

Industrial Organization: Past History and Future Problems

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Source: *The American Economic Review*, Vol. 60, No. 2, Papers and Proceedings of the Eighty-second Annual Meeting of the American Economic Association (May, 1970), pp. 83-89

Published by: American Economic Association

Stable URL: <https://www.jstor.org/stable/1815790>

Accessed: 18-04-2020 22:26 UTC

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# INDUSTRIAL ORGANIZATION: RETROSPECT AND PROSPECT

## INDUSTRIAL ORGANIZATION: PAST HISTORY AND FUTURE PROBLEMS

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### I. Retrospect

The label, "Industrial Organization," and the initial form and impetus came out of Harvard. At Harvard and elsewhere a variety of descriptive institutional courses had appeared in such fields as utilities, trusts, corporations, financial organization, agriculture, and marketing. Typically, these courses were not integrated with economic theory, perhaps, because of the high interest in and need for collections of factual materials. The Great Depression and the NRA experience and the publication of Berle and Means, *The Modern Corporation and Private Property*, in 1932, led to a demand for a more basic theoretical-empirical approach. The hearings and studies and final report of the Temporary National Economic Committee on the Concentration of Economic Power beginning in 1938 provided additional emphasis and welcome empirical materials.

The first phase at Harvard definitely reflected "the Chamberlinian Revolution"; literally so, because the initial exploratory course work succeeding the traditional course on corporations, which had been given by W. Z. Ripley, was a joint effort of Professors Edward H. Chamberlin and Edward S. Mason. The empirical-institutional and public policy pulls were stronger for Mason than for Chamberlin, for he continued to take greater strides into the real world with the realization that this was to some extent at the expense of theoretical elegance. In his general introduction to the collection of essays written over the period 1936-56 and published in 1957 under the title, *Economic Concentration and the Monopoly Problem*, Mason characterized the study of business organizations as "eclectic methodologically" and as a "muddy, but not uninteresting, field."<sup>1</sup>

Gradually, at Harvard, a corps of coworkers arose, including scholars in law and public administration, in addition to economists. Among the very first was Donald H. Wallace, whose study of market control in the aluminum industry became the model for other investigations.<sup>2</sup> By

1938, Professor Mason was able to present the framework of analysis as then envisaged before this Association at its meetings in Detroit, Michigan.<sup>3</sup>

The primary interest as outlined in the 1938 position paper was in price policy: "the deliberative action of buyers and sellers to influence price" and especially the policies of large-scale industrial enterprises.<sup>4</sup> Although there was a heavy empirical-institutional stress, it was held that "a frame of reference of important greater generality than that of the institutionalist was required for useful work."<sup>5</sup> The conceptual orientation was from the theories of monopolistic competition and oligopoly with the internal organization and decision making of enterprises inherently and explicitly an important part of the framework but in the setting of the market structure of each enterprise. Consequently, markets and market structures, so it was stated, "must be defined with reference to the position of a single seller or buyer."<sup>6</sup> Finally, and in logical sequence, the primary contribution to "greater generality" would be through the classification or grouping of firms in terms of similar market structures and market conditions with the hope and expectation that "a careful study of the empirically determinable differences in market structure may go far in explaining observable differences in policy and practice."<sup>7</sup>

Consequently, a basic aspect of the approach was and continues to be the conceptualization and definition of market structures. So far as I can discover, the verbiage, "market structure," arose out of the discussions in the original Harvard group. Very early, however, a difference of viewpoint arose which still continues. In his 1938 position paper, Mason stated explicitly:

... The market, and market structure, must be defined with reference to the position of a single seller or buyer. The structure of a seller's market, then, includes all those considerations which he takes into account in

<sup>1</sup> Edward S. Mason, *Economic Concentration and the Monopoly Problem* (Harvard Univ. Press, 1957), pp. 4 and 8.

<sup>2</sup> D. H. Wallace, *Market Control in the Aluminum Industry* (Harvard Univ. Press, 1937).

