EVIDENCE ON

MERGERS AND ACQUISITIONS

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I. INTRODUCTION

This paper provides a broad brush treatment of the empirical economics literature regarding the effects of mergers and acquisitions. Much of the literature has direct or indirect implications for competition policy.[1]

Of most direct interest to those concerned with merger-related antitrust issues are three types of empirical studies: stock market event studies, large-scale accounting data studies, and case studies that use either interview methods or more objective, data-intensive, pre-merger and post-merger performance approaches to study individual mergers. In recent years, researchers have begun to merge the stock market study approach and the accounting/finance approach in the hopes of providing a more robust analysis. Sections III through VI discuss briefly the strengths and weaknesses of each type of study as well as discussing specific studies in each category.

In addition to empirical studies that directly use data on mergers, indirect insight into the potential effects of certain types of mergers might be gained by examining the relationship between market concentration and the profits or prices of firms in a market. These structure-conduct-performance studies are examined briefly in a separate section (VII). Our literature summary also includes a short examination of the merger-related results that have been obtained in markets conducted in a laboratory setting (section VIII).

In addition, a data appendix provides information on merger and acquisition activity over the past two decades. Some of these data reveal general merger trends and some relate more directly to Federal Trade Commission and Department of Justice activity in the merger area (e.g., merger filings under the Hart-Scott-Rodino Act and FTC and DOJ requests for additional information in the course of reviewing those mergers).

We begin with a short list of possible motives for mergers.

II. MERGER AND ACQUISITION MOTIVES

There are a number of motives that might play a role in merger activity. The most general motive is simply that the purchasing firm considers the acquisition to be a profitable investment. The most common theme found in the work of economists who have written about merger activity is that mergers are often thought of as an alternative form of investment. Firms will undertake acquisitions

[1] This review does not cover empirical literature that deals directly with antitrust issues such as: empirical methods for estimating residual demand or demand systems, simulation of the effects of mergers using Bertrand or Cournot models, or optimal antitrust policy. In addition, the paper makes no attempt to review theoretical developments that might affect how economists view mergers.

when it is the most profitable means of enhancing capacity, obtaining new knowledge or skills,[2] entering new product or geographic areas, or reallocating assets into the control of the most effective managers/owners. Thus, many of the same factors that influence major investment decisions would also influence merger activity.[3] This view of mergers as a special case of business investment is not universally accepted, however. For example, Scheffman argues that managers seldom consider static cost reductions or price increases in making merger decisions. Rather, decisions to merge are part of a broader strategic plan aimed at positioning the firm to achieve some long-term goal.[4] In a related vein, Andrade and Stafford find that the timing of mergers is much different than the timing of general nonmerger business investment.[5] At the industry level, general business investment is fairly stable through time, whereas merger activity is much more concentrated in small time periods. In addition, Andrade, Mitchell, and Stafford note that much merger activity occurs as a reaction to deregulation and thus is clustered in the post-deregulatory period.[6] This research implies that merger activity is something other than a simple extension of business investment. Regardless of the general motivations for mergers, there are a few categories of factors that ought to play a role in a least some mergers. Several of those factors are discussed below.

A. Efficiencies

Firms may combine their operations through mergers and acquisitions of corporate assets to reduce production costs, increase output, improve product quality, obtain new technologies, or provide entirely new products. The potential efficiency benefits from mergers and acquisitions include both operating and managerial efficiencies. Operational efficiencies may arise from economies of scale,[7]

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[2] For evidence that in certain high technology industries, acquisition activity may be a substitute for R&D activity, *see* Blonigen & Taylor, *R&D Activity and Acquisitions in High Technology Industries: Evidence from the U.S. Electronic and Electrical Equipment Industries*, 48 JOURNAL OF INDUSTRIAL ECONOMICS 47 (March 2000).

[3] For a longer list of more specific factors that might influence merger intensity across industries, *see* WESTON, CHUNG & HOAG, MERGERS, RESTRUCTURING & CORPORATE CONTROL (1990) or Bittlingmayer, *Merger as a Form of Investment*, 49 KYKLOS 127 (1996).

[4] Scheffman, *Making Sense of Mergers*, 4 THE ANTITRUST BULLETIN 715 (Fall 1993).

[5] Andrade & Stafford, Investigating the Economic Role of Mergers (mimeo, Harvard Business School, 1999).

[6] Andrade, Mitchell & Stafford, *New Evidence and Perspectives on Mergers*, 15 JOURNAL OF ECONOMIC PERSPECTIVES 103 (Spring 2001).

[7] Economies of scale refer to the long-run reduction in the per unit cost of making a product as the volume of production rises, allowing all inputs to be varied optimally.

production economies of scope,[8] consumption economies of scope,[9] improved resource allocation (e.g., more resources in the hands of better managers), moving to an alternative less costly production technology or asset configuration, improved use of information and expertise, improved focus on core skills of the firm, a more effective combination of assets, improvements in the use of brand name capital, and reductions in transportation and transaction costs. It may be that mergers or acquisitions are the quickest, cheapest, or only way to attain these benefits.[10]

The gains from mergers and acquisitions are not, however, limited to narrowly considered gains to the firms (and ultimately to consumers). The ability of one firm to merge with another firm or acquire its assets also creates a market for corporate control.[11] Many economists consider an active market for corporate control an important safeguard against inefficient management.[12] An active market for corporate assets can also provide benefits in the form of more efficient reallocation of resources from relatively inefficient to efficient firms during periods of industry contraction or industry turmoil.[13]

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[8] Production economies of scope refer to the reduction in overall costs from the joint production of complementary products.

[9] Consumption economies of scope refer to the increased consumer welfare from the joint consumption of complementary products.

