Part 3: Industrial Concentration through Horizontal Mergers: Effects on Performance

In order to justify an activist competition policy towards mergers it is not sufficient just to be aware of the construction-default inherent in free enterprise systems, as described above. More than this, the economic case for an activist antimerger policy has to be based on an economic model or paradigm which can serve as a framework for public policy. The weaker the empirical evidence for such a paradigm, the weaker the case for distinct antimerger policy.¹

In evaluating the theoretical basis for an antitrust policy towards horizontal mergers, we will proceed as follows:
- We will present the concentration-collusion doctrine as the theoretical foundation underlying the past enforcement policy towards horizontal mergers, evaluate empirical attempts at verification and critically evaluate the insufficiencies associated with the traditional approach.
- We will then present the rival theory underlying the current approach towards horizontal mergers, the so-called new learning hypothesis. The theoretical basis as well as empirical attempts at verification will be evaluated critically and its public policy implications will be discussed.
- Furthermore, we will try to separate efficiency effects from market power effects by answering the question as to what extent horizontal industry concentration is justified by technical economies and additional non-technical efficiencies. Our emphasis will be on the role of market share and the distribution of firm shares in a particular market, according to recent empirical findings.

I. The Economic Rationale Underlying the Traditional Merger Policy

The economic case for traditional horizontal merger policy is based on the so-called concentration-collusion doctrine, which can be considered a special

variant of the structure-, conduct-, performance-paradigm that was treated in Part 1 of the contribution submitted.²

1. The Content of the Concentration-Collusion Doctrine

The economic principle of the concentration-collusion doctrine was first emphasized implicitly by Adam Smith, who noted that competitors would restrain competition by harmonizing (colluding) their economic activities and agreeing upon matters of joint interest.³ With regard to antimerger policy, this economic impetus for public policy was elaborated on first by Augustin Cournot. His theoretical work showed that a decrease in the number of competitors would have deleterious effects on market performance in that the equilibrium price achieved would be above the one obtained by competition.⁴ Hence, a tendential increase in the number of competitors seemed to be necessary in order to obtain the competitive equilibrium price and, therefore, good market performance.⁵

Actually, this can be considered the starting-point of and the economic basis for the concentration-collusion doctrine.⁶ The doctrine can be traced back to Edward H. Chamberlin who can probably be credited for having been the first to argue explicitly that the probability of the recognition of mutual interdependence among competitors would rise as the number of competitors decreased and that eventually a critical level of concentration would be

² Cf. Green, Industrial Organization Paradigms ..., supra, 484; and Pautler, A Review ..., supra, 587.
³ Smith, Adam, The Wealth of Nations, New York 1937, p. 128: "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in conspiracy against the public, or in some contrivance to raise prices."
⁵ Again, it becomes obvious that good economic performance and not just freedom to compete must be a valuable criterion for the policymaker in order to accept the tenet submitted.
reached which would allow for collusive action and non-competitive pricing. The increased awareness of mutual interdependence stems from the fact that competitors gradually approach perfect information on relevant market characteristics and, simultaneously, the probability of detecting violations of interdependence, i.e. of collusive conduct, increases. Hence, the essence of the doctrine is to show "that successful (tacit or explicit) collusion would approach joint maximization and that the ability to collude increases with concentration".

The crucial yardstick for the evaluation of the economic evils of collusion are various performance criteria. According to basic monopoly and oligopoly theory, collusion due to increased industry concentration will lead to output restrictions and as market prices are raised and exceed marginal costs, allocational inefficiencies will occur as concomitants. Hence, price-cost margins might be seen as a proof of the quality of performance. Power to raise prices by any form of collusion might result not only in allocational inefficiencies but also in increased costs of production as competitive pressures to minimize costs are reduced.

7 Cf. Chamberlin, Edward H., The Theory of Monopolistic Competition, 8th ed., Cambridge, Mass. 1962, pp. 46 f.: "The assumption of independence cannot be construed as requiring the sellers to compete as though their fortunes were independent, for this is to belie the very problem of duopoly itself." On the aspect of mutual interdependence, cf. as well Greer, Industrial Organization ..., op. cit., 11 f.; Green, Industrial Organization Paradigms ..., supra, 575; and Areeda, Phillip, and Donald F. Turner, Antitrust Law: An Analysis of Antitrust Principles and Their Application, vol. 4, Boston and Toronto 1980, p. 55: "There is a general agreement that beyond some point the smaller the number of firms and the larger the share of the market occupied by one or relatively few firms, the greater the likelihood of substantial departures from competitive performance, particularly with regard to price."


The conclusions issuing from this line of theorizing provide the welfare-theoretic basis for policies that attach to collusion, the exercise of market power as well as to substantial accretions to such power eventually added by mergers.\textsuperscript{10}

2. Economic Returns as a Standard of Measurement

In order to measure market power, the representatives of the former theoretical edifice associated with the Harvard School used different performance measures. These performance measures indicate the degree of attainment of the performance variables allocative, productive, and dynamic efficiency (technological progress).\textsuperscript{11} They encompass output restriction, price elevation, profit rates of return, price-cost margins, and the extent of overcapacity, etc. and relate these factors to structural variables such as, e.g., the degree of industry concentration, the market shares of the competing firms, or the height of the barriers to entry.\textsuperscript{12}

Economic returns, price-cost margins and profit rates have received particular attention in this context. Crudely stated, the profitability of an enterprise can be viewed as its basic motivation. This leads to the hypothesis widely agreed upon that economic returns serve as an adequate yardstick for a company’s performance. At the same time, profitability serves as an indicator of whether the company actually faces sufficient competition. If it faces sufficient competition, excess returns on capital invested and, therefore, undue market power are supposed to be transitory and will be eroded.

\textsuperscript{10} Cf. Green, Industrial Organization Paradigms ..., supra, 484; Greer, Industrial Organization ..., op. cit., 404 f.; and Pautler, A Review ..., supra, 575 f., who note that the antitrust authorities in the U.S. felt secure enough in their knowledge of the relationship between concentration and performance to base their general guidelines for horizontal mergers on the concentration-collusion doctrine; cf. as well, Horizontal Merger Guidelines 1968, issued by the U.S. Department of Justice.

\textsuperscript{11} Cf. Koch, Industrial Organization ..., op. cit., 190; and Singleton, Industrial Organization ..., op. cit., 4 f.

at least over a longer period of time.\textsuperscript{13} The importance of individual structural factors then depends on how much they add to profitability in the individual case.\textsuperscript{14}

In addition to a number of statistical problems there are three crucial problems in measuring performance, i.e., in measuring market power by means of profitability:\textsuperscript{15}

- Severe operationality problems exist in measuring profitability;
- market power may exist even at low "excess profits";
- "excess profits" may exist in competitive markets in the short-run (as an incentive to imitative competition).

In addition to the notion that excess returns must be non-transitory in order to indicate market power, another qualification has to be made. Economic returns might also reflect an enterprise's higher efficiency or higher innovativeness. It will be the main task of this part of our contribution to find some evidence on the causes of excess returns: to what extent are such returns attributable to higher efficiency and to what extent can they be put down to market power?

The underlying technique of performance measurement seems to be the main point of dispute for the present. For the purpose of measuring monopoly or

\textsuperscript{13} On this position cf. Shepherd, William G., The Economics of Industrial Organization, 2nd ed., Englewood Cliffs, N.J. 1985, p. 65, who emphasizes profitability in the sense of accounting returns only. For a profound discussion on the difference between economic returns and accounting returns, cf. Areeda, Phillip, and Donald F. Turner, Antitrust Law: An Analysis of Antitrust Principles and Their Application, vol. 2, Boston and Toronto 1978, §§ 508-510, 512c, and § 508: "Substantial market power usually brings higher returns than needed to attract capital into the business ..., we will show that persistent excess returns are convincing proof of durable, individually held market power for a firm that is the only producer of a physically distinguishable product, or that has produced a very high and relatively stable proportion of the output of that product."


\textsuperscript{15} Cf. Schmalensee, Another Look at Market Power, supra 1805; and also again, Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft, op. cit., 11 f.
market power, the current theory associated with the Chicago School tends towards a theoretical case-by-case analysis and uses perfect competition as a standard of reference:

"The term 'market power' refers to the ability of a firm (or a group of firms, acting jointly) to raise price above a competitive level without losing so many sales so rapidly that the price increase is unprofitable and must be rescinded." 18

This evaluation of market power follows logically from the price/quantity-definition of monopoly. The existence of market power as such is of less importance; with regard to antitrust theory and policy the extent of market power is of much greater concern. The theoretically correct index for the measurement of this power is the Lerner index which relates price-cost margins to price and indicates deviation from an efficient resource allocation. 17

The Lerner index must equal zero if perfect competition is prevalent, and increases up to one with the extent of market power individually held. Some critics of the current tenet, however, doubt that measures such as the Lerner index are suitable for the general case and reject them for this reason: 18

"Concepts such as the Lerner index of monopoly, relating price to marginal cost, reflect the adoption of these criteria," (i.e., performance criteria) "criteria which have become widely adopted principles of antitrust economics. Nonetheless these are incorrect criteria upon which to construct standards of antitrust policy."

While other adherents of current theory accept such measures of market power in principle, they stress the problems of using these measures. For instance, Landes and Posner emphasize the difficulty of extricating the necessary data and especially of measuring the elasticity of demand which is used in the Lerner index: 19

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19 Landes/Posner, Market Power in Antitrust Cases, supra, 943.
"More important is the difficulty that would face a court or an enforcement agency in estimating elasticities of demand for purposes of using (the) approach in antitrust enforcement and adjudication."

The dead-weight loss, which has already been discussed, seems to be the only concept that is accepted by all representatives of current theory. As has been emphasized above, this measure presents the monetary loss which results in an economy by virtue of the fact that a monopoly offers a smaller quantity than would be offered under competitive conditions.\textsuperscript{20} We have pointed out the practical difficulties of the model and the qualifications necessary to make use of the approach. Furthermore, the dead-weight loss is severely handicapped by the fact that as a rule it is static and strictly efficiency-orientated (in contrast to a multiple-goal approach advocated by us in this contribution); it therefore does not serve as a broadly enough based concept for the purpose of empirical proof.

In order to find empirical evidence of supracompetitive profits, an empirically observable relationship between factors that determine the structure of an industry and the resulting profits has to be constructed. In addition to profits, the degree of technological innovation or technological efficiency can be used as a criterion for measuring performance.\textsuperscript{21} Additional measures can only be determined vaguely.\textsuperscript{22} We have to return to so-called proxy variables, which will be treated further below. Our considerations will be based on the commonly used structure-performance studies employing such proxy variables. Furthermore, we will return to the problems of performance studies as used by traditional, after having evaluated the empirical evidence on the concentration-collusion doctrine.

3. Empirical Attempts to Verify the Concentration-Collusion Doctrine

Empirical studies aiming to verify the concentration-collusion doctrine have commonly attempted to determine the role of various structural factors in

\textsuperscript{20} Cf. the criticism of this measurement concept by Schmalensee, Another Look at Market Power, supra, 1793.
\textsuperscript{22} Cf. Bain, Industrial Organization, op. cit., 458 ff.
facilitating collusion. In this context, collusive behavior has been seen as an attempt to restrain competition, which leads to poor performance.23

Commonly, underlying these studies, were four different independent structural variables, used either separately or simultaneously. Competitive performance was seen to be influenced primarily by the degree of market concentration, the size distribution of the firms (market shares), barriers to market entry, and the degree of product differentiation. Since the emphasis of the traditional studies was on the degree of market concentration as measured by concentration ratios or the Hirschman-Herfindahl index as presented above, we will proceed along the same lines.24

Underlying the traditional studies are two different sets of data. Both are based on the Standard Industrial Classification Code (SIC), which regards markets in terms of industries and "delineates market breadth with a system of numerical codes".25 The breadth of delineation runs from two-digit major industry groups (e.g., electrical equipment and supplies) which are broken down into narrower industries (e.g., five digits: electrical integrating instruments) and then finally into seven-digit single product categories. One set of data is collected by the U.S. Internal Revenue Service (IRS). The data provided comprises the two-, three-, and four-digit levels of industry aggregation in terms of the census classification scheme. This sort of

24 Cf. Green, Industrial Organization Paradigms ..., supra, 484; Singleton, Industrial Organization ..., op. cit., 11.
25 Greer, Industrial Organization ..., op. cit., 103; and cf. as well Koch, Industrial Organization ..., op. cit., 173-175.
classification is contaminated, however, since whole companies are assigned to their primary industry category.\textsuperscript{26}

The second set of data used is provided by the U.S. Bureau of Census that collects statistics on manufacturing activity at the level of individual plants, and condenses the figures to concentration ratios of the four, eight, twenty, and fifty largest firms.\textsuperscript{27}

We will infra recur to the question of general data insufficiencies being possibly responsible for spurious results in the studies presented.

\textbf{a. Empirical Evidence}

The most commonly used performance variables in the traditional studies are prices, profits, and price-cost margins, the latter being considered a correct substitute proxy for economic returns.

\textbf{aa. Concentration and Prices}

The primary proof of the concentration-collusion doctrine should come from a link between the degree of concentration and the level of price. If an increase in concentration raises the probability of mutual interdependence, the actual result would be an inelastic demand situation. This would encourage incumbent competitors to raise prices. Hence, an increase in concentration is associated with a rise in price. This reasoning only holds ceteris paribus, however, since the height of entry barriers to the market in question as well as the intensity of potential competition have to be considered at the

\textsuperscript{26} Cf. Intriligator, Michael D., et al., Conceptual Framework of an Econometric Model of Industrial Organization, in: Weston, J. Fred., and Stanley J. Ornstein (eds.), The Impact of Large Firms on the U.S. Economy, Lexington et al. 1973, pp. 23-55, 35; and Scherer, Industrial market structure ..., op. cit., 270: "(F)or diversified corporations, this means that vast amounts of irrelevant or 'contaminating' activity are loaded into the primary industry totals along with correctly classified primary industry, profits, sales, and assets."

\textsuperscript{27} Cf. Koch, Industrial Organization ..., op. cit., 173-175; Shepherd, The Economics ..., 67-69; Scherer, Industrial market structure ..., op. cit., 271; and Singleton, Industrial Organization ..., op. cit., 16 note 21, who notes that industries are defined on the basis of similarity of production processes: "As a result firms which do not compete with each other are sometimes included in the same industry while firms which do compete are sometimes not included in the same industry."
same time. Low barriers and strong potential competition would make the demand situation more elastic.  
Empirical studies have been performed mainly with regard to industries where data is available relatively easily, such as commercial loan terms in banking, mortgage rates of mortgage-lending institutions, interest rates of savings bonds, food retailing, and newspaper publishing. All of these studies have indicated that the net effect of increased concentration is a significant tendency to raise prices:

"Although one can, as always, quarrel with the particular samples, controls, and methods employed in these studies, their overall thrust is unambiguous. Prices do tend to be higher when markets are highly concentrated than when they are not."

