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The effects of conglomerate mergers on concentration in manufacturing industries, 1967-1977

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**THE EFFECTS OF CONGLOMERATE MERGERS ON CONCENTRATION IN
MANUFACTURING INDUSTRIES, 1967-1977**

Iowa State University

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The effects of conglomerate mergers on concentration
in manufacturing industries, 1967-1977

by

Keith William Heimforth

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
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1983

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I. INTRODUCTION

A. The Nature of Conglomerate Mergers

The first step in commencing a study of conglomerate mergers must be to reach an understanding of what exactly is a "conglomerate merger." Because the term has become part of common language, it is seldom precisely defined.

For purposes of this study, a merger is defined as the unifying of control of two companies formerly under separate control. The primary connotation of the term "conglomerate" in reference to a business firm is that the firm is engaged in diversified activities. However, the concept of "diversification" is itself imprecise, since virtually every firm is "diversified" to the extent that production of any good or service requires more than one operation. A manufacturer of shirts, for example, generally is involved, at the least, in the cutting of fabric, the stitching of the shirts, and the packaging of the final product. Thus, it would be more accurate to refer to a firm as diversified if it is involved in activities that are often performed by separate firms.

It is conventional to define such diversification as "vertical" in nature if the different activities are related stages in the production of a good or service; an example would be the drilling, refining, and distribution stages of home heating oil. A firm engaging in such activities is generally referred to as "vertically integrated" rather

than diversified, in order to convey more precise information, namely, that the different activities are related in a vertical fashion. Another form of diversification is found in a firm that produces one product and sells that product in two or more geographically distinct markets. This situation is not often referred to as diversification, although it is consistent with the term as explained above and with Federal Trade Commission (FTC) merger classifications (FTC 1981, pp. 102-3). A firm whose diversified activities are neither vertically related nor simply geographically differentiated is in general referred to simply as "diversified." That use of the term is employed in this study.

The term conglomerate, as it is used in the literature, implies diversification in the above sense. However, a further refinement is sometimes employed, reserving the term for firms that achieve rapid growth via the acquisition of other firms in "unrelated" industries. In other words, "conglomerate" sometimes connotes not simply diversification, but rapid diversification by means of numerous diversifying mergers. Such a distinction can be useful, due to the potentially differing effects of diversifying acquisitions, as opposed to a firm developing different product lines and services with its own resources; the latter means of diversification is often referred to as internal diversification. Although these differing effects will be discussed in this dissertation, this study has as its focus the effects of diversification via mergers. Since some of the mergers studied did not involve "conglomerates" in the narrow sense just discussed, the terms "diversified firm," "a firm diversifying via conglomerate merger," and

"conglomerate" are used interchangeably in this study.

With the preceding discussion of diversification, it is possible to attach theoretical and empirical meaning to the term "conglomerate merger." As an abstraction, the term will be used to denote a merger in which the "surviving" (i.e., post-merger) firm is more diversified than were both of the pre-merger firms individually. Thus, it is not necessary for either pre-merger firm to be diversified in order for their merger to be classified as "conglomerate."

For empirical purposes, FTC merger classifications will be employed (FTC 1981, pp. 102-3). The Commission identifies mergers as being "horizontal" (between firms in the same product and geographic market), "vertical" (between firms with an actual or potential buyer/seller relationship), or "conglomerate" (all mergers that are neither horizontal nor vertical). The conglomerate mergers are further classified by the FTC as "market extension," "product extension," or "other." These distinctions are made on the basis of whether the merging firms produce the same product for different geographic markets (market extension), different but related products (product extension), or essentially unrelated products (other). (See Chapter IV for further discussion of these classifications.) In accord with the preceding definition of diversification, "conglomerate mergers" will herein refer to the "product extension" and "other" categories only, unless otherwise noted.

B. The Incidence of Conglomerate Mergers in Recent Years

The FTC publishes data on the number and nature of mergers in which the acquired firm is in the manufacturing or mining sector and has assets of \$10 million or more on the date of acquisition (FTC 1981). (See Chapter IV for further discussion of these data.) The data span the years 1948-79, and in each of these years at least one conglomerate merger is identified. However, the significant aspect of the data for present purposes is the larger proportion of all large mergers that are classified as conglomerate in the middle and latter years of the period as compared to the early years. (See Table 1.) Dividing the data into convenient decade groupings, the percentages of all large mergers that were conglomerate mergers are 52% for 1948-59, 75% for 1960-69, and 72% for 1970-79. During the six-year conglomerate merger "wave" of 1966-71, fully 82% of all large mergers were conglomerate in nature. Although conglomerate merger activity subsided somewhat in the following three years, the last five years of the 1970s saw the percentage rise back to the 75% level.

There are undoubtedly many reasons for the marked increase in conglomerate mergers during the past three decades, including financial and tax advantages. Although it is not the purpose of this study to investigate and analyze the various factors underlying the increase in such mergers, one factor seems sufficiently clear and important to warrant mention, namely, the antitrust environment of the period. In 1950, the Celler-Kefauver Amendment to Section 7 of the Clayton Act

Table 1. Large acquisitions in manufacturing and mining, 1948-79^{a,b}

1948-1963					1964-1979						
Year	Number of acquisitions	Number of "product extension" acquisitions	Number of "other" acquisitions	Number of "product extension" plus "other" acquisitions	"Product extension" plus "other" acquisitions as a percentage of total acquisitions	Year	Number of acquisitions	Number of "product extension" acquisitions	Number of "other" acquisitions	Number of "product extension" plus "other" acquisitions	"Product extension" plus "other" acquisitions as a percentage of total acquisitions
1948	4	2	0	2	50%	1964	73	42	8	50	68%
1949	6	4	0	4	67%	1965	64	31	13	44	69%
1950	5	1	0	1	20%	1966	76	41	18	59	78%
1951	9	3	1	4	44%	1967	138	84	33	117	85%
1952	16	4	3	7	44%	1968	174	102	49	151	87%
1953	23	7	2	9	39%	1969	138	63	45	108	78%
1954	37	14	5	19	51%	1970	91	36	36	72	79%
1955	67	27	9	36	54%	1971	59	25	23	48	81%
1956	53	21	5	26	49%	1972	60	22	14	36	60%
1957	47	19	6	25	53%	1973	64	12	21	33	52%
1958	42	19	7	26	62%	1974	62	15	20	35	56%
1959	49	14	14	28	57%	1975	59	25	26	51	86%
1960	51	24	8	32	63%	1976	82	27	29	56	68%
1961	46	16	9	25	54%	1977	101	38	33	71	70%
1962	65	28	12	40	62%	1978	111	37	39	76	68%
1963	54	26	11	37	69%	1979	97	41	44	85	88%

^aSource: Federal Trade Commission (1981).

^bExcluding companies for which data are not publicly available.

strengthened that act's provision restricting mergers that may have an adverse impact on competition. As discussed in more detail later in this chapter, the amended act, and subsequent court decisions interpreting it in the early 1960s, closed many horizontal and vertical avenues to firms with an urge to merge. The congressional hearings on the Celler-Kefauver amendment make clear that the Congress intended conglomerate mergers to fall within the purview of the act (Narver 1967, Chapter III), and several court decisions of the middle-1960s affirmed this fact. However, it was less likely that a diversifying acquisition would be held to adversely affect competition than would a horizontal or vertical merger. This became even more apparent with the 1974 U.S. v. Marine Bancorporation et al. decision (418 U.S. 602), after which conglomerate merger activity once again increased.

Whatever the reasons for the observed increase of conglomerate mergers, it is the possible effects of conglomerate mergers that are the focus of this study. The following section briefly discusses such effects.

C. Possible Economic Effects of Conglomerate Mergers

1. Increased aggregate concentration

Many of those concerned about conglomerate mergers emphasize the effect these mergers may have on "aggregate concentration" in the U.S. economy. As an abstract concept, aggregate concentration refers to the extent to which a relatively small number of economic agents or units

own or control private sector resources. Various measures of aggregate concentration have been constructed, and they include the percentage of assets, sales, value-added, or employment accounted for by the largest 50, 100, 200, or 1,000 firms in some population such as all U.S. corporations or all manufacturing corporations.

That there exists no consensus regarding the effect of conglomerate mergers on aggregate concentration is hardly surprising, given the lack of agreement concerning two more fundamental questions:

1) Is aggregate concentration important? and, 2) What has been the direction of change in aggregate concentration in recent years?

With respect to the first question, some economists would agree with Benston (1980) that the concept of aggregate concentration is "a meaningless tool with respect to the existence of economic power" (p. 60). The basis for this view is that the important consideration is the size of a given firm relative to other firms in each market in which the firm competes, and not its absolute size (or, its size relative to all firms).

An alternative view is that large diversified firms, with easier access to credit markets, have a financial leverage that can result in enhanced power in their individual markets (Scherer 1980, p. 104). In other words, absolute size per se confers special economic advantages that may increase a firm's relative power and/or size within a market. Also, to the extent that such firms are diversified, their size may enable them to take advantage of other effects of diversification discussed below.

Regardless of the economic importance of firm size, there may be political and social ramifications that warrant concern. Such possibilities include the greater political influence that may be associated with the control of more economic resources, the reduction in the number of independent voices from the business community that results from fewer, larger firms, and the effects on local communities of having "local" businesses headquartered in distant cities. Empirical testing of these possibilities is, of course, difficult, though in recent years an increasing number of attempts have been made (for example, Pittman 1976 and Marx 1982). Certainly, no consensus exists regarding the existence or significance of such adverse effects. However, one observer, who is most skeptical regarding any adverse political and social implications of firm size, acknowledges that those considerations are "Perhaps the principal concern of the supporters of legislation to forclose mergers of large corporations..." (Benston 1980, p. 55).

If the economic, political and social effects of aggregate concentration are subject to debate, so, to a lesser degree, is the recent trend in aggregate concentration. Depending on the data base employed and the interpretation of that data, one may conclude that concentration in the post- World War II era has been stable over time (Benston 1980, pp. 55-59), tended to increase (Backman 1970, p. 129), or is "high and ever-increasing" (U.S. Department of Justice 1979, p. 1). (The latter two conclusions, while not inconsistent, do reflect different subjective impressions of the seriousness of the perceived increases in concentration.) However, the range of these interpretations is not

large, compared with the different views regarding either the significance of aggregate concentration trends or, what is more germane to the present study, the role of conglomerate mergers in those trends.

At one end of the spectrum of thought regarding mergers and aggregate concentration is Benston (1980). He argues that the merger activity of recent years has "in no way materially affected the level of aggregate concentration" (p. 60), largely because he considers that level to have been stable throughout the period of merger activity.

A slightly less sanguine view is taken by Steiner (1975), who reviews several empirical studies and concludes that "the phenomenon of the large firm is thus not exclusively or primarily a product of the large merger" (p. 301). Steiner concedes that mergers are "an important source of upward mobility" for firms below the "largest 200" category, but contends that, especially for larger firms, internal sources of growth play a more important role (Steiner 1975, p. 299).

Shenefield does not rank internal expansion and mergers as to their importance in the growth record of large firms, stating simply that "large conglomerate mergers contribute significantly to economic concentration" (U.S. Department of Justice 1979, p. 1). This view is certainly not inconsistent with that of Steiner (1975). However, Shenefield is more concerned than is Steiner about this aspect of conglomerate mergers partly because, unlike internal growth, mergers "are identifiable, discrete events on which the law may focus" (U.S. Department of Justice 1979, p. 1). Like Shenefield, Mueller (1977) contends that if such large mergers had been prevented, the level of

aggregate concentration would be "significantly lower," and may have declined during the periods of economic growth in the 1950s and 1960s (pp. 337-39).

For purposes of this study, it is not necessary to reconcile, or choose between, conflicting views of issues surrounding aggregate concentration. Rather, it is sufficient to note that some evidence can be interpreted to indicate that conglomerate mergers have resulted in levels of concentration higher than might otherwise exist, and that there may be economic and/or political-social reasons to be concerned about any such effects of conglomerate mergers. Thus, these considerations should be borne in mind when considering the policy implications of this study.

2. Loss of market information

In a market economy, information regarding the profitability of alternative uses of resources is crucial for the efficient allocation of those resources. Under conditions of competition, resources will tend to be moved out of activities that generate below average rates of profit and into activities that generate, or are expected to generate, above average rates of profit (abstracting from differing levels of risk associated with the different activities). Diversified firms interfere with this process of market allocation of resources, to the extent that their profits are reported only on a company or divisional basis.

Typical of this problem are nine conglomerate firms studied by the FTC (1972). Varying amounts of detail concerning sales and profits

of these companies were found in their annual reports, but none of the firms provided a breakdown of invested capital or total assets on even a divisional basis. Furthermore, for the most part, sales and profit "detail" consisted of heterogeneous groupings of products "far too broad to be economically meaningful in a product sense" (FTC 1972, p. 119). The FTC study chose one of these firms as a "test case" for an in-depth search of other public sources for more useful and detailed profit information; none was found. It is also significant that of the 53 divisions shown publicly by the nine firms in the FTC study, none reported losses. However, the much more detailed internal records kept by the firms and provided to the FTC showed losses in 79 of 361 divisions (FTC 1972, p. 121). Focusing on the eight largest of these divisions for each conglomerate, nine of 72 reported losses (FTC 1972, p. 122). The study concluded that the public "divisional reporting by conglomerates functions more as a public relations device for management than as a guide to resource allocation, or as a means of protecting investors" (FTC 1972, p. 119).

The dearth of information necessary for stockholders, investors, and potential industry entrants to make optimal decisions may well result in an inefficient allocation of resources. The problem is not due to conglomerates per se; rather, it results from the combination of increasing firm diversification and the lack of requirements for firms to report relevant market information at the level of economically meaningful products and/or industries. However, lacking such requirements, it is clear that conglomerate mergers can only serve to exacerbate the problem of "imperfect information."

3. Loss of potential competitors

A final concern regarding conglomerate mergers that will not be substantively addressed in this study, but merits a brief discussion at this point, is that of potential competition. As Steiner explains, "potential competition," as it relates to conglomerate mergers, is an elusive concept with many interpretations (Steiner 1975, pp. 257-58). For present purposes it will suffice to offer two broad meanings of the term. One refers to the effect that a firm acknowledged to be a potential entrant into an industry may have on the behavior of firms currently in that industry. If the industry is characterized by a degree of oligopolistic co-operation, the established firms, in an attempt to discourage entry by other firms, may hold prices below the level that would otherwise prevail. If the most likely de novo entrant (or one of the few most likely entrants) acquires a firm in the industry, the rationale for the established firms to restrain prices to limit entry will have been removed, and prices may subsequently rise. (For a discussion of theories relating to such "limit pricing," see Scherer (1980, pp. 232-52).)

A second sense in which a conglomerate merger can be said to reduce potential competition is more straightforward. A firm may enter an industry de novo, which (ceteris paribus) results in an increase in the number of firms in the industry, or it may enter via merger, in which case the number of firms in the industry is not changed. Entry via merger, then, results in fewer firms in an industry than does de novo entry. If a given firm would, in fact, enter de novo absent

the possibility of entry by acquisition, and if the number of firms and the degree of competition in an industry are positively related, then entry by that firm via merger results in a loss of potential competition. Related to this argument is the fact that de novo entry expands production capacity in an industry, which could result in increased output and decreased price in that industry. Thus, de novo entry could move an oligopolistic or monopolistic industry closer to the price/quantity combination that would prevail under perfect competition. Again, this potential competition is foregone when entry occurs via merger.

As with most topics related to conglomerate mergers, controversy surrounds the theoretical and practical importance of the relationship between such mergers and their alleged effects on behavior in markets through a loss of potential competitors. Empirical testing of the various theories is at best difficult, and at worst intractable, involving as it does such intangibles as firms' intentions and alternative pricing actions that would otherwise have occurred.¹

4. Effects on market shares of acquired firms

The three possible effects of conglomerate mergers discussed up to this point have been relevant to, but generally beyond the scope of, the present study. Their inclusion in this introductory chapter

¹A means for empirically testing theories of potential competition in the banking industry is discussed in Rhoades (1975).

is meant to make the reader aware of the rather limited focus of the potential effects of conglomerate mergers analyzed in subsequent chapters. This perspective is especially important for drawing policy implications from the empirical results presented in Chapter V.

The potential effects of conglomerate mergers upon which this study focuses are ones that may affect the market share of a firm acquired in a merger. Since such potential effects are discussed at some length in Chapter II, they will be only briefly mentioned at this juncture.

Two practices that, in theory, may lead to an increase in the market share of an acquired firm are reciprocal buying agreements (or, reciprocity) and cross-subsidization. Reciprocity refers to the situation where two companies agree to purchase each others' products; cross-subsidization occurs when a firm uses revenues earned in one of its (geographic or product) markets to subsidize activities (sales, advertising, etc.) in another of its markets. It has been argued that conglomerate mergers enhance the possibility of these practices, although the theoretical and empirical bases for these arguments are tenuous enough to have stirred much debate.

Aside from the possibilities for reciprocity and cross-subsidization arising, Edwards (1955; 1970) contends that when large diversified firms meet in several markets an attitude of "mutual forbearance" may develop between them, each eschewing price competition in each market for fear of retaliation in other markets. If such a "live and let live" attitude develops, the result might be a stabilization of the firms'

market shares in the markets in which they meet. Though this theory is the subject of less theoretical and empirical analysis in the literature than other aspects of conglomerate mergers, both cautious support and vigorous opposition relating to it can be found.

Finally, the effects, if any, of conglomerate mergers on the production efficiency of the acquired and acquiring firms must be considered. Plausible arguments can be made that diversifying acquisitions will tend to increase production efficiency, for example by replacing poor managers or allowing scale economies of joint production to be realized. Alternatively, it may be that conglomerate mergers reduce production efficiency, for example due to managerial diseconomies. Such efficiency changes could affect the pricing or other policies, and hence the market shares, of acquired and/or acquiring firms. In terms of their importance to this study, possible efficiency effects lie somewhere between the "related but tangential" concerns of aggregate concentration, information loss, and potential competition, and the "primary considerations" of reciprocity, cross-subsidization, and mutual forbearance. This is so because the efficiency effects stemming from conglomerate mergers are important (and oft-studied) concerns themselves, and yet any such effects that do occur would be reflected in the data used in this study. Therefore, the theory and evidence relating to the efficiency effects of conglomerate mergers are discussed, if briefly, in Chapter II in conjunction with those aspects of conglomerate mergers with which this study is primarily concerned.