[10] For a discussion of conditions under which various efficiencies might (or might not) be attributed directly to merger activity, *see* Farrell & Shapiro *Scale Economies and Synergies in Horizontal Merger Analysis,* 68 ANTITRUST LAW JOURNAL 685 (2001).

[11] Prior to 1900 most firms were closely held by owners who also ran the firm. Over time, as the corporate form of organization grew, the tie between ownership and control became more tenuous. BERLE & MEANS, THE MODERN CORPORATION (New York, 1932) were the first to extensively study the separation of control from management. Manne, "Mergers and the Market for Corporate Control," 73 JOURNAL OF POLITICAL ECONOMY 110 (April 1965), studied the role that mergers might play in facilitating a market for whole corporations. Chandler, *The Competitive Performance of U.S. Industrial Enterprises Since the Second World War*, 68 BUSINESS HISTORY REVIEW 1 (Spring 1994) discusses the advent of the modern market for corporate control during the 1970s and 1980s.

[12] If a firm is poorly managed, its market value will be less than its potential value if the same firm were well managed. The market for corporate control allows more efficient management teams to profitably takeover such firms. Barber, Palmer & Wallace, *Determinants of Conglomerate and Predatory Acquisitions: Evidence from the 1960s,* 1 JOURNAL OF CORPORATE FINANCE 283 (1995) find that this management discipline motive was central to the hostile takeovers during the 1960s. Mitchell and Lehn suggest that disciplining incumbent management was one explanation for the "bust-up" acquisitions of the 1980s, where heavily diversified firms were purchased and the parts resold to firms specializing in each industry. *See* Mitchell & Lehn, *Do Bad Bidders Become Good Targets?* 98 JOURNAL OF POLITICAL ECONOMY 372 (April 1990). Also *see* Jensen, *Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers,* 76 AMERICAN ECONOMIC REVIEW 323 (1986). More generally, Romano reviews the economics/finance literature and finds the operating efficiency and management control explanations for mergers to be consistent with the evidence. *See* Romano, *A Guide to Takeovers: Theory, Evidence, and Regulation*, 9 YALE JOURNAL OF REGULATION 119 (1992).

[13] Mitchell & Mulherin, *The Impact of Industry Shocks on Takeover and Restructuring Activity,* 41 JOURNAL OF FINANCIAL ECONOMICS 193 (1996), focus on mergers as a means of reacting to industry-specific shocks such as (continued...)

B. Financial and Tax Benefits

Mergers and acquisitions may lead to financial efficiencies. For example, firms may diversify their earnings by acquiring other firms or their assets with dissimilar earnings streams. Earnings diversification within firms may lessen the variation in their profitability, reducing the risk of bankruptcy and its attendant costs.[14]

Prior to the mid-1980s, there may also have been significant tax reduction benefits associated with mergers and acquisitions. The empirical evidence, however, regarding these benefits implied that if they existed, they were likely not a major motivation for most merger activity. Romano's[15] review of the literature on the tax incentives for mergers up to about 1990 found little support for the hypothesis that tax changes had a significant effect on takeover activity. Regardless, of how extensive the tax benefits were prior to 1987, for more recent mergers, the Tax Reform Act of 1986, which broadened the definition of taxable income and limited the ability of acquiring firms to use the acquired firm's net operating losses to reduce future taxes, likely reduced any potential tax benefits associated with mergers and acquisitions.[16] The loss of one tax benefit, related to a change in the "General Utilities" doctrine, was almost surely the cause of a late 1986 increase in merger activity as firms rushed to beat the higher taxes that would be required in 1987.[17]

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[13](...continued)
technology changes. They argue that the timing and clustering of 1980s takeovers and restructurings indicate that these actions were the means by which firms and industries adjusted to exogenous shocks. Andrade, Mitchell & Stafford, *New Evidence and Perspectives on Mergers*, 15 JOURNAL OF ECONOMIC PERSPECTIVES 103 (Spring 2001) focus on reactions to deregulation as a driving force behind much of the 1990s merger activity.

[14] In the absence of bankruptcy costs, investors may be able efficiently to diversify by purchasing shares in a number of unrelated firms, thereby reducing any benefits from diversification within a single firm.

[15] *See* Romano, *supra* note 12, at 133-136.

[16] For a discussion of the complex effects of the 1986 Act, *see* GILSON & KRAAKMAN, THE LAW AND FINANCE OF CORPORATE ACQUISITION, SUPPLEMENT 1988, (1988). In a related study, D. BREEN, THE POTENTIAL FOR TAX GAIN AS A MERGER MOTIVE: A SURVEY OF CURRENT KNOWLEDGE AND RESEARCH OPPORTUNITIES, (Bureau of Economics, Federal Trade Commission, 1987), also found little evidence that tax policy affected the pattern of mergers. Tax effects were not entirely eliminated , however. Long & Ravenscraft, *Decade of Debt: Lessons from LBO's in the 1980s*, THE DEAL DECADE: WHAT TAKEOVERS AND LEVERAGED BUYOUTS MEAN FOR CORPORATE GOVERNANCE, (Blair ed. 1993) found evidence that the deductibility of interest payments (which was largely unaffected by the Tax Reform Act of 1986) was a major source of cash flow improvements in LBO firms during the 1980s. Schipper & Smith, *Effects of Management Buyouts on Corporate Interest and Depreciation Tax Deductions*, 34 JOURNAL OF LAW AND ECONOMICS 295 (1991), who examine management buy-outs, however, (p. 329) note that because any tax gains from interest deductibility could be obtained without going through a takeover or merger, its is not clear why one would necessarily expect that deductibility to affect merger or takeover activity.