For several reasons, however, these studies are of restricted usefulness in their attempts to verify the concentration-collusion doctrine:

- Structural factors other than industry concentration such as, e.g., barriers to entry or the extent of buying power might affect the level of prices in actual markets in cases where the ceteris paribus-condition no

28 Cf. Shepherd, The Economics ..., 126 f. for specific examples and the underlying reasoning; and Pautler, A Review ..., supra, 615-624 for a survey.
34 Scherer, Industrial market structure ..., op. cit., 288; cf. for one of the latest case studies, Barton, D., and R. Sherman, The Price and Profit Effects of Horizontal Merger: A Case Study, 32 JJE (1984), pp. 165-178; and Pautler, A Review ..., supra, 615; Greer, Industrial Organization ..., op. cit., 295 f. note 1 for a largely complete survey on the studies.
longer obtains. The extent to which these factors add to or subtract from the pricing effect is difficult to determine correctly.

- Prices cannot - as a rule - be compared across different markets, since there is no way of standardizing what constitutes a 'competitive price'.
- There is a paucity of useful data on prices, which restricts empirical attempts to verify the doctrine in respect of certain industries particularly those which might show irregular structural or legal features.36

In essence, the results of the price studies can be considered crucial for a proper interpretation of the profit studies to be presented because they might add information necessary to distinguish price-raising effects from cost-depressing effects that are due to scale economies:37

"Without these price studies we could never be certain that the observed positive association between profits and concentration (or profits and market share) was indeed due to 'market power'. A skeptic would argue that the cause of the positive profit association was not market power pushing up prices, but rather some non-price profit-enhancing variable like productivity or efficiency, which would be positively but unmeasurably associated with concentration."

A complex interplay of price increasing and cost decreasing-effects seems to be at work, the latter of which we will deal with infra; there seems to be a tendency for suppliers to refrain from lowering their prices to such an extent as gained cost advantages would allow them to do. A study by Kelton38, who inquired into the correlation between concentration and prices in the field of food and tobacco products shows a durable positive and significant correlation between the two variables in periods without inflation (change of the price level of 8% when the level of concentration increased by 10%).39

36 For example, much of the banking business in the United States is regulated. This affects the results of banking studies severely, cf. Pascher, op. cit.
37 Greer, Industrial Organization ..., op. cit., 299, italics original; and cf. Scherer, Industrial market structure ..., op. cit., 287.
39 Cf. Weiss, Concentration and Price ..., supra, 8.
bb. Concentration, Profit Rates, and Price-Cost Margins

The concentration-profitability relationship is considered to be the probably most thoroughly tested hypothesis in economics. The pioneering study within the field was performed by Joe S. Bain in 1951. He tested the hypothesis "that the average profit rate of firms in oligopolistic industries of a high concentration will tend to be significantly larger than that of firms in less concentrated oligopolies or in industries of atomistic structure". He collected data from 335 firms in 42 industries for the period of 1936-1940 on the rate of return on equity after tax (the underlying performance measure) and correlated this data with the eight-firm concentration ratio (the measure for market structure). Bain did not find a linear relationship between concentration and profitability as measured by rate of return on equity. Nevertheless, he found profits to be significantly above average for an eight-firm concentration ratio above 70%.

A whole spate of empirical studies followed the one performed by Bain. The majority of these studies showed a significant positive correlation between

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42 Cf. Bain, Relation of Profit Rates ..., supra, 313. Probably the most recent of these studies are Salinger, M., Tobin's q, Unionization, and the Concentration Profits Relationship, RandJE (1984), pp. 159-170; and Schmalensee, Richard L., Do Markets Differ Much?, 75 AER (1985), pp. 341-351.
concentration or further independent structural variables and profits as the dependent variable across various industries:43

"Almost all of the 32 concentration-profits studies except Stigler's have yielded significant positive relationships for years of prosperity or recession, though they have depended on a wide variety of data and methods."

During the period of traditional studies Stigler was the only scholar to present a deviant study. However, his different results can be traced to the fact that high inflation or price controls occurred in the period of inquiry and/or to false assumptions.44 It has to be noted, however, that the concentration-profitability relationship has not been statistically significant in the vast majority of the cases. It is disputable whether this is a consequence of a weak correlation or of insufficiencies of the data base.

There was strong evidence that the contention of a strong correlation would hold even if different time periods were examined, different countries com-


44 Cf., e.g., Kilpatrick, Robert W., Stigler on the Relationship Between Industry Profit Rates and Market Concentration, 76 JPE (1968), pp. 479-488; and for the study, Stigler, George J., Capital and Rates of Return in Manufacturing Industries, Princeton, N.J. 1963.
pared, and varying profitability definitions chosen.\textsuperscript{45}

Most of the traditional empirical tests of the concentration-performance relationship chose average after-tax profit-rates ("rate of return on equity after tax") for leading firms whose primary product was assigned to the industry according to the SIC. The use of rather simple profit rates has disappeared over time, current emphasis being placed on the following measures of profitability as substitute proxy variables:\textsuperscript{46}

- rate of return on equity as an indication of the profitability of the firm's invested capital, and therefore of misallocation of resources and inefficiency; at the same time, this is the actual variable to be maximized by the shareholder;
- rate of return on assets;
- rate of return on sales; it remains ambiguous whether or not allocative inefficiency can be measured by means of this variable;\textsuperscript{47}
- price cost margins, which have been used with increasing frequency in recent studies as a substitute proxy for the \textit{Lerner} index; and
- \textit{Tobin}'s q, which tries to avoid the problems associated with the differences in profitability definitions.\textsuperscript{48}

The rate of return on equity and price cost-margins have received the most attention in recent studies. Their advantages and disadvantages will be dealt with infra.

\textsuperscript{45} Cf. Greer, \textit{Industrial Organization ...}, op. cit., 407 f.: "Given this wide variety of tests, the general consistency of a positive concentration-profit relationship is impressive"; Kilpatrick, Robert W., \textit{The Validity of the Average Concentration Ratio as a Measure of Industrial Structure}, SEJ (1976), pp. 711-715; Scherer, \textit{Industrial market structure ...}, op. cit., 278 f.; and Singleton, \textit{Industrial Organization ...}, op. cit., 11.


\textsuperscript{48} The advantage of this variable is to be seen in the fact that the "capital market valuation of rents appropriately incorporates firm risk, corresponds to an equilibrium valuation of rents and minimizes any distortions introduced by tax laws and accounting conventions", Smirlock, Michael, Thomas Gilligan and William Marshall, \textit{Tobin}'s q and Structure-Performance Relationship, 74 AER (1984), pp. 1051-1060, 1054.
b. Collusion and "Critical Levels" of Concentration

In concentration profitability studies there is a strong tendency to determine whether there exists a continuous or discontinuous relationship between concentration and profitability, i.e. whether or not a steady upward progression of profitability may be found as industry concentration increases. Such a break in the concentration-profitability relationship could be of importance as a sound theoretical basis for antimerger policy because

"(i)f such a break existed, and it could be attributed to market power, and if the breakpoint was relatively stable over a large class of markets, then one might be able to devise an antimerger policy that would slow the movement of concentration above the critical level".

For studies performed on the basis of U.S. samples the results have been unambiguous, even if we consider the variety of performance measures used. The four-firm concentration ratio CR₄ was detected to be between 45 and 60% of the market in question and between 60 and 70% for the eight firm concentration ratio CR₈. Areeda and Turner assert that this does not imply enough consensus on what the critical levels are, actually, because a span of discretion is left. This follows from the contention that four-firm concen-
tration levels CR4 below 55–60% are not likely to foster collusion, whereas, if these CR4 ratios are higher than 75–80% collusive conduct is rather likely.52

Additionally, a variety of abstrusnesses justifies a closer look at the ambiguous results. To begin with, there seems to be a significant difference between high and low concentration industries in that no such break point of profitability presumably exists in low concentration industries.53 The pooling of low and high concentration industries in samples might be biasing the relationship, and hence may be inappropriate for the determination of a critical level of concentration.54

Furthermore, Kwoka found out that especially the four-firm concentration ratio has the tendency to mask the possible asymmetry and importance of individual firm shares of the market. When introducing the market shares of the top four firms it was seen that the shares of the top two firms were consistently positive and at the same time significant, whereas the coefficients of the third and fourth largest firms were negative and often insignificant.55 This has shattered the whole traditional field of concentration-profitability studies and has led to the contention that the two-firm concentration ratio is the correct structural variable. There has been found to be a profitability break at a CR2 of 35%. This seems to indicate that four-firm concentration ratios carry a rather strong bias due to data aggregation and hence it can be contended that "concentration by itself may not be detrimental, but that dominance may be a more important problem".56 As a result, firm dominance as documented by CR1 and CR2 may be considered the real source of market power rather than collusion via simple four firm industry concentration if the tenet held. A critical concentration ratio would simply

52 Cf. Areeda/Turner, Antitrust Law ..., vol. 4, op. cit., § 910d.
54 Cf. Dalton/Penn, The Concentration/Profitability Relationship ..., supra.
56 Pautler, A Review ..., supra, 645. This has been assumed implicitly already by Mann, H. Michael, Asymmetry, Barriers to Entry, and Rates of Return in Twenty-Six Concentrated Industries, 8 WEJ (1970), pp. 86-89; and documented by Shepherd, The Elements of Market Structure, supra.
be the outcome of a bias due to data aggregation. This has been confirmed by later studies.57

c. The Suitability of Different Performance Criteria

The suitability of a performance measure has to be determined by its ability to indicate the existence of nontransitory market power, hence to indicate the ability to raise price above the competitive level for an extended period of time. For the time being, it is "difficult to reach confident judgments except where excess returns are indicated by all or most of the plausible techniques of measurement".58 At the heart of the discussion lies the question of which performance variable serves the purpose of indicating market power best, which variable can be used to proxy a theoretically correct index if this is found to be inoperational, and which measurement technique is finally to be applied in actual empirical studies.59

It is often contended that the economic rate of return is the sole superior indicator of monopoly or market power and that the validity of performance measures is judged by whether they are able to serve as a proxy for economic rates of return.60 This does not seem to be correct, however, since the choice among different performance measures rather depends on the underlying purpose of the study within which the measure is used. Conclu-

57 Cf. Pautler, A Review ..., supra, 649: "Since at least 1977, the emphasis has shifted toward the market-dominance problem, and the large market shares held by leading firms have become the focus of attention." Cf. as well, e.g., Kwoka, John E., and David J. Ravenscraft, Collusion, Rivalry, Scale Economies, and Line of Business Profitability, Washington, D.C. 1982.
60 Cf., e.g., Areeda/Turner, Antitrust Law ..., vol. 2, op. cit., § 512c; Fisher, Franklin M., and John J. McGowan, On the Misuse of Accounting Rates of Return to Infer Monopoly Profits, 73 AER (1983), pp. 82-97, 82: "Thus, the economic rate of return is the only correct measure of the profit rate for the purpose of economic analysis. Accounting rates of return are useful insofar as they yield information as to economic rates of return."
sively, strong doubt can be cast on the hypothesis that economic returns are the sole valid basis.\textsuperscript{61}

Because of inoperationality, the theoretically correct variable has to be proxied by a substitute in every case. The crucial question that has been discussed in this context is whether or not accounting profit data is able to reflect economic returns due to monopoly power.\textsuperscript{62} It was concluded that "the accounting rate of return ... is a misleading measure of the economic rate of return ... (t)hus comparisons of accounting rates of return to make inferences about monopoly profits is a baseless procedure".\textsuperscript{63}

Although this reproach has to be rejected since it is based on a variety of false calculations and is tested on the basis of performance criteria other than profitability-on-sales which substitutes for the Lerner index quite correctly, cautiousness is recommended in making a choice about the correct

\textsuperscript{61} Cf. Long/Ravenscraft, The Misuse of Accounting Rates of Return: A Comment, supra, 495: "The correct definition of profit depends on the context in which it is employed ... Existing evidence suggests that the Lerner index, which can be approximated by profit/sales, better reflects the degree of monopoly power." For a reasoning along the same line, cf. Koch, Industrial Organization ..., op. cit., 191 f.

\textsuperscript{62} Cf. Brozen, Yale, The Persistence of "High Rates of Return" in High Stable Concentration Industries, 14 JLE (1971), pp. 501-512, 512; Pautler, A Review ..., supra, 580 note 22; Fisher/ McGowan, On the Misuse of Accounting Rates of Return ..., supra, 82: "Such a procedure is valid only to the extent that profits are indeed monopoly profits, accounting profits are in fact economic profits, and the accounting rate of return equals the economic rate of return."

\textsuperscript{63} Fisher/McGowan, On the Misuse of Accounting Rates of Return ..., supra, 89; and cf. as well Brozen, Yale, The Significance of Profit Data for Antitrust Policy, in: Weston, J. Fred, and Sam Peltzman (eds.), Public Policies Toward Mergers, Pacific Palisades 1969, pp. 110-127; but cf. Scherer, Frederic M., On the Current State of Knowledge in Industrial Organization, in: de Jong, Henk W., and William G. Shepherd (eds.), Mainstreams in Industrial Organization – Book 2, Dordrecht et al. 1986, pp. 5-22, 9, who notes that data problems are always difficult to deal with: "(E)veryone admits that accounting data are imperfect, and it is virtually impossible to prove the negative proposition that the problems are not so serious as to preclude valid inferences. Much seems to hinge on basic matters of faith ... Attempts to test the robustness of structure-performance regression results to variations in accounting conventions have shown no significant sensitivity", citation omitted.
accounting rate of return. Nevertheless, a survey of empirical studies relating accounting earning changes to stock market price changes, the latter being an indicator for economic returns, finds strong evidence of a significant correlation between the two and no evidence that large deviations are common.

The most suitable proxy variable for the Lerner index are price-cost margins which have been introduced by Collins and Preston. They are calculated by subtracting the marginal cost approximated by variable costs from the price and relating this difference to the price. Return on sales is properly used as a proxy for the price-cost margin. If we assume average costs not to be constant, the price-cost margin is a function of the Lerner index and the elasticity of the average cost curve, and is considered to have "both sound theoretical roots and the considerable practical advantages of availability and reliability" because of the interrelatedness with the theoretically correct performance measure.