D. Conglomerate Mergers in Antitrust Law

1. Amended Section 7 of the Clayton Act

The key provision of American antitrust law relating to mergers is Section 7 of the Clayton Act. Section 7 of the original Clayton Act, passed by Congress in 1914, proscribed the acquisition by a company of the stock of another company if the effect of the acquisition may be to substantially lessen competition between the two companies or to tend to create a monopoly. The act had no bearing on diversifying acquisitions, focusing as it did on mergers between direct competitors. In fact, it had little effect on any merger activity, since the acquisition of the assets of a firm was not prohibited regardless of the relationship between the merging firms.

Recognizing the ineffectiveness of the Clayton Act in preventing mergers, Congress passed the Celler-Kefauver Act in 1950. This act amended Section 7 to bring asset acquisitions under the jurisdiction of the Clayton act and to broaden the range of proscribed mergers to include those that, in the words of the amendment, "may in any line of commerce in any section of the country...substantially lessen competition or tend to create a monopoly." This new phrasing replaced wording in the original act that limited application of Section 7 to direct competitors, and thus arose the possibility of conglomerate mergers running afoul of the law.

Although twelve years passed before the Supreme Court handed down a comprehensive decision under the amended Section 7 (Neale 1970,

p. 183), merger opponents found their patience rewarded by the court's application of the new law. In the Brown Shoe Co. decision (370 U.S. 294 (1962)) and subsequent decisions in the mid-1960s, the court made it increasingly difficult for horizontal and vertical acquisitions by large firms to survive tests of legality (Steiner 1975, p. 155). Many observers, such as Steiner (1975) and Dean (1970), credit this stance with being an important cause of the dramatic increase in the number of conglomerate mergers that occurred in the latter years of the 1960s. Though this argument is likely correct, conglomerate mergers themselves were subjected to increased scrutiny for antitrust violations by the court beginning in 1965. The concern was that such mergers "may substantially lessen competition" through the increased probability of such practices as reciprocity, cross-subsidization, or the loss of potential competition, as the following discussion of five important conglomerate merger cases indicates.

Reciprocity was the focus of the first conglomerate merger case to come before the Supreme Court (Neale 1970, p. 191), in *FTC v. Consolidated Foods Corp. et al.* (380 U.S. 592 (1965)). The FTC found that Consolidated, a large wholesaler and retailer of processed foods, had violated Section 7 by purchasing Gentry, Inc., a manufacturer of dehydrated onion and garlic. The argument was that Consolidated could exert pressure on its suppliers to purchase from Gentry in order to maintain their business relationships with Consolidated. Refusing to rely on the post-merger record (which provided conflicting evidence relating to reciprocity), the court sustained the FTC decision on the

basis of a substantial probability that the merger would result in anti-competitive reciprocity. A concurring, but weaker, opinion written by Justice Stewart provided the basis for several subsequent government defeats in conglomerate merger cases involving the potential for reciprocity. The court's current view of the reciprocity that might result from conglomerate mergers is not entirely clear (Steiner 1975, pp. 244-48).

In the 1967 Procter and Gamble decision (386 U.S. 568), both the issues of cross-subsidization and potential competition were raised as the result of Procter and Gamble's acquisition of Clorox Chemical Company, the leading manufacturer of household liquid bleach. This product extension merger was challenged by the FTC due to the concentrated nature of the bleach market, the dominant position of Clorox in that market, and the possibility that subsequent to the merger Clorox's dominance would be further strengthened. The Supreme Court upheld the FTC ruling, noting that Procter's ability to bring to bear in the bleach market its enormous resources, especially its advertising budget and its profits from other markets to finance cross-subsidization, might dissuade smaller competitors from aggressively competing in the market. Although the cross-subsidization aspect of the case was prominent in the court's decision, such "deep pocket" arguments have not played a major role in subsequent conglomerate merger decisions (Scherer 1980, p. 560).

Of more enduring importance was the court's finding that Procter and Gamble was a potential de novo entrant to the bleach industry prior

to the merger, exerting "considerable influence" on the market behavior of firms in that industry. The loss of this moderating influence was an additional reason cited for disallowing the merger. The loss of a potential competitor had figured in previous court decisions, such as *U.S. v. El Paso Natural Gas Co. et al.* (376 U.S. 651 (1964)), but the application of the doctrine to conglomerate mergers clearly represented a fortification of the antitrust arsenal to be used against such mergers.

After several lower court decisions disallowing conglomerate mergers on potential competition grounds (Steiner 1975, p. 269), the Supreme Court, in *U.S. v. Falstaff Brewing Corp. et al.* (410 U.S. 526 (1973)) and *U.S. v. Marine Bancorporation et al.* (418 U.S. 602 (1974)), imposed more difficult burden of proof requirements to stop mergers on those grounds. Essentially, the new court guidelines require evidence that the existence of a potential competitor in fact tempered oligopolistic pricing behavior before the merger can be disallowed on a "loss of potential competition" basis. Not surprisingly, the government subsequently lost a number of successive cases brought against mergers on potential competition grounds (Scherer 1980, p. 562).

One aspect of conglomerate merger law related to potential competition, but not yet addressed by the Supreme Court, concerns the acquisition of a firm with a small market share in a concentrated market, referred to as a "toe-hold" acquisition. In *Bendix Corp. v. FTC* (450 F. 2nd 534 (1971)), the appeals court struck down the acquisition of Fram Corporation by Bendix on the basis of Fram's 17.2% share of the concentrated automotive oil filter market and Bendix's position as a

potential entrant. (Note that this decision was reached prior to the Falstaff and Marine Bancorporation decisions.) However, the court clearly stated that had Bendix entered the industry via a toe-hold acquisition, it would not have violated Section 7, since such a merger "may be as economically desirable and beneficial to competition as internal expansion into a relevant market..." (450 F. 2nd 534 (1971, p. 536)). Their reasoning was that a firm such as Bendix could use its resources to allow a relatively small firm in a market to expand its market share and inject aggressive competition into a competitively stagnant oligopolistic market. Furthermore, the court noted that if significant barriers to de novo entry exist in an industry, a toe-hold acquisition might be the only way of introducing new competition to the industry. Thus, the defense of certain conglomerate mergers as being pro-competitive was accepted into judicial case law. Considering the Falstaff and Marine Bancorporation decisions, and the apparently diminished importance accorded to the possibilities of reciprocity and cross-subsidization, conglomerate mergers may be said to currently be subject to relatively gentle treatment under U.S. antitrust law.

2. Proposed changes in the legal status of conglomerate mergers

The controversy over the effects of conglomerate mergers has, predictably, sparked a controversy relating to the legal status of such mergers. On the one hand are proposals to restrict the occurrence of conglomerate mergers. The report issued in 1969 by a task force commissioned by President Johnson (the "Neal Report") recommended that

mergers between large firms and leading firms in concentrated markets should be prohibited under new legislation (Warren 1975, p. 289). This recommendation was made at a time when the Justice Department, under its then existing conglomerate merger guidelines (Neale 1970, pp. 503-5), was pursuing its most vigorous prosecution to this date against such mergers. As the conglomerate merger "wave" of the late 1960s subsided, so did calls for legislative action to oppose diversifying acquisitions. The renewed merger activity of the mid-to-late 1970s led to a renewal of the push for public policy changes. In 1979, the Justice Department called for "effective, yet flexible" legislation, noting that "major social, political and competitive concerns raised by conglomerate mergers are beyond the reach of existing law" (U.S. Department of Justice 1979, p. 21 and p. 31). Such proposals were introduced by the Department of Justice, the FTC, and Senator Edward Kennedy at congressional hearings held during 1979. Although the specifics of the proposals varied, all of them sought to prevent certain acquisitions by large firms, without the government needing to show a probability of specific anti-competitive practices. As such, they may be viewed as attempts to shift the focus of concern regarding conglomerate mergers from the traditional antitrust emphasis on competition in individual markets to a broader view encompassing those mergers' effects on corporate "bigness" in general. If so, the change in perspective might be the result either of accepting the view that conglomerate mergers are unlikely to adversely affect competition in individual markets, or accepting the fact that the courts have increasingly taken

such a stand.

Another view of public policy relating to conglomerate mergers is that taken by Benston (1980), Bork (1970), and others. Their recommendations emphatically oppose any new anti-merger legislation, and, in most cases, oppose prosecution of conglomerate mergers under the existing Section 7 of the Clayton Act. The bases for this position include the alleged efficiencies that result from conglomerate mergers, the lack of clear-cut evidence of harmful effects of such mergers, and the administrative costs (public and private) of enforcing any of the proposed laws. For these and other reasons, Benston concludes that the proposed legislation "would harm American entrepreneurs, shareholders, managers, workers, communities, and consumers, as well as our political democracy" (Benston 1980, p. 66).

Intermediate positions between the two extremes can also be found. (See Steiner (1975, Chapter 12).) However, until more agreement can be reached regarding the effects of conglomerate mergers, it is unlikely that "compromise" solutions will find any greater acceptance than their more extreme counterparts. The remainder of this study is a modest attempt to contribute to an understanding of the economic effects of conglomerate mergers.

E. Overview of the Remainder of this Dissertation

In Chapter II, the theoretical relationship between conglomerate mergers, changes in the market shares of acquired firms, and competition

in the acquired firm's market are discussed. Evidence from previous studies that investigated these relationships is discussed in Chapter III. Chapter IV presents a model for analyzing the effects of conglomerate mergers on industry concentration, and a discussion of the data used to test the model. Evidence from estimation of the model, as well as related evidence, is presented and interpreted in Chapter V. A summary of this study and a brief discussion of some implications of its results are presented in Chapter VI.

II. MARKET CONCENTRATION AND CONGLOMERATE MERGERS

This chapter explains the concept of market concentration, and examines some of the ways in which it might be related to conglomerate mergers. In Section A, the theoretical importance and the measurement of market concentration are discussed. The following two sections develop the possible relationship between a conglomerate merger and changes in market concentration. Such a relationship is itself the result of two more fundamental relationships: that between a conglomerate merger and a change in the market share of the acquired firm, and that between a market share change and a change in market concentration. Therefore, these two relationships are discussed, in turn, in Sections B and C. Section D considers the potential effects of more than one conglomerate merger occurring in an industry, and a brief summary of the chapter appears as Section E.

A. Market Concentration

1. Market concentration and competition

The terms "market" and "industry" are not, in general, synonymous, industries being defined by goods or services produced and markets by the groups of buyers and sellers of those goods and services. Thus, a given industry may consist of one or more markets. For example, restaurants in New York and Houston may be thought of as being in the same industry, but in different markets. Nevertheless, the two terms

will be used interchangeably in this study for two reasons. First, the concentration ratios to be used in the study are based on the assumption of national markets. Second, the difference between industries and markets is not as often distinct in the manufacturing sector (the focus of this study) as it is in other sectors of the economy, although some local and regional markets do exist in the manufacturing sector.

Market concentration generally refers to the number of firms and the distribution of their market shares in a given market. At one extreme is the "perfectly competitive" market, in which there is a large number of firms and the market share of each firm is so small as to prevent the firm from appreciably affecting the industry price. At the other extreme, in a monopoly market one firm has a 100% market share for a good or service with no close substitutes. In between these two extremes lie the vast majority of real-world economic markets, some closer to one extreme and some closer to the other.

Conventional wisdom in economics holds that the fewer firms there are accounting for a large percentage of sales in a market, ceteris paribus, the less price competition will occur in that market. Weiss (1974, pp. 188-93), for example, has detailed at least eight variants of oligopoly theory that relate levels of market concentration to market power with respect to prices. The crux of the matter in all of these theories is the interdependence of firms' profit-maximizing decisions in oligopolistic industries. Then, the fewer rivals a firm has, the less difficult it is to ascertain its rivals' intentions, whether by experience, tacit understandings, or overt collusion. If

this leads to co-operation among firms, the industry price will be kept at a higher level than that which would result from a more independent pursuit of self-interest on the part of each firm.

In recent years, some dissension from this perspective has emerged among a minority of economists. In particular, Demsetz (1974) has argued that there is "no serious theoretical basis" (p. 166) for expecting a relationship between market concentration and market power with respect to price. His view seems to be that potential and actual entry into an industry constrains the pricing decisions of existing firms, and forces prices to approximately competitive levels, in the absence of government-erected barriers to entry.

Two of the means that have been employed to test these opposing theories are studies of the relationship between concentration and price, and studies of the relationship between concentration and industry profits. The number of studies of the former type is relatively small, due to the inappropriateness of comparing prices of diverse industries' products. In industries with several distinct regional or local markets, however, the concentration-price relationship can be meaningfully analyzed. Scherer (1980, pp. 287-88) reports the results of such studies of the banking, gasoline, and food retailing industries, all of which support the existence of a positive relation between market concentration and market prices, as predicted by conventional economic theory.

It is not necessarily the case that higher prices will result in supra-normal profits in an industry, since low market demand or excess industry capacity may cause a concomitant high average cost. Also,

high industry profits in concentrated industries may reflect low average costs resulting from economies of scale or superior management, rather than reflect a high price due to monopoly power. These ambiguities notwithstanding, there has been extensive research into a concentration-profits relationship as a means of indirectly testing the concentration-market power theories. (See Weiss (1974) for a summary of such studies.) In spite of serious data difficulties, the overwhelming majority of these studies provide moderate-to-weak support for the existence of a positive relationship between concentration and industry profits. Together with evidence from the concentration-price investigations, they buttress the view that market concentration is an important factor in determining the amount of price competition in individual markets.

2. The measurement of market concentration

As discussed in the preceding section, general, though hardly unanimous, agreement exists among economists that market concentration is a factor that affects competition. Less agreement exists with respect to the most appropriate means of measuring market concentration. The most often used measures for manufacturing industries are the four-firm and eight-firm concentration ratios (CR-4 and CR-8, respectively) compiled by the Bureau of the Census and published by the U.S. Department of Commerce (1981a) using the Standard Industrial Classification (SIC) system. This system arranges manufacturing firm data into categories with a two-, three-, four-, or five-digit number, where more digits represent more disaggregation. For example, a firm producing roofing

asphalt would be classified into major industry group 29 ("petroleum and coal products"), industry group 295 ("roofing and paving materials"), industry 2952 ("asphalt felts and coatings"), and product class 29522 ("roofing asphalts and pitches"). The CR-4 and CR-8 figures are published at the four-digit (and five-digit) level(s), and show the percentage of sales accounted for by the four and eight largest firms in each industry (and product class). (The 20-firm and 50-firm concentration ratios are also compiled and published in the same report.)

The primary attribute of these measures of concentration, as compared with the measures briefly discussed below, is their fairly comprehensive availability, in a readily usable form, to all researchers. For the manufacturing sector, 450 four-digit industries are identified, and data for many of these cover, at regular intervals, the entire post-World War II period.

To be sure, many problems are associated with the use of these concentration ratios to measure market concentration. For one, the markets represented by the ratios are defined as being national in scope. For goods that are perishable or relatively expensive to transport, regional or local market definitions would be more economically meaningful. Second, some markets are defined so as to include products that are not reasonably close substitutes for each other, from the point of view of customers. (Often, such market definitions are based on the degree of substitutability in production, or, cross-elasticity of supply.) These two factors cause the concentration ratios so affected to understate the true degree of seller concentration with

respect to market sales.

On the other hand, at least two factors exist that cause some concentration ratios to overstate the true degree of seller concentration. The first is the failure, in some industry definitions, to include products that serve as close substitutes for the products in the industry. The second is the exclusion of imports from all industry calculations. In those markets where imports are a substantial portion of domestic consumption (e.g., automobiles, electronic equipment, etc.), and in an environment of increasing international trade, this latter problem may be the most serious of all.

Further problems with the ratios include their failure to measure the dispersion of sales among the industry leaders, and the failure to adequately account for varying degrees of "fringe firm" (non-leading firm) competition. In spite of these and other drawbacks of the ratios, as Mueller and Hamm (1974, pp. 511) note, "Most industrial organization economists agree that concentration ratios...are the best available... useful measures of one dimension of the extent of oligopoly in American industry."

The resignation with which most economists accept such a flawed measure of concentration is best explained by a brief look at some alternative measures. One is the Herfindahl-Hirschman Index, H:

$$H = \sum_{i=1}^N S_i^2$$

where S_i is the market share of the i th firm and N is the number of firms in the industry (Scherer 1980, p. 58). The index approaches its

maximum value of one as the number of firms decreases, and also as the inequality among the market shares of a given number of firms increases.

Another measure, a "comprehensive concentration index" (CCI), is proposed by Horvath (1970). Its formula is:

$$CCI = X_1 + \sum_{j=2}^N (X_j)^2 (1 + (1 - X_j)), \quad i = 1; j = 2, 3, \dots, N$$

where N is the number of firms in the industry and X is the fraction of sales for each individual firm, X_1 being the largest, and the remaining shares being ranked in descending order of size. CCI reflects the largest firm's market share and the size of each of the remaining firms relative to the dominant firm and to each other.

Both of these measures share with the concentration ratios the problem of the correct definition of a market or industry. The H and CCI measures do, though, take into account the potential for fringe firm competition and the dispersion of sales among leading firms, and so represent a conceptual advance beyond the concentration ratios. Unfortunately, however, the precise market share data necessary for the calculation of H and CCI is unavailable to private researchers for most industries. Until such data are made available, the many disadvantages of using concentration ratios will continue to be outweighed by this single advantage: comprehensive concentration ratio data are easily obtained.

B. Conglomerate Mergers and Changes in the Market Share of an Acquired Firm

The market share of a firm acquired in a conglomerate merger may be affected in two ways: through an increase in the firm's market power vis-à-vis its competitors, or through a change in the firm's efficiency in producing or marketing its products. The concern about the conglomerate mergers of the 1960s and 1970s, and the proposed public policies resulting from that concern, stemmed largely from a fear of increased market power for the acquired firm. As discussed briefly in the introductory chapter, expected manifestations of this increased market power include reciprocal buying practices, cross-subsidization strategies, and mutual forbearance between large conglomerates. These possibilities will now be examined more closely, followed by a discussion of the alleged efficiency effects of conglomerate mergers.

Reciprocal dealing, or reciprocity, refers to the situation where two companies, firms A and B, purchase each other's products. Such a practice is innocuous in its economic effects as long as both companies feel free to purchase elsewhere and make purchasing decisions solely on the basis of quality and price. It may even be beneficial, to the extent that transactions costs are reduced. However, price competition and economic efficiency can be reduced if, for example, firm A agrees to purchase from firm B only if B agrees to purchase from A at a price above that at which B could purchase equal-quality products from A's competitors. This situation could occur if A is a large and valued buyer of B's products; in other words, reciprocity can result from A's

monopsony power.

