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Industrial Organization: Boxing the Compass

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Industrial organization has always prided itself on its good relation with reality. Its mission is to apply to the facts the apparatus of microeconomic theory developed by modelbuilders and systematic theoreticians. It is concerned with policy, at least to the extent of providing the best thought and analysis of economists to those who make policy. In its widest focus it is concerned with the efficiency of the arrangements, organizations, and institutions that men rely on to guide the production of what they need.

Changes in the field of industrial organization, therefore, may come in two general ways: (1) changes in the methods and tools of economic theory, which open up new paths of application; (2) changes in the real problems that men deem to be important, arising from the evolution of economic organization and from changes in the norms by which people evaluate the performance of the economy.

The contemporary state of the subject illustrates both of these influences. The newer interests are best observed against the background of the older formulation of the field, which has persisted for over 30 years and which still presents not only recurring policy issues but innumerable problems for research.

INDUSTRIAL ORGANIZATION AS A SPECIALIST SUBJECT: THE TRADITIONAL VIEW

The "tradition" is not very old; it was generated by the great upsurge of theoretical interest at the beginning of the 1930's in the economics of the firm and of imperfectly competitive markets, represented by E. H. Chamberlin [5], Joan Robinson [19], and their successors. By the end of that decade its general approach was set [14]. To be brief, it consisted of an investigation of four main aspects of the firm and the market (as well as some side issues):

1. Structure, or the relatively fixed aspects of the market environment that are not easily changed by short-run business decisions. The basic elements of market structure include the number and size distribution of sellers and buyers, the conditions of entry into the industry, demand conditions (elastic or inelastic, etc.) and the nature of the product (differentiated or homogeneous, etc.), cost conditions and technology, and influences of labor and material markets and locational factors such as transportation costs.

2. Conduct, or the behavior of firms in the market, ranging from purely competitive or price-taking behavior by firms constrained by atomistic structural conditions, to the typical maximizing behavior of a single monopolist. The types of behavior of greatest interest to specialists in industrial organization are, of course, those of oligopoly, or competition among the few.

3. Performance, or the evaluation of the results observed in the market. The most commonly used test of performance is the rate of profit (deviations in either direction too far from the norm indicate poor performance). But there are others—the size of selling costs in relation to other opportunities for competitive performance, the flexibility of prices in relation to costs, the propensity to innovate, to adopt improvements in technology, and to pass the benefits along to buyers, and the responsiveness of investment flows to profit opportunities.

4. Norms. These are the ultimate values by which the performance of firms, industries, markets, or the entire economy is judged. The most commonly recognized norms are: *efficiency* in the allocation of resources, including efficiency in minimizing costs of production; *progressiveness* in technology and organization; *equity* in income distribution and the protection of legitimate rights of various groups in the economic process; and *stability* of employment, incomes, and prices. These various norms may conflict with each other, at least in part, which in turn can lead to inconsistencies in the public policies that are responsive to them. The conflict between efficiency and equity as norms of performance in economic organization has become especially noteworthy in recent times.

Research in industrial organization has not—or not yet—succeeded in constructing a completely connected system linking together these four aspects in an articulated reversible scheme for analysis and policy. Besides producing a great deal of research on particular facets of structure and types of behavior, it has established links between structure and *performance* (as judged by certain norms) and has constructed some gen-

eralizations on the relationship between structure and *behavior* in particular markets of the modern industrial state.

Investigations of economic performance usually bypass behavioral problems and go directly to the configurations of market structure that tend to produce adequate (or good) performance—generally judged by the norm of allocative efficiency, since different norms may produce different conclusions about structure. This inquiry makes use of a variety of equilibrium models of the market. It usually relies on the purely competitive model as an "ideal" of efficient resource allocation. The relation between market structure and profit performance has been extensively researched.[1] Less is known about the relation between market structure and other norms—notably progressiveness—and hardly anything about the effect of market structure on aggregate (macroeconomic) stability. These are important issues, and we should continue to try to learn more about the relationships.