Although it does not indicate resource misallocation as, e.g., return on the firm's equity does, it serves as an indicator of the firms' ability to raise prices above the competitive level. This is of importance for the contribution submitted in that "an excess of price over average variable cost is likely to provide a reasonably accurate measure of the degree of market power".

64 Cf. Areeda/Turner, Antitrust Law ..., vol. 2, op. cit., § 512c; Long/Ravenscraft, The Misuse of Accounting Rates of Return: A Comment, supra, 494; and Stauffer, Thomas, The Measurement of Corporate Rates of Return: A Generalized Formulation, 2 BJE (1971), pp. 434-469, 467 f.: "Most firms or industries are little affected by the corrections, which partly vindicates the accounting rate of return as a practical tool. There are certain egregious counter-examples, however."


66 Cf. Collins/Preston, Price-Cost Margins and Industry Structure, supra, and Pautler, A Review ..., supra, 591; and Areeda/Turner, Antitrust Law ..., vol. 2, op. cit., § 513a: "(P)ersistent and substantial differences between price and marginal cost strongly suggest either that excess returns have in fact been earned or that they could have been even though the books show otherwise. Accounting profits might understate the firm's true profits or reflect non-competitive policy choices."


68 Areeda/Turner, Antitrust Law ..., vol. 2, op. cit., § 513b; and Koch, Industrial Organization ..., op. cit., 191; but cf. Liebowitz, S. J., What Do Census Price-Cost Margins Measure?, 25 JLE (1982), pp. 231-246, 246: "I have found that the census-price-cost margin does not measure the variable it was purported to measure, nor is it much of a proxy for more traditional profit measures."
d. Insufficiencies of the Traditional Studies

We have concluded that most of the traditional empirical studies on the concentration-profit relationship find a strong correlation among the variables. However, a number of restrictions have to be mentioned with regard to the studies especially with regard to the ones using aggregated industry data and leading to a somewhat weaker correlation between concentration and profits:

- Often limited samples of data for too short a period of time were used; thus a certain source of bias was assumed due to the fact that time periods were picked randomly. The positive correlation would be assumed to disappear if other periods of time were chosen for the inquiry.69

- In essence, the first point is closely associated with the contention that excess profits are only a temporary problem and will be eroded over time in every case.70 The logical conclusion to be drawn from the observation that competitors' profitability in various industries remains above average over time, is considered to be proof of some kind of (efficiency) superiority of incumbents versus potential competitors.

- As we have already mentioned supra, the level of profit is not solely influenced by the degree of concentration. Other structural variables such as barriers to entry, market share, firm size, capital requirements, and the stage of market evolution influence the level of profits as well and must therefore be analyzed individually and be carefully distinguished from one another. The attempt to determine their influence by means of multiple regression analysis may lead to multicollinearity, possibly overemphasizing the role of the degree of industry concentration.71

- Another source of uncertainty is that economic rents differ from bookkeeping profit rates. To what extent these differ from each other and may become arbitrary, therefore, would have to be evaluated in each individual case, as to the extent to which such a difference would affect the empir-

69 Cf. Greer, Industrial Organization ..., op. cit., 410; and Scherer, Industrial market structure ..., op. cit., 277 f.
70 Cf., e.g., Brozen, Yale, Concentration and Structural and Market Disequilibria, 16 AB (1971), pp. 241–248; and Brozen, The Persistence of "High Rates of Return" ..., supra.
71 Cf. Böbel, Wettbewerb und Industriestruktur ..., op. cit., 26 and 55; Koch, Industrial Organization ..., op. cit., 195; and Scherer, Industrial market structure, 279.
The longer the time period over which economic rents and book-keeping profit rates are compared, the less should be the difference between the two if average values are juxtaposed.

The main criticism of the traditional studies is the use of data which is aggregated on an industry level. By aggregating the data, potential explanatory variables may lose their importance in explaining profitability differentials among competitors, since the profitability of market leaders may be exaggerated.

This contention is supposed to be backed up by the finding that the simultaneous introduction of additional structural variables leads to a somewhat weaker concentration-profitability relationship. This might either be a reason for the weak correlation due to an averaging of the profit rates or a reason for the correlation to be spurious. In essence, this seems to be the main cause of the uncertainty that remains in the attempt to separate efficiency from market power effects with regard to the causal relationship between concentration and efficiency. This implies a strong need for data on a firm or commodity group level.

The use of cross-sectional data is a final point that is put forward against traditional concentration-profitability data and leads to the contention that "interindustry or intermarket comparisons of profits are irrelevant.

72 Cf. Greer, Industrial Organization ..., op. cit., 406; Hagerman, Robert L., and Lemma W. Senbet, A Test of Accounting Bias and Market Structure, 49 JB (1976), pp. 509-514; Koch, Industrial Organization ..., op. cit., 195 f.; Brozen, The Significance of Profit Data for Antitrust Policy, op. cit.; and Weiss, The Concentration Profits Relationship and Antitrust, op. cit., 196, state the opposite case that the relationship is rather underestimated due to the data problems: "The reported rates of return can vary a great deal depending on which of many accounting conventions are used. Even if the choice of accounting conventions were randomly distributed among firms, such variations would introduce errors that would reduce the correlation between concentration and profits." This seems to be in accordance with the findings on the robustness of such studies with regard to changes in the performance measure.

73 Cf. Schmidt, Ingo, and Jan B. Rittaler, Die Chicago School of Antitrust Analysis: Wettbewerbstheoretische und -politische Analyse eines Credos, Baden-Baden 1986, p. 60; and Scherer, On the Current State of Knowledge in Industrial Organization, op. cit., 8: "Let me make the point more strongly: At least for the United States, the many studies that found a positive association between aggregated industry profits and concentration were almost surely spurious, the victims of aggregation biases."

because they indicate nothing about what would happen to profits if concentration within an industry or market changed.\textsuperscript{75}

Furthermore, the alleged relationship seems to be evidently stronger in consumer goods industries than in producer goods industries because of knowledgeable industrial buyers who may hold a certain amount of buyer power as well.\textsuperscript{76}

II. The Validity of the Mainline Paradigm and the New Learning-Hypothesis

Since the 1970s, the validity of the mainline paradigm underlying the traditional approach to industry concentration and mergers was attacked on the grounds of two propositions. The explicit so-called new learning hypothesis held that industry concentration trends occur because of interfirm efficiency differences.\textsuperscript{1} This was accompanied by the more implicit suggestion that the new learning hypothesis makes the concentration-collusion doctrine lose its theoretical foundation because it was concluded that concentration and collusion are not as a rule necessarily associated with each other.\textsuperscript{2}

1. Efficiency as a Cause of Concentration

With regard to the first proposition, the traditional industrial organization approach assumed that it was necessary for firms in an industry to achieve a certain size in order to be efficient in the sense of having lower average costs, assuming access of competitors to almost identical common technology and the presence of economies of scale.\textsuperscript{3} This led to the chain of causation, which asserted that size as a result of an expansion of output would cause lower costs and, therefore, increase (productive) efficiency.

\textsuperscript{75} Greer, Industrial Organization ..., op. cit., 412 italics original.
\textsuperscript{76} Cf., e.g., Collins/Preston, Price-Cost Margins and Industry Structure, supra.
\textsuperscript{1} Cf., e.g., Demsetz, Harold, Industry Structure, Market Rivalry, and Public Policy, 16 JLE (1973), pp. 1-9.
However, within the current context, the relation between concentration and profits has undergone reinterpretation. Accordingly, concentration has to be perceived as an expression of efficiency (the actual so-called new learning) and therefore higher profits are an expression of efficiency as well. Competitors that have attained a large market share allegedly satisfy the wants of consumers better than smaller firms, regardless of the degree of industry concentration. Hence an increasing degree of concentration means aggressive competitive behavior primarily due to efficiency differences with prices close to long-run costs. Declining concentration would be an indicator of cartelization or monopolistic price behavior, however, because entry of newcomers due to supracompetitive profits would be stimulated and this in turn would lead to the erosion of excess profits. Newcomers would immediately erode monopoly power that is not based on efficiency. For instance, what may look like a resource monopoly in the short run is actually an expression of competition in the long run; therefore, such monopoly positions cannot be maintained. As a result, it could be concluded that profits which have not been eroded over a long time show that a firm operates efficiently in the market.

In this line of reasoning, concentration is considered to be absolutely necessary in some markets in order to achieve economic efficiency. According to the view of this tenet, different levels of efficiency lead to an elimination of weaker competitors and thereby to concentration (efficiency causes concentration). Therefore, the size of the firm that is realized through internal growth, for instance, is also the most efficient size for the firm. Whereas the traditional mainline paradigm ascribed supracompetitive profits in markets to increased concentration and barriers to entry, barriers to entry are regarded here as a reward for high risk and superior efficiency, or as being the result of a natural monopoly which would not allow for further competitors. For the mainline paradigm, profits that have not been eroded

by competition in the long run indicate market power in that "they show clearly that there is some impediment to effective imitation of the firm in question". 9

2. Concentration May Possibly Cause Collusion

A far-reaching consensus with the mainline paradigm remained on the view that the likelihood of collusion would increase with growing concentration because of the perception of increased mutual interdependence among firms. Here the idea of mutual interdependence is accepted – in contradiction of the general reasoning (!). However, a possible abuse through an exertion of monopoly power would become well-known to potential competitors and this would induce new entry. Moreover, collusion could be recognized easily by the antitrust authorities and therefore be dealt with at once. As a result, the proposition of the mainline paradigm that market concentration serves as a substitute proxy for and an indication of collusion and should therefore be of antitrust concern, became subject to criticism on the grounds that public policy intervention may discourage competitive conduct that would otherwise promote efficiency. 10

According to the current reasoning, explicit collusion, i.e., conspiracy or concerted action (cf. Sec. 1 Sherman Act), and implicit collusion or spontaneous coordination (cf. the control of market dominating groups under Art. 86 Treaty of Rome and under Sec. 22 para. 2 ARC in Germany), which is not covered by U.S. antitrust law, are judged in a different manner. 11

(1) In order not to reject American antitrust policy in toto, the current tenet expresses the opinion 12 that horizontal price conspiracies should be prohibited, since collective monopolies have the same effect on price and output as an individual monopoly. The tendency towards conspiracy increases when concentration increases and the number of competitors de-

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9 Schmalensee, Another Look at Market Power, supra, 1806.
10 Cf. Demsetz, Economics as a Guide to Antitrust Regulation, supra, 383, and Bork, The Antitrust Paradox, op. cit., 193: "(T)o explain industrial concentration on grounds other than efficiency, ... will prove difficult or impossible to do ...".
12 Posner, The Chicago School ..., supra, 932: "Partly, perhaps, for tactical reasons (not to seem to reject antitrust policy in its entirety), the members of the Chicago School would sometimes denounce price fixing."
creases. The necessity of public policy and legislation is accepted at least to this extent.\(^{13}\)

(2) Neglecting the position of Stigler who regards tacit or implicit collusion, i.e., spontaneous coordination as a problem in markets with high interdependence due to a high degree of concentration, the other representatives of the current tenet deny that implicit collusion actually restrains competition (i.e., favoring conscious parallelism).\(^{14}\) It is not denied that concentration is an important factor in facilitating collusion. However, the question of how excessive profits can exist without attracting newcomers in the long run is seen to be the core issue since it is assumed that the entry of newcomers would cause an immediate or gradual price decline.\(^{15}\)

This would necessarily lead to the suggestion that supracompetitive profits that have not been caused by efficiency, but rather by implicit collusion, would have the effect of lowering concentration because of entry by newcomers or it would force firms to lower their prices in order to prevent newcomers from entering the market (e.g., by means of limit pricing). This reasoning takes for granted, however, that ideal markets without any bar-

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13 Cf. e.g. Demsetz, Economics as a Guide, supra, 383, and Bork, The Antitrust Paradox, op. cit., 406. Vertical arrangements, however, have to be judged in an unrestricted and completely different way, according to Bork because they do not have any output consequences: "Vertical price fixing (resale price maintenance), vertical market division (closed dealer territories), and, indeed, all vertical restraints are beneficial to consumers and should for that reason be completely lawful", Bork, The Antitrust Paradox, op. cit., 297.


15 It is assumed that due to changing conditions with regard to demand, technology, and different cost situations, collusion that is favored by oligopolistic interdependence between the firms is in practice very difficult to deal with, Bork, The Antitrust Paradox, op. cit., 92: "Conventional oligopoly theory, however, is little more than a guess about the ways in which firms might be able to behave in a market composed of a few sellers." This cannot be considered new knowledge, however, since the determinants of cartelization have been known for some time, cf. Koch, James V., Industrial Organization and Prices, 2nd ed., Englewood Cliffs, N.J., 1980, pp. 424-428; and Schmidt, Wettbewerbspolitik und Kartellrecht: Eine Einführung, 2nd ed. Stuttgart 1987, pp. 112 ff.
riers to entry are the rule rather than the exception - an assumption which we have already dealt with critically in one of the preceding sections.  

3. The Theoretical Basis and the Empirical Evidence of the New Learning

The main contention of the new-learning hypothesis is that a strict merger control carries with it the peril of sacrificing efficiencies due to scale economies and related nontechnical efficiencies. Consequently, the industry's structure is the result of differing efficiencies of firms over time. However, the unwarranted assumption underlying this assertion is that the improvement of efficiency is the only motivation for concentration. A high degree of concentration is regarded as the result of superior abilities on the part of entrepreneurs. According to this line of thinking, it is important whether the firm has reached its efficient size by internal or external horizontal growth.

In this context, representatives of the Chicago School speak of "competitive effectiveness", emphasizing that the approach does not only apply to mechanistic or technical processes. Productive efficiency is not only determined by economies of scale and transaction-cost efficiencies but also by specialization advantages, ability to obtain capital, management skills, etc.

A positive correlation between concentration and profits is acknowledged by economists adhering to the current tenet. However, they would consider the relationship to be spurious, misinterpreted, or overstated for a number of

16 Accordingly, the sustainability of profits has to be viewed in the context of market barriers. If the latter are not substantial, persistent profits really have to be considered an outcome of superior efficiency.
18 Cf. Hauptgutachten der Monopolkommission IV: Fortschritte bei der Konzentrationserfassung, Baden-Baden 1982, ch. VI: "Motives of concentration", in which the German Monopolies Commission deals with the different underlying causes of concentration (for instance, legal framework, imperfect capital markets, patents, striving for market power, etc.).
reasons. Productive efficiency should not be seen as analogous to or even confused with profitability, since the relative efficiency of a firm is not evaluated by its profit rates but by its relative success in the marketplace:20

"Productive efficiency, like allocative efficiency, is a normative concept and is defined and measured in terms of consumer welfare. Since a free market system assumes that consumers define their own welfare, it follows that productive efficiency consists in offering anything whether products or services, that consumers are willing to pay for."