[17] A graph of the number of monthly merger filings required by the Hart-Scott-Rodino Act shows a very large spike in November 1986 (494 transactions in one month - an all time high) that resulted from firms trying to beat an adverse tax effect of the 1986 Tax Act which was to take effect in January 1987 (See Figure 3). That tax effect likely was very
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C. Market Power Effects

Some mergers may result in market power which redounds to the benefit of the merging firms. For example, George Stigler[18] argued that such an effect might have been a primary motivation for many of the mergers and acquisitions during the last quarter of the nineteenth century and the first half of the 20th century. He called the 1887-1904 merger wave "mergers for monopoly" and the 1916-1929 wave "mergers for oligopoly." Regardless of whether market power was, or was not, a major motivation for mergers in the first-half of the century,[19] it is doubtful that the bulk of more recent merger activity could be attributed to an effort to secure market power. Following the passage and enforcement of effective antimerger legislation in 1950, mergers between competing firms with significant market shares (those mergers most likely to be anticompetitive) became relatively rare,[20] and those that did occur (mainly in the 1980s and 1990s) were allowed only after review by the U.S. antitrust agencies or other regulatory agencies (e.g., FCC for telecommunications, FERC for electricity, State Attorneys General, etc.).[21]

D. Management Greed, Self-Aggrandizement, or Hubris

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short-lived, affecting the timing of mergers, but not the long-run number of mergers .

[18] Stigler, *Monopoly and Oligopoly by Merger*, 40 AMERICAN ECONOMIC REVIEW (May 1950), *reprinted in* THE ORGANIZATION OF INDUSTRY (1968).

[19] The historical evidence is unclear about whether or not late nineteenth and early twentieth century industrial and railroad "trusts" actually engaged in what we understand today as anticompetitive behavior. ARMENTANO, ANTITRUST AND MONOPOLY: ANATOMY OF A POLICY FAILURE (1990), argues that these firms tended to have many rivals and that they continuously increased output and reduced prices. Interestingly, Ginsburg, *Rationalizing Antitrust: A Reply to Professor Armentano*, 35 ANTITRUST BULLETIN 329 (Summer 1990), former Assistant Attorney General for Antitrust, does not dispute Armentano's report of the history. For a recent recounting of the history for Standard Oil, *see* Boudreaux & Folsom, *MicroSoft and Standard Oil: Radical Lessons for Antitrust Reform*, ANTITRUST BULLETIN 555 (1999). Boudreaux & Folsom argue that Standard Oil's market share peaked at about 90% in 1890 and had fallen to 65% by 1911 when the government's antitrust case was filed. During this time, prices and unit costs fell and quantities rose as Rockefeller pursued productivity gains. For some evidence from turn of the century stock markets indicating that trust formation was likely to be welfare enhancing on average, *see* Banerjee & Eckard, *Are Mega-Mergers Anticompetitive? Evidence From the First Great Merger Wave*, 29 RAND JOURNAL OF ECONOMICS 803 (Winter 1998). For a general argument that the antitrust laws do not systematically provide benefits by reducing market power and were not intended to do so, *see* McCHESNEY & SHUGART, THE CAUSES AND CONSEQUENCES OF ANTITRUST: THE PUBLIC CHOICE PERSPECTIVE (1995).

[20] Stigler, *The Economic Effects of the Antitrust Laws*, 9 JOURNAL OF LAW & ECONOMICS (October 1966) reprinted in G. Stigler, ed., THE ORGANIZATION OF INDUSTRY (1968) concludes that the 1950 merger act had a strongly adverse effect upon horizontal mergers of large firms.

[21] Since the 1970s, in the small percentage of merger transactions that were considered competitively troubling enough to be reviewed closely by the antitrust agencies (amounting to 2 to 4 percent of filed mergers or about 50 to 100 per year), the antitrust agencies often required divestitures to address the anticompetitive aspects of the transactions prior to allowing the merger to move forward.

Morck, Shleifer, and Vishny[22] present evidence consistent with the notion that managerial incentives may drive some mergers that ultimately reduce the long-run value of the firm. The managers may overdiversify, overemphasize growth, or simply make bad acquisition decisions.[23] Although self-aggrandizement by managers may motivate some mergers and acquisitions, Mitchell and Lehn[24] provide evidence that managers who make poor acquisitions increase the likelihood that they will, themselves, become acquisition targets. If so, the market for corporate control will tend to reduce the scope of self-aggrandizing behavior. In addition, Matsusaka[25] provides evidence from the conglomerate merger era (1968-74) that at the time these diversifying deals were struck, the market favored the transactions. Thus, a characterization of this period as one filled with "run-away" managers, would be incorrect. For better or worse, the market apparently approved of the diversification.[26]

E. Obtaining a Good Buy

While acquiring firms cite "obtaining a good buy" as a reason for their acquisitions, the underlying implication that markets may consistently undervalue corporate assets, is questionable.[27] If all potential acquirers have similar perceptions about the value of potential targets and the market for corporate control is competitive, then the potential acquirers would bid up the price of targets which appeared to be bargains until the acquiring firms would, at the margin, expect to receive only

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[22] Morck, Shleifer & Vishny, *Do Managerial Objectives Drive Bad Acquisitions?* 45 JOURNAL OF FINANCE 31 (March 1990). Blair also provides evidence that during the latter half of the 1980s managers used excess earnings to inefficiently pursue takeovers. *See* (Blair ed. 1993) THE DEAL DECADE: WHAT TAKEOVERS AND LEVERAGED BUYOUTS MEAN FOR CORPORATE GOVERNANCE.

[23] For example, Avery, Chevalier & Schaefer, *Why Do Managers Undertake Acquisitions? An Analysis of Internal and External Rewards for Acquisitiveness*, JOURNAL OF LAW ECONOMICS & ORGANIZATION 24 (April 1998), find evidence from the mid-1980s that CEOs may pursue acquisitions to enhance their prestige and status in the business community.

[24] *See* Mitchell & Lehn, *supra* note at 12.