In addition to causing allocative inefficiency by replacing price as the allocative device, reciprocity may also constitute an entry barrier, as potential entrants to an industry may be discouraged by reciprocal buying arrangements of existing firms. This would be especially possible in the case of a small specialized potential entrant, with no buying power leverage of its own.

Although possibilities for reciprocity exist in the absence of any mergers, it has been argued (Steiner 1975, p. 226) that a conglomerate merger increases the possibility of such practices; by increasing the diversification of the acquiring firm, such a merger increases the number of its opportunities for establishing reciprocal relationships. An example would be the acquisition by ITT of the Canteen food service company. In order to maintain ITT's custom, its many suppliers might be induced to use Canteen's services even at a premium price. It is such a situation that concerns some opponents of conglomerate mergers.

Backman (1970, p. 99) has argued, as have others, that anti-competitive reciprocity is unlikely to occur, because it is costly and inefficient for the firms practicing it, and because it conflicts with the "profit center" concept of managing large diversified companies. (A "profit center" is an operating unit of a company with its own decentralized purchasing and sales departments. At ITT, for example, the manager of a profit center is rewarded or penalized according to the profit performance of the profit center for which that manager is responsible (Geneen 1970). The argument is that a profit center manager

would refuse to make purchasing decisions on the basis of benefits that might accrue to any other profit center.) Thus, Backman (1970, p. 95) claims, "The theory of 'reciprocity effect' is exaggerated beyond all relationship to its possible economic importance." Still, evidence from court cases¹ and interviews with company executives (Greer 1980, p. 427) indicate the anti-competitive effects of the practice are not entirely hypothetical.

Another practice that, it is alleged, can increase the market share of a firm acquired in a conglomerate merger is cross-subsidization, or, a "deep pocket" strategy. This would occur when a firm lowers the price in one of its markets with the intent of thereby gaining a sufficient share of the market to subsequently increase its price above the level that would otherwise have existed. To do this, a firm needs a source of revenue to subsidize sales in the target market. A diversified firm would have the opportunity to draw funds from its profitable product lines or geographic markets in order to pursue such a "deep pocket" strategy for increasing the market share of a firm it acquires; hence, the concern over the possibility of this situation arising due to conglomerate mergers.

One form of cross-subsidization is predatory pricing, which can be defined as a firm's reduction of its price below the average cost of one or a few specific competitors (and perhaps below the average cost

¹For example, In re: Waugh Mfg. Co., 15 FTC 232 (1931); FTC v. Consolidated Foods Corp., 380 U.S. 592 (1965); and, U.S. v. General Dynamics Corp., 258 F. Supp. 36 (1966).

of the predator firm as well), the intent being to drive these firms out of business. In order for such a strategy to be profitable, it is necessary that the firms exit quickly in response to the price cuts, that subsequent re-entry is difficult and slow, and that the predator's time discount rate is low (Scherer 1980, p. 338). Economists of widely varying persuasions are skeptical regarding the occurrence of this extreme form of cross-subsidization, due to the restrictive conditions under which it is profitable. Also, the practice might be inhibited by the use of profit centers in managing a conglomerate.

There are milder forms of cross-subsidization that, while falling short of classic predatory pricing, can be advantageous to a firm practicing them. Greer (1980, p. 432) refers to them as "power investments," and includes in this category spending for advertising and other forms of product differentiation. In the same vein, Scherer (1980, p. 338) describes actions by an industry leader to enforce industry pricing "discipline." These actions can result in increased market power, and firms wanting to attempt them would likely turn to internally generated funds. Again, the opportunity to do this is greater for a diversified firm than for a specialized firm, ceteris paribus, and so a conglomerate acquisition raises concerns in some quarters in this regard.

Evidence of the practical significance of cross-subsidization is hard to come by. Instances of classic predatory pricing might include

the original Standard Oil Company¹ and Reynolds Metals Company² cases, although a revisionist history of the former case is accepted by some, such as McGee (1958). The advertising campaign for Miller Beer subsidized by the tobacco revenues of the parent company, Phillip Morris, is one example of the "power investment" strategy discussed above.³ The same possibility concerned the U.S. Supreme Court in its decision to uphold the FTC in disallowing the acquisition of Clorox Chemical Company by Procter and Gamble Company.⁴ More comprehensive analysis is largely precluded by the unavailability of profit and expenditure data for each of a diversified firm's products. Lack of such data prevents one from having a reasonable estimate of the extent to which cross-subsidization in any of its forms exists.

Another concern raised in regard to conglomerate mergers is the possibility that an attitude of mutual forbearance may develop between large diversified firms that face each other as rivals in numerous markets (Edwards 1955; 1970). While reciprocity and cross-subsidization can be thought of as possible means for increasing the market share of an acquired firm, mutual forbearance would be more likely to result in the stabilization of the market shares of the acquired firm and others in the acquired firm's industry. A firm with the opportunity to

¹Standard Oil Company of New Jersey v. U.S., 221 U.S. 1 (1911).

²Reynolds Metals Co. v. FTC, 309 F. 2nd 223 (1962).

³Business Week, November 8, 1976, pp. 58-67.

⁴FTC v. Procter and Gamble Co., 386 U.S. 568 (1967).

aggressively compete for sales in one market in which it operates may decline that opportunity, fearing that such action might provoke its rivals in that market to retaliate in another market common to each. A "live and let live" attitude regarding competition for increased market shares may develop between the firms, as each perceives the potential losses from such retaliation to exceed any potential gains from an aggressive competitive act.

Large diversified firms that are rivals in two or more markets may find themselves in one of two situations when facing each other in one of those markets (Edwards 1970, pp. 436-38). Either they will differ considerably with respect to the importance each places on its sales and profits from that market, or they will be similar in that regard. In the former instance, "the most sensible policy for each firm is to recognize the other's priority of interest for products important to the other but not to it, in the expectation that similar recognition will be given reciprocally" (Edwards 1970, p. 437). In other words, "spheres of influence" may develop between conglomerates with substantially the same areas, but differing emphases, of diversification. In the instance of conglomerates that have similar areas and emphases of diversification, "the relation between competitors is likely to have aspects of mutual forbearance, akin both in kind and motivation to that which is attributed by many economists to oligopoly" (Edwards 1970, p. 437). In either case, the assertion is that competition between large diversified firms will be weakened, and the implication is a rigidity of market structures.

Limited evidence of the existence of mutual forbearance between diversified firms can be found, most of it anecdotal. (For examples, see Greer (1980, p. 422).) As well, at least two empirical studies of the phenomenon have been completed, one supporting its existence in the banking industry (Heggstad and Rhoades 1978), and one failing to support its existence in the Japanese economy (Caves and Uekusa 1976, pp. 72-86). As in the cases of reciprocity and cross-subsidization, a direct test of this hypothetical result of diversification through merger is rendered extremely difficult by the lack of availability of the necessary data.

The preceding discussion dealt with strategies that might be pursued by a conglomerate firm to increase the market share of an acquired firm (or, in the case of mutual forbearance, stabilize an acquired firm's market share). Although there is no consensus that such activities occur to a significant degree, to the extent that they do occur they would clearly interfere with the allocative efficiency of market results. Another set of hypotheses about the effects of conglomerate mergers concerns the production efficiency of the conglomerate firms and their acquisitions.

In a sense, the issue of conglomerate efficiency in production is tangential to the question of how a conglomerate merger affects the market power of the acquired firm. In overly simple terms, the two issues can be thought of as the cost-reducing (or cost-increasing) and the price-increasing (or, market share-increasing) effects of conglomerate mergers, respectively. The latter effects, having to do with the allocative efficiency of markets, are the focus of this study. Any such

effects, whether beneficial or harmful to competition, could arise regardless of the effects on an individual firm's production efficiency. However, a change in a firm's level of efficiency can affect that firm's ability to engage in price competition, if not necessarily its willingness to do so. Also, since the present study has a fairly narrow perspective, any policy considerations stemming from its results must be considered in light of some familiarity with evidence pertaining to other perspectives, such as conglomerate efficiency.

Most of the controversy surrounding the production efficiency effects of conglomerate mergers concerns the existence of one or more means by which such a merger can increase the efficiency of the acquired and/or the acquiring firm. Sources of possible real economies resulting from conglomerate mergers include reduced risk of firm failure due to a sales downturn in any single product line, the replacement of poor managers, and joint production of products to take advantage of scale economies at various levels of production. (See Benston (1980, pp. 31-35) as an example of the many discussions of the possible "synergistic" effects of conglomerate mergers.) If evidence of significant resource savings from such sources could be found, it would constitute a strong argument in favor of conglomerate mergers.

Mueller (1977) has conducted an extensive review of studies that search for increases in firm efficiency due to conglomerate mergers. He found "a surprisingly consistent picture" showing that conglomerate mergers "have not resulted in increased efficiency" (Mueller 1977, p. 344); Scherer (1980, p. 141) has reached a similar conclusion.

Benston (1980, p. 2 and pp. 44-45), reviewing many of the same studies as Mueller (1977) and Scherer (1980), concludes that conglomerate mergers have led to increased efficiency, but his view is largely based on findings of gains to shareholders of acquired firms. These findings are also reported by Mueller (1977) and Scherer (1980), but are explained as mainly resulting from the payment by acquiring firms of a premium over the market value of the acquired firms. (In this context, Mueller (1977, p. 332) concedes that the mergers "appear to have generated [some] efficiency gains," contradicting somewhat his final conclusion cited above.) At the least, it seems safe to conclude that there is a lack of evidence of dramatic economies arising from conglomerate mergers. Thus, it does not seem likely that increased efficiency of acquired firms is a factor that will be found in this study to have affected the market shares of those firms.

The evidence just discussed obviously also relates to the possibility that conglomerate mergers might reduce the efficiency of the acquired or the acquiring firms. Although the theory underlying such a hypothesis has not been carefully developed in the literature, it is implied by theories of managerial diseconomies (Dean 1970). Specifically, it could be argued that in the process of diversifying, a conglomerate may so increase its corporate co-ordination problems that an overall reduction in firm efficiency results. This might happen because of the relatively rapid diversification entailed by conglomerate acquisition, as opposed to the (presumably) more lengthy process of internal development of a new product line. Also, more careful

consideration of the advisability of adding a new product line may occur in the case of internal development. As Dean (1970) argues, conglomerate acquisitions often occur as the result of opportunity (i.e., the acquisition is "doable"), rather than because of significant complementarities between the acquired and acquiring firms. If, as he claims, managerial ability is not easily transferable across industries, the result might be poorer performance of the acquired firm, and, thus, a loss of its market share.

Although business publications abound in examples of conglomerates that were unable to "digest" one or another of their acquisitions, the evidence cited earlier indicates that this problem is not a general one. Therefore, any trend toward decreases in the market shares of acquired firms observed in this study would not likely be attributable to conglomerate-related managerial inefficiencies.

C. Changes in Market Shares and Changes in Market Concentration

As explained previously, this study assumes the perspective of conventional economic theory that competition in a market is affected by the distribution of the market shares of firms in that market. From this perspective, one may infer the effects of conglomerate mergers on competition by observing the effects of those mergers on the market shares of acquired firms. Unfortunately, the requisite market share data for such an inference are generally unavailable. Therefore, it is also necessary in such an inquiry to infer changes in market shares from

changes in market concentration ratios, for which data are available. It is hoped that this doubly indirect approach will yield some insight regarding the effects, if any, of conglomerate mergers on competition. This section details the possible ways in which changes in market shares of acquired firms can be related to changes in market concentration. Throughout the following discussion it is assumed that the only source of change in market shares is a change in the market share of an acquired firm.

If the acquired firm were one of the leading firms (the four or eight largest) in its market, any increase in its market share that is not at the expense of the other leading firms' shares will cause concentration in that market to increase. Any loss of its market share that is not captured by the other leading firms will cause concentration to decrease. The concentration ratio will remain unchanged if any increase or decrease in the acquired firm's market share is entirely taken from, or captured by, the other leading firms. Thus, a change in the market share of an acquired leading firm could cause concentration in its market to increase, decrease, or remain unchanged.

The effect of the acquisition of a non-leading firm is a bit more complicated. If such a firm loses some of its market share after the acquisition, the concentration ratio would increase if at least some of that share were acquired by a leading firm. If all of the lost market share were acquired by non-leading firms, the concentration ratio would likely remain unchanged, ceteris paribus, but it would increase if another non-leading firm acquired enough of the lost market share to

push that firm into a leading firm position. In no case could the lost market share of an acquired non-leading firm result in a decrease in market concentration. So, assuming that in at least some instances the lost market share is acquired by leading firms, the average effect in this case would be an increase in market concentration.

If an acquired non-leading firm increases its market share post-acquisition, the concentration ratio can, in theory, either increase, decrease, or remain unchanged. The three possibilities are presented algebraically below for the case of CR-4. The following notation is used:

S_i is the market share of the i th firm in the industry, when the firms are ranked $i = 1, 2, \dots, n$ from largest to smallest, according to their market shares.

S_A is the market share of the acquired firm, A.

Superscript 1 denotes the situation at the time of the acquisition of firm A (period 1).

Superscript 2 denotes the post-acquisition situation (period 2).

In the cases considered here, it is assumed that $S_A^2 > S_A^1$, i.e., the market share of the acquired non-leading firm increases post-acquisition.

By definition, the four-firm concentration ratios in the industry in

periods 1 and 2 are $\sum_{i=1}^4 S_i^1$ and $\sum_{i=1}^4 S_i^2$, respectively.

If firm A, due to a post-acquisition increase in its market share, becomes a leading firm by period 2, then by definition firm A has displaced one of the firms that was a leading firm in period 1. In this

situation, S_D^1 denotes the period 1 market share of the leading firm that firm A displaces post-acquisition (by period 2). Thus, $S_A^2 - S_D^1$ is the difference between the market share of firm A in period 2 and the market share in period 1 of the firm that is displaced (between periods 1 and 2) by firm A. Further, the combined lost market share (between periods 1 and 2) of the leading firms other than the one displaced by firm A can

be denoted as $\sum_{i=1}^3 (S_i^1 - S_i^2)$.

$$\text{Case 1: } \sum_{i=1}^4 S_i^1 = \sum_{i=1}^4 S_i^2, \text{ or, no change in CR-4.}$$

A post-acquisition increase in the market share of an acquired non-leading firm will not affect CR-4 if either of the following conditions holds:

a) if all of the post-acquisition increase in firm A's market share comes from other non-leading firms, and $S_A^2 < S_i^1$ for all leading firms. (The second part of this condition means that firm A does not become a leading firm by period 2); or,

b) if $S_A^2 - S_D^1 = \sum_{i=1}^3 (S_i^1 - S_i^2)$. Under this condition, firm

A becomes a leading firm by period 2, but the difference between firm A's market share in period 2 and the displaced firm's market share in period 1 is equal to the combined lost market share of the other three leading firms.

Case 2: $\sum_{i=1}^4 S_i^1 > \sum_{i=1}^4 S_i^2$, or, a decrease in CR-4.

CR-4 will decrease if at least some of the increase in firm A's market share is obtained from a decrease in the combined market shares of the leading firms, and if either of the following conditions also holds:

a) if firm A does not become a leading firm by period 2; or,

b) if $S_A^2 - S_D^1 < \sum_{i=1}^3 (S_i^1 - S_i^2)$.

Case 3: $\sum_{i=1}^4 S_i^1 < \sum_{i=1}^4 S_i^2$, or, an increase in CR-4.

CR-4 will increase only if both of the following conditions hold:

a) if firm A becomes a leading firm by period 2; and

b) if $S_A^2 - S_D^1 > \sum_{i=1}^3 (S_i^1 - S_i^2)$.

In other words, in order for the acquisition of a non-leading firm to result in an increase in concentration because of an increase in the acquired firm's market share, two conditions must hold. First, the acquired firm must become one of the leading firms. Second, its ultimate market share must exceed the share of a displaced original leading firm by an amount greater than the sum of the differences between the pre- and post-merger shares of the other leading firms (which need not be the same firms in both periods). Evidence presented by Goldberg (1972) and the FTC (1972) suggests that the first of these conditions

is not likely to be often met. Consideration of the second condition makes the likelihood of Case 3 occurring rather small. Hence, the average effect of an increase in the market share of an acquired non-leading firm is expected to be a decrease in concentration.

In light of the preceding discussion, then, concentration may be expected to decrease in three different instances:

- 1) the market share of an acquired non-leading firm increases due to its increased efficiency (but the firm does not become a leading firm);
- 2) the market share of an acquired non-leading firm increases due to the practice of reciprocity, cross-subsidization, or similar "anti-competitive" practices (but the firm does not become a leading firm); or,
- 3) the market share of an acquired leading firm decreases due to its reduced efficiency.

Recall that the perspective of this study, and, indeed, of most analyses of conglomerate merger effects, is that a decrease in concentration is desirable from the standpoint of increasing competition. Note, however, that only in the first of the above cases does this desirable effect stem from an unambiguously desirable cause. In the second case, concentration decreases as a result of the same actions that would be condemned for causing an increase in concentration if the acquired firm were an industry leader. In the third case, reduced firm efficiency, seldom applauded by economists, is seen to reduce concentration and perhaps ultimately lead to increased allocative efficiency.

If concentration increases as a result of a conglomerate merger, the reason would be one of the following:

- 1) an increase in the market share of an acquired leading firm due to its increased efficiency;
- 2) an increase in the market share of an acquired leading firm due to its "anti-competitive" practices; or,
- 3) a decrease in the market share of an acquired non-leading firm due to its decreased efficiency.

(A fourth possibility is the unlikely Case 3 explained on Page 44 above, where the acquired non-leading firm becomes a leading firm after increasing its market share due to its increased efficiency

or its "anti-competitive" practices, and $S_A^2 - S_D^1 > \sum_{i=1}^3 (S_i^1 - S_i^2)$.)

While an increase in market concentration may be generally undesirable, the first case above indicates (as does the unlikely fourth possibility) that it may result from a desirable increase in firm efficiency.

The paradoxes just described, of desirable effects caused by, or accompanied by, undesirable ones, should be borne in mind during any interpretation of empirical results regarding the effects of conglomerate mergers on changes in industry concentration. They also render ambiguous the use of "pro-competitive" and "anti-competitive" to describe those effects, a practice common in the literature on conglomerate mergers.