Again, this argument presupposes that (overproportionate) internal and external growth only occurs because of superior efficiency. According to empirical estimates trying to find evidence for this view, a divestiture of concentrated industries with CR4 more than 50% would result in cost increases of about 20% and price increases of about 15%.21 Since the market structures resulting from unfettered competition are considered to be an outflow of superior efficiency and since efficiency is the goal of antitrust policy, no reason for interference emerges. An abuse of power in concentrated industries would result in a natural deconcentration of the industry since efficient newcomers would enter the market by virtue of the non-existence of barriers to entry.22 Even leaving aside the issue of efficiency, the divestiture of industries does not seem to be practicable.23

20 Bork, The Antitrust Paradox, op. cit., 104 f. This deprives the antitrust analyst of an operational criterion for the determination of market power since 'success in the market' embodies a tautology: Everything that prevails in the end is successful, regardless of the conditions and circumstances present, cf., e.g., McGee, Efficiency and Economies of Size, op. cit., 88 f.
21 Cf. Peltzman, Sam, The Gains and Losses from Industrial Concentration, 20 JLE (1977), pp. 229-263. But see Scherer, Frederic M., The Causes and Consequences of Rising Industrial Concentration, 22 JLE (1979), pp. 191-208, 208: "(T)here is no reason to suppose that deconcentration need impose efficiency sacrifices as long as government enforcement agencies and courts do not behave like bulls in (vitreous) china shops."
Effective divestiture would presuppose a knowledge of the optimal market structure, which does not exist on account of the complexity of market forces. Therefore, divestiture could not be carried out in a constitutional way. The aforementioned shortcomings of the traditional studies have been emphasized in a number of empirical studies, which try to lend support to the new learning hypothesis:24

- The most important reason is the existence of aggregation biases which would make results spurious. This is one of the results issuing from Demsetz' work. It is concluded that the positive correlation between concentration and profits is only valid for firms with a large market share in an oligopoly (core of the oligopoly), but not for the fringe of small firms in a (partial) oligopoly because "the differential profitability of large firms did not fall as concentration (and the probability of collusion) increased".25 If collusion caused the profits-concentration relationship all competitors and not just the ones owning large market shares in a market would attain supracompetitive profits.26 This need not necessarily be the case, however, since collusion might only be an advantage to the core of the oligopoly, whereas fringe firms - more or less - have to act as price takers.

In addition to economies of scale, experience-effects from cumulated pro-


25 Singleton, Industrial Organization ..., op. cit., 47; and for the study, Demsetz, Industry Structure, Market Rivalry, and Public Policy, supra, 7 f.; although empirical efforts to verify the structure-conduct-performance paradigm and, therefore, implicitly the concentration-collusion doctrine are rejected, the scholars associated with current theory now heavily draw on such studies to prove their hypotheses.

26 The essence of the findings holds that "(c)oncentrated industries, then, will typically consist of several large, relatively efficient firms sharing the majority of the market and a fringe of many smaller, less profitable firms. The industry profit rate in such concentrated industries will be above average precisely because the large profitable firms share the majority of the market. The above-average profit rate in such industries will emphatically not be the result of collusive output restriction", Singleton, Industrial Organization ..., op. cit., 47, italics original.
duction (learning by doing), goodwill, and the difference in the quality of management are used in order to explain superior performance and hence concentration tendencies; the latter factors imply the realization of a more favorable production and cost function, the actual realization of which seems at least disputable. Demsetz draws the conclusion that the absolute cost advantages, economies of scale or other efficiencies which are due to individual firm superiority, are the reason for the higher profits. The underlying reasoning results from an industry profile (firms A-L), a market price, and different total costs such as the ones depicted:

![Industry Profile Diagram]

**Fig. 6: Industry Profile**

- Persistent profits are concluded to be an indicator of efficiency as a result of the underlying **potential competition doctrine**. This doctrine holds

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27 Cf. Alchian, Armen, and Harold Demsetz, Production, Information Costs, and Economic Organization, 62 AER (1972), pp. 777-795, 777; Green, Industrial Organization ..., supra, 484; and Kallfass, Die Chicago School ..., supra, 598.

28 Cf. as well Brozen, Bain's Concentration ..., supra, 367: "(I)t seems that the less concentrated industries were less concentrated because that was the efficient pattern of organization just as the more concentrated became so because that was the efficient way to organize them. The market selected the appropriate structure for each industry." This makes the disaggregation of data a primary task for subsequent empirical research.

29 Cf., e.g., Clark, John Bates, The Control of Trusts, New York 1901.
that "(n)o matter how concentrated an industry, external competition will constrain the collusive behavior of entered firms".  

- Criticism on the underlying empirical test to verify the traditional tenet rests on the alleged insufficiency of the kind of data (accounting data) and the data base used (FTC, IRS, PIMS, or SIC data). The results of former empirical studies are furthermore considered to be spurious because problems in the sampling techniques result from the general use of a small number of industries and profit rates for few firms at a point in time rather than at several points. Hence, the choice of the underlying sampling techniques has to be considered in interpreting the results.

- Concentrated Industries were found to have profits below equilibrium and un-concentrated industries to show profits above equilibrium. This suggests that industries earning low profits are therefore held to be collusive more likely than concentrated and high profitability industries.

- Excess profits - if they appeared - are seen primarily as a problem of temporary disequilibrium in individual markets; it is therefore held that they tend to disappear in later years. There is an encompassing consensus that the elimination of excess profits is to be considered an indicator of sufficient competitive pressure, and is hence empirically relevant.

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30 Singleton, Industrial Organization ..., op. cit., 44. This is an equivalent to the assumption that meaningful market barriers do not exist; and Demsetz, Industry Structure, Market Rivalry, and Public Policy, supra, 1: "(I)n the absence of effective barriers to entry it would seem that the concentration of an industry's output on a few firms could only derive from their superiority in producing and marketing products or in the superiority of a structure of industry in which there are only a few firms", italics supplied.

31 Cf. Benston, George J., The Validity of Profits-Structure Studies with Particular References to the FTC's Line of Business Data, 75 AER (1985), pp. 37-67; Pautler, A Review ..., supra, 597; Scherer, On the Current State ..., op. cit., 7 f.; and Singleton, Industrial Organization ..., op. cit., 47 f. and 51; and Brozen, Yale, Deconcentration Reconsidered: Comment, 14 JLE (1971), pp. 489-491, 491: "We need not, however, be concerned that above-normal profits are more prevalent in concentrated industries. It appears that findings to this effect are the consequence of the use of small samples. Larger samples do not show any relationship between concentration and rates of return."


33 Cf. implicitly admitted by Demsetz, Industry Structure, Market Rivalry, and Public Policy, supra, 3; and Pautler, A Review ..., supra, 597 note 66: "Brozen did not show that the relationship ... was spurious, but only that it was not persistent in any individual industry."
The final argument holds that no causal relationship exists between concentration and profitability, although a correlation may be found. It is argued that a verified correlation could not serve as evidence for the existence of an underlying chain of causation.\(^{34}\) This argument seems of the utmost importance since it deals with the separability of efficiency gains from market power effects.

4. Revised Policy Conclusions for Horizontal Mergers

As a result of this reasoning on the relationship between concentration and collusion, Bork raises doubts as to whether mergers would lead to substantial restraints of output and believes that "the effect would usually be outweighed by cost savings".\(^{35}\) However, he admits that with monopolistic structures, the restraints of output may outweigh the efficiency gains so that "we are in an area of uncertainty".\(^{36}\) Bork therefore comes to the preliminary conclusion that mergers up to 60 or 70% market share should be legal per se. However, "(p)artially as a tactical concession to current oligopoly phobia and partly in recognition of section 7's intended function of tightening the Sherman Act rule, I am willing to weaken that conclusion".\(^{37}\)

Posner explicitly refers to Bork on the subject of the limits of horizontal concentration.\(^{38}\) He expresses in a rather unspecified way that antitrust po-

\(^{34}\) Cf., Green, Industrial Organization ..., supra, 489; Singleton, Industrial Organization ..., op. cit., 50; and, e.g., the separate statement of Bork, Robert H., White House Task Force on Antitrust Policy, Report 1, CCH TRRer No. 415, May 26, 1969, Supplementary, at 1-B to 2-B: "My objection to the proposed statute is that the studies relied upon are shaky and open to question and that the correlation, if it were shown to exist, would prove nothing."

\(^{35}\) Bork, The Antitrust Paradox, op. cit., 221. The welfare trade-off as the underlying methodology has been treated with regard to its shortcomings in Part 2 of the contribution submitted.

\(^{36}\) Bork, The Antitrust Paradox, op. cit., 221.

\(^{37}\) Bork, The Antitrust Paradox, op. cit., 221. But cf. Stigler, The Organization of Industry, op. cit., p. 265 and 270, who figures out a substantial decline of horizontal mergers according to FTC statistics on the merger activities of the 200 leading firms in the U.S.A. from 1948–1953, 1954–1959, and 1960–1964. He traces this decline to the effect of the amendment of Sec. 7 Clayton Act in 1950. In the summary of the chapter on the economic impacts of the antitrust laws he stresses this fact once more without any comment. Thus, it seems that he is in favour of this effect of the amendment of Sec. 7 Clayton Act.

\(^{38}\) Cf. Posner, The Chicago School of Antitrust Analysis, supra, 933.
licy should deal mainly with horizontal mergers that lead directly to monopolies or which contribute to cartelization by a large reduction of the number of firms in a market.\(^\text{39}\)

In the case of horizontal mergers, the effects of output restriction outweigh the efficiency gains only if the merger results in a very high degree of concentration. Consequently, Bork regards as "presumptively lawful all horizontal mergers up to the market shares that would allow for other mergers of similar size in the industry and still leave three significant companies".\(^\text{40}\)

He takes the view that the maximum market share realized by a merger should be about 40 %.\(^\text{41}\) Although, he objects that "even at these levels the law would certainly be preventing the realization of some efficiencies"\(^\text{42}\), he supports this proposal for horizontal mergers in his recommendations.\(^\text{43}\)

As competition is regarded a free play of market forces, interference in market structures is generally rejected. How divestiture in cases of overproportionate internal or external growth is accordingly evaluated in this view, seems to be apparent. In general, remedies through market structure interference are rejected on the argument that the organization of an industry which has developed over time without any legal restrictions can be viewed as an outcome of the underlying cost situation ("survival of the fittest").\(^\text{44}\) As a result, divestiture would harm consumers by forcing suboptimal sizes and market shares upon the firms and depriving the firms of incentives to grow by means of efficiency-enhancing conduct.\(^\text{45}\) The underlying reasoning, upon which the hypothesis is based, holds

\(^{39}\) Cf. Posner, The Chicago School of Antitrust Analysis, supra, 928; taken to its logical extreme, the notion that no meaningful barriers to entry exist, and the assertion that there will not be any form of collusion, no matter how concentrated the industry is, effectively means the minimum number of firms in an industry necessary to insure competition and, therefore, competitive performance, is one, cf. Singleton, Industrial Organization and Antitrust, op. cit., 44.

\(^{40}\) Bork, The Antitrust Paradox, op. cit., 221 f.


\(^{42}\) Bork, The Antitrust Paradox, op. cit., 222.


\(^{44}\) Cf. Demsetz, Economics as a Guide ..., supra 375.

\(^{45}\) Cf. Demsetz, Economics as a Guide, supra, 375.
"that any size achieved by internal growth without predation is the most efficient size for that firm. This, in turn, leads to the conclusion that the dissolution of any such firm will always create an efficiency loss". (Therefore) "the law should never attack such structures since they embody the proper balance of forces for consumer welfare." 

After the Reagan Administration received responsibility for antitrust policy, the enforcement agencies have rarely attacked mergers. Even in the case of horizontal mergers there is a very generous interpretation of the antitrust law - especially in the oil industry; as a result, the concentration in this industry has been strengthened. The four biggest firms: Exxon, Mobil Oil, Standard Oil of California, and Texaco have become much bigger than all the other firms, so that the oligopolistic nucleus in this industry has become still stronger. The break-up of Standard Oil in 1911 into different competing firms has been offset as a result.


The policy conclusions just presented rest on the new learning hypotheses and underlying premises, as well as on empirical evidence. Most of the empirical evidence, however, is ambiguous enough to leave room for divergent interpretation; hence, some of the new learning hypotheses are still disputed and so are the resulting policy conclusions. This is mainly due to the following aspects.

a. Impediments to Competition

Although former empirical (mostly qualitative) results on the importance of impediments to competition did not justify the emphasis which was put on this element of market structure, impediments to competition do exist and their importance in deterring sufficient pressure due to potential competition is underestimated by current Chicago theory. The original potential competition doctrine supplied by John Bates Clark does not hold in a real economy characterized by numerous frictions which partly invalidate the functioning

47 Cf. as well Schmidt/Rittaler, The Chicago School of Antitrust Analysis, op. cit., 77 f.
of the competitive mechanism and have therefore to be seen as impediments to new competition.\textsuperscript{48} Such barriers are able to distort the proper working of competition and, therefore, also distort the efficient allocation of economic resources. This does not necessarily mean that they are to be condemned per se, since their impact may be competition-enhancing from time to time which makes a trade-off necessary in an actual case.\textsuperscript{49} Collusion thus can be seen as a policy problem primarily in industries that are accompanied by persistent impediments to competition of any kind in the sense of the insider-outsider concept which we have presented. Although some of these barriers can be viewed as being a form of efficiency, they can represent an impediment to new competition at the same time.\textsuperscript{50} This makes necessary the trade-off just mentioned.

This view is consistent with the notion of the role of mobility barriers as an extended explanatory approach. Mobility barriers can be considered in the heritage of barriers to competition:\textsuperscript{51}

"The theory of entry barriers, concentrating on the movement of a firm from zero output to some positive output, has missed a great opportunity for generality. Entrants into an industry can be entirely new firms or firms already established elsewhere. Firms may enter one or another segment of a given industry, and firms already operating in one segment may shift to another."