[25] Matsusaka, *Takeover Motives During the Conglomerate Merger Wave,* 24 RAND JOURNAL OF ECONOMICS 357 (Autumn 1993).

[26] More recently, Hou, Olsson & Robinson, Does Takeover Increase Stockholder Value? (mimeo, University of Chicago, 2000) confirmed that diversifying mergers were value enhancing during the 1963 to 1995 period using observation periods from 4 months to 3 years following the mergers. Barber, Palmer & Wallace, *Determinants of Conglomerate and Predatory Acquisitions: Evidence from the 1960s* 1 JOURNAL OF CORPORATE FINANCE 283 (April 1995) find that the motives underlying conglomerate mergers of the 1960s were as economically sound as those underlying the non-conglomerate mergers. In a related vein, Maloney, McCormick & Mitchell, *Managerial Decision Making and Capital Structure,* 66 JOURNAL OF BUSINESS 189 (April 1993) examined over 950 mergers and acquisitions finding that increased leverage may be one way to minimize costs of managerial discretion. Increased debt seemed to improve decision-making. Mueller & Reardon, *Rates of Return on Corporate Investment,* 60 SOUTHERN ECONOMIC JOURNAL 430 (October 1993), at 443 also find that result.

[27] A firm might, however, be a "good buy" if it were undervalued because of poor management and the existence of state antitakeover laws or other impediments that prevent the market for corporate control from working effectively.

a normal return from their acquisitions. This expectation is consistent with many of the empirical results on the effects of mergers - buyers appear to earn small returns, if anything. If, however, perceptions differ (for example, the acquirer is more optimistic than the target), then the acquiring firm may believe that it found a bargain while the target can be happy with the acquirer's offer.[28]

Because mergers done through stock appear to differ from those done via cash (the stock market appears to prefer cash deals),[29] some commentators have wondered whether the use of "overvalued" stock might allow a firm to make a "good buy." This theory implies that the purchasing firm that uses stock to pay for the assets has better information than the selling firm shareholders who are accepting the stock in payment. Whether this is plausible might depend on the compensation schemes for selling firms' executives and the extent of unique information held by the purchasing firms' managers.

F. Stakeholder Expropriation

Shleifer and Summers[30] suggest a number of other motives for mergers and acquisitions in which the shareholders may gain at the expense of other stakeholders.[31] For example, some target firms may seek acquirers to escape financial problems or to break unfavorable labor contracts. Other firms may seek leveraged purchases of their targets to increase the surviving firms' risk-return profile at the expense of existing debt holders. Romano[32] evaluated the various stakeholder arguments based on the financial/economics literature. While the literature is not always conclusive, Romano generally finds the evidence to be inconsistent with the theory that takeovers are motivated by a desire to expropriate gains from taxpayers, bondholders, labor, or consumers.[33]

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[28] Indeed, Roll, *The Hubris Hypothesis of Corporate Takeovers*, 59 JOURNAL OF BUSINESS 197 (April 1986), argues that "hubris" may induce the management of an acquiring firm to overbid for its target. For a discussion of evidence related to the hubris hypothesis, *see* Romano, *supra* note 12, at 150-152.

[29] For some evidence regarding the stock market's apparent preference for cash-based acquisitions, *see* Andrade, Mitchell & Stafford, *New Evidence and Perspectives on Mergers*, 15 JOURNAL OF ECONOMIC PERSPECTIVES, 103 (Spring 2001); and Hou, Olsson & Robinson, Does Takeover Increase Stockholder Value? (mimeo, University of Chicago, 2000).

[30] Shleifer & Summers, *Breach of Trust in Hostile Takeovers*, in CORPORATE TAKEOVERS AND THEIR CONSEQUENCES (Auerbach, ed. 1988).

[31] "Stakeholders" refers to all parties that have an interest in the well-being of a firm including stockholders, creditors, managers, employees, retirees, customers, suppliers, and residents of the community in which the firm is located.

[32] *See* Romano, *supra* note 12, at 133-142.

[33] Since Romano's review additional work on the stakeholder effects has been forthcoming. That literature has shown some negative effects on bondholders, particularly those holders of higher quality bonds. The size of this effect is insufficient, however, to explain the large premiums obtained in the takeovers and thus bondholder expropriation cannot be a convincing argument by itself for the takeover activity. *See* Warga & Welch, *Bondholder Losses in Leveraged Buyouts*, 6 REVIEW OF FINANCIAL STUDIES 959 (Winter 1993). In addition, research has continued on the labor

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III. ALTERNATIVE APPROACHES FOR THE DIRECT STUDY OF MERGERS

Evidence regarding the effects of mergers comes to us from many different sources. Much of the evidence comes from the finance literature where the main focus is on the ultimate effect of a merger on the stockholders of the acquiring and target firms. One common technique for examining the effects of a merger or acquisition employs the stock market's reaction to the event. "Event studies" utilize the assumption of efficient financial markets (i.e., the notion that the price of a firm's stock reflects all available information bearing on the expected future profitability of the firm) to assess the perceived consequences of mergers and acquisitions. A relatively long period before the event is used to estimate the "normal" relationship between the individual firm's stock price and the price of the broad market (or of a matched sample of firms). A change in this normal relationship around the time of the event represents an "abnormal" movement - the stock price movement that is unique to the event. The abnormal movements are summed over the event "window" (say, five days around the event date) and statistical tests are performed to see if the abnormal movement during the window of time is significant.[34] For example, when firm A announces that it intends to acquire firm B, one can check the abnormal movement in the stock prices of each firm to see if the market has a particular reaction (either positive or negative) to the announced transaction and whether the market thinks that the buyer, seller, or both are expected to profit by the deal. One can also examine the stock price reactions of firms that are rivals of the merger partners to see if their stock prices moved abnormally around the time of the acquisition announcement or around the time a challenge to the merger is announced by an antitrust agency. The examination of rivals' stock price movements around these events (arguably) helps in determining the competitive implications of a merger.

