers. The restraining force of government regulation and the ineffable surge and search for technological improvement--which is a mark not only of the automotive industry but of twentieth-century culture--also operate to assure consumer welfare. The present concern with pollution is not, in our opinion, properly a fault of any industry (unless it has broken the law). No one until now has properly evaluated or understood the full and disfunctional implications of large-scale roadbuilding, suburbanization, large-scale automotive production, cheap and easy transport, and all the other social forces at work. Scapegoats are rituals, not efficient causes; and whipping boys are ways of transferring guilt, not of solving problems.

Appendix A

SHORT-RUN TERM COST FUNCTIONS OF AUTOMOTIVE FIRMS--AN ECONOMETRIC STUDY

Introduction

This appendix builds on an econometric model of the automobile industry, developed by Dr. H. Tsurumi.¹ Our purpose is to analyze how the average total cost of automobile production by each of the major firms would vary with volume of production during any particular year between 1947 and 1965. The implications and limitations of the analysis, together with methods of improving it, will be discussed.

The Rationale of an Econometric Analysis

Data of the annual (automotive) production of a firm, together with the corresponding series of annual expenses, contain basic information about the average or normal relation of cost to volume. But any meaningful interpretation of these data must take account of--in other words, make corrections for--changes in economic conditions, the product, and the firm. By identifying variables which measure such changes, and then statistically analyzing how they interrelate to affect costs and are affected by volume, one can formulate a mathematical model which reflects the economic characteristic of the firm under varying conditions.

1

Hiroki Tsurumi, An Econometric Study of Oligopolistic Competition among American Automobile Firms, 1947-1965 (Ann Arbor, Mich.: University Microfilms, Inc., 1967). A Ph. D. Thesis, University of Pennsylvania, 1966.

The accuracy of such formulation depends upon the nature and quality of available data. Ideally and specifically, it should be possible to estimate the costs that would be incurred by the firm for various levels of production.

The Econometric Model

The econometric model developed by Dr. Tsurumi is taken as the starting point for such an analysis. This model consists of five sub-models, one for each of the following companies: General Motors, Ford, Chrysler, American Motors, and Studebaker. These submodels are interrelated and may be linked to an industrial aggregate model. Each company model includes demand, price, and investment determinations, together with equations describing labor requirements, wages, raw material costs, and general and administrative expenses. All told, there are 140 equations involving 134 variables, statistically estimated on the basis of published data for the years 1946 to 1965.

The Variables of the Analysis

For our short-term cost function analysis, the following variables are studied. The superscript i identifies companies in the following order: General Motors, Ford, Chrysler, American Motors. A negative integer at the lower right-hand corner is used to indicate a lagged variable. Thus, w_{-2}^2 represents Ford's wage rate two years previously.

A^i : i -th producer's depreciation allowances, 10 millions of current dollars

- ATC^i : i-th producer's average total costs for passenger cars, 100 current dollars per vehicle
- ALC^i : i-th producer's average labor costs for passenger cars, 100 current dollars per vehicle
- ARC^i : i-th producer's average raw material costs for passenger cars, 100 current dollars per vehicle
- AGC^i : i-th producer's average general and administrative expense for passenger cars, 100 current dollars per vehicle
- AAC^i : i-th producer's average depreciation allowances for passenger cars, 100 current dollars per vehicle
- C^i : i-th producer's total costs, 10 millions of current dollars
- G^i : i-th producer's general and administrative expenses, 10 millions of current dollars
- K^i : i-th producer's net capital stock deflated by the deflator, DEF, 10 millions of constant dollars
- L^i : Total employment in the i-th company, 1,000 persons
- L_N^i : Nonproduction workers in the i-th company, 1,000 persons
- L_P^i : Production workers in the i-th company, 1,000 persons
- P_I^i : i-th producer's factory retail price of passenger cars, 100 current dollars
- P_{II} : Wholesale price of buses and trucks, 100 current dollars
- R^i : i-th producer's raw material costs, 10 million of current dollars
- t : Time, starting from 1947 = 0
- U^i : i-th producer's total net sales from all operations, 10 millions of current dollars
- ΔUn : A change in national unemployment rate (%)
- V^i : i-th producer's value of sales from automobiles, 10 millions of current dollars