According to this approach, interfirm variations in profitability cannot only be explained by interfirm efficiency differences but also by the concept of mobility barriers within an industry, a concept developed primarily by Caves

\textsuperscript{48} Demsetz speaks of "natural frictions and ignorance that characterize any real economy", Demsetz, Industry Structure, Market Rivalry, and Public Policy, supra, 3. The question remains, however, how one is to separate these natural frictions from impediments to competition. This seems to be a definitional issue primarily and from an antitrust policy point of view it has to be decided on a case by case basis. Cf. as well Pautler, A Review ..., supra, 605: "It seems that much of the debate boils down to whether barriers to entry and immobility among firms are really serious enough to be concerned with and, if they are, whether they can be reduced efficiently through antitrust measures."


and Porter. The market entry approach is enlarged to a mobility approach. It holds that industries contain strategic groups and that there are mobility barriers into and out of these strategic groups that account for a major proportion of interfirm profitability differences. Whereas the traditional approach departed from homogeneous industries with identical firms, it is now assumed that firms can be separated from each other by means of economically relevant features which account for the mobility barriers. This is concluded from the fact that structural determinants of profitability differ between strategic groups, "depending on their status in their particular industry". This makes it difficult for a firm belonging to one strategic group to change to another. These kinds of barriers are apt to protect in a twofold manner. They protect from newcomers and they protect from incumbents of other strategic groups. Entry could possibly be made easier since entry can follow successively from strategic groups with low mobility barriers and low risk to strategic groups with rather high mobility barriers and high risk.

b. Accounting Data and the Data Base

Although data problems are always difficult to deal with, attempts to test the robustness of structure-performance regression results for variations in accounting conventions have shown no significant sensitivity. The biases due to data aggregation have led to attempts to compile firm and business unit level data. This has been done primarily by the PIMS (profit impact of marketing strategies) data base and the FTC Line of Business Program, the latter containing data on revenues, sales, and equity of 3,007 businesses in

52 Cf. Caves/Porter, From Entry Barriers to Mobility Barriers, supra; and Porter, Michael E., The Structure within Industries and Companies' Performance, 61 RES (1979), pp. 214-238.
53 Pautler, A Review ..., supra, 610. Although the studies are based on crude sets of data, the empirical evidence is as strong as it is for the differential efficiency approach proposed by the current tenet.
industries on a legal basis. The former is intended to isolate the long-run determinants of firm profitability among 37 variables and contains data obtained from large firms, voluntarily contributing line of business data which is compiled by the Strategic Planning Institute. The firms are free to define their businesses and since the lines of business are picked by the firms on an arbitrary basis they are not randomly distributed. Although a number of interpretation problems remain, the studies based on the new sets of data confirm earlier results on the predominance of the market share value over simple concentration variables in the sense that if market share is introduced simultaneously into a regression equation containing concentration ratios, concentration as an explaining variable loses its significance.

This has not silenced critics on the use of accounting data, however. It is repeatedly argued that "the numbers reported, which are derived from the companies' accounting system, do not reflect economic market values well".


57 Cf. Pautler, A Review ..., supra, 629 note 162, who mentions the lack of correspondence to relevant markets; and Scherer, Industrial market structure ..., op. cit., 270, who emphasizes that due to data secrecy it is impossible to say "what companies and industries are being studied or what the absolute size of any business is."


59 Benston, The Validity of Profits-Structure Studies, supra, 64; and the rejoinder, Scherer, Frederic M., et al., The Validity of Studies with Line of Business Data: Comment, 75 AER (1987), pp. 205-217, 209: "(C)ontrary to the implications drawn by Benston, the basic structural relationship estimated using LB data turn out to be robust across a wide range of variable definitions, sampling frames, and controls for accounting method variations."
Aside from the arguments already listed in rejection of this reproach, severe analytical carelessness can be documented in empirical studies that emphasize a sort of worst-case analysis (reproach of selective empiricism).\textsuperscript{60}

The selective empiricism of the current tenet becomes especially evident with regard to the debate on the concentration-profitability relationship referred to supra. Demsetz, for instance, reinterpreted all studies which supported the traditional findings - a positive correlation between market concentration and supra-competitive profits of the large firms as indicating market power - in the sense that they had unintendedly discovered a concentration-efficiency nexus.\textsuperscript{61} In 1977 Peltzman tried to support the Demsetz hypothesis by holding that "the main result ... is that long period changes in market structure are accompanied by increased efficiency. This efficiency gain is most pronounced where concentration is growing".\textsuperscript{62}

But a closer look at the data of the Peltzman study reveals a further aspect of selective empirism. All of the industries in the study with rather fast increases in concentration were consumer goods industries with important product innovations and large-scale advertising campaigns.\textsuperscript{63} The criticism that the Peltzman study - which most of the Chicago adherents rely on - was biased by the consumer goods industries was confirmed by further studies in which data of consumer goods and producer goods industries were used. These studies showed that Peltzman's findings do not hold for producer goods industries.\textsuperscript{64}

\textsuperscript{60} Cf. Schmidt/Rittaler, The Chicago School of Antitrust Analysis, op. cit., 97; and Scherer, Frederic M., et al., The Validity of Studies with Line of Business Data: Comment, 215: "Data are fallible. So are scholars. Yet when an article is as consistently negative as Benston's, one suspects bias, and when it contains as many demonstrable errors as Benston's, one suspects a degree of carelessness incompatible with the burden a scholar must bear when he singles others' work out for criticism"; and Benston, George J., The Validity of Studies with Line of Business Data: Reply, 75 AER (1987), pp. 218-223, 221 f., who partly admits this.


\textsuperscript{62} Peltzman, The Gains and Losses ..., supra, 251.

\textsuperscript{63} Cf. Scherer, The Causes and Consequences of Rising Industrial Concentration, supra, 289.

\textsuperscript{64} Cf. Mueller, A New Attack on Antitrust ..., supra, 41 f.
Although a number of interpretation problems remain, the studies based on the new sets of data confirm earlier results on the predominance of the market share value over simple concentration variables. These findings have been confirmed in a variety of studies, essentially leading to a converging emphasis.

A study performed by Martin for 1975 was based on the FTC Line of Business, using 4,527 LBs of 475 firms and 275 industries. Inquiring into the relationships between profitability, market share, corporate structure, economies of scale, demand characteristics, advertising activities, R&D activities, capital intensity and internal organizational firm structure, he drew the following conclusions:

- Lines of business with a high market share do have a positive effect on profitability. This is based on an increase in market power as well as on economies of scale; the relative importance of the two factors varies from industry to industry.

- Lines of business in concentrated industries have lower rates of return - on average - than other lines of business. The most likely underlying reason for this is that oligopolists had problems maintaining and enforcing collusive agreements in times of recession.

- The absolute size of a line of business seems to be rather significant. Larger lines of business have larger profits than smaller lines. Lines of business that are part of a diversified enterprise show higher profits as well. As a rule, these lines show higher market shares. This seems to be in accordance with the market share hypothesis.

- If price is primarily used as a competition parameter in a line of business this tends to induce a search for non-price competition, such as product differentiation through advertising.

65 Cf. Pautler, A Review ..., supra, 629 note 162, who mentions the lack of correspondence to relevant markets; and Scherer, Industrial market structure ..., op. cit., 270, who emphasizes that due to data secrecy it is impossible to say "what companies and industries are being studied or what the absolute size of any business is."


The concurring efficiency differential- and concentration collusion-hypotheses were tested by Clarke, Davis and Waterson on the basis of price-cost margins in the U.K., using a model to separate market power effects from efficiency effects. The study is based on 147 and 155 manufacturing industries on a three digit level for the period from 1971 to 1977 respectively, using the ratio of gross profits to sales as the dependent variable.

If the efficiency-differential hypothesis by Demsetz holds, relatively small firms should be of lower profitability than relatively large firms, regardless of the level of industry concentration; and the profitability differences should be larger, the higher the level of concentration. However, Demsetz’ hypothesis is not confirmed by this study. The authors conclude that “both efficiency and market power effects are at work”.

Amato and Wilder emphasized the relation between profitability, firm size and further structural variables for the years 1966 to 1975, including 40 manufacturing industries, classified by IRS data. The basic hypothesis to be tested is that, because of the separation of owner and management, utility maximization by managers in accordance with firm size is the correct variable. It was also tested whether profitability is a non-linear function of firm size. The result that there is no relationship between firm size and profit rate - which contradicts most of the previous studies - is supposed to be due to an improved data base. Demsetz’ differential efficiency hypothesis is rejected and it is stated that the results of market share/profitability studies cannot be applied to firm size/profitability studies.

c. The Core of the Oligopoly and Other Omissions

Although it is conceded by the current tenet that concentration facilitates collusion and that real markets are characterized by oligopolistic structures, concentration is in fact of little importance for antitrust policy because it is argued that there is no clear theoretical basis for a general

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69 Clarke/Davies/Waterson, The Profitability-Concentration Relation ..., supra, 448.
oligopoly theory. Due to changing conditions with regard to demand, technology, and different cost situations, collusion that is favored by oligopolistic interdependence between the firms is in practice very difficult to deal with.

According to this view, the fact that monopolies neither act as a collective monopoly, nor act purely competitively does not permit the conclusion that oligopolists behave uncompetitively.

There is an exception, however, in the case of Stigler who was among the first to deal with problems of competition in an oligopoly. Though Stigler is in favour of an oligopoly theory, he has not succeeded in developing a coherent economic and legal approach to oligopoly.

However, if we start from the more realistic assumption of market imperfections and if we assume furthermore that with increasing concentration and a decreasing number of competitors the interdependence between the firms increases, i.e., that every supplier has to take account of the behavior of his competitors as a reaction to his own behavior, then a single supplier has monopolistic discretion, which he has neither under the conditions of perfect competition (price being given) nor in a (partial) monopoly (where the fringe of the small competitors has no influence on the market activities).

However, accepting the correlation between concentration and the interdependence of firms is not enough to settle the question of whether oligopolists must behave in a competitive way or not. In order to answer this question, the existing structural conditions of the market have to be looked

73 Bork, The Antitrust Paradox, op. cit., 92: "Conventional oligopoly theory, however, is little more than a guess about the ways in which firms might be able to behave in a market composed of a few sellers." A different view is offered by Stigler. He accepts the existence of an authority that takes legal action against collusion, thus accepting the phenomenon as a real one. Thus he comes to the conclusion that "(t)he Sherman Act has reduced the availability of the most efficient methods of collusion and thereby reduced the amount and effects of collusion", Stigler, The Organization of Industry, op. cit., 271.
into as well (for instance, the stage in market evolution, product homogeneity or heterogeneity, degree of information - these being factors which qualify the importance of the number of the firms). Structural conditions which lead to oligopolistic behavior cannot be established for the general case. Significant and empirically meaningful statements can be made only by showing a correlation between specific market structures and the likelihood of oligopolistic behavior. Consequently, a classification of specific oligopolistic forms of behavior restraining competition becomes necessary.77

The assertion that concentration does not necessarily lead to collusion since oligopolies are rather fragile in nature does not take into account sufficiently the fact that there is often a distinct symmetry of interest within a small group of competitors substituting for legal sanctions (e.g., penalties for breach of contract).78

This distinct symmetry of interest may be the answer to the question why firms of the oligopoly core do not seem to compete among each other on a price basis. Under the circumstances presented, positive price-cost margins should pose an incentive to expand output until competitive returns are realized and prices equal marginal costs. This would have the effect that most of the smaller and allegedly inefficient firms would have to leave the market. The fact that in reality this often does not happen, presents some evidence that superior efficiency and collusive behavior may go hand in hand.79 This makes the original reasoning become more or less tautological with regard to the efficiency-differential hypothesis of large firms because "comparing profitability amongst large and small firm profits is defective, in that their efficiency would imply higher profits, but their higher profits do not necessarily imply their efficiency".80 This seems to be apparent to some of the ad-

77 Cf. Zohnhöfer, Werner, Wettbewerbspolitik im Oligopol: Erfahrungen der amerikanischen Antitrustpolitik, Basel and Tübingen 1968, pp. 26 ff. 78 Cf. Schmidt/Rittaler, The Chicago School of Antitrust Analysis, op. cit., 97. 79 Cf. Green, Industrial Organization Paradigms ..., supra, 493; and Greer, Industrial Organization ..., op. cit., 412 f.: "Collusion can reward an industry's big firms with excess profits and simultaneously reward its small firms with only normal profits even if the concentration fostering the collusion is not grounded on big firm efficiencies." 80 Clarke/Davies/Waterson, The Profitability-Concentration Relation ..., supra, 438.
The Persistence of Profits In the Long Run

The workability of the market mechanism is seen by the Chicago School in terms of a long-run realization of its basic functions: coordination, information, and allocation. However, market processes are perceived to take a certain amount of time to adjust to changing economic conditions because the relevant information has to be processed. According to this view, it is this which is responsible for temporary market frictions. However, this ought not to be mistaken for impediments to competition. Since the whole concept stands or fails with the assumption of the non-existence of impediments to competition and a long-run view of market processes (time horizon), both premises are of crucial importance.82 We will try to find evidence for the validity of the assumption of the long-run effectiveness of the market mechanism by observing as to whether above average profitability is reduced to average competitive rates of return over time.

There is a general consensus that high profits can persist over a longer period of time when the observed enterprise has cost or related efficiency advantages, offers a superior good or holds market power in comparison to actual or potential competitors.83 Nevertheless, sufficient competitive pressure is supposed to exercise persistent downward pressure on prices and profitability so that the ideal norm would seem to be that only costs plus a normal return on capital ought to be earned in unconcentrated industries.84

There is no consensus on two issues, however. First, the question remains as to whether above-average profitability is just a result of a disequilibrium

81 Cf. Demsetz, Harold, Two Systems of Belief about Monopoly, op. cit., 178; and Carter, Collusion, Efficiency and Antitrust, supra, 438 and 441, who seems to acknowledge that these results are consistent with collusion among the large firms and efficiency differentials vis-à-vis smaller firms at the same time.

82 Impediments to competition have been treated supra, showing the limited use of the assumption of ultra-free entry.


state of the market or whether there actually is a movement of above-average rates of return toward that norm and whether or not this movement occurs less quickly in more concentrated industries in comparison to less concentrated ones. Second, if profits are not eroded quickly in some industries this does not necessarily mean that these profits are persistent as a result of market power. They can also be persistent as a result of efficiency differences, product preferences, or as a result of a mixture of power, product preferences, and efficiency.

With regard to the first question, empirical evidence suggests that the erosion of profitability divergences in concentrated industries - if it occurs at all - takes a much longer time than it does in less concentrated industries, regardless of whether profit margins of high and low concentration with either high or low barriers are examined, or results of concentrated industries are treated as if they were competitive.

Contrary to the assertion of the current tenet, under certain circumstances profits may be an index of market power in cases in which profits are not eroded in the long-run. This is the case when profitability differences cannot be justified by persistent interfirm-efficiency differences as expressed by cost differences and when in addition the market in question may be facing impediments to competition. In this case profits can be considered an expression of market power arising from a restraint on competition. This makes it necessary to distinguish efficiency effects carefully from market power effects.