D. Industries Experiencing Multiple Conglomerate Mergers

A final theoretical consideration concerns the occurrence of more than one conglomerate merger into a particular industry. It is not immediately clear whether this situation would tend to increase or reduce the likelihood of a change in the market shares of acquired firms. On the one hand, there are at least two reasons that multiple conglomerate mergers into an industry might reduce the likelihood of a change in concentration. First, the more firms that gain an "advantage" in a market from acquisition by a firm outside that market, the smaller is each firm's relative advantage; in the extreme, an advantage for each is an advantage for none. The same reasoning holds for any disadvantages due to conglomerate acquisition. Second, the possibilities for mutual forbearance increase, ceteris paribus, the more conglomerate firms there are that meet in an industry. Since an implication of mutual forbearance is the increased stability of market shares, this supports a hypothesis that more conglomerate mergers in an industry will be associated with less change in concentration.

On the other hand, it can be argued that if each conglomerate merger has a given probability of affecting concentration, an increase in the number of such mergers into an industry increases the probability of some change in concentration in that industry. This line of reasoning, of course, requires the probability that a given merger, M_1 , will affect concentration to be sufficiently independent of the existence of other conglomerate mergers; in other words, if other mergers

into an industry mitigate the effects of M_i , the sum of the effects of those mergers on concentration must be assumed to outweigh any mitigating influence on the effects of M_i that they might exert.

Because of the conflicting possibilities just discussed, the effects on changes in industry concentration in the event of multiple conglomerate mergers into an industry are even more difficult to predict than the effect of a single conglomerate merger.

E. Summary

The discussion in this chapter has examined the theoretical relationship between conglomerate mergers and changes in market concentration. Competing theories have led to different predictions in at least two areas with which this dissertation is concerned: the direction, if any, in which a conglomerate merger might be expected to change an acquired firm's market share and concentration in that firm's industry; and, whether any competitive effects of conglomerate mergers become more likely or less likely in the event of multiple mergers in an industry. These questions will be addressed in the empirical work of this study, in Chapters IV and V. First, though, it will be useful to discuss the evidence from relevant studies by other researchers. Such a discussion is the focus of the following chapter.

III. REVIEW OF RELEVANT LITERATURE

Most studies of conglomerate mergers have been concerned with the production efficiency effects for firms that have engaged in conglomerate mergers, rather than with the effects on competition in industries that have experienced such mergers. The studies attempt to discern whether large diversified firms are able to reduce costs relative to more specialized firms due to risk-spreading, lower borrowing costs, faster redeployment of capital, or other advantages. If such an effect could be demonstrated, then it might wholly or partially offset any anti-competitive effects of mergers that result in the ability to raise prices above costs.

Results from these studies were discussed briefly in Chapter II, where it was concluded that there is little evidence of dramatic efficiency (or inefficiency) effects on firms as a result of their having been involved in conglomerate mergers. In any event, efficiency gains or their absence have no necessary relationship to the competitive effects of conglomerate mergers due to reciprocal buying, deep-pocket strategies, or mutual forbearance, which are the primary focus of this study. Therefore, there will be no further discussion relating to studies of the efficiency effects of conglomerate mergers,

As explained in the preceding chapter, direct systematic testing for a relationship between conglomerate mergers and the practices of reciprocity, cross-subsidization, and mutual forbearance is exceedingly difficult. This is because the necessary information regarding such

trade and pricing practices is closely held by private firms. Even if these practices occur, the dim view that the courts take of them ensures that such information as is made public will be unlikely to reveal the occurrence of the practices. Because of these difficulties, studies of the effects of conglomerate mergers on competition have generally been forced to rely on proxies for competition such as market concentration ratios or, in one instance, changes in the market shares of acquired firms. The four major studies of this type will be discussed below.

Caves (1981) conducted a study that, while not directly addressing the issue of conglomerate mergers, does have relevance to this dissertation. The study employed the 1972 Enterprise Statistics classification of manufacturing industries, published by the Bureau of the Census, in which industries are defined somewhat more broadly than the three-digit level of the SIC categories. The change in concentration in 67 of these industries between 1963 and 1972 was analyzed as a function of the change in diversification into (and out of) the industries, while controlling for the change in industry shipments, the consumer-goods status, the degree of product differentiation, and the capital intensity of the industries. The measures of inbound and outbound diversification were proportional changes in the coverage ratio and the specialization ratio, respectively, as reported in the Commerce Department's Census of Manufactures. The former is the proportion of shipments by all plants classified to an industry accounted for by firms classified to the industry; the latter is the proportion of

shipments of firms classified to an industry accounted for by plants classified to the industry. These measures do not distinguish between different types of diversification (conglomerate or vertical integration) or different means of diversification (internal or acquisition). The measure of inbound diversification is relevant to this dissertation because it does include conglomerate mergers, and because many of the alleged competitive effects of conglomerate mergers are associated with other types and means of diversification. (For a discussion of the similarities between vertical and conglomerate mergers, see Goldberg (1972, pp. 49-51).)

For the entire sample, Caves found the coefficient on the inbound diversification variable to be positive but not significantly related (at the 10% level) to changes in CR-4, CR-8, or CR-20. Dividing the sample into groups of industries with concentration ratios greater than the median level and less than the median level altered these results somewhat. In the high-concentration group, inbound diversification still had a coefficient insignificantly different from zero. However, the coefficient on inbound diversification was positive and significant (at the 5% level) for the low-concentration group of industries. In Caves' opinion, this positive correlation does not support a "market power" hypothesis, since "It can hardly pay to dip into the deep pocket in order to lift four-firm concentration from 18% to 25%" (Caves 1981, p. 292). Rather, it suggests to him that "in some industries diversifying entrants enjoyed some rent-yielding advantage against small-share specialized firms that raise their market shares and hence seller

concentration" (Caves 1981, p. 292). Given the coarseness of the diversification measure, accepting Caves' conclusions does not necessarily support the view that conglomerate mergers result in increased firm efficiency. In fact, the results seem more likely to reflect efficiencies gained through vertical integration or internal diversification, since these hold the same potential efficiency gains as conglomerate mergers without the disadvantages of mergers discussed by Dean (1970) and cited in Chapter II above. At least, though, the study does not seem to support the theory that conglomerate mergers will result in increases in concentration due to the practice of reciprocity, cross-subsidization, and the like.

Markham (1973) looked at changes in concentration in 18 three-digit SIC industries that experienced three or more conglomerate mergers during the period 1958-67, and 43 four-digit SIC industries that experienced 10 or more conglomerate mergers during the period 1961-70. Though not explicitly stated, his assumption must have been that multiple conglomerate mergers would make more likely any effects of those mergers on concentration. In both samples, there were more decreases in concentration than increases. However, the nature of his data and the lack of rigor in his method of analysis led to the cautious conclusions that "diversifying acquisitions have had no measurable effect on concentration in the 4-digit industries acquired" (Markham 1973, p. 110), and that "such acquisitions may possibly have reduced the level of market concentration" (Markham 1973, p. 109) at the three-digit level. At the least, it is clear that his study fails to support the hypothesis that

conglomerate mergers result in increases in market concentration.

An additional observation by Markham was that "In three-fourths of the industries the change in concentration, whether an increase or a decrease, was less than five percentage points" (Markham 1973, p. 109). Unfortunately, he does not compare this result with increases or decreases in concentration in industries experiencing little or no conglomerate merger activity. Such a comparison with a "control group" of industries would have made this observation, and those cited above, more meaningful.

A Federal Trade Commission study (FTC 1972) employed a data set that contained market share information unavailable to most researchers. The study examined the nature and effects of nine large firms that were engaged in extensive conglomerate merger activity during the 1960s.¹ These companies accounted for about 8% of the total number of mining and manufacturing acquisitions of firms with assets of \$10 million or more during the period 1960-68 (FTC 1972, p. 21). However, only seven of the firms submitted usable data regarding acquired five-digit product classes; these were the data used for the market share analysis, which covered the years 1963-69.

It was found that about 54% of the acquired firms' market shares in their product classes were less than 1%; only about 9% of the acquired firms' market shares were 10% or greater. Furthermore, the

¹The firms were: Litton Industries, Ling-Temco-Vought, Gulf and Western Industries, ITT, Textron, Rapid-American, White Consolidated Industries, FMC Corporation, and Norton Simon (FTC 1972, p. 18).

four-digit industries represented by these product classes were most apt to be relatively unconcentrated: 60% of them had a CR-4 of 40% or less, and only 12% had a CR-4 of 60% or greater. Thus, the tendency for these seven firms was to acquire relatively small firms in relatively unconcentrated industries. The report states that the pattern of acquisitions "does not provide much ground for alarm or enthusiasm from a competitive standpoint. It can be described as largely neutral" (FTC 1972, p. 82).

After acquisition, the acquired non-leading firms' market shares exhibited slightly more decreases than increases, while decreases and increases were equal in number for the acquired market shares of leading firms. Thus, the study concludes that for both toe-hold and leading firm acquisitions, "there is no systematic tendency for market shares either to increase or decrease after acquisition" (FTC 1972, p. 82). These facts did not surprise the authors, given their other findings that acquired firms experienced few changes, on average, in management, advertising expenditures, or profitability after acquisition. The study provided no evidence regarding the occurrence of mutual forbearance between the conglomerates.

The results of the FTC study, then, are generally in accord with those of Markham (1973) and the Goldberg studies (1972; 1974) (which are discussed below). However, the time period analyzed allowed little time for any effects to materialize from mergers taking place at the peak of the conglomerate merger "wave" of the late 1960s. The limited sample and time period should cause agreement with the FTC view that "The data

presented...are suggestive rather than definitive" (FTC 1972, p. 86).

A fourth type of approach was taken by Goldberg (1972; 1974) to analyze changes in concentration in manufacturing industries during the period 1954-63. In his initial analysis, Goldberg tested whether the change in concentration in industries entered by conglomerate acquisition was significantly different from zero. He found that "The null hypothesis that conglomerate mergers are not associated with concentration change cannot be rejected" (Goldberg 1974, p. 309). The study had the appealing aspect of separating conglomerate mergers into leading and non-leading firm categories, as the economic theory suggests should be done. However, his use of each merger as one datum results in multiple-counting of industries experiencing more than one merger, and renders his use of the Central Limit Theorem suspect. (That theorem requires independent observations to construct an asymptotically normally distributed variable for statistical testing; two observations of the same industry are clearly not independent.) Further, Goldberg failed to compare a lack of change in concentration in these industries to the trend of concentration in industries that did not experience conglomerate mergers. This prevents the drawing of sound conclusions regarding the effect of conglomerate mergers on concentration.

The second analysis in each of Goldberg's studies (1972; 1974) was more ambitious: he used regression analysis to study changes in industry concentration, again focusing only on industries experiencing conglomerate mergers. The independent variables used, in various combinations, included the assets of the acquired and acquiring companies, the ratio

of those assets, the length of time since the merger, the number of conglomerate mergers into an industry, and the average level of concentration (the initial level plus the final level, divided by two). All of those variables, with the exception of the last one, seem appropriate; however, regressing $(CR_{t+1} - CR_t)$ on $(CR_{t+1} + CR_t)/2$ is curious, to say the least. However, it should be noted that this questionable variable was not used in all of Goldberg's regressions.

In general, the coefficients of the independent variables were not significantly different from zero at the 5% level, although the coefficient on the "time" variable occasionally was significantly positive. In one regression focusing on leading firm mergers, the number of such mergers had a significantly positive coefficient.

Goldberg's results, then, seem to strongly reject the hypothesis that conglomerate mergers affect concentration, as measured by concentration ratios. However, three caveats to this conclusion must be offered. The first is to note again the methodological problems of the study, especially the lack of a "control" group of industries not experiencing conglomerate mergers. Second, Goldberg neglected to control for some important factors that have been shown to affect changes in industry concentration levels over time: in particular, entry of new firms (Caves and Porter 1980) and whether an industry produces consumer goods or producer goods (Mueller and Hamm 1974; Scherer 1979; Caves and Porter 1980). The third shortcoming of the study is that it examines the period 1954-63, which is prior to the conglomerate merger "wave" of the late 1960s. As Scherer (1980, p. 347) has noted,

"Interpretation of [Goldberg's] results would be facilitated if there were comparable (and ideally better controlled) evidence concerning the period after 1963...."

Mueller (1977), in the most complete review to date of studies of the effects of conglomerate mergers, states that "A fair consensus exists that conglomerate mergers have not contributed to increases in industry level concentration, ...and have not had serious anti-competitive effects" (p. 336). He specifically bases this conclusion on the Markham, FTC, and Goldberg studies. As explained above, though, each of these studies has serious shortcomings, either in the depth of the study (Markham 1973), the scope of the study (FTC 1972), or the statistical approach (Goldberg 1972; 1974). Furthermore, none of the studies examines evidence from the 1970s. Thus, the evidence to date seems insufficient to support such "a fair consensus." The remainder of this study seeks both to overcome shortcomings of the prior studies, and to use data from the 1970s that were unavailable to previous investigators, in an attempt to shed some light on what effect, if any, conglomerate mergers have had on changes in industry concentration in the manufacturing sector of the U.S. economy.

IV. A MODEL AND DATA FOR EXAMINING THE EFFECTS OF CONGLOMERATE MERGERS ON INDUSTRY CONCENTRATION

In this chapter, the model used to test theories relating conglomerate mergers and industry concentration is presented. Section A is a discussion of the variables that economic theory and previous studies suggest should be used in such an investigation. The data used in this study are discussed in Section B.

A. The Theoretical Model

1. Dependent variables

As explained in Chapter II, this study focuses on industry concentration as one important determinant of the degree of intra-industry competition. Also in that chapter was offered a justification for the use of four-firm and eight-firm concentration ratios (CR-4 and CR-8, respectively) as the measures of industry concentration. In accord with that discussion, then, the dependent variable in the model is the change in CR-4 or CR-8 from 1967 through 1977 for the various industries to be analyzed.

Previous studies have analyzed both absolute and proportional changes in concentration (Caves 1981; Caves and Porter 1980; and, Goldberg 1972, 1974). Explicit in Goldberg's studies, and implicit in the others, is the argument that economic theory does not suggest whether the absolute change or the percentage change is, in general,

the appropriate variable to consider. However, economic theory and common sense should lead one to reject the treatment of an increase in CR-4 from 5% to 6% as comparable to an increase in CR-4 from 60% to 72%, although both are 20% increases. It seems clear that analysis of proportional changes is inappropriate when initial levels are substantially different. Therefore, the dependent variable is, alternatively, the absolute change in concentration and a "proportional change" that measures the percentage change in the gap between 1967 concentration and the most extreme concentration ratio possible, namely, 100%. The proportional change variable is calculated as:

$$\text{PROCHNGCR}_i = (\text{CR}_i, 1977 - \text{CR}_i, 1967) / (100 - \text{CR}_i, 1967),$$

where CR_i is the four- or eight-firm concentration ratio for the i th industry. Thus, in the example above, the change from 60% to 72% is a greater absolute and proportional change than the increase from 5% to 6%. In any case, if two industries have the same absolute change in concentration, the one with the higher initial concentration would have the greater "proportional" change in the sense defined above. This approach is generally consistent with oligopoly theories that postulate a "critical level" of concentration. (A critical level of concentration is a level below which industries act "competitively," and above which non-competitive practices, such as collusive pricing agreements, may arise.) A possible inconsistency between this approach and a "critical level" theory would arise with equal PROCHNGCRs for two industries, one industry initially slightly below a critical

level and the other initially well above such a level. It could reasonably be argued that the former industry had experienced a more anti-competitive change in concentration, though PROCHNGCR would not capture that effect. Still, it is hoped that the use of 100% concentration as an absolute standard would yield interesting results, in the absence of agreement regarding "the" critical level, or even its existence.

2. Independent variables

The independent variables in the model fall into two categories: variables relating to conglomerate mergers, and variables included to control for other factors thought to influence changes in industry concentration. The control variables are discussed first.

a. Type of product The nature of an industry's customers (producers, consumers, or both) has been found in previous studies to be significantly related to changes in that industry's level of concentration. In particular, Mueller and Hamm (1974), Scherer (1979), and Caves and Porter (1980) found concentration in consumer-goods industries to have increased during periods when concentration in producer-goods industries has remained stable or decreased. This finding has been explained by reference to theories of product differentiation. It is suggested that, at the manufacturing level, large advertising expenditures by leading firms can serve to increase, or at least protect, the market shares of those firms. This may be due to the persuasive effects of the advertising, the entry barriers resulting from the

advertising and other forms of product differentiation, or some combination of these factors. Furthermore, it is argued that product differentiation, and particularly persuasive advertising, is more likely to affect the purchasing patterns of consumers than to affect purchases by other producers. The basis for this argument is that businesses will often have employees specializing (full-time or part-time) in the purchasing process. These specialists are able to develop expertise in judging the quality of the goods they purchase and keep records of past purchases, reducing their susceptibility to unsubstantiated persuasive advertising. Consumers, on the other hand, are less likely to develop such expertise, being unable to spread the cost of it over a sufficiently large volume of purchases. Hence, the inclusion of a variable to capture any such differences between consumer-goods and producer-goods industries.

b. Growth in industry demand Economic theory suggests that the market shares of firms are likely to be more volatile, and concentration ratios more likely to decline, in industries that are growing, as opposed to stagnant or declining industries (Shepherd 1964, pp. 203-6). This will be true if growth in industry demand outstrips the growth in optimal plant or firm size, or exceeds the ability of leading firms to meet the growth in demand, or encourages the entry of new firms. In other words, the growth of an industry is expected to be negatively related to the change in concentration in that industry, and a variable

to account for this relationship is included in the model.

c. Entry of new firms The model also includes a variable to represent the net entry of firms into an industry. According to Mueller and Hamm (1974, p. 515), this variable should be "viewed more as a symptom than a cause because it reflects the more fundamental causes of structural change." For instance, as noted above, the entry of firms into an industry will likely be related to the growth of the industry. Also, the rate of entry is a reflection of the height of barriers to entry such as capital requirements. These underlying relationships certainly make a theoretical interpretation of this variable's regression coefficient somewhat difficult; still, its inclusion seems warranted for at least two reasons. First, if the effects of conglomerate mergers are to be isolated, it is important to control to some degree for other potential influences on concentration, such as entry barriers. This variable serves that function, albeit indirectly and imperfectly. Second, in spite of the correlation between entry of firms and growth of industry demand, Caves and Porter (1980) found both variables to "wield independent influences on concentration" (p. 11).

