

1967

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Recommended Citation

J. Fred Weston, *Antitrust Standards for 1975*, 46 Neb. L. Rev. 646 (1967)

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ANTITRUST STANDARDS FOR 1975

J. Fred Weston*

The formulation of standards for antitrust policy has long been an important goal of researchers in the field of industrial organization. The continued development of economic theory and the growth of a body of law and cases have offered promise of a body of knowledge and experience from which generalizations could emerge. Hopefully such standards would provide guidelines to enforcement agencies and to the courts. In addition, a clear statement of principles would provide a businessman with a framework to guide policies and practices.

Previous attempts at formulating the standards or guidelines for antitrust policy have been based on a review of the development of economic doctrine, historical trends in the economy and an accumulation of concepts expressed in legal decisions. Previous formulations have been primarily historical in their orientation. The present study seeks to formulate standards for antitrust policy by consideration of the nature of the economy of the future.

It is important in evaluating current policies in any field to consider their implications for the future. Present policies and actions represent an accumulation of experience that will determine the nature of the body of doctrine in the years ahead. Court decisions today will have an impact not only on business policies directly concerned, but also will determine what is possible or permissible in the years ahead. Hence present actions define future environments. Therefore one of the tests of present policies is to attempt to visualize what their implications will be in the economy of the future.

This paper will seek to pursue its objective of a consideration of the formulation of standards for antitrust policy with reference to their future implications by analysis of four areas. First, the main outlines of the characteristics of the economy of 1975 will be set forth. Second, the objectives of antitrust policy will be reconsidered, reformulated and restated. Third, propositions about the structure and behavior of industries in the economy will be considered. Fourth, the implications of the foregoing background materials will be related to a statement of economic processes which will place in perspective public policies toward the internal and external growth patterns of business firms.

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I. CHARACTERISTICS OF THE ECONOMIC ENVIRONMENT OF 1975

This section will deal with the salient characteristics of the economic environment as it appears to be developing through the present decade ending in 1975. Of the myriad of economic characteristics that may be considered, this analysis will focus on the following:

- A. Growth
- B. Innovation and Technological Change
- C. The Revolution in Communication and Transportation
- D. Developments in Management Technology
- E. Economic Integration

A. GROWTH

The growth characteristics of the American economy can be demonstrated by some illustrative data. From a gross national product of 208 billion dollars in 1946 the economy has grown at over a six and one-half per cent rate compounded annually until the gross national product in 1966 will be approximately 738 billion dollars. Upon a fertile technological base, growth may be expected to continue into the future. The economy of 1975 will be one in which gross national product will exceed one trillion dollars.

The growth in the total economy will be accompanied by corresponding growth in the major segments of the economy. For example, the computer industry is estimated to be a forty billion dollar industry by 1975. The automobile industry will sell in the range of twelve million units; the total value of autos and parts sold in 1975 will be in the range of forty-five billion dollars.

The high rate of growth in the economy as a whole and in individual segments of the economy implies that large size will continue to be an important characteristic of the American economy in the next decade. In a large economy and in industries of large total dollar magnitudes, the absolute size of individual firms will continue to grow if they only maintain their present market shares. The large firm is likely to continue to be a leading characteristic of American firms.

An offsetting advantage for smaller firms relates to another basic characteristic of the economy of the future. With growth and increased productivity in the economy, the economy of the future will be a high income, high leisure economy. This is an economy in which the demand for services grows and in which increased emphasis on individualistic products and workmanship may

be demanded. These are traditionally the areas of greatest advantage for small firms. Thus one major pattern of economic change appears to confer substantial advantages for the position of small firms in the economy.

B. INNOVATION AND TECHNOLOGICAL CHANGE

The increased pace of technological change is suggested by some data on research and development outlays in the United States. Research and development expenditures which totalled about two billion dollars during the decade of 1930's, totalled about sixty-eight billion dollars during the decade of the 1950's, and will total about 275 billion dollars during the decade of the 1960's. A rapid evolution of technology has proceeded from mechanical to chemical, to electrical, to electronic, to nucleonic, and to metals technology. The future will see many interrelations of these. The combinations of these into complex automated systems is also an emerging development.

While one cannot specify the precise technological developments that will occur in the future, two propositions may be stated. One, the development and applications of science have always been unevenly applied in American industry. Two, the advanced technology industries are likely to be the most productive of dynamic change in the future.

The increased pace of technological change has many implications for the nature of the economic environment related to appropriate policies for industrial organization. First, product and process changes are accelerated. Since many changes are unpredictable and since the rewards of successful participation in change are substantial, a growing incentive is provided to business firms to diversify. Here the main motive is for diversification to enable a firm to "protect its technological flanks."

Also, older industries will, therefore, tend to have slower growth rates. Indeed the substitution of the new products for the old may result in an absolute decline in the level of sales for old industries and established firms in them. Therefore, there is increased pressure for diversification on the established firms in older industries. Another aspect of significance is that the positions of the older established firms is likely to be eroded by the emergence of new industries which decrease the growth rates of sales and profitability of investments in the older and established industries.

Second, the ratio of capital per worker is increased. This tends to make for larger size firms. It also increases the ratio of over-

head costs to total costs. This increases the volatility of a firm's profits over the business cycle.

Third, more education is required for the complex world and there is more capital invested in the education of people. Thus persons become important repositories of capital investment as compared with individual firms. Thus the ability of a firm to control large aggregates of capital investment is diminished. People cannot be owned and they are free to move from one firm to another as well as to organize, initiate, and develop their own individual firms.

Fourth, the development of atomic energy and weapons systems means that power can no longer be decentralized and dispersed as at an earlier time in history. This imposes the necessity for being able to manage significant aggregates of power. Since the world becomes more inter-dependent from the standpoint of preserving its own safety and survival, it is less advantageous for any individual nation to seek self-sufficiency. No nation can be self-sufficient in a world in which such powerful instruments of destruction exist. Thus there is a likelihood that the barriers to economic trade will be reduced and economic interdependence between nations will be increased. The competition of products from other countries is an important force for reducing tendencies toward control of domestic markets by individual firms. This tends to decrease the potential of an individual firm for obtaining market power in its domestic economy. It also makes much less meaningful statistics portraying the share of the market of the largest four or largest eight firms in a particular domestic economy. The total world market needs to be taken into account.

C. THE REVOLUTION IN COMMUNICATIONS AND TRANSPORTATION

The great technological advances of the last twenty years have inexorably shrunk the world. All parts of the world are within a few hours apart by jet and rocket. By advanced methods we can now communicate in words and pictures in a matter of seconds. No country remains isolated. All nations are stirring. The world has become a set of inter-related nations.

As a part of the advances in communication processes, the computer provides for processing and retrieval of information at an accelerated pace. Potentials for communication and control of individual organizations and between organizations have increased greatly.

The implications of these developments reinforce the influences outlined above. Improved techniques of communication control

make possible the efficient development of larger scale operations. These technological developments, therefore, tend to result in or at least make possible the operation of larger scale firms. In addition, the increased pace of technological change in communication and transportation tend to increase the size of markets. This is similar to the development which took place in the United States at the turn of the century. The completion of the transcontinental railroad systems made the United States truly a common market in an economic as well as a political sense. The consequence of this was to break down local and regional markets. It reduced local and regional market control opportunities. It stimulated the development of horizontal mergers to achieve nationwide operations to match the national markets.

This shrinking of the size of the world will result in the emergence of multi-national business firms. Increasingly the sphere of operation of business firms will extend over multi-national and world markets. The scope of competition then increasingly becomes international rather than national, regional, or local in nature.