A second approach to measuring merger effects involves examining the accounting data for firms before and after an acquisition to determine the changes associated with the merger. These

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[33](...continued)
expropriation question. Peoples, Hekmat & Moini, *Corporate Mergers and Union Wage Premiums,* 17 JOURNAL OF ECONOMICS AND FINANCE 65 (Summer 1993) find that greater merger activity in an industry is associated with a lower wage for unionized workers, but no difference in wages for nonunion workers. Another recent study of 120 hostile takeovers occurring between 1979 and 1989 found that the likelihood of being a hostile takeover target was unrelated to the wage structure of the industry. Thus, firms paying wages above the norm did not appear to be more likely to become targets. These results imply that takeovers during the 1980s were not likely motivated by a desire to inefficiently redistribute income from workers to owners. *See* Neumark & Sharpe, *Rents and Quasi Rents in the Wage Structure: Evidence from Hostile Takeovers,* 35 INDUSTRIAL RELATIONS 154 (April 1996).

[34] Event studies using stock market data are subject to certain methodological problems. The studies are often sensitive to differences in study design, definition of data, and selection of the sample. Some economists have further argued that the stock market may be inefficient and that this inefficiency may significantly detract from the usefulness of stock market event analyses. For discussion of this point, *see* RAVENSCRAFT & SCHERER, MERGERS, SELL-OFFS, AND ECONOMIC EFFICIENCY (1987), at 7-11, and Kleindon, *Variance Bounds Tests and Stock Price Valuation Models*, 94 JOURNAL OF POLITICAL ECONOMY 953 (1986). For a more recent argument that market predictions are fairly accurate predictors of ultimate merger performance, *see* Sirower & O'Byrne, *The Measurement of Post-Acquisition Performance: Toward a Value-Based Benchmarking Methodology,* 11 JOURNAL OF APPLIED CORPORATE FINANCE 107 (Summer 1998).

studies may focus on accounting rates of return, profit margins, cash flow returns, expense ratios, or any number of other accounting and financial measures of firm performance. Each measure has its proponents and critics. These studies try to control for confounding factors by comparing the post-acquisition changes in financial performance to industry averages or (better yet) to multiple regression-based estimates of what would have occurred absent the acquisition. Many of the large sample multi-industry studies in this category examine mergers that occurred prior to 1980, becuase the multi-industry studies were more in vogue in that period. Some of the more recent evidence in this category comes from studies that compare pre-merger and post-merger performance of firms in only one industry (e.g., banking or hospitals).

Recently, studies have appeared that have combined the accounting measures and stock market event study approaches. When applied to relatively large samples of mergers, the results can provide indications about (1) whether the approaches tend to produce consistent results, and (2) whether the mergers typically produce gains for shareholders. Some of these studies have also focused on samples of mergers in which divestitures later occurred to determine whether the initial acquisitions were efficient.

Yet another technique for examining merger effects is to track prices, output, product quality, or R&D intensity over time for individual mergers, adjusting for factors other than the merger that might reasonably be thought to affect prices or output levels. This adjustment is done through econometric techniques, by choosing appropriate control groups, or both. The bulk of the recent empirical evidence on mergers using this technique comes from the airline, banking, and hospital industries, although we also have studies of individual mergers in certain other industries.

Much of the literature on merger effects focuses upon the effects on the firms involved and on the wealth of the shareholders of the acquiring and target firms. For those mainly interested in the potential anticompetitive effects of mergers, however, one must recall that there is no way to obtain a large sample of mergers that would be generally expected to raise prices, reduce output, or reduce quality post-merger. Those mergers would have to come mainly from the 2% to 4% of reported mergers that each year are investigated in great detail by the antitrust authorities. In many of those cases, the transactions are reconfigured to avoid the anticompetitive problem or they are abandoned after the antitrust agency makes its negative assessment known. This process of merger review and deal reconfiguration, makes it difficult to assemble a sample of problem mergers. On occasion, the government sues but fails to block a problem merger, thus producing a possible review candidate. Even then, being able to obtain sufficient data to model the expected post-merger price is another constraint. Ultimately, there are precious few potentially problematic deals that make it through (or around) the antitrust screen and for which there are public data sufficient for post-merger analysis. We will, however, review a study of one such merger in the hospital industry. Otherwise, one must settle for a sample of "close call" mergers that might have been thought by some observers to lead to competitive problems, but that were still allowed by the reviewing agency without substantial pre-merger remedies. The paper by Schumann *et al.* presents at least one such case and some of the mergers in the airline and grocery retailing industries may fall in this category.

IV. STOCK MARKET STUDIES OF MERGER EVENTS

While the recent larger scale studies of mergers have used stock market event analysis as one part of their investigations, there are other studies that have focused principally on that technique. These studies can be divided into many categories. In this section we review those studies that attempt to determine the effects of mergers on the merging firms and on the market as a whole. In a second section, we examine a set of studies that tries to answer the question "Does the merger lead to market power?"

A. Stock Price Effects

1. Target Firms

Stock market studies using the capital asset pricing model consistently show that target companies' stockholders enjoy significant abnormal returns. Jarrell and Poulsen[35] examine 663 successful tender offers from 1962 through 1985 and find that takeover premiums averaged 19 percent in the sixties, 35 percent in the seventies, and 30 percent in the first half of the eighties. Similarly, Jensen and Ruback[36] who surveyed 13 studies of pre-1980 stock market data, find positive returns of between 16 percent and 30 percent to the targets of successful mergers and tender offers. Andrade, Mitchell, and Stafford report remarkably stable target firm returns of 23 to 25 percent for completed mergers spanning decades in the 1973 to 1998 period.[37]

Additionally, Bradley, Desai and Kim[38] find that target firm stockholders realize significant positive abnormal returns upon the announcement of a takeover offer even if the takeover does not go through. The authors conclude that these gains are primarily due to stock market anticipation of a future successful acquisition bid for the target. However, targets who defeat a hostile takeover bid ultimately see their stock value return to approximately the pre-takeover level if no takeover occurs.