87 Cf., e.g., Qualls, P. David, Concentration, Barriers to Entry, and Long-Run Economic Profit Margins, 20 JIE (1972), pp. 146-158.
89 Cf. Mueller, United States' Antitrust: At the Crossroads, op. cit., 226 who emphasizes with regard to the U.S. American Fortune 500 that "an examination of the list of persistently most profitable firms suggests that this image of efficiency does not characterize these firms."
III. Firm Market Share as the Essential Determinant of Interfirm Profitability Differences

In the following, the aforementioned line of reasoning leads us to the attempt to determine the extent to which concentration is actually justified by technical and non-technical efficiencies. The result can be considered a prima facie assumption on the threshold beyond which undue market power may be assumed to emerge.¹

1. Interfirm Profitability Differences: Efficiency or Market Power?

The former tenet associated with the Harvard School does not necessarily seem to be in conflict with the new learning hypothesis, even if it seems that this former tenet as the underlying rationale for antimerger policy is in actual need of a few refinements. There is no reason why economies of scale could not be responsible for generating the intra-industry results which Demsetz and others offer as support for the efficiency-causes-concentration hypothesis.²

The roots of a possible complementarity lie within the role that market share as an element of market structure plays. Both the adherents to the former and the current tenet take the view that the correlation between market share and profit is much more central - even analytically more precise - than the correlation between concentration and profits.³ This seems to be largely in accordance and consistent with findings on the role of market shares. According to the view of the former tenet, however, higher profits of firms with large market shares are the result of better opportunities of making use of advantages in product differentiation and price differentiation, i.e. better opportunities of exerting individual monopoly power and raising prices beyond the competitive level, as well as of making use of econo-

¹ Necessarily, the ceteris paribus clause applies. Additional structural and behavioral aspects have to be considered depending on the individual case.
² Cf. Scherer, The Causes and Consequences of Rising Industrial Concentration, supra; and Clarke/Davies/Waterson, The Profitability-Concentration Relation: Market Power or Efficiency?, supra, 437, who note that in the case of firms producing along a production function exhibiting scale economies “there would be a natural tendency over time for the larger firms to be more successful and for the industry to become more concentrated”.
³ Cf. Scherer, On the Current State ..., op. cit., 6; and recently, Buzzell/Gale, The PIMS Principles ..., op. cit.
mies of scale or other cost advantages. Whereas the use of industry-wide
data in former empirical studies led to spurious results due to data aggrega-
tion and thereby to a positive correlation between concentration and pro-
fit, as has been demonstrated supra (exaggeration of profits of market lea-
ders)⁴, recent empirical inquiries show that the profits of the firms have to
be seen primarily as a function not only of (relative) market share, but also
of invested capital, market growth, life cycle stage, and product differen-
tiation advantages:⁵

Fig. 7: Relative Market Share and Profitability Differences

![Relative Market Share and Profitability Differences](image)


These studies are based on the above mentioned PIMS-Data Base and FTC Line of Business Program, which refer to firm information instead of industry data. They offer significant solutions to data problems due to industry aggregation, and tend to throw quite a different light on the new learning-

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⁴ Cf. Scherer, On the Current State ..., op. cit., 6. The structural importance of market shares was emphasized as early as 1972, cf. primarily Buzzell/Gale/Sultan, Market Share - A Key to Profitability, supra; and Shepherd, The Elements of Market Structure, supra, but an extreme data insufficiency problem remained that made it difficult if not impossible to test the importance of market shares.

⁵ Cf. esp. Ravenscraft, Structure-Profit Relationships at the Line of Business and Industry Level, supra, where product differentiation is measured by the amount of advertising and a patents-to-sales ratio; and Abell/Hammond, Strategic Market Planning ..., op. cit., 289: "PIMS-findings indicate that investment intensity, market share, industry growth rate, life cycle position, and marketing expense/sales ratios are among the most important factors affecting ROI and cash flows", which emphasizes market share overproportionately.
hypothesis of the Chicago School (efficiency causes concentration) than was originally thought:6

"The typical firm earning persistently high profits has a large market share in a differentiated product industry. If it is more efficient than its competitors, it is not because it produces the same product as they at lower costs, and sells it at lower prices. If anything, the price it charges probably exceeds that of its competitors for a product that is perceived to be superior along one or more product characteristic dimensions. ... The successful firm is more efficient than its competitors in using nonprice modes of competition."

Due to a high market share, the supplier can take advantage of his monopsonistic discretion to charge higher prices; however, due to the lack of competitive pressure, it is not guaranteed that the efficiency gains will also be passed on to consumers. In this case, the hypothesis that an increase in the efficiency of a business due to cost reductions - be it actual or potential - leads self-evidently to higher growth and greater welfare has not been established empirically. It has not been shown that a potential efficiency increase resulting from a merger would be synonymous with an increase in overall efficiency.7 Hence the role of market share not only serves as a basis for an efficiency explanation but also as a basis for a possible market power explanation.8 As size of firm, level of market concentration, and explicit product differentiation are essentially all held constant, recent investigation has suggested that market share per se has to be considered a source of market power regardless of the level of concentration and that this kind of market power is distinct form the one usually associated with

6 Mueller, Dennis C., Profits in the Long Run, op. cit., 229, italics supplied; and cf. idem, United States' Antitrust: At the Crossroads, op. cit., 225, which emphasizes that "(f)irms with large market shares in differentiated product industries are more profitable presumably because they have higher quality products or products which are perceived to be of higher quality ... If one wants to describe the most profitable firm as being more efficient, they appear to be more efficient at differentiating their products through advertising or patentable product improvements.", italics supplied.

7 As a result, "Increased efficiency cannot necessarily be inferred from a presumed increase in profitability in the case of large firms. In such cases, profits may also be caused by market power. Such market power can in turn be regarded as almost a guarantee that the potential for efficiency and in particular innovation is not being exploited to the fullest and the the maximum welfare possible is not being achieved", Caspari, Manfred, Joint Ventures Under EEC Law and Policy, unpublished paper, presented at the Fordham Corporate Law Institute, New York, October 23, 1987, p. 8.

8 Cf., e.g., Pautler, A Review ..., supra, 611.
oligopolistic market structures.\textsuperscript{9} The implications that can be drawn from these findings are that market share can be considered at least as important for the existence and exercise of market power as is the case with all the other elements of market structure and that industries that may show competitive overall structure "may actually have a market power problem that is not apparent from overall industry performance".\textsuperscript{10} The results of these studies falsify the Demsetz hypothesis that profitability differences are an outflow of efficiency differentials, but do clearly indicate that a unique kind of market power associated with market share is responsible for persistent above average profitability.\textsuperscript{11}

As has been emphasized above, however, the monopoly problem or the problem of welfare losses due to monopoly and market power are assumed to play only a minor role in the U.S.\textsuperscript{12}

This seems to support the view that the supplier with a high market share is profiting from lower costs as well as from higher prices; however, the customers do not gain necessarily from these increases in efficiency, and this contradicts the explicit goal of consumer welfare.\textsuperscript{13} This makes it

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\textsuperscript{9} This aspect of large market shares has strongly been emphasized particularly by Rhoades, Stephen A., Market Share as a Source of Market Power: Implications and Some Evidence, 37 JEB (1985), pp. 343-363, esp. 359; and Ibid., 347 and 350, which characterizes the underlying reasoning by asserting that there may be "product differentiation that is unique to market leaders (in the buyer's perceptions) irrespective of specific product differentiation policies... - giving market leaders an opportunity to sell their products at premium prices even if the quality of their products is identical to that of their competitors".

\textsuperscript{10} Rhoades, Market Share as a Source of Market Power..., supra, 346.

\textsuperscript{11} Cf. again Rhoades, Market Share as a Source of Market Power..., supra, 359 f., who concludes that "these findings, along with the work on strategic groups, raise the possibility that markets may generally be defined too broadly" and that "the antitrust authorities... should devote attention to the market share of firms to be acquired, regardless of market concentration."

\textsuperscript{12} This view is based on the study of Harberger, Arnold C., Monopoly and Resource Allocation, 44 AER (1954), pp. 77-87. Losses of allocation would be more than compensated for by profits due to productive efficiency and, hence, would increase 'consumer welfare'. This position has to be criticized since later studies have found higher welfare losses, as has been demonstrated supra; besides, the Harberger study on which the Chicago view is based has been criticized on many aspects, cf. Böbel, Wettbewerb und Industriestruktur ..., op. cit., 179 ff. and 201 ff.

\textsuperscript{13} Cf. the legal wording of Art. 85 para. 3 Treaty of Rome where in the case of a rationalization cartel a fair share of the resulting benefits has to be passed on to consumers.
\end{flushleft}
obvious that the efficiency differential explanation offered by Demsetz and others does not provide convincing evidence on "how one is to distinguish those situations where scale economies only have efficiency effects, from those where the firms enjoying such economies realise entry into the industry is difficult (for whatever reason) and thus set high prices". A major hint could be the extent to which market shares are necessary to exploit economies of scale. If it is assumed that beyond this point on a scale, additional efficiency gains, regardless of source, are non-existent or play a marginal role only, the corresponding market share could serve as a sort of borderline, indicating as it were the limits of a technical imperative. Beyond this point, undue market power could be assumed to exist.

The view that concentration is only caused by efficiency-differentials is consistent with the hypothesis that if the general conditions of production were characterized by economies of size and increased industry concentration with related efficiencies in an unlimited manner, welfare maximization resulting from the attainment of these economies, from the rate of technological progress, and from the availability of a superior management would require unlimited growth of size. A typical goal conflict as described above would arise since the attainment of all possible cost savings would result in a loss of effective competitive pressure within the particular market, which would otherwise tendentially hold down prices close to marginal costs. A trade-off between attainable efficiencies in the short-run and sufficient competitive pressure in the long-run would become necessary.

In order to measure efficiency, an empirically observable relationship has to be established between factors that determine the structure of an industry.

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15 This postulate is the so-called traditional defense hypothesis and was first put forward by Schumpeter, Joseph H., Capitalism, Socialism and Democracy, New York 1942; and later by Galbraith, John K., American Capitalism - The Concept of Countervailing Power, Boston 1952.

16 Cf. Gröner, Helmut, Konzentration und Wettbewerbsordnung, 8 Jura (1986), pp. 520-527, 522; and Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 84 ff. The adherents of the current tenet, perform this trade-off by means of the Williamson-model which we have treated supra.
and performance criteria such as profits, costs, or rate and extent of technological innovation.\(^{17}\)

2. The Range of Economies of Size as an Alternative Explanatory Approach

Whether profitability can be viewed as an adequate indicator of the extent of productive efficiency is questionable, since the relative efficiency of a firm cannot only be evaluated merely on the basis of its profit rates. It is not only the latter which indicates whether the firm is subject to sufficient competitive pressure, but also its relative success in the market, although, as we have emphasized, there are problems associated with this approach.\(^{18}\)

This market success may be evaluated on the basis of the so-called survivor test developed by Stigler.\(^ {19}\) The standard of reference for the underlying cost situation is the structure of an industry that for a longer period of time has not been subject to legal barriers to entry and, furthermore, has not changed its characteristics during that time period.\(^ {20}\) Thus, in determining the optimum firm size, the survivor technique proceeds to

"classify the firm in an industry by size, and calculate the share of industry output coming from each class over time. If the share of a given class falls, it is relatively inefficient, and in general is more inefficient the more rapidly the share falls".\(^ {21}\)

The other methods used are statistical cost analyses, engineering studies, and profitability studies. The question remains as to how valuable different

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\(^{17}\) Cf. Bain, Industrial Organization, op. cit., 434 ff. Additional measures can only be determined vaguely, cf. ibid., 458 ff.


\(^{19}\) Originally the basis of the test was developed by John Stuart Mill, Principles of Political Economy, New York 1929, p. 134.

\(^{20}\) Cf. Demsetz, Harold, Economics as a Guide ..., supra, 375.; Scherer, Economies of Scale and Industrial Concentration, op. cit., 18; and for the deficiencies, Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 91.

\(^{21}\) Stigler, The Organization of Industry, op. cit., 73; and for a critical assessment of the test, Bain, Joe S., Survival Ability as a Test of Efficiency, 59 AER (1969), pp. 99-104, and Shepherd, William G., What Does the Survivor Technique Show about Economies of Scale, 36 SEJ (1967), pp. 113-122. It has to be noted critically that the ability to survive not only depends on intrafirm efficiencies, but also on other determinants, such as public policy intervention, economic influences due to foreign trade, economic boom or depression scenario, etc., Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 91.
techniques are in the attempt to determine a minimum optimal scale\textsuperscript{22} and, furthermore, whether or not the choice of the measurement technique makes a difference in determining the extent of efficiencies that can be attained by rising industrial concentration.\textsuperscript{23}

The most commonly used technique, and one that is considered at the same time to be the most appropriate one, is the engineering study, which tries to elaborate on the exact shape and properties of cost functions. This is done by the questioning of engineers specialized in the planning of new production facilities and currently or formerly employed by differently sized companies.\textsuperscript{24} If the use of statistical cost studies is commonly rejected\textsuperscript{25}, the use of such engineering studies is also heavily disputed by some adherents of current theory: they have put forward a number of arguments against the applicability of such studies, the majority of which, however, can be rejected to a large extent.\textsuperscript{26}

Engineering studies are viewed as incomplete with regard to the full extent of efficiencies because "they can cover only technical processes, which leaves out ... product design; research; planning; administration; cost and

\textsuperscript{22} "Minimum optimum scale is the smallest output per unit of time at which the plant or firm can realize the lowest-obtainable unit cost of production", Koch, Industrial Organization ..., op. cit., 127.

\textsuperscript{23} This also means efficiencies in addition to simple plant or firm economies. For detailed and critical surveys on the different measurement techniques, cf. McGee, Efficiency and Economies of Size, op. cit., 65-88; Monopolkommission, Hauptgutachten VI: Gesamtwirtschaftliche Chancen und Risiken wachsender Unternehmensgrößen, Baden-Baden 1986, paras. 600-604; Scherer, Industrial market structure ..., op. cit., 92-94; and Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 88-92.

\textsuperscript{24} "The persons or groups performing these functions accumulate much information on alternative equipment and plant designs and the associated investment and operating costs", Scherer, Industrial market structure ..., op. cit., 94.