<sup>3</sup> E. S. Mason, "Price and Production Policies of Large-Scale Enterprise," *A.E.R.*, Mar., 1939, sup. Reprinted at pp. 55-72 in Mason, *op. cit.* Page references here are to the reprint, not the original.

<sup>4</sup> *Ibid.*, p. 55.

<sup>5</sup> *Ibid.*, p. 55.

<sup>6</sup> *Ibid.*, p. 65.

<sup>7</sup> *Ibid.*, p. 66.

determining his business policies and practices. His market includes all buyers and sellers, of whatever product whose action he considers to influence his volume of sales.<sup>8</sup>

The grouping together of firms for purposes of analysis, however, would be in terms of other factors than market structure alone, unless the concept of structure were extended to include these factors or conditions. Mason listed five types of such conditions: (1) the economic characteristics of the product; (2) cost and production characteristics of the firm's operations; (3) numbers and relative sizes of buyers and sellers and relative ease of entry of new firms; (4) demand conditions; and (5) differences in distribution channels. Admittedly, too, this was an incomplete listing; each situation must be investigated in the search for the relevant conditions.<sup>9</sup> Although the subjective and enterprise goal factors affecting decision-makers were explicitly involved, the stress definitely was upon the objective and external elements of the environment of decision making. Thus, it was stated that in the tire industry, "while the personality of Firestone, plus the fact that his firm is admittedly a low-cost producer, has no doubt been an important factor, it seems probable that if Firestone, like God in another context, had not existed, the structure of the tire market would have created him."<sup>10</sup>

I shall not recall the variations of emphasis and usage over the years. Fortunately, Joe S. Bain surveyed the literature down to 1947. Hence, I may leave to your rereading his summaries of empirical materials and findings. He noted a surprising amount of research evidence. He concluded, however, "in spite of the aggregate, resultant contribution, our empirical knowledge of price making, its origins, and its results is still fragmentary."<sup>11</sup>

Bain also discussed at some length the issue of objective determinism (referring to the Mason-Nourse polemic) through market structure analysis and the use of market structure characteristics as bases of more refined market classifications. He presented, for example, an abbreviated classification based upon a model introduced by E. S. Mason a decade before.<sup>12</sup> But he concluded that the industry studies and other empirical researches have made "little definite progress as

yet in establishing an objective classification of markets, each subcategory of which would contain industries with a uniform and distinctive type of competitive behavior."<sup>13</sup> In this connection, he reviewed and appraised briefly a number of classifications and criticized them as either nonobjective, or too general, or lacking empirical support, or in some cases, even the possibility of empirical testing.<sup>14</sup>

Exceedingly interesting, in terms of the issue of objective determinism through the market structure-market classification framework of analysis, was the tentative suggestion that at any given time (or under a static or quasi-static market structure) executive market discretion might be confined to a relatively narrow range; but over time the executive has enough discretion as to allow "significantly different policies designed to change market structure." Consequently, "the dynamic course of market structure (and hence behavior) over substantial time intervals may not be at all determinate."<sup>15</sup> Bain also raised the issue of the scope and focus of investigations and concluded that both the firm and the industry are appropriate foci, but insisted that the investigations must be intensive case studies. Finally, Bain lamented the lack of "an adequate and dependable set of norms of satisfactory price-output results for individual industries"<sup>16</sup> and stressed the need for the development of "a basic theory and of norms appropriate to a quasi-monopolistic economy in dynamic process."<sup>17</sup>

It is important to note, too, that Bain, who was one of the earliest of Mason's Ph.D.'s in this field, in his own work, clearly and definitely decided to stress the traditional industry, partial equilibrium approach<sup>18</sup>; and this pattern has become the more characteristic and productive one in industrial organization to this point. The industry approach has numerous advantages, including the recognizable line of descent from neoclassical partial equilibrium theory and the ability to use Census data developed in terms of natural categories. A substantial number of useful industry studies have been made in this context usually by the use of Census and other industry data.<sup>19</sup> An

<sup>8</sup> *Ibid.*, p. 65.