These stock market studies consistently find that lower returns tend to be associated with negotiated mergers, the higher returns with tender offer takeovers. The same phenomenon may be driving the result that the returns forthcoming from transactions that are paid for in cash are

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[35] Jarrell & Poulsen, *The Returns to Acquiring Firms in Tender Offers: Evidence from Three Decades*, 12 FINANCIAL MANAGEMENT 18 (1989).

[36] Jensen & Ruback, *The Market for Corporate Control: The Scientific Evidence*, 11 JOURNAL OF FINANCIAL ECONOMICS 5 (April 1983).

[37] Andrade, Mitchell & Stafford, *New Evidence and Perspectives on Mergers*, 15 JOURNAL OF ECONOMIC PERSPECTIVES 103 (Spring 2001).

[38] Bradley, Desai & Kim, *The Rationale Behind Interfirm Tender Offers: Information or Synergy*? 11 JOURNAL OF FINANCIAL ECONOMICS 183 (April 1983).

systematically higher than those from transactions that involve stock swaps.[39]

2. Acquiring Firms

Whether the stockholders of the acquiring firms gain is much less certain. Most studies covering the 1960s and 1970s find that acquiring firms' stockholders receive small or zero abnormal returns from mergers; some even find negative abnormal returns. Jensen[40] summarizes the evidence, arguing that "[a]cquiring-firm shareholders on average earn about 4 percent in hostile takeovers and roughly zero in mergers." Jarrell and Poulsen[41] identify a secular decline in the returns to successful bidders in tender offers. They find statistically significant positive abnormal returns of 5.0 percent to acquiring firms in the sixties and of 2.2 percent in the seventies, but statistically insignificant negative abnormal returns to acquiring firms in the eighties. The small or negative returns to acquirers in the 1980s was confirmed in several studies and similar results were obtained for a sample of large acquisitions in the mid-1990s and for all mergers through 1998.[42] The negative returns to acquirers also appeared when the event window was expanded to cover several years.[43]

3. Stock Market Returns as Predictors of Ex-Post Merger Performance

Stock market event analysis measurements of the net returns to the target and the buying firm provide a prediction of gains or losses to the shareholders of the merging firms rather than evidence that the gains (or losses) actually occurred. Thus, the evidence of net gains to the merging partners, on the order of 1 to 2 percent, may not be persuasive indicia that such gains occurred.[44] Ravenscraft and Scherer[45] argue that the history of conglomerate mergers indicates that the stock market predicts financial outcomes quite poorly. They, therefore, question the usefulness of stock market analyses of

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[39] *See* Hou, Olsson & Robinson, Does Takeover Increase Stockholder Value? (mimeo, University of Chicago, 2000).

[40] Jensen, *Takeovers: Their Causes and Consequences*, 2 JOURNAL OF ECONOMIC PERSPECTIVES 21 (Winter 1988).

[41] *See* Jarrell & Poulsen, *supra* note 35.

[42] *See* Andrade, Mitchell & Stafford, *New Evidence and Perspectives on Mergers*, 15 JOURNAL OF ECONOMIC PERSPECTIVES 103 (Spring 2001), esp. Table 3.

[43] *See* Loughran & Vijh, *Do Long-Term Shareholders Benefit from Corporate Acquisitions?* 52 JOURNAL OF FINANCE 1765 (December 1997). They also found distinctly different returns for hostile cash tender transactions and friendly mergers using long post-merger event windows. Compared to a matched sample of nonmerging firms, five year excess stock market returns to acquirers following a typical 1970s or 1980s transaction were a positive 61 percent for cash tender offers, but were a negative 25 percent for stock mergers.

[44] Some commentators have argued that for the small set of mergers that are heavily reviewed by the antitrust agencies, those agencies obtain more information than is available to the market participants, and thus the agencies can make better informed predictions about the effects of the merger than can the market.

[45] *See* Ravenscraft & Scherer, *supra* note 34.

mergers.[46] More recently, however, Ravenscraft and Pascoe[47], Healy *et al.*[48], and Kaplan and Weisbach[49] have each found a positive, albeit weak, correlation between *ex ante* stock market returns and *ex post* accounting measures of profits, cash flow returns, or acquisition success. This conclusion was echoed by Kaplan in his volume of twenty case studies.[50] In a more positive assessment of the markets' predictive ability, Sirower and O'Byrne[51] argue that their accounting measure (economic value added) is fairly highly correlated with initial stock market predictions about the success or failure of a merger (explaining 46 percent of the variation), and thus the market is a useful predictor of the ultimate outcome.

Rather than using abnormal stock market price movements around the time of an event as predictors of future actual performance, certain researchers have examined the abnormal stock market performance of merging firms over a long period of time (a few months to a few years) following the merger. These studies are not the usual event studies, because they do not use the theory of market expectations to draw implications about the likely effects of a merger; rather they try to measure actual performance against a benchmark. In this respect they are like financial studies of pre- and post-merger performance. For example, Loughran and Vijh examined 947 whole firm acquisitions from the 1970s and 1980s and found that, compared to a matched sample of nonmerging firms, five year excess stock market returns to acquirers following the transaction were a positive 61 percent for cash tender offers, but were a negative 25 percent for stock mergers.[52] The authors conjecture that the gains for cash tenders are due to management improvements not available in friendly stock mergers. They note that the initial stock price changes around the time of the deals failed to efficiently incorporate

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[46] In a related vein, Stein argues that if firm efficiency can be signaled only by current earnings, then temporarily low earnings may lead to undervalued stock, causing managers to fear unwarranted takeovers. *See* Stein, *Takeover Threats and Managerial Myopia*, 96 JOURNAL OF POLITICAL ECONOMY 61 (1988). Meulbroek *et al.* have argued, however, that Stein's hypothesis is inconsistent with their evidence showing that firms' relative R&D spending falls after the firms are insulated from takeovers by antitakeover amendments. *See* Meulbroek, Mitchell, Mulherin, Netter & Poulsen, *Shark Repellants and Managerial Myopia: An Empirical Test,* 98 JOURNAL OF POLITICAL ECONOMY 1108 (October 1990).