\textsuperscript{25} "Statistical cost studies utilize historical cost-output data to make inferences about economies of scale", Koch, Industrial Organization ..., op. cit., 128. The main problem of this technique seems to be the secrecy problem in data availability and the general incomparability of interfirm cost data; it has to be rejected, therefore, cf. Monopolkommission, Hauptgutachten VI ..., op. cit., paras. 600 and 604; and Scherer, Industrial market structure ..., op. cit., 93. Profit studies are viewed as a complementary technique to engineering studies and/or survival tests.

\textsuperscript{26} Cf. most prominently, McGee, Efficiency and Economies of Size, op. cit., 68-80.
quality control; finance; marketing; and so on”. 27 These efficiencies should be considered as very insecure in nature, however. They vary considerably from case to case, they often resist proper measurement, where they do not, ambiguous results are often encountered. We are thus in an area of uncertainty. At the present, there is no evidence that the inclusion of further efficiencies enlarges the efficient size for the individual firm. 28

The alternative survivor test also shows weaknesses significant enough to raise strong doubts about its applicability:

- Survival ability may reflect either superior efficiency, monopoly power, or discriminatory legislation depending on various criteria, and there is no clear separation of the underlying causes. 29

- This method does not take into consideration - in addition to costs as an expression of efficiency - that other factors such as, e.g., tax policy, other forms of public intervention, or influences of international trade can affect competitiveness and the ability to survive. This approach is therefore clearly biased methodologically. 30

- As a rule, less efficient firms are not driven out of the market as is suggested by the survival-of-the-fittest doctrine. This lends support to the hypothesis that firms within a noncompetitive oligopoly nucleus jointly

27 McGee, Efficiency and Economies of Size, op. cit., 69; and Fisher/Lande, Efficiency Considerations in Merger Enforcement, supra, 1608: "In short, these studies inherently can focus only on part of what determines differential firm efficiency, and what the studies omit is frequently very important." For a general description of the insufficiencies and limitations of the scale economies analysis, cf. Gold, Bela, Changing Perspectives on Size, Scale, and Returns: An Interpretative Survey, 19 JEL (1981), pp. 5-33.

28 With regard to the efficiency effects of mergers, "econometric studies neither prove nor disprove that mergers yield efficiencies on average", Fisher/Lande, Efficiency Considerations in Merger Enforcement, supra, 1619. The same line of reasoning holds with regard to multi-plant economies of scale which for Scherer leads to the critical conclusion that "(t)he best available evidence on this point, derived from interviews with 125 manufacturing firms, suggests that the managerial and central staff economies of multi-plant operation are at most slight, and that in many instances, especially beyond some modest threshold, multi-plant size is disadvantageous", Scherer, Industrial market structure ..., op. cit., 101.

29 Cf. Scherer, Industrial market structure ..., op. cit., 93. Furthermore, Stigler doubts whether the socially optimum size is determinable at all by any technique; he describes this issue as an ethical concept, cf. Stigler, The Organization of Industry, op. cit., 73.

perform an umbrella-pricing strategy on the grounds of mutual interdependence within the nucleus, protecting those firms on the fringe of the oligopoly which are less efficient.  

- A sufficiently large number of competitors is necessary for an application of the technique. Small number studies (i.e., esp. oligopolies) result in confusing statements and often lead to the conclusion that quite different firm sizes are all seen to be optimal.

Most of the empirical investigations that rely on the survivor technique reach conclusions almost identical with those of engineering estimates and cost studies. These results are that the minimum optimal size for firm or plant economies is usually a small fraction of total market demand, which seriously questions the role of economies in determining size and concentration.

Contrary to the assertion of the efficiency-concentration adherents, the bulk of econometric studies of the post-war era, which relate firm size to efficiency show that "scale economies were not so substantial that most indu-

31 "Conceivably, the competition referred to could involve the foreclosure of markets for outputs, monopolization of input markets, predatory pricing, and the like. Survival, then, might be an indicator of private efficiency but not of social efficiency", Koch, Industrial Organization ..., op. cit., 127, which is in accordance with our assumed cost-decreasing and price-raising effect of large market shares and the assertion that benefits not necessarily be passed on to consumers, due to barriers to entry and hence a lack of competitive pressure.

32 Cf. Shepherd, What Does the Survivor Technique ..., supra.

33 For a survey of the studies of Bain, Haldi and Whitcomb, Pratten, and Scherer, cf. McGee, Efficiency and Economies of Size, op. cit., 71-77. Besides, this seems in accordance with the original tenet of the Chicago School, which holds that "full exploitation of available scale economies at both the plant and firm levels would ... result in small firms", Koch, Industrial Organization ..., op. cit., 123, citing Henry C. Simons and Frank H. Knight.

34 Although they assert that a high level of industry concentration is warranted by economies of large size, in many, if not most cases, it may not be possible to identify or even quantify these economies. Therefore, adherents of current theory see it simply as a matter of faith that market structures that result from unrestrained competition are efficient market structures, cf. Singleton, Industrial Organization ..., op. cit., 44, citing Demsetz.
tries should be expected to be oligopolies"³⁵, regardless of what measurement technique was chosen in individual studies.

From a survey of the measurement of economies or diseconomies of scale relying on engineering estimates, cost studies, and the survivor technique, and an inquiry into the main findings resulting from the studies it can be concluded that "(d)espite very different analytical approaches in the various studies, a general pattern seems to emerge from a very large number of studies; beyond a certain point, average costs do not vary substantially over wide ranges of plant sizes".³⁶ Moreover, the cost gradients which are responsible for the steepness of the individual cost curve, are generally low so that the cost disadvantage of firms that work at suboptimal plant levels are comparatively small and can easily be compensated or even more than compensated for by sufficient competitive pressure, disciplining costs, and the holding down of prices to marginal costs. Using a range from 4 to 14 percent for the alleged critical market share, after which no significant scale economies are likely to be attained, it is estimated that the true cost effect that results from a reduction of excess market share varies between 5 and 20 percent of additional monopoly profits achieved in the case of excess market share.³⁷

³⁵ Pautler, A Review ..., supra, 611; Shepherd, The Treatment of Market Power, op. cit., 119, who notes "that scale economies explain only a relatively small portion of the major dominant-firm positions". Cf. also Scherer, Industrial market structure ..., op. cit., 94, who states that "with few exceptions, the minimum optimal plant scale revealed in studies of American manufacturing industries has been small relative to industry size." Idem, p. 95: "We conclude then that economies of scale at the plant level do not in the vast majority of instances necessitate high national concentration levels for U.S. manufacturing industries."

³⁶ Fisher/Lande, Efficiency Considerations in Merger Enforcement, supra, 1606 f.; Scherer, Industrial market structure ..., op. cit., 91-98; and Shepherd, The Economics of Industrial Organization, op. cit., 181-185 and 193, who notes that "economies of scale appear to be limited, so that market shares above 10 percent commonly embody mainly excess market share"; and even Peltzman, The Gains and Losses from Industrial Concentration, supra, 231, who provides empirical evidence for the Chicago tenet. For a more recent survey of empirical studies on the topic cf. Monopolkommission, Hauptgutachten VI ..., op. cit., Tabs. 1, 4, 10, 12, 17, 23, 26, 30, and 36, pp. 235-261, summarizing the studies from Bain (1951) to Owen (1980), essentially presenting analogous results for individual branches.

³⁷ Cf. Shepherd, The Economics of Industrial Organization, op. cit., 195; and Scherer, Industrial market structure ..., op. cit., 94: "(T)he long-run cost curves in most industries are much less steep at suboptimal plant scales than one is led to believe by typical textbook illustrations."
With regard to the underlying cost function, *Shepherd* reaches the conclusion, therefore that "(t)he typical 'industry' cost curve for the firm is dish-shaped, with MES at 5 percent of the market or less. The constant-cost range may be wide, though presumably average cost rises eventually ...".38

Empirical evidence on this was strongly affirmed by some early Hearings of the U.S. Senate from 1964 to 1969 in which the economic and sociopolitical consequences of increased concentration in the economy were scrutinized. Essentially, these Hearings provided the following results:39
- There is no reliable correlation between the size of a firm and its profitability;
- the minimum optimal scale of a firm and hence the minimum efficient size in the technical sense may be different from industry to industry; and
- in the majority of industries in the U.S. economy the actual level of concentration may not be justified by the existence of economies of scale.40

Probably the most recent study within the tradition of engineering studies which tries to elaborate on the interdependence of economies of scale and concentration is the one performed by the German Monopolies Commission (MC) in its Sixth Main Report.41 In its report the MC tested the significance of economies of scale in 18 branches of the German economy. The relation between the planned size of a plant and the average cost of production is

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38 Shepherd, The Economics of Industrial Organization, op. cit., 206.
39 Cf. Economic Concentration: Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary, United States Senate, Washington, D.C. 1964-1969, Parts 1-8a. An extensive evaluation of these Hearings may be found in Petry, Horst, Technischer Fortschritt, Integration, internationale Wettbewerbsfähigkeit und Unternehmensgröße, 183 JNST (1969), pp. 271-299.
40 This may be different in the case of relatively small national markets. However, economies of scale that bulk large relative to any national market, and would therefore lead inevitably to highly concentrated industries at the national level, may be smaller relative to the EEC market as a whole. Thus, the creation of the Common Market may serve as an antitrust policy, curbing what would otherwise be problematic levels of monopoly power in some national markets, cf. Krugman, Paul, whose study is part of the report "Efficiency, Stability and Equity: A Strategy for the Evolution of the Economic System of the European Community", Brussels, 1987.
41 Cf. Monopolkommission, Hauptgutachten VI ..., op. cit.
portrayed by what is called the 'long-range planning curve'. This planning curve comprises technical economies only and not pecuniary economies.\textsuperscript{42} In all of the branches analyzed, the MC finds the minimum efficient size to become enlarged over time. Specialization as well as automatization advantages are the primary cause for this development, which seems to provide certain evidence for the size/concentration argument. However, industry concentration in a number of economic branches is significantly higher than required by economies of scale. In the majority of the branches presented, industry concentration is lower than the full exploitation of technical economies would require them to be.\textsuperscript{43}

The importance of economies of scale may increase in the presence of a number of conditions which can be listed as follows:\textsuperscript{44}
- Minimum efficient size constitutes a large share of the domestic output;
- Suboptimal scales are associated with above average cost increases (high cost gradient of the underlying cost curve);
- Minimum efficient plant sizes are not outweighed by inefficiencies resulting from the distribution- or from the input-side of the firm;
- Cost disadvantages cannot be compensated for by smaller plant sizes through means of production flexibility;
- The competitiveness of firms is based primarily on pricing policies and not on innovativeness or product differentiation advantages.

In a number of economic branches the significance of economies of scale is diminished, however. Technical economies may lose some of their significance primarily due to a high proportion of transportation costs in relation to total costs, which do not allow significant economies to be realized. Other factors are fluctuating or stagnating market demand, making the exploitation

\textsuperscript{42} Cf. Monopolkommission, Hauptgutachten VI ..., op. cit., para. 593. The efficiency advantages are seen to be rooted in specialization advantages, physical laws (so-called 0.6 rule), economies of massed reserves, management capabilities and further residual efficiencies, cf. ibid., paras. 594-599; and Shepherd, The Economics of Industrial Organization, op. cit., 170-172.

\textsuperscript{43} Cf. Monopolkommission, Hauptgutachten VI ..., op. cit., tabs. 40 and 41 at pp. 263 f.; and for a synopsis, Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 90.

\textsuperscript{44} Cf. Monopolkommission, Hauptgutachten VI ..., op. cit., paras. 605-609.
of economies impossible, and changes in minimum efficient sizes as a result of frequent changes in make-or-buy decisions.45

Summarizing these results, the proposition can be put forward that it is not advisable to yield all of the technical economies since the production flexibility which can be an important management parameter is restricted in this case. Even in the cases in which larger minimum efficient sizes should be attained, this cannot solely be attributed to technical economies. It is additional research and development efficiencies as well as product differentiation advantages that underly present observable concentration tendencies.46

The degree of efficiency gains from cost savings may be consistently overstated for two reasons:47
- First, the misallocation burden (dead-weight loss) which can be demonstrated by the welfare triangle is underestimated, as has been demonstrated (cf. supra Williamson's trade-off model).
- Second, the benefits from economies of scale may not be passed on to consumers if there is not sufficient competitive pressure on the firms; this may be the case primarily with efficiencies attainable in addition to the technical economies and for so-called X-inefficiencies.

If it is assumed - as is done by the current tenet - that meaningful barriers to potential competition do not exist, the latter argument seems crucial for critics of the Chicago School. As has been noted supra, economies of large scale production and product differentiation advantages of established over potential entrant firms have a dual character and can be regarded as efficiency advantages or (so-called) natural barriers to entry. According to Bork such natural barriers exist,

46 Cf. Monopolkommission, Hauptgutachten VI ..., op. cit., para. 755. These economies are difficult to operationalize, however, and hence difficult to take into consideration. Furthermore, it is unclear whether these additional efficiencies show up in general and are significant, cf. Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 104 f. It is furthermore open to question whether external growth via mergers is necessary to attain these efficiencies.
47 Cf. Shepherd, The Economics of Industrial Organization, op. cit., 195.
"(w)hen existing firms are efficient and possess valuable plants, equipment, knowledge, skill, and reputation. (Therefore,) potential entrants will find it correspondingly more difficult to enter the industry, since they must acquire those things".48

The ambiguous character of such barriers becomes obvious once again because they can be seen to impede sufficient competitive pressure, whereas they may present efficiencies at the same time.

Whereas the considerations above emphasized the extent of economies in a given state of technology, the additional question has to be raised as to what extent technological progress increases economies in research and development and hence makes corporate mergers and internal growth in size unavoidable.49

Basically, economic and financial potentials of large sized companies enable them to respond to product differentiation strategies and competition for innovations in a more appropriate way than rather small firms because of the amount of capital required. There is strong empirical evidence, however, that the ability to innovate is not necessarily associated with the willingness to innovate.50 With regard to the basic invention leading to the innovation, there is no empirical evidence whatsoever that the efficiency-causes-size or concentration hypothesis is deterministic in nature.51 The aforementioned U.S. Hearings came to the conclusion that the attainment of R&D efficiencies cannot necessarily be derived from mergers and internal growth. The reasoning that large sized companies are of extraordinary importance for the general rate of technological progress and economic development may be verified or falsified according to the individual industry analyzed and this

48 Bork, The Antitrust Paradox, op. cit., 310 f. This explanation for the assertion that persistent competitive pressure might not become real competitive pressure is based on the fact that most of the newcomers are not able to survive after entry since they are less efficient than established firms. This has been established by simple observation of non-entry over a longer period of time, cf. Posner, The Chicago School of Antitrust Analysis, supra, 945.