D. DEVELOPMENTS IN MANAGEMENT TECHNOLOGY

Related to the preceding topic dealing with the merging role of the computer in information systems are other important developments in the realm of management technology. These include the application of the formal techniques of management science including operations research, linear programming, simulation, dynamic programming, game theory and heuristic programming to the problems of the business firm.

Many of these techniques rely upon the development of new mathematical models and efficient, powerful, and inexpensive computation procedures by which to solve the problems formulated by these methods. In addition, a substantial body of formal theory principles, procedures, and analytical techniques has been developing in the area of the management of organizations including business firms. Increased capabilities in relating characteristics of the environment and changes in the environment to the policies and strategies of business firms have been developed. Substantial advances in the techniques of planning and control have been achieved.

Again the implications of these developments are to facilitate efficient operation of multi-product, multi-plant, and large scale operations. Divisionalization can be efficiently administered with the help of improvements in management technology. The opportunities for efficient diversification are increased, particularly if a multi-product firm can achieve some "common thread" in relationship

between the activities in which it engages. A common thread or carryover of capability implies that an individual activity can be performed more efficiently as a part of other activities than it could be carried on separately.

These trends tend to improve the position of the large firm vis-a-vis the smaller firm. Improvements in planning and control enable the larger firm to have a faster reaction time to environmental changes. This has been one of the historical advantages of smaller firms—their speed of reaction and their increased flexibility because of their smaller size. On the other hand, all aspects of management technology are also available to small firms. The relative growth rates of small versus large firms in the future will be determined largely by the extent to which each adopts and utilizes improvements in management technology.

E. ECONOMIC INTEGRATION

Another trend of great significance is the tendency for countries of the world to form economic communities. This is in part an attempt to imitate the great advantages achieved in the large size market available to American firms. The further development of economic integration as evidenced by the European Economic Community, the European Free Trade Association, the Latin American Common Market, and the Southeast Asia Common Market will provide opportunities for larger scale production operations for firms.

The breakdown of regional tariff barriers, the reduction in requirements for special types of goods for small individual countries will increase opportunities for mass production, particularly in Western Europe. Indeed it appears that one of the developments of the European Economic Community will be a division of labor among individual firms in individual countries. Thus the European Common Market countries have already witnessed trends toward horizontal mergers between large firms in these economies. These represent the prelude toward specialization of firms in individual countries and particular product lines where the resource advantages of a particular country confers some advantages on particular industries. There will be a tendency for the major production of particular goods in the entire Common Market to be performed in these individual firms in individual countries.

The implications of the development of common markets may now be indicated. A major result is that the advantages of the mass production industries and firms in the United States have diminished. The mass production firms of the United States will

be subject to increased competition from European firms that will be enabled to further their mass production techniques and operations by virtue of the larger Common Market in which they operate. Thus it will increase the competition from European firms with American firms in the United States' markets. In addition, competition in third countries will also be increased between the mass production firms of the United States and the mass production firms of other countries.

Thus great pressures for increased efficiency and effectiveness of operations will be placed upon American firms in the mass production industries. Also concentration measures for the American economies must increasingly take account of the nature of international markets and international competition. The impact of increased competition between firms in different countries re-emphasizes the importance of avoiding government barriers to international competition in the form of national tariff barriers, import quotas, and other obstacles to international trade.

The major characteristics of the economic environment of the future have now been outlined. Some of their implications for the nature of business operations and salient characteristics of industrial organization have also been sketched. A foundation has been laid for the development of further analysis for an appraisal of appropriate antitrust standards in the light of the prospective economic environment of 1975.

However, before reviewing specific public policy recommendations, it is necessary to consider two other aspects of the subject. One is to review the objectives of economic policy in the United States. The second area is to identify the fundamental economic characteristics of the economy which may provide a basis for the formulation of public policies. A consideration of the first of these two topics will be taken up next.

II. SOME OBJECTIVES FOR THE UNITED STATES ECONOMY

Much attention and study have been given to the formulation of the goals of the American economy. Among many items discussed, five may be singled out for particular attention. These are:

- A. Growth
- B. Stability
- C. Equity
- D. Decentralized Power
- E. Strong International Position.

Each of these will be treated briefly so that public policy recommendations may be evaluated with reference to the objectives or goals for the American economy.

A. GROWTH

The dimensions of growth can be expressed in a number of forms. One is the growth of the total economy as measured by gross national product in current dollars. One refinement is to deflate gross national product, to express it in real terms or in terms of dollars of constant purchasing power.

But since population also grows, another meaningful measure is growth in real GNP per capita. But neither output indexes nor price indexes take sufficient account of quality. Therefore, the impact of innovation and wider diversity of products as well as their improved quality need to be taken into account. Thus with respect to growth, probably the best statement of goals is with reference to the growth in real income per capita with proper consideration of diversity of products and their quality.

B. STABILITY

Stability refers to the avoidance of wide fluctuations in output. Stability is important in making it possible for firms, governments, and individuals to effectively plan their future. Thus stability may be recognized to have an important bearing on potentials for achieving growth as well.

But probably the most important aspect of stability is to achieve reasonably full utilization of resources on the average. This is the objective of minimizing unemployment.

But again quality factors should be taken into account; minimizing unemployment is not enough. There is also the objective of developing meaningful occupations for people. This implies occupations that excite the interest and imagination of people as well as to provide a livelihood. Related to this is the goal of occupations that develop the inherent capabilities of people, particularly those capabilities that represent the best of human qualities.

C. EQUITY

Equity implies some principles for distribution of products and incomes in an economy. In an enterprise system, this represents application of marginal productivity principles. In economic societies organized by different concepts, different criteria such as equality or need might be employed.

Since the American economy is organized on a private property and price system basis, this implies the use of marginal productivity criteria. On the other hand, in the general value judgments of the American people there is some preference for consideration of equality and need. Thus criteria for equity are not unambiguously defined in the American economy.

One of the major objectives of antimonopoly policy has been the protection of consumers against high prices and inferior products. Vigorous competition stimulates better products and lower prices. But competitive processes result in success for some firms and failure for others. Sometimes public policy appears to seek to protect competitors rather than competition. Thus protecting competitors receives precedence over protecting consumers. The rationale for such a priority has been formulated on the basis of a preference for industries composed of small firms for reasons covered by the following policy objective.

D. DECENTRALIZATION OF POWER

It is a strong American tradition to oppose huge aggregations of power. The preference for decentralized power exists in both the political and economic spheres; indeed it pervades all aspects of the organization of American life. This is consistent with the division of labor and with the division of power among the three branches of government—legislative, judicial, and executive. It is also consistent with the federal system of the national government and state and local governments.

In the realm of economic organization it represents a historical preference for atomistic firms. This implies an organization of industries in which no firm has an influence on price or output. It is an economic organization in which the actions of an individual firm need not be taken into account with reference to actions or reactions of other firms.

The goal of decentralized power is expressed most generally in the desire for a pluralistic society. This is a society in which centers of power are diffused in each of the spheres of government, business firms, labor unions, religious groups, social groups, cultural groups, and national groups. It also signifies decentralization of power within any of these groups. In addition, it implies decentralization of power as between groups. Thus no one group within any of these social, economic, or cultural divisions would be in a position to have a monopoly of power.

The concept of the pluralistic society in the economic sphere is no longer expressed in the objective or atomistic firms. The nature

of the modern world makes this an unrealistic and archaic objective. Rather the objective is expressed in terms of a preference for less concentration rather than more concentration where possible, and a preference for smaller firms rather than larger firms. These objectives must also be balanced against objectives of efficiency, innovation, and growth.