[47] Ravenscraft & Pascoe, *Can the Stock Market Predict Merger Success*? (mimeo, University of North Carolina and Center for Economic Studies, Bureau of the Census, July 1989).

[48] Healy, Palepu & Ruback, *Does Corporate Performance Improve after Mergers?* 31 JOURNAL OF FINANCIAL ECONOMICS 135 (1992).

[49] Kaplan & Weisbach, *The Success of Acquisitions: Evidence from Divestitures,* 47 JOURNAL OF FINANCE 1078 (March 1992).

[50] MERGERS AND PRODUCTIVITY, (Kaplan ed.), National Bureau of Economic Research Conference, University of Chicago (2000), see esp. p. 6.

[51] Sirower & O'Byrne *The Measurement of Post-Acquisition Performance: Toward a Value-Based Benchmarking Methodology* 11 JOURNAL OF APPLIED CORPORATE FINANCE 107 (Summer 1998).

[52] *See* Loughran & Vijh, *Do Long-Term Shareholders Benefit from Corporate Acquisitions?* 52 JOURNAL OF FINANCE 1765 (December 1997).

this information. One other such study by Hou, et al. investigates the abnormal rate of return for a large portfolio of firms (over 3,400 listed on the three major exchanges) that had undergone mergers or takeovers between 1963 and 1995.[53] The results are broken into various subsets: within-industry group versus diversifying mergers, buyers versus targets, cash versus stock payment mechanisms, decade-by-decade comparisons, etc. For the shorter time horizons, the authors find the standard results - abnormal returns to the portfolio of target firms are large and returns to the buyers are positive, but relatively small. Returns to the horizontal mergers are large and returns to the diversifying mergers, while smaller, are still positive and significant. Returns to cash deals (that use purchase accounting) are significantly higher than those in stock deals (that use pooling accounting).[54] The returns from the 1980s are the greatest of any decade (those were the years of cash-based hostile takeovers), but they also tend to fade more than those of other decades as the horizon is lengthened. As the horizon is lengthened to two or three years, the abnormal returns tend to get smaller, but remain positive. The authors conclude that the results are more consistent with mergers being efficient than with arguments that mergers are managerial mistakes or self-aggrandizing behavior by managers.

B. Market Power Implications

While the finance literature indicates that substantial market valuation gains occur at least for targets of takeovers, the source of those gains is difficult to identify. The studies surveyed in this section examine whether market power (e.g., collusion) might be a source of the gains. Because the market power rationale is implausible for most mergers, this literature focuses only on those horizontal mergers where the possibility of market power effects is greatest. The market power hypothesis implies that mergers which create or enhance market power allow the surviving firm and its rivals to increase product prices. These higher prices should be reflected in increased equity values of rival firms at the time of the merger announcement. The market power hypothesis also implies that an antitrust challenge to a merger which creates or enhances market power would harm rival firms by preventing product price increases. Therefore, the equity values of rival firms should fall on the announcement of an antitrust challenge to an anticompetitive merger.

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[53] Hou, Olsson & Robinson, Does Takeover Increase Stockholder Value? (mimeo, University of Chicago, 2000). The authors examine monthly average returns over several horizons ranging from 4 months to 3 years following the event dates using an estimation technique that adjusts for autocorrelation and heteroskedasticity in the error term The authors use a three-factor model to derive a benchmark for normal returns. The factors include: (1) the return relative to the market, (2) an adjustment for firm capitalization size, and (3) whether the acquirer is categorized as a "growth" versus "value" firm. Both value-weighted and unweighted portfolios are estimated, with the unweighted results being much larger (e.g., 2.5 percent per month versus 0.70 percent). The authors focus on the weighted results. The use of the long time horizon results is controversial in the finance literature, because it relies critically on the accuracy of the underlying model of "normal" returns. For periods beyond a few months, it is difficult to unambiguously attribute abnormal stock movements to the merger rather than to other activities of the firm.

[54] The fact that transactions paid for in cash outperform transactions paid for in stock appears to be a common and robust result of the finance literature. Different authors attribute the result to the accounting treatment, or to management/shareholder agency issues, or to differing time periods (the hostile 1980s deals done with cash versus the friendly 1990s stock swaps), but regardless of interpretation, the result appears robust.

Most of the studies of this issue, beginning with Eckbo,[55] find that shareholders of rivals to firms involved in horizontal mergers earned significant positive abnormal returns, on average, when the mergers were first announced.[56] However, the rival firms had positive, but insignificant, abnormal returns when the antitrust complaints against these mergers were announced.[57] The interpretation of these results has been the subject of some controversy.

Based on the results, Eckbo rejects the market power hypothesis. He reasons that rivals benefit from the original merger announcement not because of potential market-power induced price increases, but rather because the announcement provides new information that firms within an industry can become more efficient through consolidation. The rivals were unaffected by the announcement of antitrust complaints because the benefits they would receive from the government blocking an efficient merger among its competitors were offset by the decreased probability that they could also merge and enjoy potential efficiencies.[58]

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[55] Eckbo, *Horizontal Mergers, Collusion, and Stockholder Wealth*, 11 JOURNAL OF FINANCIAL ECONOMICS 241 (1983).