- V_I^i : i-th producer's value of sales from passenger cars, 10 millions of current dollars
- w^i : Wage rate in the i-th company, 1,000 current dollars (=total payrolls divided by total employment)
- w^{GM} : General Motors' simulated wage rate (w_1^i) at simulated passenger car production X_I^1 equal to $*X_I^1 (X_I^i / *X_I^i)$. Here $*X_I^1$ and $*X_I^i$ are the actual passenger car production of GM and the i-th producer
- X^i : i-th producer's factory production of passenger cars, buses and trucks, 100 thousands of vehicles
- X_I^i : i-th producer's factory production of passenger cars, 100 thousands of vehicles
- X_{II}^i : i-th producer's factory production of buses and trucks, 100 thousands of vehicles
- Z_1 : Dummy; 0 for 1947-53, and 1 otherwise
- Z_2 : Dummy; 1 for 1947-53, and 0 otherwise

The Cost Equations

Each of the models represents an individual company's total costs as the sum of labor, raw material, and general and administrative expenses, together with an allowance for depreciation.

The labor cost is evaluated as the product of the firm's average wage rate multiplied by the number of employees. Treating General Motors as the wage leader, the models determine the wage rate for each of the other companies, in terms of their average wage rate for the previous year, and the current wage rate of GM. The latter is itself determined by General Motors' wage rate for the previous year, the change in the national unemployment rate, and the change in automotive production per employee of General Motors. This last term reflects both productivity and the over-time rate, since the wage rate is defined for these purposes as the total annual payroll divided by the number of employees.

The labor requirements of each firm are explained by automotive production, capital, net sales from all operations, and either previous labor requirements or a trend variable. The General Motor and Ford models disaggregate the total labor force into production and nonproduction employees.

For each company, "raw material" costs are associated with the wholesale value of automotive production. As discussed below, the general and administrative expenses and the depreciation allowances are taken as exogenous for this analysis.

The cost equations were formulated and estimated by Dr. Tsurumi using the method of two-stage least squares² from data reproduced at the end of this appendix. Two test statistics are given for each equation: the multiple correlation coefficient,³ denoted R^{-2} , adjusted for degrees of freedom, and the Durbin-Watson⁴ statistic, D-w, of first order

² J. Johnston, Econometric Methods (New York: McGraw-Hill Book Co., 1963), pp. 54-58, 236-37.

³ Ibid., p. 258-60.

⁴ Ibid., p. 192.

auto correlation. Identities apply to all companies. The significance of the asterisk attached to some variables is discussed below.

Identities:

$$ATC^i = ALC^i + ARC^i + AGC^i + AAC^i \quad (I.1)$$

$$ALC^i = .1w^i L^i \cdot (V_I^i / U^i) \cdot (1/X_I^i) \quad (I.2) **$$

$$ARC^i = R^i \cdot (V_I^i / U^i) \cdot (1/X_I^i) \quad (I.3)$$

$$AGC^i = *G^i \cdot (V_I^i / U^i) \cdot (1/X_I^i) \quad (I.4)$$

$$AAC^i = *A^i \cdot (V_I^i / U^i) \cdot (1/X_I^i) \quad (I.5)$$

$$X^i = X_I^i + *X_{II}^i \quad (I.6)$$

$$L^i = L_P^i + L_N^i \quad (I.7)$$

$$V_I^i = *P_I^i \cdot X_I^i \quad (I.8)$$

$$V^i = V_l^i + *P_{II}^i \cdot *X_{II}^i \quad (I.9)$$

Equations, General Motors Corporation:

$$w^1 = .0973 (X^1 / L^1) - .0669 * Un + 1.0243 * w^{-1} + 1.0230 \quad (1.1)$$

(.0382) (.0263) (.0273) (.1389)

$$R^{-2} = .9873$$

$$D - w = 1.0769$$

$$L^1 = 4.3063X^1 - .1127 *K^{-1} + .3595 *L_P^{-1} + 123.6306 \quad (1.2)$$

(.6999) (.0342) (.1037) (29.2986)

$$R^{-2} = .8211$$

$$D - w = 1.6182$$

** The .1 factor is a correction for units.

* The first coefficient is corrected for units.