d. Previous changes in concentration Another control variable in the model is one to account for prior trends in the concentration level of each industry. If industries have an "equilibrium level of concentration" which they approach rapidly whenever in disequilibrium,

previous changes in concentration might be inversely related to more recent changes. If, on the other hand, such equilibria do not exist, or are approached only at a very slow pace, a trend variable might be positively related to recent changes in concentration. In either case, it is appropriate to adjust for differences between industries with regard to their previous changes in concentration.

e. Number of horizontal mergers The final control variable is the extent of horizontal merger activity experienced by each industry. The acquisition by a leading firm of another firm in the industry, leading or non-leading, would immediately increase concentration as measured by the CR-4 and CR-8, which are calculated on the basis of national markets. The merger of two non-leading firms might increase concentration or leave it unchanged, depending on the initial size of the merging firms. Subsequent to the merger, concentration might also be affected by activities of the surviving (post-merger) firm. Since this study is not concerned with the specific effects of horizontal mergers, it is important simply to control for any effects they might have on changes in concentration.

f. Number and nature of conglomerate mergers The key independent variables in the model are those that reflect the conglomerate merger activity in each industry. Although a conglomerate merger, by definition, can have no immediate effect on industry concentration, the market share increasing or decreasing effects of such mergers,

discussed in Chapter II, may ultimately lead to an increase or decrease in concentration. As explained in that chapter, the direction of any change in concentration depends in large part on the pre-merger market share of the acquired firm. Thus, it is important to determine the market position of the acquired firm in order to test theories of the effects of conglomerate mergers. Therefore, variables are included in the model to reflect the number of leading firm and the number of non-leading firm acquisitions that occur in an industry during the period of time examined. However, as discussed below, data problems often make such distinctions unreliable. For this reason, an alternative specification of the model is also employed which has a variable reflecting all conglomerate mergers, leading and non-leading. This variable can be thought of as testing for the effects of the "average" conglomerate merger.

g. Relative sizes of acquiring and acquired firms Whether the acquiring firm helps to increase the market share of the acquired firm or causes its share to decline, the effect is potentially related to the size of the acquiring firm relative to the acquired firm. In regard to the potential for increasing a market share, the larger the acquiring firm is relative to the acquired firm, the more possible would be an increase in the acquired firm's market share due to reciprocal dealing or "deep-pocket" strategies. In regard to a decrease in the acquired firm's market share, it could be that the acquisition of a large firm

(relative to the acquiring firm) would present a greater potential for managerial diseconomies. In any event, it seems appropriate to include a variable to account for the ratio of sizes of the acquiring and acquired firms. For industries experiencing more than one merger, this variable will represent an average ratio of acquiring firm to acquired firm sizes.

h. Time elapsed since merger Although the various theories of diversification do not suggest the length of time necessary for any effects on market shares due to conglomerate mergers to arise, it is reasonable to expect any effects to become more apparent as the length of time increases. Therefore, a variable to reflect the amount of time elapsed since the completion of each merger will be included. Again, this variable will represent an average elapsed time for the industries experiencing more than one merger.

B. Data: Sources and Problems

1. Conglomerate merger data

Data pertaining to conglomerate mergers were obtained from the FTC Statistical Report on Mergers and Acquisitions (FTC 1981), and in particular, the "Large Mergers in Manufacturing and Mining" series (referred to herein as the "Large Mergers" series). To be included in the Large Mergers series, the acquired company must have been primarily

involved in manufacturing or mining, and must have had assets of at least \$10 million at the time of acquisition. The series is based on mergers for which data were publicly available. According to the report, "the exclusion of nonpublic acquisitions does not alter the trends reflected [in the statistics]" (FTC 1981, p. 99). For the years 1948-79, "77.5 percent of the number of large mergers, representing 87.8 percent of the total acquired assets, are listed in the report" (FTC 1981, p. 99).

The reasons for analyzing only large mergers are threefold. First, the percentage of all manufacturing and mining assets accounted for by firms with assets of \$10 million or more is very high, and, due to the effects of inflation, increasing. In 1967, this percentage was 84%, and it had risen to 96% by 1977 (FTC 1981, p. 106 and p. 114). Second, the Large Mergers series excludes very small companies whose acquisition would have little, if any, significance with respect to market concentration at the four-digit level. The third reason is that information regarding such acquisitions is much more available than information on very small firms, likely for the first and second reasons noted above.

Each acquired and acquiring firm in the Large Mergers series is assigned to one four-digit Standard Industrial Classification (SIC) industry, based on the primary business activity of the firm. Starting in 1970, each firm was assigned by the FTC to one of 450 four-digit industries, using data from Dun and Bradstreet. Such a classification was appropriate for this study, since the concentration ratios to be analyzed were for four-digit industries. However, prior to 1970 the

acquired and acquiring firms were assigned three-digit codes for broader "industry groups," most of which consisted of more than one four-digit industry. (In 1977, for example, there were 143 industry groups of the 450 four-digit industries.) Thus, it was necessary to assign to four-digit industries firms involved in mergers prior to 1970. This was accomplished by the author using information provided at the Dun and Bradstreet business library. In general, a company was assigned to the four-digit industry that accounted for the largest proportion of that firm's business activity in the three digit industry group to which it was assigned by the FTC. Often the assignment of a four-digit code was clear-cut, though occasionally some judgment was required based on Dun and Bradstreet company descriptions.

Beyond the possibility of misassigning a company, an obvious problem arises in assigning diversified companies to one four-digit industry. Even if the firm is correctly assigned to its "primary" industry, that industry may only account for a small percentage of the firm's total manufacturing activity. Thus, if an acquired firm is diversified, there may be significant areas of its activities that will not be subject to analysis. Furthermore, if the primary interest of an acquiring firm is in one of the acquired firm's secondary areas of activity, this method of classification will divert attention away from the industry that should be examined. In this case, as in many others in industrial organization studies, detailed public data related to the diversification of firms' activities would greatly improve the

analysis. This data constraint will tend to bias the results toward finding no correlation between conglomerate mergers and changes in concentration. Hence, any correlation that is discovered is more likely to reflect the existence of a genuine relationship.

The next step in preparing the data base for this study involved the different FTC classifications of conglomerate mergers: "product extension," "market extension," and "other." The FTC definitions of each type are as follows (FTC 1981, p. 103):

product extension: when the acquiring and acquired companies are functionally related in production and/or distribution, but sell products that do not compete directly with one another;

market extension: when the acquiring and acquired companies manufacture the same products, but sell them in different geographic markets;

other: the consolidation of two essentially unrelated firms.

Both product extension and "other" conglomerate mergers could, in theory, result in the market share increasing or decreasing effects described in Chapter II. Since the difference between these two categories is often unclear in practice, it was decided not to distinguish between them for this study. Market extension mergers could also have some of the same effects as the other two types of conglomerate mergers; for example, cross-subsidization between a firm's geographic markets.

However, due to the construction of concentration ratios based on national markets, data reflecting any such effects might be adulterated by any immediate effect on concentration that results from a market extension merger. In this sense, market extension mergers are analogous to horizontal mergers. Therefore, it was decided, for purposes of this study, to restrict data for conglomerate mergers to product extension and "other" conglomerate mergers, and to count any market extension mergers as being horizontal rather than conglomerate.

The final task relating to the merger data was to determine the market position of the acquired firms. The lack of publicly available market share data for individual manufacturing firms again posed a problem in this regard. The resolution of this problem was not entirely satisfactory, but seemed preferable to simply ignoring the issue. The approach taken was to use an ad hoc combination of FTC data for the assets of the acquired firm, census data for the fixed assets of the industry to which the firm was assigned, knowledge regarding the nature of the acquired firm's diversification, and information from persons acquainted with the industry in question.

The asset data was used to calculate SHARE, a proxy variable to represent the percentage of industry assets accounted for by the acquired firm: $SHARE_j = F_jA / I_iA$, where F_jA and I_iA are the assets of the j th acquired firm and the i th industry, respectively. This measure has two main defects. First, the FTC and Census measures of assets differ in that

the FTC (1981) reports the total assets for firms,¹ while the Census (U.S. Department of Commerce 1981b) reports only the purchase price of fixed, depreciable assets, excluding land and depletable assets such as mineral and timber rights. Second, and more important, is the "contamination" of asset data for diversified firms. All of a firm's assets are included in the FTC data, though only a portion may be related to the industry under investigation. Thus, the use of SHARE to measure a firm's percentage of its industry's assets is potentially misleading. With this caution in mind, SHARE was then employed to shed light on a firm's market position in its industry. It was recognized that the implicit assumption in such a process is that firm/industry sales is approximated by firm/industry assets, and that this assumption is not always correct. In particular, one might expect that for large firms, which tend to be more capital-intensive than smaller firms in a given industry, SHARE would exceed the firm's market share of sales. This problem, in addition to the problems with the asset data, rendered SHARE a very incomplete measure for classifying acquired firms to a leading or non-leading position. Still, it was useful, especially in identifying firms certain to be non-leaders. (Since all of the problems mentioned above tend to bias SHARE upward, a very small SHARE would almost certainly indicate a relatively small, and thus, non-leading,

¹In a phone call to Mr. William Shughart of the FTC, it was determined that the FTC asset data was obtained from annual reports of the firms, the Wall Street Journal, Moody's Investor's Services, and other sources. Hence, there is no consistent FTC definition of "assets."

firm.) In general, if $(CR-4)/10 \geq \text{SHARE}$, the firm was classified as not one of the four leading firms; if $(CR-8)/20 \geq \text{SHARE}$, the firm was classified as not one of the eight leading firms.

To classify other non-leading firms, and all of the leading firms, the qualitative considerations mentioned previously were employed. In all cases, only if a firm's market position were nearly certain was it classified as leading or non-leading. This conservative approach led, as might be expected, to a large number of firms whose market position could only be classified as "uncertain." Of the 278 conglomerate mergers in the final data sample, 167 were classified as uncertain with respect to the four leading firms, and 179 were so classified with respect to the eight leading firms. The advantage of such a conservative approach is the likelihood that any firms labeled leading or non-leading were correctly classified. With respect to the four largest firms in each industry in the sample, 20 leading firm and 91 non-leading firm acquisitions were identified; of the eight largest firms, 45 leader and 54 non-leader acquisitions were identified.

2. Sample of industries

Having constructed a conglomerate merger data set as detailed as seemed possible under the circumstances, it was necessary to choose a time period and industry sample to analyze. The period chosen was 1967-77. The latter date was chosen to coincide with the most recent and available Census of Manufactures, which is performed every five

years by the Department of Commerce. The majority of the data from the 1977 Census were published in 1981 (U.S. Department of Commerce 1981a), with special reports still being issued at the present time. The decision to begin the analysis in 1967 was made for three reasons. First, 1967 was a Department of Commerce Census year. Second, 1967 was the year that the dramatic increase in conglomerate mergers began. Third, the choice of 1967 permitted the use of the preceding census data (from the 1963 Census) to construct a crude trend variable for concentration, while remaining within a 15-year time frame. This admittedly arbitrary limit on the time period to be examined was thought necessary to minimize the effects of profound technological changes; the farther back in time one looks, the less the "same" economy and markets can be observed.

The analysis is restricted to industries in the manufacturing sector of the economy. While this focus is more limited than one might desire, it is consistent with the majority of empirical work in the industrial organization field. This convention can be explained largely on the basis of data availability, and can be justified by the fact that the manufacturing sector accounts for a plurality of all private sector output in the U.S.¹

¹In 1980, 25.4% of private sector gross domestic product in the U.S. originated in the manufacturing sector, compared to 18.2% in the retail and wholesale sector, 16.9% in the finance, insurance and real estate sector, 14.8% in the service sector, 10.5% in the transportation and utilities sector, 9.3% in the mining and construction sector, and 3.3% in the agriculture, forestry and fisheries sector (Council of Economic Advisers 1982, p. 244).

The 1977 Census of Manufactures (U.S. Department of Commerce 1981a) identifies 450 four-digit industries in the manufacturing sector. The sample of industries used in this study, however, was substantially limited by several factors. First, the Department of Commerce periodically redefines manufacturing industries to reflect changing patterns of production and consumption. With each revision of industry definitions, some industries are absorbed into others, some new industries are identified, and some industries have products added to or deleted from their definitions. So, it was necessary to identify industries that were consistently defined over the period 1963-77. For purposes of this study, "consistently defined" meant that industry definitions were not changed or that any changes did not significantly affect the comparability of industry statistics over the period, according to the Census report.

Mueller and Hamm (1974) note that the choice of unchanged industries (industries that have not been redefined over a period of time) may render the sample unrepresentative of all manufacturing industries, introducing a bias into the analysis. However, they determined that their sample of unchanged industries was "quite representative both as to trend and level of industry concentration" (Mueller and Hamm 1974, p. 512). The same is true of the sample in this study. Furthermore, Caves and Porter (1980, p. 3) point out that "If the sample excludes new and fast growing industries, it also excludes declining sectors that have been consolidated with other industries [and, hence,] such

a sample is not necessarily biased."

A second factor that limited the choice of sample industries concerned the coverage ratio reported in the census data, which reflects the proportion of shipments classified to an industry that were produced by plants classified to that industry. If a "large" percentage of an industry's products are produced at plants classified to other industries, the concentration ratio for the industry in question becomes less meaningful. It was hoped that excluding industries with a coverage ratio less than 80% (an admittedly arbitrary cut-off level) would minimize this problem.

It was determined that 206 industries were consistently defined over the period 1963-77 and also had a coverage ratio greater than or equal to 80%. However, 13 of the 206 industries with consistent and satisfactory census data lacked data from other sources, or consisted of extremely diverse products categorized by the Bureau of the Census as "not elsewhere classified." The exclusion of those industries left 193 industries in the basic data sample.

3. Dependent variable

The dependent variable for the analysis is the change in industry concentration between 1967 and 1977 in the sample industries. The changes in both the four-firm and eight-firm concentration ratios were calculated from Census of Manufactures data (U.S. Department of Commerce 1981a, Table 7) in two different ways. First, the variables CHNGCR4 and

CHNGCR8 were calculated as follows for the absolute change in concentration in each industry i :

$$\text{CHNGCR4}_i = \text{CR-4}_{i, 1977} - \text{CR-4}_{i, 1967} \quad i = 1, 2, \dots, 193;$$

$$\text{CHNGCR8}_i = \text{CR-8}_{i, 1977} - \text{CR-8}_{i, 1967} \quad i = 1, 2, \dots, 193.$$

Second, the proportional change in four- and eight-firm concentration, PROCHNG4 and PROCHNG8, respectively, were calculated for each industry i as follows:

$$\text{PROCHNG4}_i = (\text{CR-4}_{i, 1977} - \text{CR-4}_{i, 1967}) / (100 - \text{CR-4}_{i, 1967})$$

$$i = 1, 2, \dots, 193;$$

$$\text{PROCHNG8}_i = (\text{CR-8}_{i, 1977} - \text{CR-8}_{i, 1967}) / (100 - \text{CR-8}_{i, 1967})$$

$$i = 1, 2, \dots, 193.$$

4. Independent variables

a. CONGMERG_i; L4MERG_i; NL4MERG_i; U4MERG_i; L8MERG_i; NL8MERG_i;

U8MERG_i These variables represent the amount of large

conglomerate merger activity in each industry i , as detailed by the FTC Large Mergers series, and described in Subsection 1 of this section. CONGMERG _{i} is simply the number of conglomerate mergers occurring in industry i . The other six variables represent the classification of firms acquired in the mergers as leading firm (L), non-leading firm (NL), or uncertain (U), with respect to the four (4) or eight (8) industry leaders. (See subsection 1 above for a discussion of how this classification was accomplished.)

On the assumption that any effects of conglomerate mergers on the market shares of acquired firms would not arise immediately, it was decided to ignore mergers that occurred during 1977, the year on which the 1977 concentration ratios are based. So, the 278 mergers analyzed in the study occurred during the period 1967-76.

Finally, it was necessary to adjust the data for firms that were acquired more than once during the sample period, to the extent that such information was available. Again, a one-year time limit was decided upon. If the two acquisitions occurred within twelve months of each other, they were counted as one merger on the assumption that the original merger had insufficient time to affect market shares. If more than twelve months separated the two acquisitions, they were counted separately.

Each regression equation employed either CONGMERG or the appropriate group of leading, non-leading, and uncertain variables. In light of the conflicting theories regarding the effects of conglomerate mergers, the signs of the coefficients on these variables were not predicted.

b. DCONS_i; DPROD_i; DMIX_i These are "dummy" variables that take on a value of one when identifying an industry as producing primarily consumer goods (DCONS), producer goods (DPROD), or both (DMIX), and have a value of zero otherwise. For approximately one-half of the sample, this designation was accomplished using 1972 Input-Output (I-O) data for the U.S. economy (U.S. Department of Commerce 1979, Table 1).

With these data, it was possible to construct a ratio, R_i , as follows:

$$R_i = \text{PCE}_i / \text{TCO}_i,$$

where PCE_i is the amount of personal consumption expenditures on the total commodity output (TCO_i) for each industry i . If R_i equalled or exceeded 70%, the industry was classified as a consumer-goods industry; if R_i was less than or equal to 30%, the industry was classified as a producer-goods industry; industries for which R_i fell between 30% and 70% were classified as mixed-goods industries. (This classification is similar to that used in Scherer (1979).)