Besides the approach to performance there is the approach to behavior. I have argued elsewhere [15] that insufficient attention has been given to this kind of analysis—essentially positivist rather than normative. Perhaps it has had less appeal to economists because of their preoccupation with equilibrium solutions and with the efficiency norm. Behavioral analysis is concerned less with an evaluation of an equilibrium result than with an ongoing process and its structural determinants. It is a particularly interesting approach in oligopoly markets, which show such marked deviations from simple equilibrium and such a wide dispersion of behavior patterns.

Economic analysis has made some progress in predicting patterns of behavior (conduct) in various kinds of markets, both oligopolistic and nonoligopolistic, from certain combinations of structural elements. We know, for example, what configurations of structure are likely to produce basing-point systems; strong price leadership; chronic price warfare; market sharing; and that pattern of disorderly competition that has come to be known as the "cartel syndrome." There is always some danger of anecdotal explanations and ad hoc analysis in this approach. Nevertheless I think we need to carry it much farther, with the aid of new tools of analysis. We have some obligation as economists to explain the economic behavior that we observe, even though at present we can't link up most behavior patterns with definite evaluations of performance.

[1] [2, 3, 6, 11, 23], for example.

Economic explanations of behavior have not yet made full use of organization theory—that is, the behavioral theory of the firm and its analysis as a functioning organism. Economists have usually assumed that the firm is a single decisionmaking unit motivated entirely by the desire for maximum profits—and for many purposes of economic analysis nothing more is needed. But for analysis of behavior, particularly in the oligopolistic markets where large firms have relatively wide options and face a complex set of constraints, an amalgam of organization and market theory should be fruitful.[2] The pioneering work of Oliver Williamson [28], William Baumol [4], and other scholars [3] should be pushed along (and no doubt will be, by them and by others) until we can incorporate managerial economics and market analysis into the same system, with common axioms and analytical structure.

Pushing back the frontiers of the major problems of industrial organization does not reduce the need for continued spadework in the "old" areas. The need for factual input is enormous. The underlying structure evolves, and our bank of information needs to be kept up to date. New forms of organization appear, and the changes must be evaluated, trends projected, effects of new technology predicted, and changes in concentration and integration charted. Even such an old-fashioned form as the traditional "industry study" fills a continuing need. Without a continuous renewal of our fund of factual material and structural analysis in the basic categories of industrial organization, the more advanced applications of the subject would eventually wither.

Other Research in the Familiar Directions

A considerable amount of research effort has been devoted to certain issues in industrial organization without producing final, or even semifinal, answers that are satisfactory in the present milieu. The deficiencies are partly due to the continued evolution of the problems. In any case, more research is called for. Several examples follow.

1. Structure and Equity. For many years we have witnessed the growing influence of equity on public policy and market organiza-

[2] There is no good evidence that maximum profits as a goal of the enterprise have been superseded by a managerial "utility function in five variables" (Adelman [1], p. 137). But profit maximizing does not necessarily lead to a predictable equilibrium in oligopoly markets, nor does the goal explain the process of reaching it.

[3] Not forgetting the contributions from the direction of managerial science by Cyert and March [7] and many others.

tion. Economists, wedded to the norm of allocative efficiency, have generally taken an unfavorable view of this trend. We have been prone to view equity as a matter of the distribution of income, and economic theory tells us that distributive considerations need not interfere with efficiency in resource allocation. Once the economy meets the optimum conditions for allocation, any distributive shortcoming can be met by direct redistribution. There are no problems that can't be solved by paying someone a lump sum or collecting a lump sum from him.

Public officials and policymakers have shown little interest in this prescription for a solution of the equity problems, nor have they found the political means by which direct income transfers could substitute for other policies responsive to problems of equity. Instead, public policy has frequently chosen to change market structure to deal with those problems. It has, in other words, created or fostered or protected monopoly and organizational power to correct what was thought to be a disadvantageous income position for certain groups. It has also done this to protect other kinds of equitable rights. We used to call this the "drift toward Syndicalism," though now we might call it the evolution of the New Industrial State or perhaps the Emerging Tribe. The government has not only conferred economic power upon groups to further their own interests but has inevitably become involved in guiding the relationships and settling disputes among these power blocs.