$$L_N^1 = .02984U^1 + 9.6878^*t + 92.5686$$

(.02107) (1.6124) (10.6753)

$$R^{-2} = .9638 \quad (1.3)^*$$

$$D-w = .6812$$

$$U^1 = 1.3254V^1 + 95.6220$$

(.0484) (3.9829)

$$R^{-2} = .9767 \quad (1.4)$$

$$D-w = .7507$$

$$R^1 = .5955V^1 + 76.3971$$

(.0309) (24.8497)

$$R^{-2} = .9540 \quad (1.5)$$

$$D-w = .5908$$

Ford Motor Company:

$$w^2 = .3411w^{GM} + .7437^*w^2$$

(.1438) (.1264) ⁻¹

$$R^{-2} = .9710 \quad (2.1)$$

$$D-w = 1.5780$$

$$L_P^2 / ^*K_{-1}^2 = 3.2896 X^2 / ^*K_{-1}^2 + .6022 (^*L_{P,-1}^2 / ^*K_{-2}^2) - .13925 \quad (2.2)$$

(.8842) (.1094) (.13621)

$$R^{-2} = .8559$$

$$D-w = 1.2166$$

$$L_N^2 = .0417 U^2 + .8931^*t + 16.1397$$

(.0243) (.7629) (5.2592)

$$R^{-2} = .7803 \quad (2.3)$$

$$D-w = 1.5250$$

$$U^2 = 1.0744 V^2 + 30.4361$$

(.0332) (13.9377)

$$R^{-2} = .9832 \quad (2.4)$$

$$D-w = 1.2342$$

$$R^2 = .5682 V^2 + 28.1948$$

(.0333) (13.9840)

$$R^{-2} = .9420 \quad (2.5)$$

$$D-w = 1.0650$$

Chrysler Corporation:

$$w^3 = .2089 w^{GM} + .8565^*w^3$$

(.1393) (.1309) ⁻¹

$$R^{-2} = .9726 \quad (3.1)$$

$$D-w = 2.6581$$

$$L^3 / ^*K_{-1}^3 = 7.7406 (X^3 / ^*K_{-1}^3) + .5445$$

(.5082) (.1955)

$$R^{-2} = .9316 \quad (3.2)$$

$$D-w = 1.0261$$

$$U^3 = 1.4929 V^3 - 44.9937$$

(.1099) (24.6451)

$$R^{-2} = .9163 \quad (3.3)$$

$$D-w = 1.1674$$

$$R^3 = .8971 V^3 - 17.2197$$

(.0690) (15.4793)

$$R^{-2} = .9101 \quad (3.4)$$

$$D-w = 1.3164$$

*

The first coefficient is corrected for units.

American Motors Corporation:

$$w^4 = .4993 w^{GM} + .5806 * w^4 \quad R^{-2} = .9225 \quad (4.1)$$

$$(.1769) \quad (.1652) \quad -1 \quad D-w = 2.1294$$

$$L^4 / * K^4_{-1} = 4.4248 (X^4_1 / * K^4_{-1}) \cdot * Z_1 + 12.6033 (X^4_1 / * K^4_{-1}) \cdot * Z_2 \quad (4.2)$$