Due to differences between I-O industry classifications and the SIC system, for approximately one-half of the sample industries it was not possible to calculate R_i . In most of these instances, it was clear how to classify the industries in question (e.g., "men's and boy's trousers," and "blast furnaces and steel mills"). The few industries for which the appropriate classification was less certain were put in the mixed-goods category (e.g., "woven carpets and rugs"). The final result was the identification of 57 consumer-goods industries, 112 producer-goods industries, and 24 mixed-goods industries in the sample. The theory and evidence discussed in subsection A-2-a of this chapter led to an expectation that the coefficient on DCONS_i would be positive; the coefficient signs for DPROD_i and DMIX_i were not predicted.

c. ENTRY_i Census of Manufactures data (U.S. Department of Commerce 1981a, Table 7) for the number of companies in each industry

were used to calculate the proportional change in the number of firms in each industry during the period 1967-77 as follows:

$$\text{ENTRY}_i = (\text{COS}_{i, 1977} - \text{COS}_{i, 1967}) / \text{COS}_{i, 1967}$$

where COS_i is the number of companies classified to each industry i in 1967 and 1977. It was expected that ENTRY_i would have a negative coefficient.

d. CHNGSHIP_i This variable is included to reflect the proportional change in business activity for each industry during the period 1967-77. It was calculated, using Census of Manufactures data (U.S. Department of Commerce 1981a, Table 7) as follows:

$$\text{CHNGSHIP}_i = (\text{SHIP}_{i, 1977} - \text{SHIP}_{i, 1967}) / \text{SHIP}_{i, 1967}$$

where for most industries SHIP_i represents the value of industry shipments in industry i in 1967 and 1977, deflated by the producer price index for all commodities for that year (U.S. Department of Commerce 1980, p. 36). For eight of the industries in the sample, however, the census data report the value-added or the value of production by the industry, rather than the value of shipments. Because the variable reflects proportional change, because an industry's value of shipments is used in calculating its value-added, and because value of production and value of shipments are so closely related, it was felt that this data inconsistency was not a significant problem. CHNGSHIP_i was expected to have a negative coefficient.

e. CHCR467_i ; CHCR867_i Variables to reflect the change in each industry's four- and eight-firm concentration ratios during the period 1967-77 were calculated as follows:

$$\text{CHCR467}_i = \text{CR-4}_{i, 1967} - \text{CR-4}_{i, 1963}$$

$$\text{CHCR867}_i = \text{CR-8}_{i, 1967} - \text{CR-8}_{i, 1963}$$

where the subscript i identifies each industry. The four- and eight-firm concentration ratios for 1967 and 1963 were obtained from the Census of Manufactures (U.S. Department of Commerce 1981a). For reasons discussed previously, no prediction was made concerning the expected sign of these variables' coefficients.

f. HZMERG_i A variable to account for the number of horizontal plus market extension mergers in each industry i was constructed from the FTC Large Mergers series (FTC 1981). Since the immediate effects of horizontal mergers completed during 1967 are reflected in the 1967 concentration ratios, only mergers completed during the period 1968-77 are included in the data for this variable. Without classifying such mergers as "leading" or "non-leading," it is not possible to predict the sign of the coefficient on HZMERG_i . FTC and Department of Justice scrutiny of these mergers for antitrust violations, though, suggests that such mergers as are permitted may be more likely to have a de-concentrating effect, if any. (Recall from the discussion in Chapter I the relatively tough standards of legality applied to horizontal mergers during the mid-to-late 1960s.) If so, a negative sign on the coefficient

might be expected.

g. ARATIO_i The FTC Large Mergers series (FTC 1981) provides data on the total assets of the acquired and acquiring firms in each merger reported. From this data was calculated a variable, ARATIO_i, reflecting the ratio, A_j, of acquiring to acquired firm assets for the jth merger. Since the effects of a conglomerate merger on the market share of an acquired firm are thought to be more likely the higher this ratio is, the variable was expected to take on the same sign as the conglomerate merger variables. Because the coefficient sign on those variables is not unambiguously predicted by the theory, no more precise prediction was made with regard to the sign of the coefficient on ARATIO_i. The variable was calculated as follows:

$$ARATIO_i = \left(\sum_{j=1}^N A_j \right) / N$$

where A_j is defined as above, and N is the number of mergers in each industry i.

h. TIME_i Using FTC Large Mergers series data (FTC 1981), it was possible to determine the number of months, M_j, elapsed between the completion of the jth merger in an industry and the end of 1977. TIME_i is the variable included to account for that information. It was calculated as follows:

$$TIME_i = \left(\sum_{j=1}^N M_j \right) / N$$

where M_j is defined as above, and N is the number of mergers in each industry i . For reasons analogous to those regarding $ARATIO_i$, the sign of the coefficient on $TIME_i$ was simply predicted to be the same as that of the conglomerate merger variable coefficients.

5. The complete model

The primary models used for estimation purposes, then, are the combinations implied in the following:

$$\begin{aligned}
 Y_i = & \alpha_1 M_i + \alpha_2 DCONS_i + \alpha_3 DPROD_i + \alpha_4 DMIX_i + \alpha_5 ENTRY_i \\
 & \alpha_6 CHNGSHIP_i + \alpha_7 CHCR4(8)67_i + \alpha_8 HZMERG_i + \alpha_9 TIME_i \\
 & \alpha_{10} ARATIO_i + \epsilon_i
 \end{aligned}$$

where Y_i is the absolute or proportional change in CR-4 or CR-8, and M_i represents either $CONGMERG_i$ or $L4(8)MERG_i$, $NL(4)MERG_i$, and $U4(8)MERG_i$, and ϵ_i is the error term. Variations on this basic model and subsamples examined, as well as the regression results, are discussed in the following chapter.

V. EMPIRICAL RESULTS

In this chapter, empirical results from the investigation of 193 manufacturing industries are presented. Section A describes the observed changes in four-firm and eight-firm concentration ratios for the industries in the entire sample, and for the subsamples of consumer-goods industries, producer-goods industries, and mixed-goods industries. The analysis also considers changes in industry concentration in terms of the amount of conglomerate merger activity experienced by the industries. Section B reports and interprets the results of multiple regression analysis of the changes in four-firm and eight-firm concentration ratios for the entire sample, and for various subsamples.

A. Descriptive Statistics

1. Four-firm concentration ratios, 1967-77

The average four-firm concentration ratio (CR-4) for the entire sample of 193 industries exhibited very little change between 1967 and 1977, increasing by 0.2 percentage points. (See Table 2.) This change reflected a 0.4 point increase 1967-72 and a 0.2 point decrease 1972-77.

Looking at individual industries, it is found that roughly the same number (89) experienced decreases in CR-4 as experienced increases in CR-4 (87); 17 industries had the same CR-4 in 1967 and 1977.

The industries for which CR-4 increased had in 1967 an average

Table 2. Average levels and changes in four-firm concentration

	Entire sample (193 industries)	Consumer goods (57 industries)		
		All	With no conglomerate mergers	With one or more conglomerate mergers
<u>All industries</u>				
Average level, 1967	38.9	36.8	38.9	35.1
Average level, 1977	39.1	40.4	43.3	37.9
Average change, 1967-77	0.2	3.5	4.4	2.8
Average change, 1963-67	0.2	1.6		
Average change, 1967-72	0.4	2.1		
Average change, 1972-77	-0.2	1.4		
<u>Industries with an increase in concentration, 1967-77</u>				
Number of industries	87	38	18	20
Average increase, 1967-77	6.4	7.8	8.9	6.8
Average level, 1967	37.2			
Average level, 1977	43.6			
<u>Industries with a decrease in concentration, 1967-77</u>				
Number of industries	89	17	7	10
Average decrease, 1967-77	-5.7	-5.6	-6.7	-4.8
Average level, 1967	41.9			
Average level, 1977	36.2			
<u>Industries with no change in concentration, 1967-77</u>				
Number of industries	17	2	1	1
Average level, 1967 and 1977	31.5			

Producer goods (112 industries)			Mixed goods (24 industries)		
All	With no conglomerate mergers	With one or more conglom- erate mergers	All	With no conglomerate mergers	With one or more conglom- erate mergers
39.6	38.2	40.6	40.4	36.6	42.7
38.7	37.9	39.2	38.4	37.7	38.9
-0.9	-0.3	-1.4	-2.0	1.1	-3.8
-0.4			-0.6		
-0.4			0.3		
-0.5			-2.3		
42	18	24	7	5	2
5.3	7.2	3.8	5.7	7.0	2.5
56	23	33	16	4	12
-5.8	-6.3	-5.5	-5.5	-6.3	-5.3
14	7	7	1	0	1

CR-4 lower than the average for the entire sample, and by 1977 had an average CR-4 higher than the average for the entire sample. The average CR-4 for those industries experiencing a decrease went from higher than the sample average in 1967 to lower than the sample average in 1977. In other words, it was not, on average, the most concentrated industries that experienced increases in CR-4.

For those industries that showed a decline in CR-4, the average decline during the period 1967-72 (-2.9 points) was approximately equal to the average decline during 1972-77 (-2.8 points). However, for those industries with increasing CR-4 over the ten-year period the average increase during the first five years (3.9 points) was greater than during the second five years (2.5 points). These facts are somewhat surprising, considering that the Department of Commerce index of manufacturing production (U.S. Department of Commerce 1980, p. 9) rose by 18.9% in the first period and by only 16.4% in the second period, the difference being largely due to the 1974-75 recession. One might expect dominant firms to be better able than smaller firms to protect or increase their market shares during business downturns, whereas vigorous industry growth would provide smaller firms a better opportunity to cut into the market shares of industry leaders (Mueller and Hamm 1974, p. 514; Shepherd 1964, pp. 204-6). If so, 1967-72 would, ceteris paribus, be apt to exhibit smaller increases or greater decreases in CR-4 than the period 1972-77, but such was not the case.

The evidence discussed to this point does not support the

conclusion of Caves and Porter (1980, p. 3) that "a rather rapid increase in concentration was under way in the early 1970s." At most, if such a rapid increase were under way in the manufacturing sector, it appears to have slowed or stalled by the mid-1970s.

Previous studies (Mueller and Hamm 1974; Scherer 1979; Caves and Porter 1980) have noted that the calm surface of changes in average industry concentration hides significant changes below the surface with respect to concentration in consumer-goods and producer-goods industries. The same conclusion can be drawn from this study. The 57 consumer-goods industries are seen to have had a 3.5 point increase in average CR-4 (2.1 points 1967-72, 1.4 points 1972-77), with more industries experiencing increases (38) than decreases (17). Furthermore, the average increase for those 38 industries (7.8 points) was greater than the average decrease for those experiencing a decline in CR-4 (-5.6 points). These figures indicate that the trend toward increasing concentration in consumer-goods industries noted by Mueller and Hamm (1974), Scherer (1979), and Caves and Porter (1980) continued through the mid-1970s. By 1977, the average CR-4 for consumer-goods industries in the sample was higher than that for producer-goods industries in the sample. This was primarily due to the increase in the consumer-goods CR-4 rather than to the slight decrease in the average producer-goods CR-4 discussed below. To the extent that market concentration reflects the market power of the leading firms, then, the continuation of this trend is cause for concern.

The evidence from 112 producer-goods industries is also broadly consistent with that from previous studies. More such industries showed decreases in CR-4 (56) than increases (42), and the average CR-4 over the period 1967-77 fell by -0.9 points (-0.4 points 1967-72, -0.5 points 1972-77). Looking at the groups that exhibited increases or decreases one finds that the average decrease (-5.8 points) was slightly larger than the average increase (5.3 points). The only significant difference between these results and those from previous studies is the lack of evidence that producer-goods CR-4s were increasing in the late 1960s, a "possible reversal of trend" noted by Mueller and Hamm (1974, p. 519) and corroborated by Caves and Porter (1980). The reason for this difference is likely related to the somewhat different sample of industries (due to changes in SIC industry definitions) and the three-way classification of industries, into consumer-, producer- and mixed-goods categories, in the present study. (The two studies just mentioned used only the consumer- and producer-goods categories.) Which result is more representative of all producer-goods industries is difficult to determine, but the actual change in the late 1960s, whether an increase or a decrease, was apparently quite small.

Those 24 industries that were classified as "mixed-goods" industries exhibited characteristics qualitatively similar to the producer-goods industries, with a decrease in average CR-4 of -2.0 points (+0.3 points 1967-72, -2.3 points 1972-77). More of these industries experienced decreases in CR-4 (16) than experienced increases (7), and one

had the same CR-4 in 1967 and 1977. It is not clear why this "intermediate" group exhibited proportionately more and larger decreases in CR-4 than the producer-goods industries. The relatively small number of industries in this group, however, surely limits its usefulness in analyzing trends in manufacturing industries as a whole; its primary purpose was to allow the creation of more purely consumer-oriented and producer-oriented subgroups.

The changes in CR-4s discussed above can also be described with regard to the amount of conglomerate merger activity that occurred in the various sample subgroups. First, there was no apparent tendency for conglomerate merger activity to occur more frequently or less frequently in consumer-goods industries than in producer-goods industries. This conclusion is based on the ratio of consumer-goods industries to producer-goods industries (57:112), compared to the ratios of consumer-goods industries to producer-goods industries experiencing zero conglomerate mergers (26:48), one conglomerate merger (17:32), and more than one conglomerate merger (14:32).

The second observation that can be made with respect to CR-4 changes and conglomerate mergers is that industries experiencing such mergers seem to exhibit smaller increases and smaller decreases in CR-4 compared to industries with zero conglomerate mergers. This conclusion is based on the average increase in CR-4 among those industries experiencing increases, and the average decrease in CR-4 among those industries experiencing decreases. Whether one looks at consumer-goods industries,

producer-goods industries, or mixed-goods industries, the average increase in CR-4 is smaller and the average decrease in CR-4 is smaller in the industries experiencing one or more conglomerate mergers. This apparent effect will be referred to hereinafter as the "dampening relation" between conglomerate mergers and changes in CR-4. When one looks at all producer-goods industries, it appears that conglomerate mergers are associated with greater decreases in CR-4. However, this is a result of combining decreases in such industries with increases that are smaller in number and magnitude. In other words, the dampening relation between conglomerate mergers and changes in industry concentration is stronger with respect to increases in CR-4 than it is with respect to decreases in CR-4.

In the smaller and, hence, less reliable, subsample of mixed-goods industries this dampening relation would, by itself, lead to a statistical illusion similar to that just described. Also, in mixed-goods industries there is a strong tendency for conglomerate mergers to be associated with decreases in CR-4. Whether this represents a genuine relationship or a random association is not certain.

In summary, then, the evidence from the descriptive statistics for four-firm concentration indicates the following: consumer-goods industries have continued their trend toward increasing CR-4s, and producer-goods industries have continued (or reverted to) their trend of slight decreases in CR-4s; neither type of industry seems more likely than the other to experience conglomerate mergers; and, conglomerate

mergers seem to be associated with a dampening of changes in CR-4s, whether increases or decreases; in one small subsample (mixed-goods industries) conglomerate mergers are associated with a disproportionately large number of decreases in CR-4.

2. Eight-firm concentration ratios, 1967-77

The evidence regarding eight-firm concentration ratios (CR-8s) is similar in most respects to that from the CR-4 analysis. (See Table 3.) One difference is that the dampening relation is not as consistent: producer-goods industries experiencing increases in CR-8 had an average increase of 6.2 points regardless of whether or not they had experienced conglomerate mergers. Also, the average decrease in CR-8 for mixed-goods industries exhibiting decreases is greater in the group experiencing conglomerate mergers. The dampening relation for decreases in consumer-goods industries' CR-8 is barely noticeable. However, the dampening relation for increases in CR-8 in consumer-goods and mixed-goods industries, and for decreases in CR-8 in producer-goods industries, is as strong or stronger than in the CR-4 evidence.

The other notable result observed regarding CR-8s is that the average decline for both the producer-goods and the mixed-goods industries (-0.6 and -0.8, respectively) is smaller than the average decline in CR-4 in those industries. This means that the combined market share of the fifth through the eighth largest firms in such industries was increasing during the period 1967-77. Consumer-goods industries,

Table 3. Average levels and changes in eight-firm concentration

	Entire sample (193 industries)	Consumer goods (57 industries)		
		All	With no conglomerate mergers	With one or more conglomerate mergers
<u>All industries</u>				
Average level, 1967	52.0	48.8	50.8	47.1
Average level, 1977	52.8	53.1	56.5	50.3
Average change, 1967-77	0.8	4.3	5.7	3.2
Average change, 1963-67	0.5	1.8		
Average change, 1967-72	0.8	2.7		
Average change, 1972-77	0.1	1.6		
<u>Industries with an increase in concentration, 1967-77</u>				
Number of industries	85	36	17	19
Average increase, 1967-77	7.5	9.1	10.9	7.4
Average level, 1967	46.8			
Average level, 1977	54.3			
<u>Industries with a decrease in concentration, 1967-77</u>				
Number of industries	96	19	9	10
Average decrease, 1967-77	-4.9	-4.2	-4.2	-4.1
Average level, 1967	54.2			
Average level, 1977	49.3			
<u>Industries with no change in concentration, 1967-77</u>				
Number of industries	12	2	0	2
Average level, 1967 and 1977	71.4			

All	Producer goods (112 industries)		All	Mixed goods (24 industries)	
	With no conglomerate mergers	With one or more conglom- erate mergers		With no conglomerate mergers	With one or more conglom- erate mergers
53.3	50.8	55.2	53.6	46.1	58.1
52.7	50.5	54.4	52.9	49.0	55.2
-0.6	-0.3	-0.8	-0.8	2.9	-2.9
-0.1			0.2		
-0.2			0.7		
-0.4			-1.5		
41	22	19	8	4	4
6.2	6.2	6.2	6.9	10.3	3.5
62	23	39	15	5	10
-5.2	-6.4	-4.4	-4.9	-3.0	-5.8
9	3	6	1	0	1

however, exhibited a larger increase in CR-8 than in CR-4, pointing to increases in shares for the fifth through eighth largest firms as well as for the four largest firms. These results are consistent with evidence reported by Caves and Porter (1980), and they indicate a more generalized trend toward increases in industrial concentration than the average figures for CR-8 or the CR-4 data alone might suggest. It should be noted, though, that stronger fifth through eighth largest firms may result in more competition in an industry, due to their increased ability to do competitive battle with the larger firms. This possibility has received some empirical support from Miller (1967; 1971).

B. Regression Results

The regression results reported here are obtained primarily from two models. As described in Chapter IV, one model employs a broad range of independent variables; the other is an abbreviated version of that model, using fewer independent variables. In addition, results from several regressions that are of interest, but fall into neither of the above-mentioned categories, are discussed.

Four groupings of the industries in the sample are analyzed: the entire sample of 193 industries, the 83 industries which experienced no conglomerate mergers, the 50 industries which had only one conglomerate merger, and the 99 industries with one or more conglomerate mergers. Eleven of the 193 industries in the main sample are not

analyzed in any of the subsamples, due to a lack of data for calculating the independent variable ARATIO.

In Chapter IV, the variables used in the regression model are defined, the data sources used to construct the variables are discussed, and the expected signs of the variables' coefficients are given. Table 4 below is a summary of the variables and their expected signs.

Table 4. Regression model variables and expected coefficient signs

Dependent variable	Independent variables	Expected coefficient signs
CHNGCR4(8)	DCONS	positive
	DPROD	positive or negative
	DMIX	positive or negative
	ENTRY	negative
	CHNGSHIP	negative
	CHCR4(8)67	positive or negative
	HZMERG	positive or negative
	CONGMERG	positive or negative
	NL4(8)MERG	positive or negative
	L4(8)MERG	positive or negative
	U4(8)MERG	positive or negative
	ARATIO	positive or negative
	TIME	positive or negative

As might be expected, there is evidence of correlation between several pairs of the independent variables. However, of the correlation coefficients (other than those for the dummy variables) that are significantly different from zero at the 5% level, none is larger than 0.47 and only four are larger than 0.3 (HZMERC correlated with NL4MERC (.41), NL8MERC (.47), and CONGMERC (.37), and ENTRY correlated with CHNGSHIP (.43)).