Both the rationalization and the consequences of such policies remain obscure. Public authorities often claim to be moved by the inferior "bargaining power" of certain groups to confer monopoly powers upon them; yet the true economic basis of inferior bargaining power (which must be related to market structure) has not been adequately investigated nor demonstrated—nor have the effects of these policies upon economic efficiency. Public policy seems to have undertaken a great many individual alterations of market organization for the sake of equity without even a partial-equilibrium prediction of the economic effects, let alone of the consequences for the over-all configuration of the market system. If the phenomenon is largely political or sociological, we are again faced with the imperative necessity of working in the interdisciplinary fields and approaching somewhat closer to a unified social science—or at least to a dialogue with the other disciplines, which also have their explanations and predictions of the newly emerging forms of organization.[4]

[4] If the free market were to be replaced entirely by direct negotiations and quasi-political relations among organized groups, much of the economic theory of

2. The Economics of Technological Change. It may appear impertinent for anyone to suggest that more work remains to be done on the economics of technological change, in view of the major book-length studies that have recently appeared [5] and the countless articles in the professional journals during the last few decades. This work has undoubtedly greatly increased our knowledge. On some phases of the matter it has provided at least tentative answers to formerly puzzling questions, such as: do the degrees of monopoly and inventiveness show a positive correlation; are the most monopolistic firms the most inventive; and do the largest firms in technologically advanced industries typically introduce most of the innovations? We are reasonably sure now that the relation between market power and inventiveness (or progressiveness) is not monotonic, though we are less sure of where the maximum is. We know also that other variables affect the relationship strongly. Further research might give policymakers the ability to fine-tune the relationship between patent protection, for instance, and some target rate of technological change in the economy, by altering the structure of inducements to innovate and eliminating the "rents" or unnecessary returns.

Behind these questions, however, lurk others—vastly important, and even farther from solution. One is the problem of determining the optimum rate of technological change itself. To arrive at an estimate of a target rate we would need to know three things that we do not know now: (1) how to measure all of the effects of technological change, both direct and indirect, in an immensely complex web of social interconnections—i.e., "technological evaluation" in economic terms; (2) how to translate social values and norms, both economic and noneconomic, into operationally applicable measures of social benefit and social harm; (3) how to compare the marginal social cost of a technological change, including the inefficiencies of allocation in the static sense that may be necessary to induce innovation, with the marginal social benefits of the change. This simple equivalence of marginal cost and marginal social return is the test of welfare that we apply to practically every other allocation of resources, yet we are not remotely able to apply it at the present time to technological progress, which is itself an organic change in the use of resources.[6]

the market would require transmutation, to a theory of group bargaining or multilateral monopoly with a tincture of "countervailing power."

[5] [12, 13, 16, 17, 20], to name some outstanding examples.

[6] Uncertainty has been an impenetrable barrier to *ex ante* evaluation of invention and innovation. The noteworthy progress in the theory of risk and uncer-

The normative nature of the problem has to be recognized. A survey of the literature reveals an extraordinarily uncritical acceptance of a naive formulation of progress as a norm: it is "good"; so good that faster is always better; so good that any amount of technological progress, no matter how small, is worth any cost in terms of present distortion of allocative efficiency, no matter how large; so good that all of the side effects can be ignored. What we must do is work out the tradeoffs against which to make normative choices, and analyze the externalities and organizational impact of technology to a degree never before attempted. Other branches of economics are involved in this research—notably welfare economics, which faces a peculiarly difficult task in analyzing a dynamic process in which both preferences and the means of satisfying them are changing. But industrial organization should try to attain a better understanding of the complex interactions between innovation and market structure.

In addition to the suggested research on factor combinations and market performance in technological change, we need better models of the firm as an innovating mechanism. Invention innovation is a *process* (whether creative or destructive in its ultimate effects) working through an institutional structure.[7] It seems to be partly volitional, partly adaptive, partly stochastic. We also need better understanding of the natural selection of successful innovation in the economic environment. These are problems for social science, not for economics alone.