E. A STRONG INTERNATIONAL POSITION

The basic goals in connection with maintaining a strong international position for the United States are those of defense and survival. However, it also represents an objective for levels of real growth in the economy that demonstrate the effectiveness of the American set of political and economic institutions.

A strong international position also implies a balance of payments position that does not threaten the financial reserves of the American economy. Our international economic objectives include the ability to maintain a strong and effective military posture and to contribute to military balance in the world as a whole. In addition, it includes recognition of some responsibility for protecting emerging nations from outside aggression. Finally, it represents the responsibility of the more developed countries for supporting the economic and political aspirations of the developing nations.

The objectives for the American economy have been briefly reviewed. These provide the goals or reference points by which public policies will be judged. Public policies that contribute to objectives will have a strong basis for adoption. The analysis now turns to a consideration of basic propositions with regard to the nature and characteristics of the operation of the American economy.

III. BEHAVIOR CHARACTERISTICS OF THE AMERICAN ECONOMY

An analysis of fundamental propositions about the behavior of the American economy will consider four aspects. These will include the following:

- A. Concentration and Competition
- B. Economics of Size
- C. Sources of Innovation
- D. Implications of Profit Patterns

A. CONCENTRATION AND COMPETITION

A stream of United States Supreme Court decisions beginning

with *Brown Shoe Co. v. United States*,¹ have tended to equate increased concentration with decreased competition. The Supreme Court has adopted the theme of economic literature which first appeared in the early 1930's. The economic argument can be stated briefly. An industry of oligopoly in which a small number of firms account for a high percentage of industry output leads to awareness of rivals' actions and reactions. This awareness leads to spontaneous coordination of price and output policies by the oligopolists. Thus by acting in spontaneous concert, the resulting price and output policies will approximate those of a single monopolist.

Those who hold this view emphasize that characteristically in an oligopolistic industry, competition on price does not take place. The characteristic form of competition in an oligopoly is non-price competition. But the absence of price competition does not constitute evidence of lack of competition or of decreased competition. The non-price competition can be of greater intensity than price competition. Important forms of non-price competition include product variations and product quality improvements, new products and product modifications, improved service and lower maintenance expenses, and competitive advertising.

Non-price competition is engaged in for purposes of increasing the firm's rate of growth or increasing its market share and to increase profits. Probably the best evidence that non-price competition represents real and effective competition is shifts in market shares of firms in oligopolistic industries.² Business firms seek to maintain their market position. Hence there would be a tendency toward a stability in market shares because of rivalrous reactions. Thus evidence of lack of shifts in market shares would not be conclusive evidence of lack of competition. On the other hand, demonstrable evidence of shifts in market shares is strong proof that strong competitive practices are going on.

B. ECONOMICS OF SIZE

Another area where conflicting propositions have been enunciated relate to the existence of economies of scale. A number of studies have produced assertions representing some empirical material and some judgment on the minimum size of production operations to achieve low cost operations.³ The numbers that are pre-

¹ 370 U.S. 294 (1962).

² Jacoby, *The Relative Stability of Market Shares. A Theory and Evidence from Several Industries*, 12 J. INDUSTRIAL ECON. 83 (1964).

³ Bain, *Conditions of Entry and the Emergence of Monopoly*, in *MONOPOLY AND COMPETITION AND THEIR REGULATION* (E. Chamberlin ed. 1954); J. BAIN, *BARRIERS TO NEW COMPETITION* 45 (1956).

sented suggest that the necessary minimum size to achieve economies of scale is well below the existing size of the leading firms in a number of industries.

The estimates that are presented for minimum required scale of operations to achieve scale economies are not based on systematic compilations of data. A considerable portion of judgment is involved in presenting these numbers. Nevertheless, even if the numbers were the correct order of magnitude in relation to analysis of required scale of operations to achieve production economies, there are many dimensions of economies of scale that are omitted and that need to be taken into account for the valuation of the nature of economies of scale.

Some of these other dimensions include important economies achieved through related production carry-over. Techniques developed in the production of selected goods may enable a firm to produce other goods more economically than if the operation were performed by itself. In addition, important principles of product design and minimization of maintenance costs may be a part of the product design and production heritage of a firm that has valuable carry-over to related products.

Much disagreement exists on whether there are economies of scale in research. Evidence on this point will be considered in somewhat more detail in the following section. At least conceptually in selected types of technology, it is possible that large aggregations of capital would be required; also it is possible that the fruits of research may be spread over a large number of related products to minimize research costs.

The potential economies of large scale research are also related to another possible advantage of large scale organizations. Characteristically in the large scale firm there is a corporate level staffed by a vice-president group. These represent individuals with expertise, experience, and high abilities. These corporate staff vice-presidents provide guidance to the chief executive officers as well as counsel to the operating executives of the firm. Benefits of spreading the expenses of staff experts over a larger volume of operations can substantially reduce cost per unit. This principle of organization may also represent a highly significant economy of scale.

Another aspect of organization structure that relates to economies of scale is organizational quality and continuity. The existence of a large-scale organization that provides for the development of executives and which has a tradition of systematic training of executive staff may be achievable only in a large-scale organiza-

tion where opportunity for progression through a succession of opportunities and experiences is required.

A substantial economy of scale may be represented in the reduction in risks of a large diversified organization. This enables the large diversified organization to undertake products and developments that involve greater uncertainty than would be possible for a smaller and less diversified operation.

Finally, in the durable goods industries an important element of success is an effective sales or dealer organization backed up by an effective service organization. For durable goods products utilized throughout the nation, the existence of a nation-wide sales or dealer and service organization may be essential for the success of the firm. Thus the requirements of a national sales and service organization may require a size of operation well in excess of the minimum required to achieve effective economies of production operations.

The evidence in these conflicting points of view is difficult to assess. Research in the future will have to assemble these data systematically and attempt to survey the extent to which possible large scale economies from the other dimensions of scale do, in fact, exist and to what degree.

Three broad groups of evidence suggest that the possibilities of substantial economies of scale beyond production economies and may be important. One piece of evidence is the example of the International Business Machines Corporation which until relatively recent years manufactured only a small percentage of the components going into its final product. This would indicate that the marketing and service organization was a much more important element of the company's success than production economics.

The second piece of evidence is the substantial differences in the degree of concentration and the growth in absolute and relative size of firms between industries. But the incentive for achieving monopoly positions exists equally in all industries. It would appear, however, that technological and market reasons are determinate in producing relatively large scale operations in some industries and small unconcentrated operations in other industries.

A final piece of evidence is trends toward mergers abroad in the attempt to compete more effectively. For example, the creation of the larger common market of the European Economic Community has been stimulating horizontal mergers in a large number of industries among European firms. This is additional evidence of real economies of scale from large scale operations in support of

the plausibility of additional dimensions of economies of scale that were mentioned previously.