$$(.5941) \quad (1.0919)$$

$$+1.4830 \quad R^{-2} = .8865$$

$$(.2696) \quad D-w = 1.8226$$

$$U^4 = 1.1086 V^4 + 13.9526 \quad R^{-2} = .9500 \quad (4.3)$$

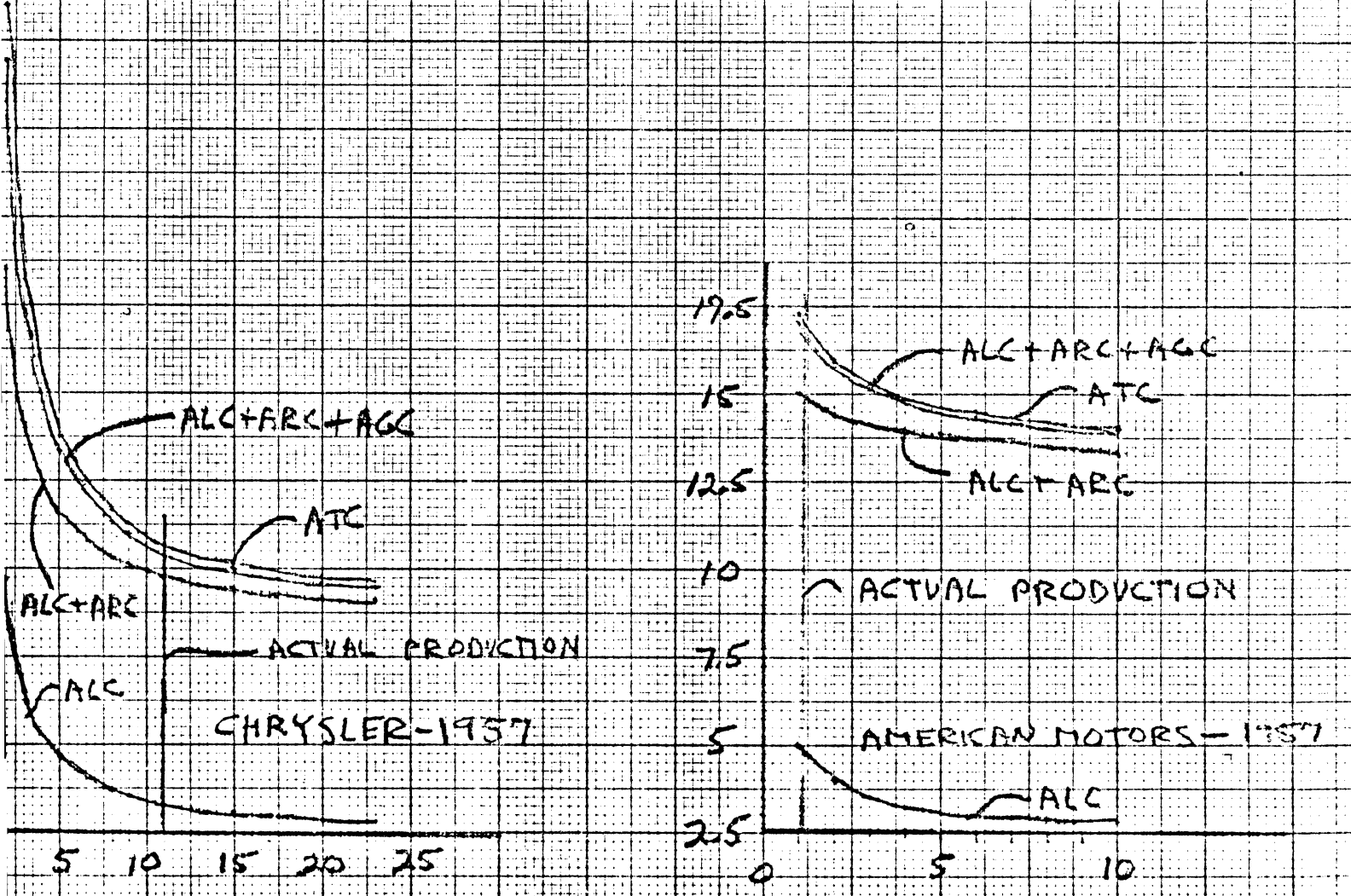
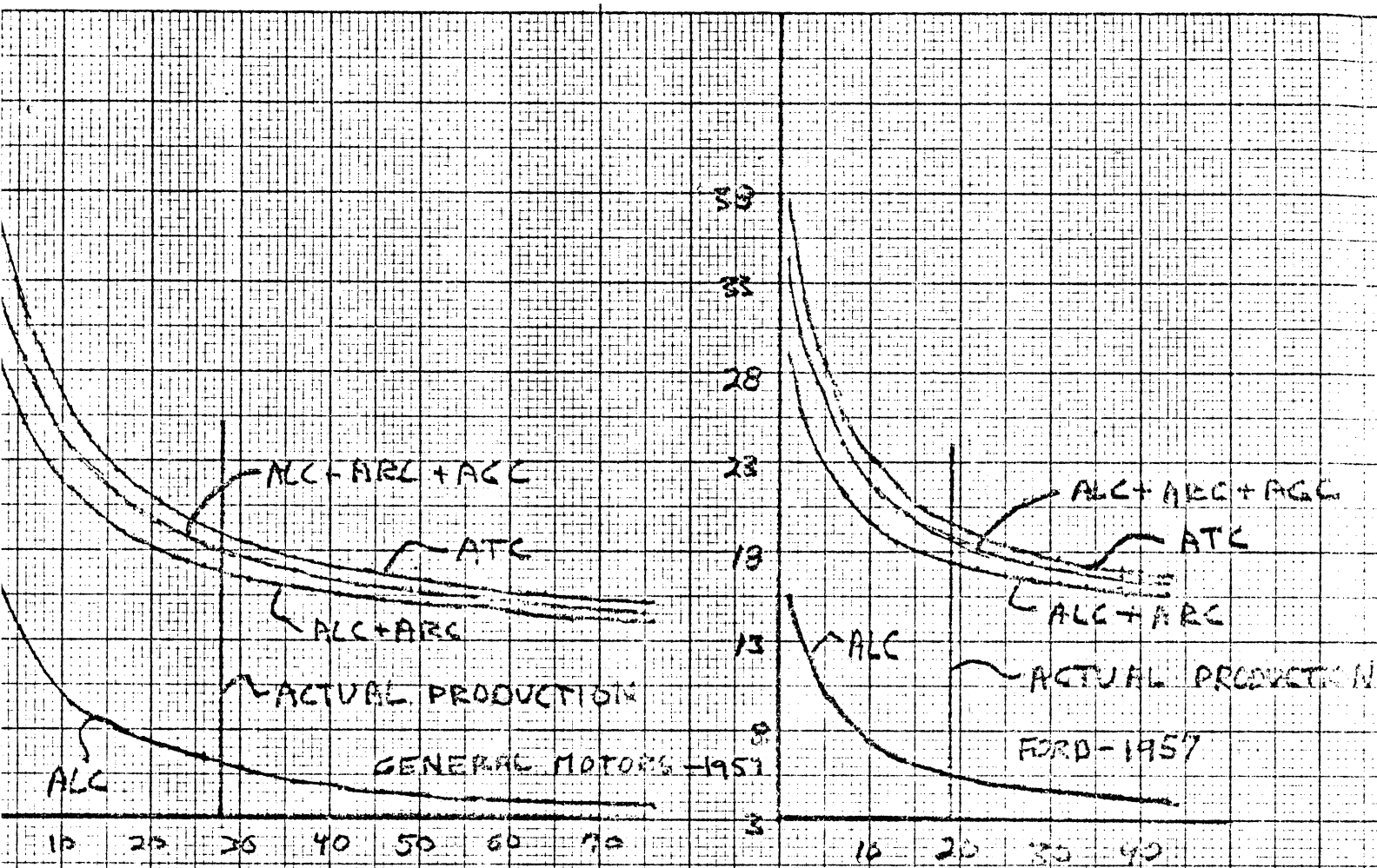
$$(.0609) \quad (3.3703) \quad D-w = 1.1839$$