The results reported in the following subsections are from the estimation of models that are linear in all variables. Preliminary equations that employed quadratic and cubic conglomerate merger variables were also estimated, but these variables were not found to be statistically significant, separately or jointly.

1. Estimation of the model using all independent variables

As explained in Chapter III, both the absolute change in CR-4 and the proportional change (as defined there) have significance in economic theory. Hence, the model was originally estimated using those alternative measures of changes in concentration, and the results were consistently similar in terms of the signs of the coefficients. However, equally consistent were the slightly lower levels of significance of coefficients and the slightly lower R^2 s of the regressions using the unconventionally defined proportional change as the dependent variable. Therefore, having noted the generally less successful attempt to use such a variable, the results presented in Tables 5 and 6 are those employing

Table 5. Regression results: complete model^{1,2}

Variable	193 industries				83 industries with no conglomerate mergers	
	ΔCR-4		ΔCR-8		ΔCR-4	ΔCR-8
DCONS	3.76 ^a (3.70)	3.87 ^a (3.71)	4.45 ^a (4.37)	4.69 ^a (4.47)	3.16 ^b (1.99)	4.18 ^a (2.78)
DPROD	0.15 (0.20)	0.13 (0.17)	0.42 (0.55)	0.45 (0.58)	-0.03 (-0.03)	0.04 (0.04)
DMIX	-1.22 (-0.79)	-1.09 (-0.70)	-0.27 (-0.18)	0.10 (0.06)	-1.20 (-0.46)	0.15 (0.06)
ENTRY	-4.29 ^a (-3.31)	-4.30 ^a (-3.30)	-6.32 ^a (-4.94)	-6.33 ^a (-4.94)	-13.80 ^a (-4.54)	-16.23 ^a (-6.06)
CHNGSHIP	-0.79 (-0.64)	-0.82 (-0.67)	0.18 (0.15)	0.13 (0.10)	1.20 (0.64)	2.17 (1.27)
CHCR4(8)67	0.06 (0.50)	0.06 (0.44)	0.01 (0.07)	0.01 (0.08)	-0.07 (-0.30)	-0.10 (-0.44)
HZMERG	0.33 (0.61)	0.32 (0.58)	0.21 (0.40)	0.04 (0.07)	-0.53 (-0.23)	-1.44 (-0.68)
CONGMERG	-0.29 (-1.05)		-0.17 (-0.64)			
L4(8)MERG		-0.98 (-0.69)		-0.87 (-0.88)		
NL4(8)MERG		-0.17 (-0.36)		0.50 (0.74)		
U4(8)MERG		-0.30 (-0.80)		-0.27 (-0.78)		
ARATIO						
TIME						
\bar{R}^2	.15	.14	.21	.20	.30	.43
N	193	193	193	193	83	83

¹t-ratios in parentheses.

²Significance levels (uppercase for 2-tailed tests, lowercase for 1-tailed tests): A,a - 1%; B,b - 5%; C,c - 10%.

99 industries with ≥ 1 conglomerate merger				50 industries with 1 conglomerate merger	
$\Delta CR-4$		$\Delta CR-8$		$\Delta CR-4$	$\Delta CR-8$
1.70 (0.72)	1.20 (0.48)	4.16 ^b (1.66)	3.94 ^c (1.45)	5.12 ^c (1.46)	5.66 ^c (1.41)
-1.15 (-0.49)	-1.38 (-0.58)	1.55 (0.63)	1.53 (0.61)	3.01 (0.96)	4.22 (1.28)
-3.24 (-1.14)	-3.63 (-1.26)	-0.45 (-0.15)	-0.60 (-0.19)	0.77 (0.17)	0.02 (0.003)
-1.00 (-0.77)	-0.96 (-0.73)	-2.67 ^b (-1.94)	-2.65 ^b (-1.91)	0.53 (0.26)	-1.58 (-0.73)
-0.51 (-0.28)	-0.51 (-0.28)	0.28 (0.15)	0.34 (0.17)	1.25 (0.42)	-0.09 (-0.03)
0.01 (0.05)	0.02 (0.12)	-0.01 (-0.04)	-0.01 (-0.05)	-0.12 (-0.47)	-0.34 (-1.03)
0.38 (0.75)	0.49 (0.95)	0.23 (0.43)	0.24 (0.41)	4.84 ^B (2.53)	4.85 ^B (2.36)
-0.28 (-0.92)		-0.28 (-0.89)			
	0.52 (0.34)		0.07 (0.05)	-1.13 (-0.34)	0.003 (0.001)
	-0.56 (-1.26)		-0.29 (-0.44)	-5.71 ^B (-2.20)	-4.22 (-0.85)
	-0.12 (-0.30)		-0.35 (-0.89)		
-0.10 (-0.53)	-0.004 (-0.44)	-0.002 (-0.22)	-0.002 (-0.21)	-0.005 (-0.43)	-0.003 (-0.21)
0.01 (0.54)	0.01 (0.58)	-0.01 (-0.48)	-0.01 (-0.45)	-0.03 (-1.02)	-0.04 (-1.17)
.04	.02	.03	.02	.30	.29
99	99	99	99	50	50

only the absolute change in concentration ratios.

In the regressions for the sample of 193 industries, DCONS, ENTRY and CHNGSHIP have the predicted sign, with the exception of CHNGSHIP in the CR-8 equations (Table 5). However, only the coefficients on DCONS and ENTRY are significantly different from zero at the 5% level. None of the other control variables (those with unpredicted coefficient signs) have coefficients significantly different from zero. (ARATIO and TIME are not used in these equations due to the inclusion in this sample of industries with zero conglomerate mergers.) Seven of the eight conglomerate merger variables have negative coefficients, but none of these coefficients are significantly different from zero. These results are found in both the CR-4 and the CR-8 analyses, with the differences between the two being the higher \bar{R}^2 and the larger significant coefficients (with higher t-ratios) in the CR-8 equations. (\bar{R}^2 is the R^2 statistic adjusted for degrees of freedom (Pindyck and Rubinfeld 1981, p. 80).)

Similar results are obtained from the subsample of 99 industries with one or more conglomerate mergers, with the notable exceptions that the coefficients on DCONS and ENTRY are insignificantly different from zero in the CR-4 equations, and are smaller and less statistically significant (relative to the 193-industry sample) in the CR-8 equations.

Comparison of the results for these two samples might suggest that conglomerate mergers are associated with the weakening of the effects of some factors related to changes in concentration in manu-

facturing industries. This possibility is suggested by the fact that it was after removing industries with zero conglomerate mergers from the sample that DCONS and ENTRY became insignificant or less significant. If conglomerate mergers are associated with a weakening or reversal of relationships that otherwise exist in manufacturing industries, the contrast should be evident when comparing the 99 industries just discussed with the 83 industries experiencing no conglomerate mergers between 1967 and 1977. The results from regressions using data from these 83 industries, while not entirely consistent, do lend some support to such an interpretation.

In the 83-industry subsample, the coefficients on ENTRY are larger in absolute value, and more statistically significant, than in comparable equations estimated for other samples, and DCONS is once again significantly, positively related to the change in industry concentration. Also, the coefficients on HZMERG are negative, albeit insignificantly different from zero, whereas they are positive in the other samples (and significantly so in the 50-industry subsample discussed below). Furthermore, it should be noted that the \bar{R}^2 s for both of these equations are higher than those obtained from regressions on the other samples.

Weighed against the evidence just discussed is the fact that the t-ratios for DCONS' coefficients, while larger than in the 99-industry equations, are not larger than in the 193-industry equations. If conglomerate mergers are associated with the weakening of the effect of this variable, the highest t-ratios would be expected in the regressions

using data from the 83 industries without conglomerate mergers, and this is not what is found.

Recall from Chapter II that it is not clear from economic theory whether multiple conglomerate mergers in an industry would make any effects of conglomerate mergers more likely or less likely to arise. Thus, it seemed important to examine a set of industries experiencing just one conglomerate merger in order to shed light on this question. One notable result, shown in Table 5, is the large and significantly negative coefficient on NL4MERG in the 50-industry subsample. This is the only evidence found among these regressions that supports the conventional economic theories regarding the competitive effects of conglomerate mergers. In light of the negative coefficients on virtually all of the conglomerate merger variables, one should hesitate to give this bit of evidence a conventional interpretation. At this point, the result is simply noted, and the interpretation is left to a subsequent section, pending a more complete discussion of all regression results.

Other results to be noted from the regressions for the 50-industry subsample include the significant positive coefficient on HZMERG (a reversal of the results from the 83 industries with zero conglomerate mergers) and the negative (though insignificant) coefficients on the trend variables, CHCR4(8)67. Also, note that DCONS and ENTRY are not significant at the 5% level, although DCONS is significant at the 10% level.

Summarizing the results from all of the regressions discussed so

far, there is no evidence of an association between conglomerate mergers and increases in industry concentration. There is found, on the contrary, consistent but weak or insignificant evidence of a relation between conglomerate mergers and decreases in industry concentration. The statistically insignificant coefficients on ARATIO fail to support the hypothesis that large conglomerate firms will use their "deep pockets" to subsidize market share increases for their acquisitions. The insignificant coefficients on TIME do not suggest that the effects of conglomerate mergers become more noticeable over time. Also, there is some evidence that the effects of non-conglomerate factors on concentration are weakened by the occurrence of conglomerate mergers into an industry.

2. Estimation of the model with fewer independent variables

It is the case that if two independent variables are significantly correlated, the estimated standard errors of their coefficients will tend to be large, causing their t-ratios to be lower than otherwise. It has been suggested (Intrilligator 1978, p. 155) that if one of the correlated variables has been included on the basis of casual or ad hoc reasoning (as opposed to firm and well-developed economic theory) it might be appropriate to omit that variable in an attempt to isolate significant economic relationships. Furthermore, if the correlation is not extremely large, and if the coefficient on the omitted variable were small, the resulting bias in the estimated coefficient of the remaining variable would be reduced (Intrilligator 1978, pp. 188-89).

For these reasons, then, it is appropriate to estimate the model after omitting the variables DPROD DMIX, CHNGSHIP, ARATIO, and TIME. The results of those regressions are presented in Table 6 and discussed in this subsection.

In general, the performance of the conglomerate merger variables is similar in these regressions to the results discussed in the previous subsection. Twenty-one of 24 conglomerate merger variables have negative coefficients, but only one of these is significantly different from zero: the coefficient on NL4MERG in the 50-industry subsample. With the exception of that one significant conglomerate merger variable, leading firm and non-leading firm mergers are again not found to have different effects on changes in industry concentration.

More change is occasionally observed in the performance of the control variables, though only in two cases did a variable pass or fail the test for statistical significance that it had previously failed or passed. The first instance occurred in the CR-4 and CR-8 equations for the 99-industry subsample, where the coefficient on DCONS increased in magnitude and became significantly different from zero. Second, in the 50-industry subsample the HZMERG coefficient dropped below the 5% level of significance in one of four regressions, though it remained significant at the 10% level in that instance.

Overall, the results from these regressions would seem to slightly weaken the tentative conclusion, based on the regressions in the preceding subsection, that conglomerate mergers are associated with a

Table 6. Regression results: abbreviated model^{1,2}

Variable	193 industries				83 industries with no conglomerate mergers	
	$\Delta CR-4$		$\Delta CR-8$		$\Delta CR-4$	$\Delta CR-8$
Constant	-0.19 (-0.26)	-0.20 (-0.28)	0.35 (0.50)	0.42 (0.59)	-0.03 (-0.03)	0.37 (0.40)
DCONS	3.87 ^a (3.39)	4.00 ^a (3.43)	4.15 ^a (3.70)	4.32 ^a (3.77)	3.48 ^b (1.92)	4.38 ^a (2.60)
ENTRY	-4.56 ^a (-3.96)	-4.61 ^a (-3.97)	-6.19 ^a (-5.43)	-6.25 ^a (-5.46)	-12.47 ^a (-5.34)	-14.23 ^a (-6.76)
CHCR4 (8) 67	0.07 (0.57)	0.06 (0.49)	0.01 (0.05)	0.01 (0.07)	-0.05 (-0.22)	-0.10 (-0.45)
HZMERG	0.27 (0.51)	0.26 (0.47)	0.24 (0.46)	0.05 (0.10)	-0.11 (-0.05)	-0.65 (-0.32)
CONGMERG	-0.29 (-1.07)		-0.20 -0.75			
LMERG		-1.12 (-0.81)		-0.94 (-1.01)		
NLMERG		-0.16 (-0.35)		0.51 (0.76)		
UMERG		-0.27 (-0.74)		-0.27 (-0.81)		
Degrees of freedom	187	185	187	185	78	78
\bar{R}^2	.15	.14	.21	.20	.30	.40

¹t-ratios in parentheses.

²Significance levels (uppercase for 2-tailed tests, lowercase for 1-tailed tests): A,a - 1%; B,b - 5%; C,c - 10%.

99 industries with > 1 conglomerate merger				50 industries with 1 conglomerate merger			
$\Delta CR-4$		$\Delta CR-8$		$\Delta CR-4$		$\Delta CR-8$	
-0.68 (-0.69)	-0.84 (-0.82)	0.18 (0.17)	0.24 (0.22)	-1.12 (-1.01)		-0.22 (-0.19)	
3.31 ^a (2.50)	3.17 ^b (2.22)	2.93 ^b (2.12)	2.89 ^b (1.90)	3.01 ^c (1.42)	2.48 (1.16)	2.80 (1.25)	2.47 (0.99)
-1.08 (-0.93)	-1.05 (-0.90)	-2.46 ^b (-2.00)	-2.46 ^b (-1.97)	0.26 (0.15)	0.71 (0.41)	-1.97 (-1.07)	-2.08 (-1.10)
0.05 (0.33)	0.05 (0.39)	-0.01 (-0.05)	-0.01 (0.05)	-0.02 (-0.10)	-0.04 (-0.19)	-0.26 (-0.82)	-0.30 (-0.93)
0.35 (0.76)	0.46 (0.95)	0.32 (0.66)	0.29 (0.54)	3.44 ^c (1.96)	4.53 ^B (2.48)	3.99 ^B (2.16)	4.42 ^B (2.24)
-0.29 (-0.98)		-0.29 (-0.93)					
	0.19 (0.12)		-0.23 (-0.20)		-2.00 (-0.63)		-0.16 (-0.06)
	-0.57 (-1.29)		-0.20 (-0.31)		-5.42 ^B (-2.39)		-3.55 (-0.86)
	-0.11 (-0.28)		-0.35 (-0.90)		-0.16 (-0.13)		0.07 (0.06)
93	91	93	91	45	43	45	43
.05	.04	.06	.04	.11	.16	.14	.12

weakening or reversal of trends that otherwise were occurring in these industries. However, the previously observed very weak negative relation between conglomerate mergers and changes in industry concentration is essentially unchanged.

3. Further analyses

In the two previous subsections, there is no evidence reported that directly supports the hypothesis that conglomerate mergers may contribute to increases in industry concentration. In fact, there is found to be weak support for an opposite hypothesis: that conglomerate mergers are associated with decreases in industry concentration. Also, some of the results reported might suggest that the effects of such influences on concentration as entry of new firms and production of consumer goods are attenuated by the occurrence of conglomerate mergers. In this subsection attempts are made to explain these results, and to find evidence that would support or contradict the tentative conclusions based on them.

The first results to be discussed concern the negative and insignificant coefficients that accompany almost all conglomerate merger variables. The insignificance of the coefficients could, of course, simply indicate the absence of a significant relationship between conglomerate mergers and changes in industry concentration. This result would be consistent with analyses by Markham (1973), the FTC(1972), and Goldberg (1972; 1974).

Another plausible explanation for the insignificant coefficients

would be the poor quality of the data available for such an analysis, as discussed in Chapter IV. While perhaps legitimate, this explanation carries the potential danger of encouraging a "believing is seeing" interpretation of whatever weak results do emerge.

A third explanation is suggested by observing a plot of changes in industry concentration against the number of conglomerate mergers occurring in those industries. For the sample used in this study, such a plot took on roughly the shape in Figure 1 below, reflecting the dampening relation referred to in Section A of this chapter.

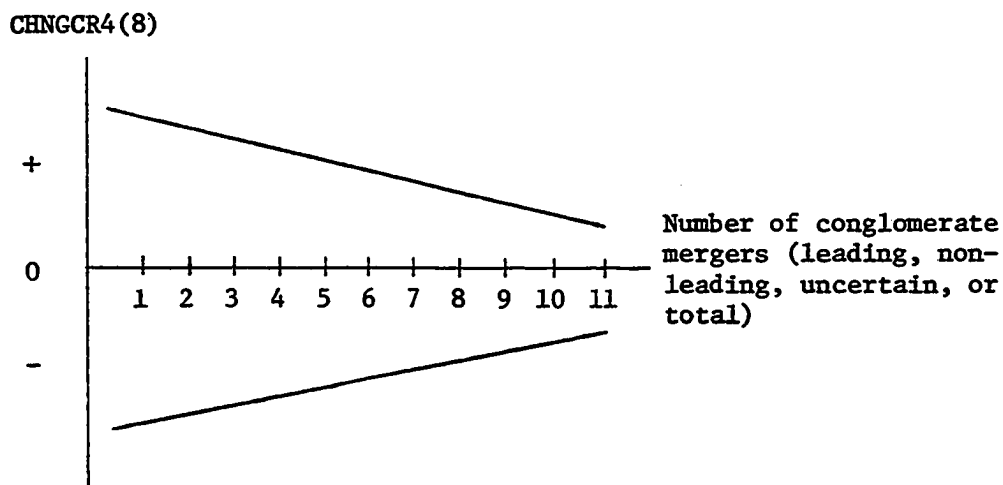


Figure 1. Relation between change in concentration and number of conglomerate mergers in 193 manufacturing industries

Data such as these might reasonably be expected to result in conglomerate merger coefficients insignificantly different from zero, especially if they indicate a heteroscedastic error term. Though heteroscedasticity in a multivariate model cannot definitely be inferred

from such a bivariate plot, the plot does serve as a warning that such a problem might exist. If so, the resulting t-ratios may be biased downward, making it difficult for coefficients to pass statistical significance tests.