C. SOURCES OF INNOVATION

One of the propositions that has been subject to considerable empirical study in recent years has been sources of innovation and the relation between size and inventiveness or innovation.⁴ Highly important stimuli to the investigation of these relations was the assertions by Professor Schumpeter that some monopolistic elements in the structure of industry were necessary and favorable to innovation.⁵

Three types of bases for the positive relation between monopolistic elements and innovation are possible:

- 1) The size of investment for some research activities is so substantial that a firm of large size is necessary to conduct research where large outlays are prerequisite.
- 2) The existence of prior monopoly power is a necessary precondition of innovative activity. The argument here is that research and development outlays provide no current return. Particularly, research and development outlays that seek to develop new product lines may have a considerable time lag before they bring in cash flow or revenues. Therefore, it is argued that there must be some prior history of high profits or high liquidity in order to finance uncertain research and development outlays.
- 3) The promise of future monopoly power is required to stimulate innovation. There must be some kind of patent system to protect the returns of the inventor. In this connection Schumpeter emphasized the process of creative destruction of a firm's market position as a consequence of rapid imitation of successful innovations. Schumpeter argued that the investments required to achieve innovations may be sub-

⁴ Mansfield, *Size of Firm, Market Structure, and Innovation*, 71 J. POLITICAL ECON. 556 nn.2 & 3 (1963). See also Mansfield, *Industrial Research and Development Expenditures Determinants, Prospects, and Relation to Size of Firm and Inventive Output*, 72 J. POLITICAL ECON. 319 (1964); Williamson, *Innovation and Market Structure*, 73 J. POLITICAL ECON. 67 (1965); Scherer, *Corporate Inventive Output, Profits, and Growth*, 73 J. POLITICAL ECON. 290 (1965); Maddala, *Productivity and Technological Change in the Bituminous Coal Industry, 1919-54*, 73 J. POLITICAL ECON. 352 (1965); Scherer, *Firm Size, Market Structure, Opportunity, and the Output of Patented Inventions*, 55 AM. ECON. REV. 1097, 1122-23 (1965); J. SCHMOOLKER, *INVENTION AND ECONOMIC GROWTH* (1966).

⁵ J. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* (3d ed. 1950).

stantial. Without the promise of a period of some protection against erosion of market position and differentially higher profits, research and development activities and innovations would be discouraged.

In response to these assertions by Schumpeter a large number of empirical studies have been undertaken. While there has been considerable research in the area, the research that has been performed has been subject to two major limitations. The number of industries that have been covered is relatively limited.

A second limitation of the empirical studies of innovation is represented by very serious measurement problems. The subject of analysis to which size of firm and concentration are related has been difficult to define. Some studies use the concept of "significant inventions" and other studies have used the number of patents. Obviously, the judgment of what represents a "significant invention" may be quite different from the standpoint of its general, social, and economic impact and the impact on either profitability or incentives to further research and development activity from the standpoint of the individual business firm. The dangers of equating the numbers of patents regardless of dollar magnitudes involved or any other measurements of impact or significance are too obvious to require elaboration. As a test of the use of a number of patents, research and development employment was also taken as an index of inventive activity. The significance of research and development employment certainly varies from industry to industry and within firms and between firms in a given industry. In addition, since the Internal Revenue Code of 1954 permitted expensing of research and development outlays, an increase has taken place in the amount of expenditures that have been labeled research and development expenditures. An additional problem is that the significance of basic research versus applied research and between applied research and prototype production activity represent boundary lines that are difficult to draw. But empirical research always poses difficulties in measurement and it is not intended by these criticisms to imply that the studies have no value. Nevertheless, the measurement problems involved in these studies are much greater than ordinarily observed in the general areas of economics where useful data are often difficult to obtain.

Three results appear to follow from the wide range of empirical studies that have been made. One is that research and development outlays tend to be proportional to sales. With some exceptions in particular industries at particular times, there does not appear to be any strong evidence that the ratio of research development outlays is greater or smaller for large firms than for small firms.

The second empirical finding is that the productivity of research and development expenditures appears to be higher for smaller firms than for large firms. Mansfield states the point and provides a rationale:

Second, holding R & D expenditures constant, the effects of firm size on the average productivity of such expenditures turn out to be negative in each industry and statistically significant in two of the three industries. Thus, contrary to popular belief, the inventive output per dollar of R & D expenditure in most of these cases seems to be lower in the largest firms than in large and medium-sized firms. In part, this may be due to looser controls and greater problems of supervision and co-ordination in a very large organization.⁶

It will be observed from this quotation that this particular study by Mansfield was limited to three industries. Also crucial in the study is that the dependent variable that is being predicted is the number of significant inventions "weighted roughly by a measure of their importance."⁷

The final conclusions have been well-stated by Professor Sherer:

Differences in technological opportunity—e.g., differences in technical investment possibilities unrelated to the mere volume of sales and typically opened up by the broad advance of knowledge—are a major factor responsible for interindustry differences in inventive output. Inventive output does not appear to be systematically related to variations in market power, prior profitability, liquidity, or (when participation in fields with high technological opportunity is accounted for) degree of product line diversification.⁸

These findings reinforce my earlier observation that the characteristic of uneven technological fertility of industries provides an important stimulus to diversification activity since greater opportunities for research and development exist in some industries than in others. The major determinant of the productivity of research and development outlays is the line of industry in which research and development outlays take place. This stimulates diversification by firms into industries with greater technological fertility and higher innovational dynamism.

The hazard of generalizing from the imperfect data available on this subject is illustrated by the following quotation:

⁶ Mansfield, *Industrial Research and Development Expenditures: Determinants, Prospects, and Relation to Size of Firm and Inventive Output*, 72 J. POLITICAL ECON. 319, 336 (1964).

⁷ *Id.* at 335.

⁸ Scherer, *Firm Size, Market Structure, Opportunity, and the Output of Patented Inventions*, 55 AM. ECON. REV. 1097, 1121 (1965).

Another most interesting study showed that between 1899 and 1937, the industries in which labor productivity increased most sharply were those characterized by declining concentration. Not only was this true, but industries of low concentration showed better performance than those with high concentration.⁽⁹⁾ Since we frequently presume that research and innovation are directed towards lowering costs, leading thereby to higher levels of output per man-hour, those studies suggest that increasing concentration has not led to more innovation but rather that the opposite may have been the case, and that "it is the competition of new rivals within an industry, not the competition of new industries, that is associated with rapid technological progress."⁽¹⁰⁾

(9) George J. Stigler, "Industrial Organization and Economic Progress," as reprinted in Harvey J. Levin, ed., *Business Organization and Public Policy*, pp. 131-133 (1958).

(10) *Ibid.*, p. 133.⁹

Analysis of the original study referred to reveals a most precarious data basis for the views expressed by Stigler. Stigler employs three categories of industries: low concentration (C), high concentration (M), and declining concentration (MC). Of forty-two industries in his list, Stigler compiled data for only twenty-nine of the industries. When I included all forty-two industries, adding a fourth category of increasing concentration (CM), the results are fundamentally different. The industries of increasing concentration performed by far the best. This would completely reverse the Stigler conclusions. Also, performance is somewhat better for the industries of high concentration as compared with the industries of low concentration, but the difference is not significant.

The industries of declining concentration continue to perform best of the four categories. But some questions of classification arise. The petroleum refining industry has one of the highest performance records of any industry in the Stigler list. It is classified as an industry of declining concentration. Some writers would have classified the industry as one of high concentration as of 1935. If the petroleum refining industry were so reclassified, the performance for the MC category of industries is substantially reduced, and the performance of the M category is greatly improved.

Another industry that gives the MC category a very high rating is canned foods. The study by G. Warren Nutter on which data for the earlier year was based to place this industry in the MC category provides as a footnote reference that his listing of canned foods in the classification of "monopolistic" in 1899 was based on information in the book by John Moody, *The Truth About the Trusts*, that

⁹ Turner, *The Economic Merits of Antimerger Policy*, in BASIC ANTITRUST QUESTIONS IN THE MIDDLE SIXTIES, Publication of the National Industrial Conference Board, Mar. 3, 1966, p. 8.

one firm "represents 65% of all canning in California."¹⁰

It is informative to observe also that the Stigler study included only eight industries that received the classification of low concentration (C). The industries, data for which are presumed to demonstrate the superiority of competitive industry over concentrated industry, were carriages, cotton goods, knit goods, cigars, gloves, shoes, flour, and rice.¹¹ The validity of basing broad generalizations on these eight industries as representative of competitive manufacturing industries is left to the judgment of the reader. A final observation may be made on the relation between innovation and the relative size of firms. If smaller firms are more active than larger firms in innovational activity, this is consistent with another proposition.