<sup>9</sup> *Ibid.*, pp. 65, 66.

<sup>10</sup> *Ibid.*, p. 68.

<sup>11</sup> J. S. Bain, "Price and Production Policies," in *A Survey of Contemporary Economics*, H. S. Ellis, ed. (Richard D. Irwin, Inc., 1948), p. 151.

<sup>12</sup> *Ibid.*, p. 161.

<sup>13</sup> *Ibid.*, p. 158.

<sup>14</sup> *Ibid.*, pp. 158, 159.

<sup>15</sup> *Ibid.*, p. 157.

<sup>16</sup> *Ibid.*, p. 169.

<sup>17</sup> *Ibid.*, p. 170.

<sup>18</sup> J. S. Bain, *The Economics of the Pacific Coast Petroleum Industry*, Part I: Market Structure, p. 11, fn. 3.

<sup>19</sup> See Bain, above, for a listing of studies down to 1947. Among the published book length studies since then are: Melvin G. de Chazeau and Alfred E. Kahn, *Integration and Competition in the Petroleum Industry*

even more numerous body of cross-industry studies on a variety of issues have appeared especially with reference to economic and market (industry) concentration.<sup>20</sup>

The factual inputs from Census data typically, however, are relatively crude. Undoubtedly, though, the availability of Census data has served to accentuate the industry type of analysis. The feasibility and high productivity of industry type researches perhaps explains the shift in Mason's position in his 1957 volume where he states:

When the term "market" is used, a Marshallian industry is meant; that is, a census industry, appropriately adjusted for product and spatial considerations. Unless we can use the conception of the market, and with it, properly rectified data, the field of Industrial Organization is a wilderness. Triffin, with his general equilibrium of the firm, has attempted to lead us up the garden path; and if we expect to retain our virtue, we had better retreat as rapidly as possible to the shelter of the Marshallian industry.<sup>21</sup>

Insofar as there is a common framework of analysis in industrial organization, it is the so-called "market structure-conduct-performance" approach. Although the causal relations presumably run from structure to conduct to performance, the interest and the analysis usually goes directly from structure to performance results or from structure to combined conduct-performance results in which business behavior (conduct) is inferred from performance results. Usually, three so-called "elements of structure" are used;

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(Yale Univ. Press, 1959); Jesse W. Markham, *Competition in the Rayon Industry* (Harvard Univ. Press, 1952); Jesse W. Markham, *The Fertilizer Industry: Study of an Imperfect Market* (Vanderbilt Univ. Press, 1958); J. W. McKie, *Tin Cans and Tin Plate* (Harvard Univ. Press, 1959); Walter J. Mead, *Competition and Oligopsony in the Douglas Fir Lumber Industry* (Univ. of California Press, 1966); Reed Moyer, *Competition in the Midwestern Coal Industry* (Harvard Univ. Press, 1964); Willard F. Mueller and Leon Garoian, *Changes in the Market Structure of Grocery Retailing* (Univ. of Wisconsin Press, 1961); William H. Nicholls, *Price Policies in the Cigarette Industry: a Study of "Concerted Action" and Its Social Control* (Vanderbilt Univ. Press, 1961); Merton J. Peck, *Competition in the Aluminum Industry* (Harvard Univ. Press, 1961); R. B. Tennant, *The American Cigarette Industry* (Yale Univ. Press, 1950). The Federal Trade Commission has published a number of industrial reports in the food, baking, antibiotics, and tire industries. The 1966 studies published under the auspices of the U. S. National Commission on Food Marketing focus upon organization and competition in sectors of the food industries.

<sup>20</sup> See N. R. Collins and Lee E. Preston, *Concentration and Price Cost Margins in Manufacturing Industries* (Univ. of California Press, 1968), for summaries of previous studies on concentration.