3. Regulatory Policy. Research on the old-line policy questions keeps regenerating itself because the problems keep regenerating themselves. Specialists in the field, both lawyers and economists, well know the delights of analyzing particular antitrust cases, at least the big ones, which present a never-repeating kaleidoscope of variations in economic facts and policy questions. But a somewhat more systematic effort is required for the formulation of general policy, even after all this time. The most recent general formulations of economic standards for antitrust policy—the reports of the so-called Neal [25] and Stigler [27] task forces—show how much still needs to be done.

tainty needs to be applied more searchingly to the economics of innovation to see whether it will help to break the uncertainty barrier.

[7] R. A. Solo in a recent review [23] of the Mansfield volumes calls for a framework for analysis that can "contain the generation, recapitulation, dissemination of information, the determinants of creativity, the process of learning by individuals and groups, . . . the receptivity or resistance to novelty" and other elements of the process of technological change.

The recommendations in the "Neal Report" for deconcentration of concentrated industries were based on economic research (which was not available to the Attorney General's Committee of the 1950's [26]) that indicated that economic performance in oligopoly tends to become distinctly unsatisfactory when the concentration rises above a critical zone and when certain other structural conditions are present, such as blockaded entry. These findings provide empirical reinforcement for a long-standing public antipathy to economic concentration and market power —an attitude supported, though somewhat gingerly, by the antitrust laws. It is fair to say that economic research has not reached a position of certainty on the relations between structure and performance.[8] It cannot yet give public policy entirely reliable guidance on every question that arises in connection with industry structure and market behavior. I need only mention as an illustrative case the enigma of advertising as a barrier to entry.

For the present, no policy of drastic modification of existing industry structure in the U.S. appears likely. The only active questions of structural change right now are those involving mergers and conglomerate firms. In the case of the large conglomerate, our theory of the firm is clearly inadequate to enable us to understand its nature or predict its performance—more or less necessary prerequisites for advice to policy-makers—though the combined trends in concentration and growth of conglomerates into concentrated markets is sufficient cause for concern. Research scholars have lately shown a very active interest in the conglomerate organization, demonstrated by the volume of publications on conglomerate mergers.

Externalities, or the effects of activity by one organization or industry upon others, is another aspect of industrial organization on which research has taken a sudden upsurge. Few questions have elicited so much popular interest in recent times as externalities, especially those that fit under the rubrics of "pollution" and "conservation." Professional interest has reacted similarly. I shall have more to say about this direction of research a little further on.

The effort to bring externalities under public control is merely one aspect of a major proliferation of government controls and "policies" on economic organization, abetted by what might be called the atrophy of laissez-faire and loss of belief in the ability of a free economy to run

[8] Eugene M. Singer [22] says that the Neal Report shows "how far an elementary structural approach can be carried in public policy."

itself. It was formerly agreed, on the whole, that the government need intervene only in those cases where the market failed to work, and failed in an egregious manner. But one no longer hears of the dichotomy of the public utilities and the others. The public utility industry is merely one of a constellation of types which are all "regulated" in some degree, or which at least encounter government policies shaped to fit their micro-economic structure. The predominant attitude among the public, if not among economists, is that public policy—regulatory, monitory, corrective, or protective—is normally needed in most activities, and that we probably don't have enough of it.

Economists who specialize in industrial organization have tried to be of use in this climate of opinion, though sometimes without much enthusiasm. Interest in regulation and regulatory problems has burgeoned. Economists have offered and will offer a great deal of advice to public officials on how to put regulation on a sound economic footing. They have studied market failure in many industries, and recommended new forms of policy to deal with it. They have even studied the problem of limits to effective regulation and what might be called the flaws in the regulatory solution to market imperfections.[9] Given the current drift in attitudes toward political economy, the increasing complexity and interdependence of economic activity, and the proliferation of problems that the market does not seem able to cope with effectively, this research interest is bound to intensify. It deserves support, since better understanding of the relationship of regulation to industrial organization will probably have a high payoff in the avoidance of gross errors of public policy. (Of course, one can find examples on both sides of this proposition.)