If there are significant economies of scale, larger firms in a given industry will be under less pressure to innovate unless the industry is technologically highly dynamic. This is because the larger firms have a strong competitive position by virtue of economies of scale. The most attractive competitive thrusts or effort on the part of the smaller firms may therefore be in the attempt to erode the position of the larger firms with economies of scale by new product developments that will enlarge the market position of the smaller firms within the broad industry boundaries. Thus the greater incentive to innovate by the smaller firms in an industry may provide corroborative evidence that the larger firms possess significant scale advantages in the established product lines of the industry.

D. IMPLICATIONS OF PROFIT PATTERNS

A central proposition in relation to profit patterns has been stated by some writers. They aver that concentration is evidence of monopoly power which produces high profits. Many pages could be written on this topic, but in this brief presentation only the outlines of some broader considerations will be treated.

The first problem in drawing any conclusions from profit data is represented by the nature of accounting measurements. Accounting data represent historical information subject to great variations in the time at which assets are placed on to the balance sheets and revaluations through mergers and other events in the life of the firm. Without a careful review of the accounting assumptions,

¹⁰ G. NUTTER, *THE EXTENT OF ENTERPRISE MONOPOLY IN THE UNITED STATES, 1899-1939* 141 (1951).

¹¹ Stigler, *Industrial Organization and Economic Progress*, in *BUSINESS ORGANIZATION AND PUBLIC POLICY* 132 (J. Levin ed. 1958).

procedures, and history for individual firms involved in profit comparisons, conclusion can be drawn only at great hazard. This is particularly true since most of the profit studies involved only a small number of industries and firms so that opportunities for large scale statistical swamping of erratic measurement procedures is not provided.

The most frequently cited study by Professor Bain concluded that profit rates were correlated with concentration.¹² The later study by Professor Stigler reached the opposite conclusion.¹³ Since the Bain study covered the years 1936-1940, it is further suspect because the study is now quite old. But even more important, the years 1936-1940 are questionable as representative of normal conditions in the United States.

The Bain study used profit to net worth as a measure of profitability. This would reflect financial policy as well as operating policies. A strong case can be made that ratios of profit to total assets should be used in addition to measures based on profit to net worth. The more serious problem is that both the measures of profit and net worth or total assets are subject to great variations over time.

A more recent study applies Bain's method to thirty industries for the period 1950-1960.¹⁴ Profit rates are calculated for twenty-one industries with concentration rates exceeding seventy percent. These are compared with nine industries with concentration ratios below seventy percent. The average profit rate in the concentrated industries was 13.3 percent and in the less concentrated industries nine percent. It is interesting to observe, however, that in five of the twenty-one concentrated industries, profit rates were below ten percent. In three of the twenty-one, profits were below the average for the less concentrated industries.

Among the less concentrated industries whose rate of return was found to be relatively low, concentration ratios are all above thirty percent. Yet in *United States v. Philadelphia Nat'l Bank* this standard was suggested as a level indicating undue concentration.¹⁵ If concentration at this level has undesirable social effects, it is difficult to understand how conclusions may be drawn by

¹² Bain, *Relation of Profit Rate to Industry Concentration*, 65 Q. J. ECON. 293 (1951).

¹³ G. STIGLER, *CAPITAL AND RATES OF RETURN IN MANUFACTURING INDUSTRIES* (1963).

¹⁴ Mann, *Seller Concentration, Barriers to Entry, and Rates of Return in Thirty Industries, 1950-1960*, 48 REV. ECON. STAT. 296 (1966).

¹⁵ 374 U.S. 321 (1963).

comparing results for two groups of industries each subject to relatively high levels of concentration.

In this more recent study, the thirty industries were also classified in three groups on the basis of judgments as to barriers to entry. Industries with very high barriers averaged 16.4 percent on net worth for the decade of 1950-1960. Industries with substantial barriers to entry averaged 11.3 percent. Industries with moderate to low barriers averaged 9.9 percent.

Following Bain, in his basic table Professor Mann identifies four specific entry barriers.¹⁶ These are scale economies, absolute cost advantages, capital requirement barriers, and product differentiation.

In theory the distinction between scale economies and absolute cost advantages is between the position on the long run average cost function and a different level of costs along the entire long run average cost function. As sources of absolute cost advantages, Professor Caves refers to patents, limited supply of some factors (generalizing control over raw material sources), know-how concerning production techniques and higher costs of capital to the new firm.¹⁷

Except for the special situations of patents and control over raw materials, the absolute cost advantages appear to be equivalent to having developed a superior organization that can produce a product at a relatively low cost. Clearly, social benefits may accrue therefrom.

The product differentiation barrier as presented in the discussions by Professors Bain and Mann appears to be the development of better quality or distinctive products or economies of scale in advertising.

The barrier of capital requirements refers both to large minimum capital requirements and scale economies in financing. Both types of barriers are often cited by economists. Their discussions ignore the periodic phenomenon of buoyant stock markets in which new issues of small firms command a high price premium. In such periods the capital requirements factor is no longer an entry barrier.

Turning to the more general aspects of scale economies an interesting problem is posed. If the major source of concentration is scale economies, increasing the number of firms in the industry

¹⁶ J. BAIN, *BARRIERS TO NEW COMPETITION* (1956).

¹⁷ R. CAVES, *AMERICAN INDUSTRY: STRUCTURE, CONDUCT, PERFORMANCE* 26 (1964).

would involve having firms of smaller size. As a consequence, most of the apparatus that seeks to prove the superiority of competitive industries could be demolished. While competitive firms might operate at the low point of their short run average cost curve, the low point of their short run average cost curves may well represent a level of costs and prices much higher than costs and prices resulting from firms in concentrated industries or oligopolistic firms operating to the left of the low point of their long run average cost functions. This suggests that quality of products may be superior or prices lower in concentrated industries because of the existence of significant economies of scale or favorable absolute cost differences. While output may be somewhat to the left of the low point of the long run average cost functions of these large firms, consumers benefit from lower prices resulting from substantially lower costs.

This raises another question with regard to criteria for judging profit levels. The accepted norm for manufacturing firms is a five to six percent profit margin on sales since a profit margin less than this makes manufacturing firms vulnerable to relatively moderate fluctuations in cost elements. With an average sales to total asset turnover ratio of two, this implies a return on total assets of ten to twelve percent. With a debt ratio equal to about fifty percent of net worth, the ten percent return on total assets translates to a fifteen to eighteen percent return on net worth. It is interesting to observe that the average profit rates on net worth for the twenty-one industries with above seventy percent concentration averaged only 13.3 percent for the decade of 1950-1960. The return for the below seventy percent group averaged nine percent. It would appear that profit performance for both the groups analyzed is low in relationship to relatively moderate standards. For the very high barrier group, the class average was 16.4 percent which was midway between the fifteen to eighteen percent norm set out. The profit performance for the other two groups appears to be quite low in relation to required levels of profitability to attract financing.

Other elements of these profit studies suggest that considerable more work is to be done. With regard to criteria, the profit measure given most emphasis in the securities markets appears to be the growth rate in earnings per share. Return on net worth appears to be very seldom mentioned in placing a value on the common stocks of individual companies. It would be interesting to run some multiple correlation studies between the traditional measure of profit on net worth, and other criteria for evaluating company performance.