<sup>21</sup> Mason, *op. cit.*, p. 5.

namely, size and size distribution, conditions of entry, and product differentiation. There is a wide variation as to what should be included from the other environmental factors and conditions affecting behavior and performance, ranging all the way from the above three elements to every conceivable objective aspect of the physical, economic, technological, and social universe that might conceivably affect decision making. But rarely does the analysis focus explicitly and sharply upon the internal organization and decision making of enterprises despite the explicit statement in the 1938 position paper, "firms are not, regardless of what economic theory may suppose, undifferentiated, profit-maximizing agencies which react to given market situations in ways which are independent of their organization . . . management . . . is influenced not only by market pressures, but also by considerations internal to the firm."<sup>22</sup> This omission is crucial, since the center of interest is the large-scale corporation and oligopoly.

The most important issue for the field of industrial organization is how to bring the large diversified corporation within the framework of analysis. The crux of the matter is whether the market structure framework can be employed at all; in other words, is it relevant? If such large corporations are free of the market, as some allege, it would seem futile to try to analyze their behavior and performance results in a market structure framework. The focus of research then should be on internal organization, policies and strategies, and their performance results. Orientation should then be from performance results back into internal organization and decision making. But if there is a significant amount of market determinism and constraint, even if only for a period of time under given structural characteristics, it would seem reasonable to use the market structure framework of analysis. Such use would also be an important managerial tool for internal purposes as well as for public policy, especially in antitrust enforcement.

## II. Summary of Views Expressed by Others

As a background for and check on my own judgment, I consulted with twenty-one persons active in the field of industrial organization, either as research contributors or as users of the research output, but omitting persons on this program, since they can speak for themselves. My inquiry was in terms of (1) the specific contributions of the field to date, (2) the chief weaknesses, and (3) sug-

<sup>22</sup> *Op. cit.*, p. 62.

gestions for the future. Time does not allow a full report on these statements of appraisal and of position. To some extent, of course, my own final observations will reflect what I learned, but not entirely so because of the wide diversity and conflicts of views and my own differences with some of them.

The diversity among these commentaries supports the view that industrial organization is not a clearly defined homogeneous entity. A few even held that industrial organization has no logic of its own as a separate field. The field continues to be broadly eclectic and evolving. It was generally agreed that the market structure, conduct, performance framework has been useful for empirical, theoretical, and public policy purposes. There was a heavy stress both on empirical work and on refinements of theoretical analysis. In the main, it was felt that the contributions to theoretical refinements and in empirical work have been substantial, but there was some dissent.

The criticisms stress the limitations of data, particularly the heavy reliance on Census data, together with limitations of measurement at all levels, the lack of normative decision models, and the lack of development of norms in general, the lack of use of refined game theoretical models, the relatively undue interest in homogeneous oligopoly models, the lack of attention to vertical market structures, the failure to develop an integrated theory or complex of theories of oligopoly, and the lack of a formal language, on the one hand, and conversely the relatively weak institutional footing on the other, among other things. Clearly, these are very sharp differences of judgment and attitude.

As for the future, the views ranged all the way from the pessimistic judgment that the field is falling apart through the moderate view that we need more of the same, only better, to a variety of suggestions for theoretical and empirical advances. In fact, sixty-two specific suggestions were made—a spectrum much too wide and diverse to present and interpret here except with broad brush strokes. A few suggested that the concept of market structure should be reexamined and reformulated in the perspective of developments in other disciplines, including general systems analysis. There was general agreement that advances must continue on both the empirical and theoretical fronts and in the application to public policies, especially in antitrust and in public regulation in general. The high need for theoretical-empirical work in the field of oligopoly and especially on problems of diversification and conglomerateness

was stressed. But there was no agreement as to the most effective approach. There was considerable stress on the further development of the theory of the firm, including growth theory, with emphasis on oligopoly theory and especially heterogeneous oligopoly and diversification. The hope was expressed that a wider variety of specific industry and cross-industry studies would appear together with comparative international studies. A few emphasized the need for relating the internal organization goals and decision making of corporations to market structure factors, especially when the internal allocation of resources has replaced the market. In the main, however, the emphasis was on external factors and upon the industry. Although the replies were not explicit, the general tenor indicated confidence in the received industry approach; but there was a minority view that the individual enterprise should be the focal point for entering into the broader industry and economic system relationships, especially in the case of multiactivity-multimarket firms. There was some difference as to the relative reliance upon general theory or intensive case studies in which business facts, economic theory, and legal theory can be correlated.