In order to get a better indication of whether heteroscedasticity of the error term is a problem with the data, the model was estimated for the entire sample, and a plot was made of the regression residuals against the predicted values for the dependent variables. This rough analysis was sufficient to convince the author that an attempt to correct for heteroscedasticity was in order, as the residuals were not apparently randomly distributed across the predicted values of the dependent variables.

The first such attempt was made on the assumption that:

$$\text{Var}(\varepsilon_i) = C X_i^{-2},$$

where ε_i is the error term of the model, C is a non-zero, positive constant, and X_i is the number of conglomerate mergers plus one in industry i . The weighted least squares regression obtained by multiplying all variables in the model by X_i would have a homoscedastic error term (Pindyck and Rubinfeld 1981, pp. 145-46). However, estimation of the model following this adjustment did not increase the significance of the coefficients, and the plot of residuals against predicted values was not improved.

A second attempt at correction for heteroscedasticity, using as weights the estimated variance of each of three subgroups of the sample

(Maddala 1977, pp. 263-64), was likewise unsuccessful. (The three subgroups were determined by the groupings in the plot of residuals mentioned above.) At this point it was decided to simply live with whatever amount of heteroscedasticity the sample contains, and no further attempts to correct for heteroscedasticity were made.

Of the theories discussed in Chapter II, only the theory of mutual forbearance might lead one to expect a dampening relation between conglomerate mergers and changes in industry concentration. The other theories suggest that conglomerate mergers may lead to increases or decreases in concentration, but the present study and prior empirical studies find little or no support for such theories, providing justification for a laissez faire public policy toward conglomerate mergers. The policy implications of finding a dampening relation, though, would certainly be different than would results simply indicating no effect of conglomerate mergers on industry concentration. However, evidence of such a relation would not emerge if the positive and negative values of CHNGCR4(8) at each level of conglomerate merger activity have the effect of "offsetting" each other in the estimation of a regression line. Two attempts are made to verify the existence of such a dampening relation, and both are generally successful.

First, the original model is estimated using the absolute value of CHNGCR4(8) as the dependent variable. It is necessary to include the other independent variables in order to filter out influences on CHNGCR4(8) other than conglomerate merger activity. However, the use

of the absolute value of CHNGCR4(8) renders the control variable coefficients very difficult to interpret, and therefore they are not reported in Table 7. The hypothesis tested is that the coefficients on the conglomerate merger variables are negative, and so a one-tailed test for significance is appropriate.

Table 7. Regression coefficients on conglomerate merger variables when using the absolute value of the change in CR-4 or CR-8 as the dependent variable

Independent variable	193 industries		99 industries with ≥ 1 conglomerate merger		50 industries with 1 conglomerate merger	
	CR-4	CR-8	CR-4	CR-8	CR-4	CR-8
CONGMERG	-0.32* (-1.62)	-0.42** (-2.10)	-0.34** (-1.73)	-0.37** (-1.81)		
L4(8)MERG	-0.85 (-0.81)	-0.60 (-0.82)	-1.07 (-1.03)	-0.11 (-0.14)	-2.27 (-1.08)	-0.15 (-0.08)
NL4(8)MERG	-0.18 (-0.52)	-0.58 (-1.14)	-0.38* (-1.30)	-0.84** (-1.95)	-2.95** (-1.69)	-7.01** (-1.96)
U4(8)MERG	-0.35* (-1.30)	-0.31 (-1.23)	-0.25 (-0.97)	-0.19 (-0.74)		

* Significant at 10% level (1-tailed test).

** Significant at 5% level (1-tailed test).

In the 193- and 99-industry samples, the conglomerate merger variables are consistently negative. (See Table 7.) The coefficient on CONGMERG is significantly negative at the 5% level in three of four regressions, and extremely close to that level of significance in the fourth. The finer classification of mergers, into leading firm, non-leading firm, and uncertain categories, yields one coefficient significant at the 5% level (NL8MERG in the CR-8 regression on the 99-industry sample), and two coefficients significant at the 10% level (U4MERG and NL4MERG in the CR-4 regressions on the 193- and 99-industry samples, respectively). In the 50-industry sample, where the inclusion of three industry dummy variables prevents the use of CONGMERG and one of the three classes of conglomerate mergers, NL4(8)MERG is significantly negative at the 5% level, and L4(8)MERG is negative but insignificant.

Thus, all three industry samples lend some support to the existence of a dampening relation. The evidence suggests that all conglomerate mergers, but especially non-leading firm mergers, are associated with such an effect. Before trying to explain why such an effect may arise, one more piece of evidence supporting its existence is presented.

A casual analysis of the descriptive statistics in Section A of this chapter and the regression results just reported would imply a negative β in the following model:

$$V_i = \alpha + \beta X_i,$$

where V_i is the variance of CHNGCR4(8) and X_i is the number of conglomerate mergers in industry i . In other words, the hypothesis is that

less variance in changes in concentration will be observed in industries, the more conglomerate merger activity those industries experience. A regression model is proposed to test this hypothesis. Lacking information on the true variance of CHNGCR4(8) for each industry, it is necessary to estimate variances for groups of industries.

First, the sample of 193 industries was divided into groups consisting of two or more industries, according to the number of conglomerate mergers occurring into each industry. There were nine such groups: industries with zero, one, two, three, four, five, seven, eight, or ten conglomerate mergers. Next, the variance of the change in CR-4 and CR-8 was calculated for each group. This being done, a weighted least squares regression of the variance of the change in CR-4 and CR-8 on the number of conglomerate mergers was estimated using the number of industries in each group as the weight. The results are presented in Table 8.

Table 8. Regression of variance of change in concentration on number of conglomerate mergers: 193 industry sample^a

Dependent variable	Intercept	CONGMERG	\bar{R}^2	N
Variance of CHNGCR4	68.67** (10.96)	-7.90* (-2.99)	.50	9
Variance of CHNGCR8	70.73 (11.56)	-8.18** (-3.17)	.53	9

^at-ratios in parentheses.

* Significant at 5% level.

** Significant at 1% level.

The significantly negative coefficients on the independent variables lead one to reject the null hypothesis of $\beta = 0$. In other words, these regressions lend support to the existence of a dampening relation.

The evidence presented so far concerning the relationship between conglomerate mergers and changes in industry concentration can be summarized as falling into three main categories:

- 1) statistically insignificant negative coefficients on most conglomerate merger variables in the original regression equation, here to be referred to as the "insignificant coefficient" result;
- 2) evidence from descriptive statistics and least squares regression results of a relation between conglomerate mergers and reduced changes in industry concentration, whether increases or decreases (the dampening relation); and,
- 3) weak evidence of an association between conglomerate mergers and the attenuation or reversal of the effects of other factors related to changes in industry concentration, here to be referred to as the "weakening relation."

It might be the case that conglomerate acquisitions are most likely to occur into older, established industries. Such industries would be more apt than newer industries to be near an "equilibrium concentration level," as determined by technological considerations, market size, entry

barriers, and other factors (Caves and Porter 1980, p. 2). Increases or decreases in concentration in these industries would then be expected to be smaller than in other industries. A tendency for conglomerate mergers to occur more often into such industries would explain the observed dampening relation, with the direction of causation from the nature of the industry (and, hence, its minimal change in concentration) to the amount of conglomerate merger activity. The insignificant coefficient result would arise if the changes in concentration, though small, were on average negative. This could be due to the pursuit of short run profits by leading firms, at the expense of a gradual and small loss of their market shares to existing firms. It also seems reasonable that other factors that influence concentration would have less of an effect on such "mature" industries. If, in fact, conglomerate merger activity were concentrated in such industries, this would account for the apparent weakening of the effect of such factors.

To seek support for this line of reasoning, it was decided to regress the number of conglomerate mergers on several combinations of variables that might reflect the "maturity" of an industry. ENTRY, CHNGSHIP, and CHCR467 were all thought to be related to the proximity of an industry to its equilibrium concentration level (assuming the existence of such an equilibrium). This relationship would be an inverse relationship for ENTRY and CHNGSHIP; therefore, if conglomerate mergers actually occurred more often into industries near their equilibrium level of concentration, those variables would have negative

coefficients in the regression results. If, on the other hand, conglomerate mergers occurred more often into fast-growing, relatively young industries, positive coefficients on ENTRY and CHNGSHIP would be expected. The coefficient sign on CHCR467 was not predicted, for the same reasons discussed when this variable was first explained. The results from this test on the sample of 193 industries are reported in Table 9.

Table 9. Test for interpretation of dampening relation: "maturity" of industries experiencing conglomerate mergers^a

Dependent variable	Intercept	ENTRY	CHNGSHIP	CHCR467	R ²	N
CONGMERG	1.43** (9.11)	1.08** (2.98)	-0.53 (-1.52)	0.01 (0.22)	.05	193
CONGMERG	1.36** (9.02)	0.85* (2.57)		0.01 (0.30)	.03	193
CONGMERG	1.46** (9.10)		-0.10 (-0.30)	-0.01 (-0.20)	.001	193

^at-ratios in parentheses.

* Significant at 5% level.

** Significant at 1% level.

Although this evidence is not unambiguous, it does not seem to provide much support for the hypothesis of more conglomerate merger

activity into "mature" industries, and therefore such an interpretation of the results of this study is rejected.

Another possible interpretation of the results would be that a disproportionate number of conglomerate mergers occurred into industries with very high levels of concentration and a large number of small "fringe" firms. Such industries would not provide much opportunity for further increases in concentration, and even rapid growth of small firms would not be expected to significantly decrease concentration. The small firms, though, might be attractive acquisition targets.

Table 10. Test for interpretation of dampening relation: level of concentration of industries experiencing conglomerate mergers^a

Dependent variable	Intercept	CR-4 1967	CR-8 1967	CR-4 1972	CR-8 1972	R ²	N
CONGMERG	1.89** (5.90)	-0.01 (-1.58)				.01	193
CONGMERG	1.81** (4.99)		-0.01 (-1.13)			.01	193
CONGMERG	2.02** (6.26)			-0.01* (-2.03)		.02	193
CONGMERG	1.93** (5.18)				-0.01 (-1.43)	.01	193

^at-ratios in parentheses.

* Significant at 5% level.

** Significant at 1% level.

This explanation, too, was refuted, in this case by regressing the number of conglomerate mergers in each industry on the CR-4 and CR-8 for 1967 and 1972 in four separate regressions (Table 10). All of the concentration variables have negative coefficients; one of them, CR-4 in 1972, is significant at the 5% level. Thus, a tendency for conglomerate mergers into less concentrated industries emerged.

A third interpretation of the results relates to the theory of mutual forbearance discussed previously. If such behavior between large diversified firms develops as a result of their entry via merger into the same industries, the tempering of competitive behavior could result in both the dampening and weakening relations. The insignificant coefficients on the conglomerate merger variables are entirely consistent with this explanation. Although the results of this study can hardly be considered as convincing support for the theory of mutual forbearance, the evidence has not led the author to a compelling alternative explanation.

VI. SUMMARY, CONCLUSIONS, AND IMPLICATIONS

A. Summary

Chapter I of this dissertation presented a brief overview of the nature of conglomerate mergers. The extent of conglomerate merger activity in recent years and some potential effects of conglomerate mergers were also discussed in Chapter I.

Chapter II began a more narrowly focused examination of some possible effects of conglomerate mergers on competition in individual industrial markets. To this end, the economic significance of market concentration was briefly reviewed, followed by a more detailed explanation of how conglomerate mergers might affect market concentration. In particular, it was explained how a conglomerate acquisition might result in practices that can affect the market share of the acquired firm, which, in turn, might affect concentration in the market of the acquired firm. The practices that were of interest for this study were reciprocal buying agreements, cross-subsidization, and mutual forbearance. To the extent that reciprocity and cross-subsidization occur and have the intended effect, they would result in an increased market share for an acquired firm. In contrast, mutual forbearance is more likely to maintain or protect a firm's market share. The effects of successful reciprocity and cross-subsidization on market concentration were shown to differ, according to the market position of the acquired firm at the

time of acquisition, and depending upon the source of any increase in that firm's market share.

Previous studies (Markham 1973; FTC 1972; Goldberg 1972, 1974) that investigated the possible relationship between conglomerate mergers and changes in industry concentration were reviewed in Chapter III. The studies did not find support for allegations that conglomerate mergers are associated with increases in concentration, and found either weak evidence or no evidence relating conglomerate mergers to decreases in concentration. Shortcomings in each of these studies were identified.

In Chapter IV, a model was suggested for the purpose of drawing inferences regarding the practices of reciprocity, cross-subsidization, and mutual forbearance subsequent to conglomerate mergers. Like the studies discussed in Chapter III, the approach was to indirectly infer the extent of such practices by analyzing the relationship between conglomerate mergers and changes in industry concentration. It was hoped that by controlling for other factors that could affect changes in concentration, and by employing data unavailable to previous researchers, some light would be shed on the effects, if any, of conglomerate mergers on the competitive behavior of acquired firms. Data used for estimation of the model and the severe limitations of those data were also described in Chapter IV.

The results of the empirical analysis of this study were presented in Chapter V. First, a series of descriptive statistics were presented. These statistics showed that there was very little change in the average

level of concentration (CR-4 and CR-8) between 1967 and 1977 in the 193 industries studied. However, the evidence showed trends toward increasing concentration in consumer-goods industries and slightly decreasing concentration in producer-goods industries (though the combined market share of the fifth through the eighth largest firms in producer-goods industries was increasing during the period). This evidence is generally consistent with prior studies of earlier time periods by Mueller and Hamm (1974), Scherer (1979), and Caves and Porter (1980).

The descriptive statistics also showed that conglomerate merger activity did not seem significantly more likely to occur in consumer-goods industries than in producer-goods industries. What is notable, however, is that industries experiencing conglomerate mergers seem to have exhibited smaller increases and smaller decreases in concentration compared to industries with zero conglomerate mergers; this was referred to as the dampening relation between conglomerate mergers and changes in industry concentration.

Evidence from ordinary least-squares multiple regression estimation of the model was presented next in Chapter V. The evidence did not provide support for theories suggesting that conglomerate mergers lead to increases in industry concentration, and only very weak or statistically insignificant evidence was found relating conglomerate mergers to decreases in industry concentration. Some evidence suggested that conglomerate mergers are associated with the weakening of factors that, in the absence of such mergers, seem to affect changes in concentration.

The existence of the apparent dampening relation observed in the descriptive statistics was supported by some further regression analyses. Two possible explanations suggested for such a relationship were tested, but these explanations were not supported by the simple tests used.

B. Conclusions and Implications

The controversy of the past two decades in regard to public policy toward conglomerate mergers has had a variety of emphases, including the effects of such mergers on aggregate concentration, production efficiency, the quality of market information, and the dispersion of political power. The results of this study do not have direct bearing on the debates surrounding these considerations. Rather, this study's results have implications germane to the question of the effects of conglomerate mergers on the subsequent competitive behavior of firms involved in such mergers. As such, any policy implications of the present study should be thought of as relating to but one aspect of the effects of conglomerate mergers, and public policy with respect to conglomerate mergers must necessarily be formed on the basis of a broader range of considerations. It is from the limited perspective of this study that the following conclusions and implications are suggested.

In Chapter III, it was noted that Mueller (1977) had, perhaps prematurely, determined that "A fair consensus exists that conglomerate

mergers have not contributed to increases in industry level concentration ..." (p. 336). This study certainly adds to that consensus. On that basis, it can be cautiously inferred that reciprocity and cross-subsidization are not used by most conglomerates to increase the market shares of acquired leading firms. On the other hand, there was found very little evidence in support of the possibility that conglomerate firms contribute to decreases in concentration by using reciprocity and cross-subsidization to increase the market shares of acquired non-leading firms. These results are consistent with the findings by the FTC (1972) that "From a competitive standpoint, the effects of conglomerate diversification ... appear to be largely neutral" (p. 86, emphasis in the original). Thus, this study provides no support for restricting or encouraging conglomerate mergers on the grounds that such mergers may result in the practices of reciprocity or cross-subsidization.

The finding in this study of an apparent dampening relation between conglomerate mergers and changes in industry concentration, however, implies that conglomerate mergers might not be neutral with respect to changes in concentration or, by inference, with respect to the competitive behavior of firms involved in conglomerate mergers. If such a relation does, in fact, exist, it is important to determine its fundamental nature.

One possible explanation of a dampening relation is the attitude of mutual forbearance that Edwards (1955; 1970) has suggested might develop between large diversified firms. Such an attitude conflicts

with the competitive behavior that most economic theory requires for the efficient operation of markets. It should be noted that if conglomerate mergers, by fostering an attitude of mutual forbearance, result in less increases in concentration, as the dampening relation would suggest, such a development should not be considered beneficial. Industry concentration is only intended as a proxy for the degree of competition, and no one would contend that it is the sole determinant of the degree of competition in an industry. If direct evidence of reduced competition exists, it is such evidence that public policy should reflect, regardless of evidence indicating no increase in concentration in the affected market. Therefore, if widespread evidence of mutual forbearance could be found, such evidence would combine with the results of this study to support a policy to slow or reverse the emergence of large, diversified firms; restraints on certain conglomerate mergers would be one way of contributing to that result.

Of course, other explanations of the observed dampening relation are possible, although to this point the author has not found compelling alternatives to the mutual forbearance explanation. In any case, the evidence suggests that further research in this regard is required before the effects of conglomerate mergers on industry concentration, and on the competitive behavior of firms involved in conglomerate mergers, should be declared with any confidence to be "largely neutral."

The call for further research into the effects of conglomerate mergers necessarily leads to another conclusion that is, admittedly, not

unique to this study. That conclusion is that significant improvements in the publicly available data base for industrial organization research are necessary before such research can provide a reliable basis for industrial policy decisions. To cite just one of many possibilities, publication of the profitability (uniformly calculated) and the shares of sales of individual firms in economically meaningful markets would greatly improve the ability to test the validity of various hypothesized industry structure/conduct/performance relationships. It would seem that the marginal cost of making such data available, in terms of resources used and infringement of "privacy rights," would be far outweighed by the additional gain in understanding of the complex operation of a market economy. A substantially improved data base would not ensure the final resolution of positive controversies surrounding industrial organization theory, much less resolve the normative questions concerning appropriate public policy; debate on both fronts would undoubtedly remain vigorous. Nevertheless, the qualitative level of such debates would certainly be raised by data that would reduce or eliminate the need for "doubly-indirect inference" approaches such as that used in the present study.

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