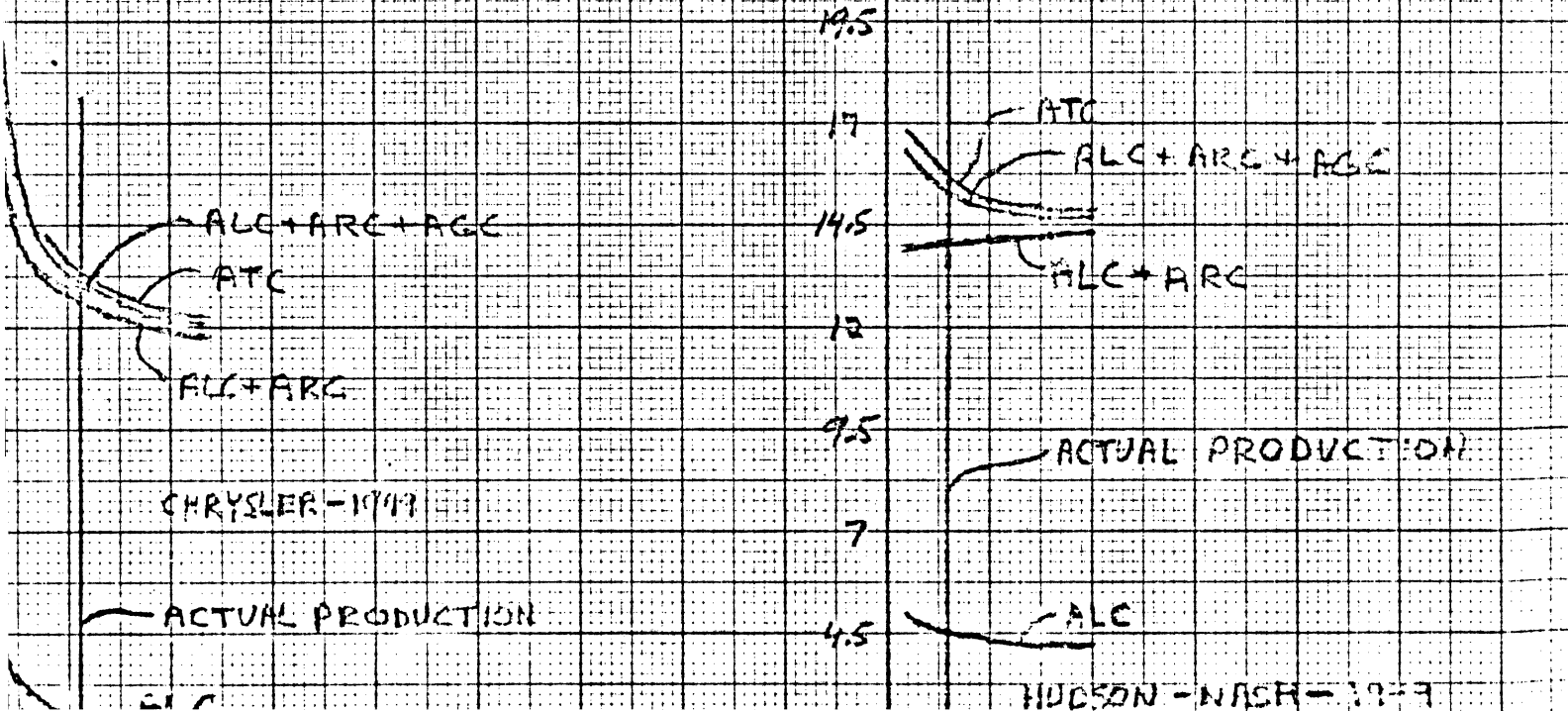
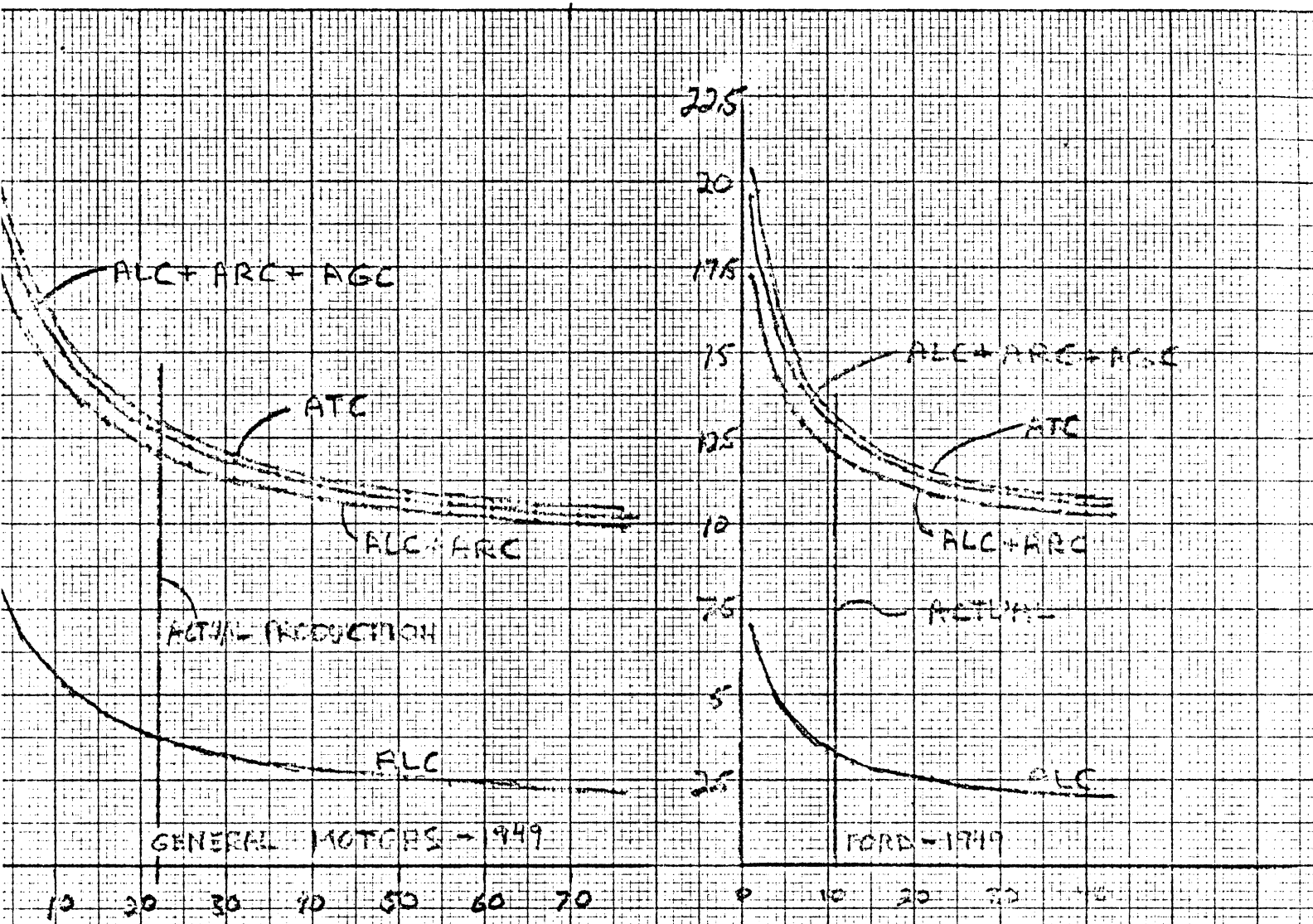
$$R^4 = .6930 V^4 + 6.7123 \quad R^{-2} = .9016 \quad (4.4)$$