It is surprising that in the studies between concentration and

profitability other possible influences on profitability have not been considered. The influence of other factors should at least be measured. At a minimum, some estimate of the following factors should be taken into account. Some partitioning of industries on the basis of risk measured by volatility of sales or major cost elements should be included. In addition, estimates of relative efficiency of major firms in the industry could be performed. Account should be taken of traditions of the development of able managers, research, production, and marketing concepts that appear to have been effectively employed. Finally, some attempt to measure improvements in the quality and diversity of products should be another important variable related to profit performance. Multiple correlation measures in which profit rates are related to concentration, risk, and efficiency might provide insights on the net role of each of these three major influences on profitability.

IV. ECONOMIC FACTORS AFFECTING SIZE AND GROWTH CHARACTERISTICS OF BUSINESS FIRMS

In this section some fundamental economic factors and processes that influence industry characteristics will be considered. Some factors relate to the basic technology of the industry; other factors are determined by the processes of product and industry growth cycles.

A. INFLUENCE OF MINIMUM INVESTMENT REQUIREMENTS

It is frequently observed that the major merger movement at the turn of the century gave American industry its characteristic pattern of concentration. But the merger movement of the turn of the century cannot explain concentration in industries which came into existence after World War I. An example is the aerospace industry which exhibits high concentration.

The high concentration that has developed in the aerospace industry is related to the influence of large investments required for product programs. Without attempting to explain all of the characteristics of the industry, I shall illustrate the basis for a tendency toward a small number of large firms to emerge in the industry.¹⁸

Let us consider a new major airplane program, without specifying a particular product:

1. Number of years to recoup investment—five years.

¹⁸ For a presentation of the leading characteristics of the Aerospace Industry, see Weston, *The Nature of the Defense-Space Market*, in DEFENSE-SPACE MARKET RESEARCH 1-19 (J. Weston ed. 1964).

2. Approximate number of planes to be sold is 2,000 in a price range of 3.5 million dollars per unit.
3. Special tooling and development costs for the new plane—200 million dollars (five year life).
4. Other more general investment requirements in plant and equipment for production—600 million dollars (ten year life).
5. Variable costs per unit of production—seventy percent of selling price.

With the above facts, the breakeven number of planes for a given manufacturer would be:

$$\begin{aligned} \$100,000,000 + \$2,500,000 X &= \$3,500,000 X \\ X &= 100 \text{ planes} \end{aligned}$$

Therefore profitable operations would permit the existence of only three firms in the industry. The numerical illustration is not intended to present precise facts, but the general pattern is indicated. The illustration suggests how the existence of large minimum investment requirements may limit the number of firms that may economically exist in the industry. Thus concentration in this set of circumstances would reflect the scale requirements of the industry.

The economic trends outlined in the initial section of this paper suggests that an increasing number of economic activities may be subject to large scale requirements which permit only two to three firms for profitable operation. Some of the factors with influences in this direction were outlined. These factors were the growth in the economy and industries which make for firms of larger absolute size. Technological change leads to larger capital requirements in some industries. The capital requirements per worker also increase in a number of industries. The revolution in communication and transportation permit larger size of markets. The use of the computer and the application of advanced management technologies permits efficient large scale operations. Thus the characteristics of the economy in the future may result in more industries in which efficient and profitable operations will accommodate only a small number of large firms.

A point to be recognized in this connection is that some of the comparisons of ideal output and pricing behavior between concentrated industries and atomistic industries may be seriously misleading. To have twenty firms producing the item described above, would involve very heavy costs for each one. Following the facts described above, the dependent variable becomes the breakeven price rather than the breakeven quantity.

With twenty firms and a total industry quantity of 400 units sold each year, the average number of units that could be sold by

one firm would be twenty per year. With a smaller number of units to be sold, the fixed costs could be reduced to perhaps one-half of optimal fixed plant for producing the planes. But variable costs will rise both because less learning experience time will be available to each firm and because less than an optimal amount of fixed plant is employed. It will be postulated that variable costs increase by one-fifth on each plane. The new breakeven equation for price would become:

$$\$50,000,000 + \$3,000,000 (20) = P (20)$$

When the equation is solved for P , it is seen that the required breakeven price is 5,500,000 dollars per plane. Thus under more "competitive" conditions in the industry, the selling price per plane would have to rise to over 5,500,000 dollars per unit for profitable operations for the firms operating in the industry.

The conventional static comparison is that the competitive firm will be operating at the low point of its average cost function, while the firms operating under imperfect competition will operate to the left of the low point of their average cost function. But the numerical illustration suggests that the nature of the industry is such that only a small number of large firms could operate near the low point of the long-run average cost function. Smaller firms would be operating far to the left of the low point of the long-run average cost function; if in short-run equilibrium, they were operating at the low point of their short-run average cost function, this would be higher than the low point of the long-run average cost function for the product. Thus the larger firms could operate substantially to the left of the low point of their long-run average cost function and yet price substantially below the required breakeven price for firms if some twenty firms were operating in the industry. The orders of magnitude suggest that prices resulting from oligopolistic firms' equating marginal costs to marginal revenues might be substantially below the prices of competitive firms based on equating marginal cost to price.

Thus the economic and technological trends emerging in the American economy in the future may result in increased concentration. The above example illustrates (but does not establish) the proposition that concentrated industries may result in prices that are substantially lower than could obtain under less concentrated industries. The above conclusion is reinforced if quality competition that is observed in oligopolistic industries is taken as an indication that prices in the industry approach the Bertrand solution.¹⁹

¹⁹ The Bertrand solution to the oligopoly pricing behavior suggests that

The competitive static models are deficient for understanding the dynamics of the behavior of industries. What is required is a set of propositions based on the processes of change and development in industries and in national economies. The processes of the growth and development of industries will next be described with their implications for antitrust standards formulated in the light of the trends and objectives discussed in the first two sections of this paper. For the conceptual framework the construct of industry life cycles will be employed.

B. THE ROLE OF THE INDUSTRY LIFE CYCLE

The concept of industry life cycle has received attention in many aspects of the literature, but has been relatively neglected in seeking to understand industry processes.²⁰ Economic textbooks and writings have been preoccupied with an analytical framework which is static in its focus and spirit. In part this reflects the difficulty of formulating a theory to explain the growth of firms, industries and national economies.

While space does not permit full documentation, the following sketch of the life cycle of individual industries is well grounded on the foundation of economic principles. The process reflects the working out of the principles of an enterprise system.²¹

(1) *The Introduction Stage of an Industry*

At the start of a new product or industry, an introduction period may be required. Time and outlays may be required to inform consumers of the nature and uses of the new product. Product development problems may also be involved. The introduction stage of a new product may be associated with losses to the innovating producers.

competitive reactions of rival oligopolists result in prices that would decline to marginal cost. G. STIGLER, *THE THEORY OF PRICE* 243, 305 (1946).

²⁰ A. BURNS, *PRODUCTION TRENDS IN THE UNITED STATES SINCE 1870* (1934); E. FRICKEY, *PRODUCTION IN THE UNITED STATES, 1860-1914* (1947); J. GASTON, *GROWTH PATTERNS IN INDUSTRY: A REEXAMINATION* (1961); Gold, *Industry Growth Patterns: Theory and Empirical Results*, 13 J. INDUSTRIAL ECON. 53 (1964).

²¹ For example, in connection with a statement indicating a preference for finite, rather than infinite, growth models, the following comment is made. "The finite model does capture at least the essence of the S-shaped growth path which is encountered so frequently (and for good economic reasons) in empirical studies of firm and industry development." Miller & Modigliani, *Some Estimates of the Cost of Capital to the Electric Utility Industry*, 56 AM. ECON. REV. 344 n.15 (1966).