### III. Prospect

The public policy interest and applications are now propelling the field of industrial organization so strongly that it would be impossible to stop the momentum. Consequently, professional workers in this field have a high responsibility and an unusual opportunity. The market structure-conduct-performance approach is now a basis of analysis and for judgments in much of the work in the antitrust field in both the Department of Justice and the Federal Trade Commission. The selection and analysis of cases is being influenced to some extent by this framework of analysis as is much of the basic research and data collection. The merger guidelines issued in 1968 by the Department of Justice are based on selective market structure criteria. And of even greater significance, courts—and especially the United States Supreme Court—are drawing heavily upon some of the hypotheses, research results, and generalizations of the literature. This is especially true of merger actions under the 1950 Celler-Kefauver Act. But the orbit of actual and potential application is much wider, and it must be so if our national economic policy of competition is enforced.

In the late 1950's, the courts—especially the United States Supreme Court—were requesting more and better economic evidence and analysis

than was being presented to them.<sup>23</sup> So far as I can judge, this is still true. I have been rechecking the opinions and briefs in antitrust cases presented to the United States Supreme Court beginning with *Brown Shoe* in 1962. Economic analysis—and especially the market structure framework of analysis, and more particularly the evidence and interpretations of concentration, market occupancy (share), oligopoly, entry, and product differentiation are being increasingly invoked. The strategic cases are *Brown Shoe* (1962), *Philadelphia National Bank* (1963), and *Procter and Gamble-Clorox* (1967) in terms of economic analysis.

Currently, high interest in and policy proposals with respect to the conglomerates (so-called) have focused attention on the most complex issue of antitrust enforcement. In the background are, of course, the reports of the P. C. Neal<sup>24</sup> and the George J. Stigler<sup>25</sup> task forces. Things are moving rapidly, and much of what scholars may consider relatively unjelled or incomplete or inadequate has been drawn into the public arena.

The field of industrial organization has been acting as a bridge between economic theory and public policy but on a selective basis. But the orbit of influence is widening. For example, there is now a more systematic working relationship and application in agriculture partly because the focus of interest increasingly is on the processing industries.<sup>26</sup> It is of high importance that a body of scholars with a basic interest in public policies and a footing in the economic theories of competition and a strong empirical interest continue in recognizable association regardless of whether the trade name be industrial organization or a more appropriate cognomen.

The general case, in terms of microtheory, really is oligopoly, even under the large numbers of monopolistic competition, when allowance is made for spatial and product and service differentiation and market segmentation. But the important issue in public policy is not the presence of a horde of local oligopolists, but the large corporation. From this standpoint, Edward S. Mason's instincts were sound in 1938, when he held that analysis must be from the vantage point

of the individual market participant. This is not to say, at all, that specific industry and cross-industry studies should not continue to be made. This line of research has been and will continue to be productive.

But the modern, powerful, diversified corporation cannot be fitted neatly into the partial equilibrium framework. But this is not to say that market structure analysis is not applicable to it. A diversified corporation is still a collection of products, product lines, and geographical divisions, and so on, in each of which market structure analysis may be applicable. It is highly important that analysis be focused, at least to begin with, in terms of the position of the enterprise in its various individual markets and submarkets at a given time. It is most interesting and perhaps significant that Edward H. Chamberlin, too, in his illuminating paper, "Monopolistic Competition Revisited," published in 1951, took the same position. Chamberlin came to view the economic system as a network of interrelated firms, in which oligopolistic relations have much greater force than he had envisaged in his original formulation.<sup>27</sup>

In a sense, I am suggesting that we should walk up Triffin's garden path<sup>28</sup> which Mason warned against in his 1957 volume. But the path need not lead into an uncharted wilderness because time and again, and perhaps, most frequently, the analysis of products and product lines and so forth could be in relation to recognized natural industry categories, data, and the appropriate norms of appraisal. Thus, a pure conglomerate, if such there be, would break up into a series of discrete units by definition, each subject to market structure analysis. Anything of interest beyond this would be related most likely to short-run financial or stock market motivation and objectives.