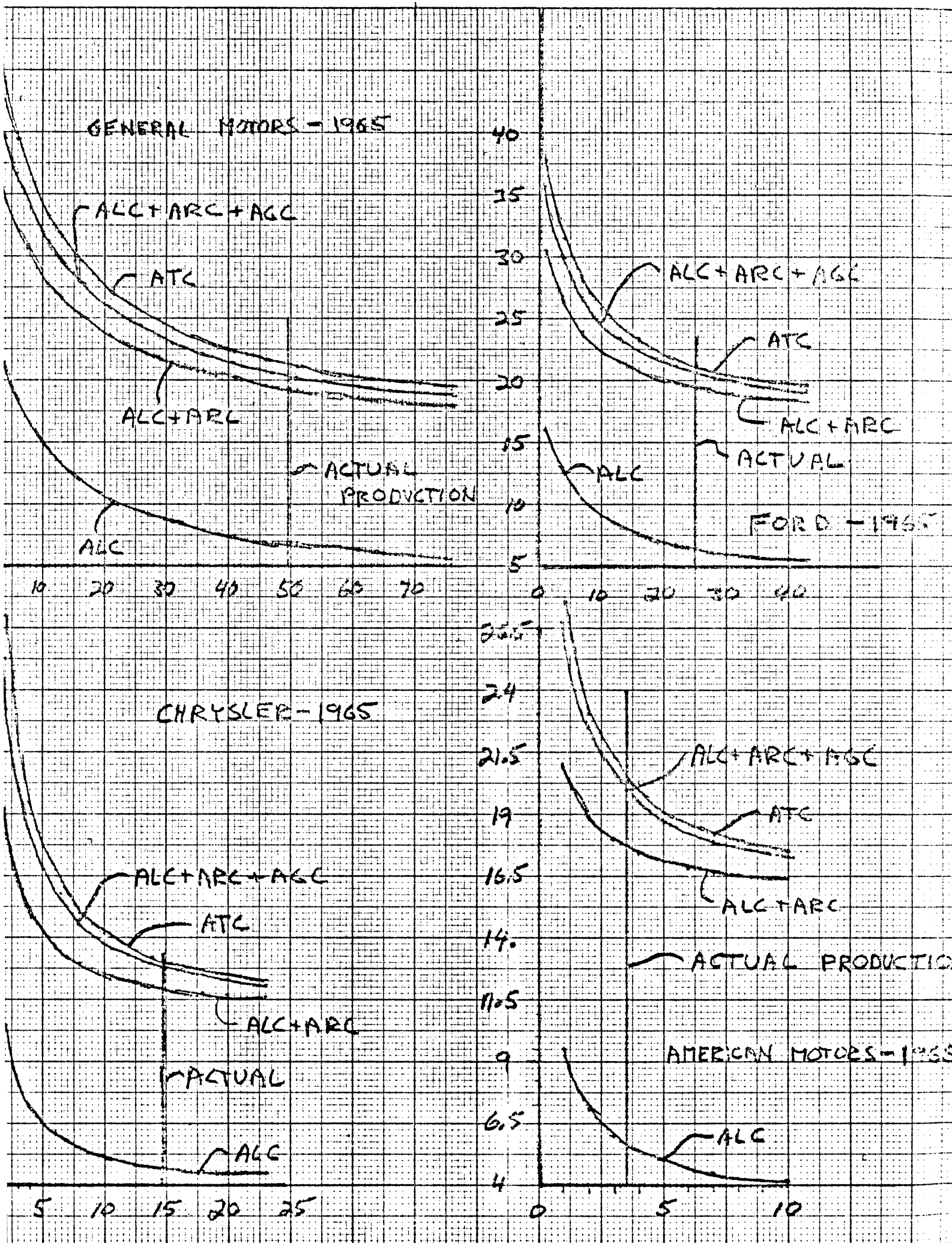
$$(.5418) \quad (2.9977) \quad D-w = 1.0656$$