(2) The Acceptance and Exploitation Stage

When consumer acceptance has been achieved, sales may expand rapidly. Since a new product creates a new demand or may substitute for an old product, a reservoir of demand is drawn on. The explosive growth in sales is associated with high profitability. Additional capacity is attracted into the industry. Even if the existing firms have patent protection, competitors will introduce related products to obtain some share of the market.

Entry conditions are relatively easy because of the large reservoir of demand, the substantial growth of sales, and the high prices and profits produced by the limited existing capacity. Capacity in the industry expands with increasing momentum.

At some point in this exploitation of the market period, sales to capacity relations become less favorable. In recent years, for example, the sales of the pleasure boat industry continued to grow at a rate of twelve to fifteen percent a year—an impressive growth rate. But capacity was growing at twenty percent a year. Pressure on prices and profits began to develop.

(3) The Maturity Stage

Near the end of the market exploitation stage or at the beginning of the maturity stage of the life cycle of the development of the industry, the growth rate of sales slows down. The additions to capacity, stimulated by the high historical profits, may reach their peak rate as the growth rate of sales begins to slow. Excess capacity in the industry may develop. Prices and profits decline.

It is at this point of the cycle that the analysis becomes particularly relevant for merger policy. With the decline in prices and profits, a process of selection begins to operate. Only those firms can survive which can reduce prices to the lower levels required by the adverse sales to capacity relations that have developed. Mergers between existing firms may take place. Larger firms which may have already developed in the industry or larger firms from other industries are likely to be the acquirers. The existing firms may have represented the thrust of a small number of individuals with a great competence in one area such as research, production, sales or advertising. In a rapidly growing industry, the possession of one strong management attribute may be sufficient for success. But as competitive pressures increase, a greater requirement for a full range of management competences begins to exert itself. Sometimes individual firms may extend the range of such competences. But the sale to a larger firm which possesses a full range of mana-

gerial skills may be the only practicable solution to preserving some of the values created by the organizers of the smaller firms.

This tendency to sell out to established firms with the required managerial experience and skills is reenforced by the tax laws. The uncertain prospective stream of profits of the smaller firms can only be received by the individual owners in the form of personal income from dividends. Personal income tax rates are sharply progressive, but capital gains tax rates do not exceed twenty-five percent. If the owners sell, they can convert uncertain future personal income to a definite capital gain with only a limited tax impact. If the owners receive the stock of the acquiring firm, realization of the capital gain can be postponed. It is of increased importance then that the securities received from the acquiring firm represent securities with prospective safety of income or principal. Again this favors acquisition by a large and established firm.

Thus rules of "preventive antitrust" which proscribe acquisitions by larger firms work severe hardships on the smaller firms. It is doubtful whether entry by the larger firms into the industries with favorable long term trends would be prevented by prohibiting such acquisitions. Under the circumstances described, with temporary overcapacity, with depressed prices and profits, the larger firm may obtain entry at a lower investment by acquiring an existing firm that has experienced a slowing in its growth momentum and foresees further difficulties ahead. The entry by the larger firms *de novo* would increase the difficulties of the existing firms. Over the long run, *de novo* entry rather than acquisition, would reduce the incentives for individual entrepreneurs to create enterprises that could be sold for capital gains. By impairing the market for capital assets, a stimulus to innovation and the creation of new small firms would be reduced. The mergers described have positive social values rather than the negative attributes often attributed to them.

Near the end of the maturity stage, the growth rate in sales will decline further. Profit margins will experience greater pressures. While the growth rates in the industry have slowed, the absolute level of sales in the industry may be large. The critical factor for profitable operations may be effective cost control of large scale, mass production operations. The effective coordination of research, advertising, production, marketing may be required to achieve reduced costs by a few cents per unit, but which might make the difference between profitable and unprofitable operations. Spreading the heavy fixed costs of machinery, presses, dies, jigs and fixtures associated with product developments or model changes may constitute significant economies of scale. If as a con-

sequence of these factors the largest firm in the industry is the low cost producer, strong motivation is exerted on the number two, three, four, etc. firms to combine to match the efficiencies from scale advantages of the largest firm. These may be termed mergers to match competitive strengths.

Such mergers would reduce the number of the second line firms in the industry. The objection expressed toward such mergers is that while they increase the competitive pressures on the largest firms, they also increase the advantage of such merged firms over the smaller firms in the industry. But the basic economics of the industry will result in a smaller number of large firms so that the industry will be characterized by two broad types of firms. The first type will be firms large enough to possess the competitive requirements of the industry at its stage of development. The other type will be much smaller firms operating as suppliers to the end product firms or concentrating on specialized segments of the market.

The industry is now mature. It is characterized by a small number of large firms which compete on product quality and advertising. A large number of small firms is likely to coexist. They may be suppliers of parts, a part of the distribution system to consumers, a part of the service organization of the industry or produce distinctive custom items for specialized segments of the market.

(4) *The Stage of Industry Decline*

The development of substitute products starts new industry life cycles for the new product developments. But new products substitute at least in part for existing products. As the sales of substitute products are successfully introduced, they begin to erode the sales of the older product lines. Characteristic growth rates per annum in the succession of stages would be:

Introduction stage	— one to two percent per annum
Exploitation stage	— eight to twenty percent
Maturity stage	— four to six percent
Decline stage	— plus one or two percent to negative four percent to ten percent

In the late maturity stage of the industry or in the decline stage, the rate of sales growth declines. Highly unfavorable sales-to-capacity relations begin to develop causing profit margins to dwindle and losses to appear.

These developments create pressures for three types of mergers.

One is toward vertical integration. A second is mergers for survival. A third is mergers for diversification. Thus pressures for horizontal, vertical and conglomerate mergers appear in the late stages of an industry life cycle. Horizontal mergers are sought by the higher cost producers to seek to match the performance of the low cost firms. The low cost firm may or may not be among the largest firms in the industry.

With unfavorable sales-to-capacity relations in the industry, profit margins become unfavorable. This is coupled with an industry that has now reached close to the maximum level of volume it will achieve. Thus another theory comes into operation. In the early stages of any industry when its volume is relatively small, specialist firms become suppliers. By supplying several firms in the industries, the supplier firms may achieve economies not available to the end-item manufacturers. The required initial investment of the end-item manufacturer is also reduced.

When the industry has reached the late maturity or early decline period, two characteristics of the industry create tendencies for vertical integration. The earlier mergers have resulted in a smaller number of firms. The industry volume is large and the sales of each individual firm is large. Profit margins have declined and the total process from raw materials to end-product is reviewed to seek economies of the total operation to achieve economies of vertical integration. Future growth in profits must come from improved profit margins more than from sales growth.

When overcapacity is chronic, it appears that it will require a long number of years for sufficient investment to be depreciated and not replaced, or changed to other industries. Under such conditions, the temptation for the marketing departments of some firms to seek to avoid the consequences of overcapacity become strong. Collusion to maintain prices may result.

Two observations in this connection are in order. First, not only is the action illegal, but unsound from a managerial standpoint. In an industry of excess capacity, resources and personnel should be redirected to more profitable opportunities rather than to seek to maintain prices to cover full costs including overhead. The economic fact is that the excess capacity has resulted in capital losses for the redundant capital investment in the industry. Two processes are initiated. Capital investment in the industry declines because internal fund flows are redirected to other investment outlets. As capacity in the industry is reduced, the basic supply and demand conditions result in competitive prices that are higher.

Thus the amount by which collusion has increased prices over competitive prices is not the total difference between what would have been charged without collusion and what was charged through collusion. Without collusion, competitive prices would have reduced industry capacity and prices would have risen part of the way toward the higher price levels resulting from collusion.