A most complex issue is the nature of the patterns and results of diversification by internal growth or by acquisition. Evolving patterns of diversification are, however, subject to theoretical analysis and interpretation. At a given period of time, market structure analysis will be able to relate the internal product unit to either a recognized industry grouping or to some other com-

<sup>23</sup> E. T. Grether, "Economic Analysis in Anti-Trust Enforcement," *The Antitrust Bull.*, Jan.-Feb., 1959.

<sup>24</sup> *Antitrust Law and Economics Rev.*, Winter, 1968-69, pp. 11-53.

<sup>25</sup> *Congressional Record*, June 16, 1969, pp. 56472-82.

<sup>26</sup> Cf. R. L. Clodius and W. F. Mueller, "Market Structure Analysis as an Orientation for Research in Agricultural Economics," *J. of Farm Econ.*, Aug., 1961, pp. 513-53.

<sup>27</sup> E. H. Chamberlin, "Monopolistic Competition Revisited," *Economica*, Nov., 1951.

<sup>28</sup> For a recent appraisal of the Triffin position and a suggested approach, see R. E. Kuenne, "Quality Space, Interproduct Competition, and General Equilibrium Theory," pp. 225-32, in *Monopolistic Competition Theory: Studies in Impact*, ed. by Kuenne (Wiley, 1967).

petitive grouping, when the traditional industry-relevant market type of analysis is inappropriate.<sup>29</sup>

The more interesting, more complex and more important, and more exciting issues arise out of (1) the synergetic relations among the internal product lines, subsidiaries, and so forth, of the large diversified corporation and (2) the continuing interactions between internal firm organization policies and practices and market structures. Careful detailed studies are needed of individual corporations, in which internal organization and policies at a given time and over periods of time are related to market structures and structural changes with the clear awareness that the successful, well-managed corporation will use its discretionary power to optimize both synergetic effects and favorable market structure factors. We know too little about the nature and effects of the interdependencies among the product lines and other units of activity assembled under one banner.

Combined market structure-internal organization-action parameter type of analysis could become, and, to some degree probably is now, a major planning tool for large diversified corporations in the American environment. This approach combines market structure analysis as developed in this country with action parameter type of analysis which has reached a higher level of refinement in the Scandinavian countries.<sup>30</sup> Scandinavian scholars have been more successful relatively in bringing individual firm behavioral analysis into relation with the framework of economic theory than in this country.

It is of utmost importance to investigate and interpret competitive behavior on the numerous fronts in which a large diversified enterprise is engaged. Such research, in my opinion, is feasible and could be planned to show both short-period and longer-period results. It would also take several strides forward in bringing the economic theories of the firm and the organizational and behavioral theories into better working relationships. It is amazing and certainly revela-

tory as to lack of integration of scholarship in the United States that a 1965 mammoth collection of essays on organizations<sup>31</sup> does not even index the field of industrial organization. The same observation applies to an antecedent volume on the behavioral theory of the firm.<sup>32</sup>

Looking even further into the horizons, perhaps the numerous and growing body of scholars in management science, operations research, game theory, and their subspecialties could come to develop more affinity with economic theory and vice versa. Much of the work in business strategies, including game theoretic models, might help to compensate for the inherent negative stance of most oligopoly models of economic theory. Similarly, too, much of the analysis in terms of business strategies tends to be so narrowly limited as to contribute little to the framework of general theory except, perhaps, as it relates to some formulation of systems analysis. The general may well be lost in a host of endeavors to solve particular problems or in investigations narrowly confined so that specific answers can be obtained. But in this respect, we are probably no worse off than other social sciences and the life sciences. Many areas of learning seem to be running over with specific, often minute, collections of data and highly specific, narrow investigations with too little effort at integration.