The New Industrial Organization

In the preface to his recent brilliant text on industrial organization, William G. Shepherd says:

> Some years ago, a senior colleague advised me that research on market structure was mostly "wrapped up and done." Soon thereafter another and younger friend, now a well-known specialist in the field, urged upon me that the "old" industrial organization

[9] All of these research interests are exemplified in the current program of Studies in the Regulation of Economic Activity of The Brookings Institution, as well as in other research programs.

field—by which he meant the issues which are covered in this book —was "dead." [10]

Shepherd's own book is conclusive testimony to the contrary, but one is led to speculate on what the younger colleague had in mind. Was there a "new" industrial organization that was alive and growing? Perhaps not; but if there was, it was probably to be an econometric or statistical one.

The intensive application of quantitative methods in all branches of economics shows no signs of diminishing—indeed, most fledgling economists now seem to win their wings this way—but there may be a little less optimism than formerly about its ability to clarify outstanding difficulties in economics. In industrial organization, quantitative research has been applied chiefly to testing the relationship between industry structure and various dimensions of performance—an "old" problem. This has been moderately illuminating. So has the simulation and statistical testing of theorems about market behavior. The old squabbles about rational behavior and the logical consequences of assumptions about market structure do not seem to have been solved empirically, however: they have been transmuted into squabbles about correspondence, identification, reliability of data, structure of equations, parameters, and statistical significance. Perhaps the greatest value that statistical testing has for the research scholar (as opposed to the policymaker) is to send him back to the drawing board repeatedly to see whether his theory and the hypotheses drawn from it can't be improved.[11]

Besides testing the implications of market theory, quantitative research has turned its attention to measuring various attributes of business behavior and the productive structure of the firm. Some of this has been quite useful, though it must be said that some appears to have been undertaken merely because the tools of measurement were available and someone wanted to try them out. Repetitive measurements and statistical

[10] [21], p. v. For other pessimistic views, see [9, 10, 22].

[11] Shepherd [21] notes, "To those willing to believe that if one cannot measure X on the first try, then X doesn't exist, the scattered empirical findings have made it possible to 'show' that concentration is inconsequential" (pp. 21–22). Also: "The rush to 'test' concepts empirically has degenerated frequently into a sort of scientism, in which a lack of findings in a faulty test using slender evidence was asserted to disprove the existence of otherwise likely phenomena" (p. 23). Grabowski and Mueller [9], p. 100, further assert that "we stand in the danger of seeing the period of infancy in the application of econometrics to industrial organization coincide with its zenith, unless we are able to develop better theories and/or come up with better data than are presently available."

formulations of endless varieties of production functions, for example, go into the data bank as building blocks for future systematic formulations on a theoretical foundation. Building blocks are useful, even essential, things to have, as long as we don't use them to build the Tower of Babel.

THE NEW, NEW INDUSTRIAL ORGANIZATION

Earlier in this survey I referred to several "familiar" directions of research in industrial organization—including (1) concern with problems of equity and distribution; (2) concern with evaluating the causes and consequences of technological change; (3) concern with external costs and benefits which escape accounting and evaluation in existing market organization; (4) concern with the public role in economic life and its tendency to enlarge itself as people become dissatisfied with the results of free, uncontrolled markets. The quantitative methods mentioned above have created some new and refined tools for this research but they do not in themselves change its meaning.

But if we push these concerns far enough, we leave the familiar territory of industrial organization—in truth, of orthodox economics itself—and sail beyond the edge of the charts. We have long known that those regions were out there, but with a kind of notional assent not involving systematic professional research interest. Now, however, the problems beckon.

The swell of discontent with our industrial society, its institutions, and its organizations is reaching such proportions that economists who concern themeselves with "organization" must soon decide whether they are going to participate in this debate or to disdain the whole matter as an unscientific uproar created by an undisciplined rabble. If we decide to ignore it we run some risk of losing "relevance" to the problems that vast numbers of our students and other fellow citizens think are important. Yet it is admittedly difficult for an "orthodox" economist to make much sense out of this uproar or to use his battery of analytic tools, as they exist now, to carve out solutions. It is no wonder that most of my colleagues regard this newest wave with mingled puzzlement and exasperation. Even those who participate in it seem to leave their scientific apparatus behind in the classrooms and laboratories as they run out to join the mobs on the quad.