The Estimated Cost Curves

For each of the four companies, and for each of the selected years 1949, 1957, and 1965, the short-term average unit costs of passenger car production were estimated at simulated volumes ranging from 50 per cent to 150 per cent of actual production. The average cost estimates were determined according to the above equations. All variables designated by an asterisk were assumed equal to their actual values for the given year as specified by the data. The resulting cost curves are shown in the accompanying figures.







Discussion of the Analysis

Distribution Costs

Our argument hypothesizes that significant returns to scale characterize distribution costs. However, the present analysis does not disaggregate distribution costs incurred by the automotive producer, and of course it excludes all costs of dealers. With appropriate data, a separate but similar analysis might be made of dealer cost functions.

General and Administrative Expenses and Depreciation Allowances

Because of the short-term effect that production volume has on costs is of interest, it is assumed (for analytic ease) that the general and administrative expenses, which include advertising expenditures as well as allowances for depreciation, are unaffected by volume. Such user and other costs are taken to be equal to the actually incurred amounts. Thus for the short-term they may be considered as fixed costs. It might have been more appropriate to treat advertising costs as a discretionary expenditure and to exclude them from the short-term cost analysis. However, the amount involved would not significantly affect the total cost functions.

The Aggregation of Costs

A major inadequacy of the analysis is the limitations of publicly available cost data aggregated for all company operations. Our analysis assumes that the costs of passenger car production are in the same proportion to costs of all operations as the value of passenger car sales is to

net sales of all operations. Obviously this is a crude first approximation. A more subtle difficulty in this aggregation of costs is caused by the correlation of nonautomotive and automotive sales, which obscures the effect that volume of automotive production has on costs. Furthermore, the effect of changes in the distribution of production among the several price categories of cars is not considered in the present analysis. Since all these drawbacks stem from the paucity of data, the accuracy of the analysis would be considerably improved if divisional cost data of high quality were available.

The Labor Costs

The determination of the costs of labor is especially critical for this analysis. The device of associating wage rates of other companies with General Motors' wage rate obscures the effect of production volume and is unsuitable for our purposes. Moreover, the wage data used by Dr. Tsurumi are of particularly low quality. What we need for a more satisfactory analysis are annual data giving both regular and overtime wages of both production and nonproduction automotive employees, preferably by division.

Unit Costs

As the model is formulated, changes in total labor and raw material costs are proportional to short-term changes in volume, while total general and administrative expenses and depreciation allowances are considered to be fixed, as we pointed out before. In other words, unit costs are formulated as constant with short-term volume. Thus the effect of volume on average total costs is due entirely to the allocation of fixed

costs to units of production. An investigation of the present cost data itself yields no indication that unit costs actually incurred are significantly affected by short-term volume changes.

Limits of Extrapolation

Although the analysis indicates that average costs decrease with short-term increases in volume, it is important to realize that the analysis is limited to actual experience between 1947 and 1965 and provides little indication of the effect of volume changes beyond that range.

Summary

The econometric model of the automobile industry developed by Dr. Tsurumi⁵ can be used to support the assumption that for each of the automobile companies the short-term average total cost curves are significantly decreasing over a wide range of production. Although in many respects the model is crude, nevertheless it does reflect actual experience with considerable accuracy and may be considered a sound basis for analysis. That average total costs in the relevant range fall when output increases is apparent (the coefficients of determination show this, although the reasons may be, and probably are, more complex than merely the spreading of overhead). With an improved data base, the model may be significantly refined for more accurate analysis.

5

Tsurumi, An Econometric Study . . . , pp. 149-56, and 161-62.