The field of industrial organization was pushed forward appreciably by the opportunities and motivation for systematic cross-disciplinary interaction provided by the Merrill Foundation at Harvard over a period of years in the early 1950's.<sup>33</sup> Two of the book-length products stimulated by this group interaction in themselves represent a high return on the investment of time and other resources; namely, J. S. Bain, *Barriers to New Competition*, and the Kaysen and Turner volume on *Antitrust Policy*.

There is high need for another, but wider and more continuous, interdisciplinary endeavor. I made such a recommendation before the Joint Economic Committee of Congress on September 23, 1959. The need and the opportunity and likelihood of substantial success are much greater now. It should be possible now at least to get agreement on the conceptualization and definition

<sup>29</sup> Cf. C. D. Edwards, "The Changing Dimensions of Business Power," in *Das Unternehmen in Der Rechtsordnung*, 1967, pp. 237-60.

<sup>30</sup> For the original development of the action parameter concept, see Ragnar Frisch, "Monopoly-Polypoly—The Concept of Force in the Economy," in *Int. Econ. Papers*, No. 1, translations prepared for the International Economic Asso. (London: Macmillan & Company, 1951). The original article appeared in April, 1933, as supplement to *Nationalokonomisk Tidsskrift*. For a general summary, see G. Mickwitz, *Marketing and Competition* (*Societas Scientiarum Fennica*, Helsingfors, 1959).

<sup>31</sup> J. G. March, ed., *Handbook of Organizations* (Rand McNally, 1965). The writings of only a few scholars in industrial organization are even cited.

<sup>32</sup> R. M. Cyert and J. G. March, *A Behavioral Theory of the Firm* (Prentice-Hall, 1963).

<sup>33</sup> For details, see Mason's preface to Carl Kaysen and D. F. Turner, *Antitrust Policy: An Economic and Legal Analysis* (Harvard Univ. Press, 1959).

of market structure. Too frequently, vertical market structure relations are overlooked entirely or not brought systematically into the analysis. One of the finest contributions would be to push the investigation of the interaction of structural and behavioral factors into long-period analysis so that we would have a better understanding of the long-run determination of market structures. The earlier ambitions for the development of systematic classifications based on market structures which were given up might be revived with the aid of the computer. An enormous and growing body of fragmented evidence is waiting for more systematic interpretation. The hypotheses and the results of the testing should be gathered together into a reasonable framework. It would be possible to improve the tools, framework, and empirical resources for the conjoined analysis of oligopoly and diversification. Certainly, quantitative analysis including econometric-type measurements could be advanced; relatively, industrial organization has lagged on this score. Hopefully, the highly varied, numerous investigations in management science, etc., oriented in terms of the internal organization and decision making of enterprises, could be brought into systematic relation with the more objective,

external-market structure-environmental types of research. Then, too, norms of performance could be related more reasonably to organizational form and structural and behavioral variables.

In the biological sciences, in which specialization and subspecialization apparently are as great or even more so than in economics and the social sciences, the field of immunology, because of its direct bearing on public health, provides both a bridge among the specialties and rays of hope in the search for general understanding and application—and also access to sizable resources for research.<sup>34</sup>

Market structure analysis is a systematic means of analyzing the linkages of enterprises into the broader macrorelations of the competitive market system and of the economy. It could be a major means for broader integration and understanding. Undoubtedly, substantial resources can be obtained from both governmental and private sources for research because of the strategic significance both for public and private policy and decision making.

<sup>34</sup> Paul A. Weiss, "Living Nature and the Knowledge Gap," *Saturday Rev.*, Nov. 29, 1969.