But strong pressures for changing the firm's product mix develop. The internal cash flow of the firm can no longer be profitably invested in the declining product lines. The firm, therefore, is required to achieve some diversification in its products. The diversification may be sought through internal development or through external mergers and acquisitions. From a managerial standpoint, a basic capital budgeting decision is involved. Factors such as alternative prospective profitability, risks, requirements for developing organizations, marketing acceptance, etc., must be taken into account.

A distinction should be drawn between two types of diversification, whether internal or external. When a firm broadens its product lines, maintaining some common threads with its traditional product lines, the diversification may be said to be concentric. The common thread may be in research, production, marketing, or any segment of the firm's experience.

When the new products do not carryover any of the historical activities of the firm, the diversification is conglomerate. The major business motive for concentric diversification is to achieve utilization of existing capabilities. The major business motive for conglomerate diversification is to enter markets which promise opportunities superior to those in the firm's traditional product line. When diversification is achieved by external actions, the mergers may also represent concentric or conglomerate diversification. Thus the traditional threefold classification of mergers should be extended to recognize two distinct categories formerly grouped under the broad heading of conglomerate mergers.

The foregoing analysis suggests that the traditional classification of mergers is archaic. In its place the following is suggested, related to the industry life cycle concept.

**Stage of Industry
Life Cycle**

Type of Merger

I. Introduction stage

Newly created firms may sell to larger firms in an industry in its maturity or decline stages to provide entry for larger firms into a new growth industry. The smaller firms' incentives to sell result from desire to convert personal income to capital gain and to avoid risks of com-

mitting large investments into managements with no experience record of successful performance. Some merging of smaller firms to pool management and capital resources.

II. Exploitation stage

Same as above, reenforced by clearer visibility of growth and profit prospects and by the larger capital requirements of a higher rate of growth.

III. Maturity stage

Mergers to achieve economies of scale of research, production, marketing, to match the low cost and price performance of some firms, domestic or foreign. Some acquisition of smaller firms by larger firms to round out the range of management competences of the smaller firms and to provide them with a broader financial base.

IV. Decline stage

Horizontal mergers for survival. Vertical mergers to make the total process more efficient and to increase profit margins. Concentric mergers to achieve synergy and carryover. Conglomerate mergers to utilize the accumulating cash position of mature firms in declining industries whose internal flow of funds exceeds investment requirements in traditional lines of business.

V. CONCLUSION

The preceding sections have treated four basic areas. First, some significant economic trends have been sketched with some indication of their implications for antitrust standards. Second, the objectives of economic policy in the United States have been reviewed. Third, a critical analysis was made of propositions which have had an important influence on recent trends in antitrust policies. Fourth, some aspects of the theory of industrial processes for understanding the internal and external growth patterns of firms was formulated.

What are the implications of the foregoing materials? With regard to the economic trends, the continued high rate of growth in the economy has had two effects. It provides an economic basis for the continued growth and development of large scale operations. The high income, increased leisure economy enhances the position and enlarges the opportunities for small firms. The service industries, characterized by small firms, will continue to grow at a relatively faster rate than the economy as a whole. Increased opportunities for specialized and distinctive products also provide opportunities for small firms.

The increased pace of research and development, technological change, and innovation lead to unequal growth rates among different industries. This, in turn, stimulates diversification incentives for firms, particularly those in relatively mature industries. The

revolution in communication, transportation, and in management technologies increase the feasibility and promote the efficient operation of large and diversified firms. The trends toward economic integration among nations and the extension of product markets reinforce the pressures described under growth and innovation for the emergence of large multi-national operations.

Five major objectives of economic policy were identified. These represent an important aspect of the value standards which greatly influence the directions of antitrust policies. The objective of decentralization of power has been expressed in many forms. The ideals of atomistic firms and federalism with strong states' rights have bowed to the progression of inexorable economic, political, and technological developments. The complex economic and social order has resulted in increasing the role of government and continued the progressive development of a strong national government. Advanced technology, the expansion of national and international markets, and the pressures of international competition have resulted in large business firms.

Trends in the American economy have been in a direction opposite to the ideal of decentralization of power. However, important progress has been made in the achievement of the pluralistic society in which no single political, economic, social, religious, or other institutional groups has moved to a dominating power position. This trend toward strong power blocks in a pluralistic society has been compatible with the achievement of significant progress toward the other four objectives. The performance record of the American economy with respect to progress toward the goals of a satisfactory growth rate, economic stability, economic and social equity, and a strong international position must be acknowledged to be very favorable, especially when compared to records of other nations of the world.

The foregoing discussion of trends and objectives in the American economy provides a useful backdrop for the evaluation of the behavior characteristics of the economy. Four propositions were evaluated. It was demonstrated that increases in concentration can be equated with declines in competition only under unrealistic static economic assumptions in which the only dimensions of the market are a given product and associated prices. This conclusion was reinforced by a consideration of the nature of economies of large-scale operations. It was shown that economies of large-scale operation can provide product quality improvements at lower prices than could feasibly be charged by atomistic firms which would necessarily be operating under higher cost conditions.

This finding is also consistent with the discussion of profit patterns. While profit patterns in some concentrated industries are higher than in less concentrated industries, the absolute level of profits has been modest. In the small number of industries studied, a sizeable proportion achieved profits lower than the average for the less concentrated industries. These facts make it difficult to equate concentration with market power to achieve abnormally high prices which produce excess profits. Much additional analysis and evaluation of the significance of observed industrial profit patterns is required.

Finally, the sources of innovation were considered. The technological fertility of an industry is probably the most important determinant of the rate of innovation in that industry. In industries in which economies of scale advantages are held by larger firms, the pressures to innovate are probably greater on the smaller firms. On the other hand, the technology of invention is such that for some types the relative advantage is to small firms and for other inventions large investments which can be assembled only by large firms are required for progress in that area of technology.

Finally the nature of dynamic economic processes was analyzed. It was pointed out that the technology of some industries may require such large fixed investments related to relatively short product cycles that such industries would support only a small number of firms. It was shown how the processes of industry development provide pressures for both internal and external diversification. The analysis suggests that both internal and external growth processes represent a part of the larger process of the competitive evolution of industries. These present pressures for the viability and growth of firms and not necessarily the entrenchment of monopoly power in an industry.

Two broad themes may be emphasized from the foregoing summary. First, the foregoing analysis establishes some important limitations on the utilization of rigid standards. The mechanical application of concentration tests to judge the social consequences of a merger are inadequate. Such a mechanistic approach will fail to reflect a basic understanding of the vital industrial processes involved. The present analysis does not suggest the presumption that all mergers are good. Rather it recommends application of tests based on an understanding of dynamic industry processes. The continued study and increased knowledge of the economics of individual industries will continue to be a requirement for the sound application of anti-trust standards.

Second, the scope of industrial competition will become increasingly international. The development of common markets will ac-

celerate international competition. By broadening the extent of industrial markets, the development of efficient large-scale operations will be accelerated. Increasingly developing nations will reach a size and maturity to support business firms with large-scale operations. These, too, will enter the international markets.

The emergence of new competitive forces, international in origin, may therefore be accelerating in the dynamic world processes. Thus another limitation on spontaneous coordination of price, product and production policies by oligopolistic firms is increasing in strength. It is important that the vigor of international competition should not be suppressed by governmental policies. Perhaps in the future development of the world economy, the most important area of anti-trust standards is the recognition of the importance of the multi-national firms and free international competition. Here is an area in which the economic policy of the United States can give strong support to the spirit and effectiveness of anti-trust standards.