49 This postulate is called the new defense hypothesis, cf. Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 84.

50 Cf. Petry, Technischer Fortschritt, ..., supra, 282 f.

evaluation may change over a period of time. Hence, economies of R&D cannot justify size and concentration in every single case.\(^{52}\)

Empirical evidence suggests that capacity expansions either by internal or by external corporate growth cannot be performed in an unlimited manner without changing the technical characteristics of the cost function, such as the cost gradient and the total level. Starting from a specified quantity of output, total average cost may increase, causing diseconomies of scale.\(^{53}\)

Further complications with regard to the evaluation of the benefits and non-technical efficiencies associated with economies from rising industry concentration arise from the fact that increased concentration is associated with a decrease in competitive pressure due to managerial slack, communication, and control problems, etc.\(^{54}\) Especially at high levels of concentration, the likelihood of higher costs increases because of the occurrence of such X-inefficiencies that would outweigh economies of scale. Originally, it was argued in this context that the efficiency-losses due to monopolies were underestimated by traditional microeconomic methodology. It was Leibenstein who pointed out that a decline of competitive pressure means additional non-allocative efficiency-losses, which have their source in motivation problems and divergent goals among managers, owners, and employees of a firm. The assumption of average cost minimization as the firm's only goal is not tenable under these circumstances.\(^{55}\) Leibenstein’s approach is crucially important for the assessment of productive efficiency, which is mainly determined by economies of scale and transaction-cost efficiencies. Whereas the current theoretical tenet holds that even at high levels of concentration decreasing costs are attainable by economies of scale or related efficiencies, the results of

\(^{52}\) Cf. Petry, Technischer Fortschritt, ..., supra, 286.

\(^{53}\) Cf. Herdzina, Wettbewerbspolitik, op. cit., 41.

\(^{54}\) Cf. our considerations on the Williamson trade-off in this contribution. Cf. as well Lande, Robert H., Wealth Transfers as the Original and Primary Concern of Antitrust: The Efficiency Interpretation Challenged, 34 HastLJ (1982), pp. 67-151, 79: "(S)ome evidence suggests that the existence of monopolies might curtail overall research and innovation or lead to other undesirable economic consequences."

\(^{55}\) Cf. Leibenstein, Harvey, Allocative Efficiency vs. "X-Efficiency", 35 AER 1966, pp. 392 - 407. Cf. as well Shepherd who states that "presumably average cost rises eventually because of (1) bureaucracy, from absolute size, and/or (2) x-in efficiency caused by the firm's market power. The constant costs may also mask a significant amount of pecuniary economies, the typical cost curve may slope upward instead of being flat", Shepherd, The Economics of Industrial Organization, op. cit., 206.
efficiency considerations may become quite different if Leibenstein's approach is taken into account, since we have to consider a possible trade-off between a positive effect on economies of scale and a detrimental one on X-inefficiencies.\textsuperscript{56}

These reflections have shown that size and (external) concentration as independent variables and efficiency as the dependent variable may increase in the same direction up to a certain level. From an overall economic point of view, however, X-inefficiencies and diseconomies of scale may contribute to a misallocation of economic resources after this level is surpassed. External concentration, therefore, is not necessary to achieve efficiencies in every individual case. From an efficiency viewpoint the market solution may be superior in these cases.

Unless non-technical efficiencies - which will be treated infra - change these findings significantly, we are able to make the assertion that economies of scale may not be attained in an unlimited manner in the sense that these economies would require the firms to strive for large market shares. Although the points beyond which economies will not occur substantially (minimum efficient size) are a priori indeterminate for the general case, since they vary from industry to industry, the aforementioned provides evidence that supracompetitive profitability beyond these thresholds is tendentially a result rather of market power than of efficiency. Increased likelihood of an occurrence of X-inefficiencies as concentration rises, tends to support this assertion, and hence tends to provide a theoretical basis for the rejection of the efficiency differential-hypothesis.

\textsuperscript{56} For an extensive survey on these counteracting effects, cf. Schmidt, Wettbewerbspolitik und Kartellrecht, op. cit., 92. With regard to the actual trade-off, Scherer comes to the conclusion that "(t)he evidence is fragmentary, but it is persuasive. 'X-inefficiency' exists, and it is more apt to be reduced when competitive pressures are strong than when firms enjoy insulated market positions. What we do not know is how large are the differences systematically correlated with monopoly power. That X-in-inefficiencies attributable to monopoly are at least as large as the welfare losses from resource misallocation seems eminently plausible. And they may well be considerably larger", Scherer, Industrial market structure ..., op. cit., 446.
3. The Evidence of Efficiency on the Basis of Merger Performance

We have found no explicit definition of the efficiency criterion within the current theoretical approach,\textsuperscript{57} and even Bork had to concede\textsuperscript{58} that efficiency cannot be measured and that substitutes have to be used in order to evaluate whether increases in efficiency have occurred. The question of how efficiency should actually be measured remains unanswered also because efficiencies are presumed to encompass much more than just technical economies. The assertion by advocates of the current tenet that efficiency can only be roughly estimated, leaves room for all kinds of subjective judgments.

The question remains, as to whether efficiencies beyond the technical ones can be measured at all. This makes necessary a method of determining these efficiencies. The most common attempt has been to cover additional efficiencies via an analysis of the effects of mergers. The results of these studies have been ambiguous and have shown that mergers do not always increase efficiency.\textsuperscript{59}

Instead of efficiency, improved performance may represent redistributive gains without real efficiency advantages in terms of resource savings, resulting from factors such as from sources of tax avoidance, good bargaining due to imperfect or lopsided information, and market power gains.\textsuperscript{60}

With regard to studies based on accounting data, stock market data and changes in resulting market shares of the merging firms, the outcomes of the merger studies performed can be summarized as follows:\textsuperscript{61}

- As a rule, merging firms are not more profitable than non-merging firms

\textsuperscript{57} Cf. Scherer, Separating Wheat from Chaff ..., supra, 995 f.
\textsuperscript{58} Cf. Bork, The Antitrust Paradox, op. cit., 192, who mentions that "efficiency cannot be studied directly or quantified."
\textsuperscript{59} For a survey, cf. Fisher/Lande, Efficiency Considerations in Merger Enforcement, supra, 1609-1624, who assert that it is mainly technical efficiencies that are important in the case of horizontal and vertical mergers and that additional efficiencies ("synergetic effects") are primarily found with conglomerate mergers (p. 1599 f.); and Mueller, United States' Antitrust: At the Crossroads, op. cit., 226.
\textsuperscript{60} Cf. Green, Industrial Organization ..., supra, 495, who holds that "logically one cannot rule out the possibility that the rise in share value reflects the effects of market power rather than increased efficiency". Cf. also Mueller, United States' Antitrust: At the Crossroads, op. cit., 227 f.
\textsuperscript{61} Cf. Green, Industrial Organization ..., supra, 495; Fisher/Lande, Efficiency Considerations in Merger Enforcement, supra, 1611 et seq.; and Mueller, United States' Antitrust: At the Crossroads, op. cit., 226-229.
are;
- there is no single motivation or effect of a merger (such as efficiency);
- whereas stockholders of acquired firms show above-average gains from mergers, stockholders of acquiring firms experience relatively few gains or no gains at all;\(^\text{62}\);
- virtually all of the studies on market shares show that some time after the merger the total proportion of the market was less than the ex ante combined totals, which means that - as a rule - the share of the combined firm in the relevant market in question declined after the merger;\(^\text{63}\); and
- individual case studies on mergers show that there is no unambiguous evidence on whether mergers in general, and horizontal ones in particular, increase the efficiency of the merging firms.\(^\text{64}\)

This may finally lead us to the conclusion that aside from observed returns to stockholders of acquired firms there is no empirical evidence for the hypothesis that mergers generally improve the efficiency of the combined

\(^{62}\) It is considered a flaw in the assumptions about the effects of mergers that gains to stockholders are considered to be pure efficiency gains, as noted above.

\(^{63}\) Cf. e.g., Mueller, Dennis C., Mergers and Market Shares, 67 RES (1985), pp. 259-267, who reports a significant decline in the after merger combined shares for a sample of 210 acquisitions. From a logical point of view and following the reasoning of the current tenet, the combined share should have been increased as a result of superior efficiency in comparison to competitors. This does not seem to be the case, however. Furthermore, "although firms with large market shares obtained primarily through internal growth tend to be more efficient than average, firms merging to achieve the same shares would not necessarily obtain comparable efficiencies", Fisher/Lande, Efficiency Considerations in Merger Enforcement, supra, 1609.

\(^{64}\) Cf. e.g., Scherer, On the Current State ..., op. cit.; recently also, Ravenscraft, David J., and Frederic M. Scherer, Mergers, Sell-Offs, and Economic Efficiency, Washington, D.C. 1987; and Green, Industrial Organization ..., supra, 496, who summarize the findings in the assertion that "if one examines the post-merger history of many merger partners, one often finds divestiture, sell-offs, abandonments and other signs of failure."
firms in terms of resources used. This may be so in individual cases, however.

IV. Concluding Remarks

In Part 3 of the contribution we basically confirmed the validity of the traditional approach underlying public policy towards horizontal mergers (concentration-collusion doctrine), although a variety of refinements were found to be important. Strong evidence was found that performance criteria as used in the empirical studies on the concentration-collusion doctrine serve as indications of market power. However, some problems remained in attempting to measure market power by means of profitability. Most importantly, economic returns and other performance measures were found most likely to measure both efficiency and market power effects at the same time, the two sets of factors being hard to disentangle from each other properly.

By comparison, the alternative measurement technique provided by dead-weight loss, which has already been presented, neglects power considerations to a large extent and is characterized by practical difficulties. The qualifications necessary to make use of the approach make the model lose its analytical clarity and applicability. Furthermore, the dead-weight loss is severely handicapped by the fact that it is static as a rule and strictly efficiency-oriented, whereas we prefer a multiple-goal approach. The measure is not able to offer a basis for generalization and it cannot serve as a broad-based concept for the purpose of empirical proof.

The traditional studies based on various performance criteria were found to have a variety of insufficiencies and shortcomings; these, however, do not call into question empirical attempts to test different hypotheses. The findings on the robustness of such studies with regard to changes in the per-

65 The empirical "experience is difficult to reconcile with the conjecture that mergers turned out on average to be profit-increasing and efficiency-enhancing", Ravenscraft, David J., and Frederic M. Scherer, The Profitability of Mergers, discussion paper, presented at the Third Meeting on Industrial Economics at the International Institute of Management, Berlin 1986, p. 34. For a recent confirmation cf. idem, Life After Takeover, 36 JIE (1987), pp. 147-155, 155, who state again that "the hypothesis that tender offer takeovers are on average efficiency-increasing warrants much more skepticism than it has received thus far in the literatures of economics, corporate finance, and securities law".
formance measure provide evidence for the validity of the traditional studies. Data aggregation biases used to pose the most serious problems for these empirical studies. Due to improved data bases, however, these difficulties have largely been circumvented.

The test of the rival hypotheses has shown that neither the concentration-collusion doctrine nor the new learning hypothesis have made obvious to what extent horizontal industry concentration and the resulting economic performance are based on efficiency and to what extent they are due to market power. Also they have not shown whether industry concentration reflects market power consequences at the same time and hence serves as a basis for an extensive use of that power as a result. (Relative) market share has been found to enable an incumbent to increase efficiency but also to take advantage of monopolistic discretion by charging higher prices; however, due to a possible lack of competitive pressure, it is not guaranteed that the efficiency gains will also be passed on to consumers. Hence the role of market shares not only serves as a basis for an efficiency explanation but also as a basis for a possible market power explanation. The efficiency-differential hypothesis is defective in that efficiency would imply higher profits, but higher profits do not necessarily imply efficiency.

Market share rather than concentration was found to be the crucial structural element. The supplier with a high market share may be profiting from lower costs as well as from higher prices; however, the customers do not necessarily gain from these increases in efficiency, a fact which contradicts the goal of consumer welfare that is explicitly appealed to by the adherents of current theory. With regard to technical economies, this makes it obvious that the efficiency differential explanation offered by the new learning hypothesis does not find convincing evidence on how one is to distinguish those situations where scale economies only have efficiency effects, from those where the firms enjoying such economies realize that entry into the industry is difficult and thus set high prices.

Furthermore, additional shortcomings invalidated the contents of the efficiency-causes-concentration explanation:
- The approach is characterized by the fact that it tends to understate severely or even completely ignores the importance of barriers to competition. Although former empirical results on the importance of barriers to new competition did not justify the emphasis which was put on this element of market structure, barriers to new competition do exist and their importance in deterring sufficient pressure due to potential competition is underestimated by the current tenet.

- Insufficiencies of the data used were heavily exaggerated. Contrary to the implications drawn by some critics, the basic structural relationship estimated, using disaggregated data, turned out to be robust across a wide range of variable definitions, sampling frames, and controls of accounting method variations.

- The existing knowledge on oligopolies is neglected. The acceptance of the correlation between concentration and the interdependence of firms is not enough to settle the question of whether oligopolists must behave in a competitive way or not. In order to answer this question, the existing structural conditions of the market have to be looked into as well (for instance product life cycle, product homogeneity or heterogeneity, degree of information - these being factors which qualify the importance of the number of the firms). The fact that the incumbents in an oligopoly nucleus obviously do not compete against each other, do not outcompete less efficient rivals and hence protect fringe firms by a price umbrella, provides evidence for the original collusion explanation, and is at the same time consistent with the differential-efficiency explanation.

- The general consensus that high profits can persist over a longer period of time when the observed enterprise has cost advantages or related efficiency advantages, i.e. when a superior good is offered or market power is held in comparison to actual or potential competitors, is disregarded or misinterpreted in that it is assumed that this is solely due to efficiency advantages. Sufficient competitive pressure is presumed to exercise persistent downward pressure on prices and profitability in a constant manner, which excludes underlying motives other than efficiency-enhancement.

Technical economies as well as non-technical efficiencies were found to explain existing industry concentration only to a limited extent. This result can be considered a prima facie proof that beyond a relatively low threshold level undue market power may be assumed to emerge. At the same time,
firms with non-scale superiorities may increase their share of the market without external corporate growth. The attempt to grow primarily via external growth can also be seen to be in accordance with the assertion that efficiency is not the only motivation of corporate executives (e.g., empire building).

In the case of mergers, increased performance may represent redistributive gains without real efficiency advantages in terms of resource savings. Aside from observed returns to stockholders of acquired firms, there is no empirical evidence for the hypothesis that mergers generally improve the efficiency of the combined firms in terms of resources used.