The extreme view, being disorderly, cannot be summed up in a single formulation. It is not all new, since it contains many fragments of

old socialism ranging from the Marxist to the Utopian. So far as one can discern the form of its basic attitudes on economics through the burning haze of its rhetoric, they seem to be about as follows. Most "goods" are actually bads, not produced to satisfy any fundamental human needs or wants, and forced on an apathetic populace by a greedy and irresponsible group of giant corporations. This view denies the primacy of wants. Consumer behavior in the marketplace is said to be the result of manipulation. Satisfaction of wants is illusory.[12] Self-interest is thought to be equivalent to greed and to the intent to exploit others; the invisible hand is a myth; the enterprise system in the "free market" is actually an engine which encourages and facilitates the exploitation of some groups by others. A variant of this view is that industry or the "corporate state" are altogether out of human control, having made unwitting captives of the people who are supposed to own and direct it. Technology has become self-directed, and the corporate state in both its industrial and governmental aspects is completely unresponsive to human needs.

The new-radical view of human nature (from which "economic man" has been expelled) is, of course, Rousseauist, in contrast to the Hobbesian view that most orthodox economists over thirty come to when they go behind the symbols and axioms to the substance of behavior and motivation. It follows that the rebels want to make interpersonal comparisons the very basis of public policy. In their view, human beings (and maybe other species too) are absolutely equal, and apparently are to have common rights in all attributes and usufructs of social organization, not excepting the economy.

Strong views, these, and very hard words. What should we make of them? I will leave it to others to deal with the welfare and behavioral aspects of the new wave, and consider what might result for research in "industrial organization" if we take it seriously.

To use the conventional language of economics, one major concern of the critics is with externalities. It would be wrong to say that economists have not been concerned with externalities; there is a voluminous literature defining them, analyzing their origins, and deducing their welfare implications. Activities generating external benefits (scientific re-

[12] As Charles Reich expressed this view in a recent article [18], "Advertising is designed to create, and does create, dissatisfaction. But dissatisfaction is no mere toy. If one creates a desire for sex, status, and excitement, and then sells a man an automobile, the desire is likely to remain unsatisfied. The wants created are real enough, but the satisfactions are unreal" (p. 89).

search, education, landscaping) and external costs (rendering plants, dilapidated housing, commercial fishing) are well-known. What is new is the enormous increase both in the scope of externalities and in public awareness of them.

Economists should increase their own contribution to knowledge of these phenomena; they have already begun to do so. I do not say that our analysis will lead to the point where we can write down a single production function for the whole economic system. But such research would in all probability increase our awareness of the interdependence of economic activity along with providing the rest of the world with a more accurate picture of what the interrelationships, costs, and benefits really are.[13] Industrial organization is necessarily involved in research on externalities because of the industrial locus of much of the problem and because any rational solutions are likely to require policies that alter the workings of certain markets—perhaps of most markets. These solutions may not satisfy all of the critics, of course, but then economics is not an apocalyptic discipline.

Similar efforts are called for on the other matters mentioned above. Ultimately, specialists in industrial organization may be expected to answer the question of whether large, bureaucratic organizations staffed by specialists are necessary in industry and government to make an economy based on an advanced technology work with tolerable efficiency; [14] or, if some other set of goals is advanced as an alternative to the ones that have guided Western economic growth for two centuries, to determine what the consequences might be for the organization of production and distribution. If we are really in a process of change from an extensive, waste-making, progressive, space-using, technologically oriented society toward an intensive, conserving, relatively static society oriented primarily toward equity and the needs of social participation, the implications for industrial organization will be profound. All agencies of economic and social research will be called on to participate in solving the problems.

[13] For a laboratory exercise, we might consider the true costs and benefits of energy production and use in the United States.

[14] Similar questions are often asked by other analysts who do not necessarily share the attitudes of the "new-radical" critics: cf. Galbraith [8].

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