[56] *See* Schumann, THE EFFECTS OF FTC ANTITRUST CHALLENGES ON RIVAL FIRMS 1981-1987: AN ANALYSIS OF THE USE OF STOCK RETURNS TO DETERMINE THE COMPETITIVE EFFECTS OF HORIZONTAL MERGERS (Bureau of Economics, Federal Trade Commission 1989); *Patterns of Abnormal Returns and the Competitive Effects of Horizontal Mergers*, REVIEW OF INDUSTRIAL ORGANIZATION (forthcoming 1993); Eckbo, *Mergers and the Market Concentration Doctrine: Evidence from the Capital Market*, 58 JOURNAL OF BUSINESS 325 (July 1985); Eckbo & Weir, *Antimerger Policy Under the Hart-Scott-Rodino Act: A Reexamination of the Market Power Hypothesis*, 28 JOURNAL OF LAW AND ECONOMICS 119 (1985); and Knapp, *Event Analysis of Air Carrier Mergers and Acquisitions*, 72 REVIEW OF ECONOMICS AND STATISTICS 703 (November 1990). Exceptions to this pattern of results are reported by Slovin *et al.* who find that for 42 airline merger announcements rival firms did not attain positive stock returns following deregulation of the industry. *See* Slovin, Sushka & Hudson, *Deregulation, Contestability, and Airline Acquisitions*, 30 JOURNAL OF FINANCIAL ECONOMICS 231 (1991). In addition, Banerjee and Eckhard found negative returns to rivals around the time of "trust " formation at the 20th century. *See* Banerjee & Eckard, *Are Mega-Mergers Anticompetitive? Evidence From the First Great Merger Wave*, 29 RAND JOURNAL OF ECONOMICS 803 (Winter 1998). Eckbo, *Mergers and the Value of Antitrust Deterrence,* 47 JOURNAL OF FINANCE 1005 (July 1992) also found negative returns to rivals in reviewing 205 Canadian mergers from 1964 to 1982, but positive returns to rivals for his 266 merger sample for the U.S. from 1963 to 1981.

[57] This pattern of insignificant rival gains at the time of a merger challenge was not found in one study. Prager examined the case of the Northern Securities railway merger in 1901 finding that rivals gained when the merger was announced, and lost at the time of the announcement that governments (U.S. and Minnesota) had successfully challenged the merger. The closest rival firms also gained when the Supreme Court allowed a stock distribution plan that effectively let the shareholders of the two firms commonly own the merging entities (in effect, the distribution plan allowed the shareholders to complete the merger that had been found illegal). *See* Prager, *The Effects of Horizontal Mergers on Competition: The Case of the Northern Securities Company*, 23 RAND JOURNAL OF ECONOMICS 123 (Spring 1992).

[58] For a discussion of Eckbo's work criticizing both the conceptual framework and the application of the method, *see* Werden & Williams, *The Role of Stock Market Studies in Formulating Antitrust Policy Toward Horizontal Mergers* 28 QUARTERLY JOURNAL OF BUSINESS AND ECONOMICS 3 (1989). For a second installment to the debate, in which Eckbo addresses some of the critiques and compares the U.S. and Canadian antimerger enforcement regimes, see Eckbo, *Mergers and the Value of Antitrust Deterrence*, 47 JOURNAL OF FINANCE 1005 (July 1992).

Schumann[59] argues that this pattern of returns is also consistent with another explanation -- that mergers may be both anticompetitive and signal potential efficiencies to rivals. Schumann contends the reason that rivals are, on average, unaffected by the antitrust complaint is that an antitrust complaint affects differently sized rivals in different ways. Specifically, Schumann shows that smaller rivals benefit significantly from an antitrust challenge. Schumann argues that this benefit may occur regardless of the competitive effects of the merger.[60] He concludes that stock market studies cannot provide unambiguous evidence on the competitive effects of mergers and acquisitions.

This stock market approach to determining the competitive effects of mergers has been applied to airline mergers that occurred during the 1980s transition from a regulated environment. McGuckin *et al.*[61] used stock market event study methods to examine two airline merger events and found that the stock market value of rivals rose following the TWA/Ozark and Texas Air/Eastern mergers. The "rivals" were defined rather narrowly to include only two other airlines in each case. Similarly, Knapp[62] finds that airline rivals gained market value at the time of six horizontal merger announcements in the airline industry in 1986. Knapp defined rivals broadly, including all other firms in the industry that were not undergoing "events" of their own. More recently, Singal (1996) finds that, around the time of 14 airline mergers, rival firms obtained positive excess returns in those markets where concentration was high, but rivals obtained negative returns when common airports were likely to lead to efficiency gains for the merging firms. The evidence from these studies is consistent with the anticompetitive effects found by other researchers who econometrically compared data on airline fares before and after the mergers. Quite different results, however, were obtained by Slovin *et al.*[63] who examined 42 airline merger announcements. They find that, prior to CAB deregulation, rival firms did obtain significant returns at the time of merger announcements, but that they did not do so from mergers occurring after deregulation. They also find that mergers leading to "dominated hubs"

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[59] *See* Schumann, *supra* note 56.

[60] In the case where the government blocks an efficient merger, the small rivals may benefit by the protection from competition. In the case where the government blocks an anticompetitive merger that also signals potential efficiencies, the small rivals may gain because they may become more likely takeover targets since their small size makes them less troublesome to antitrust authorities.

[61] McGuckin, Warren-Boulton & Waldstein, *The Use of Stock Market Returns in Antitrust Analysis of Mergers*, 7 REVIEW OF INDUSTRIAL ORGANIZATION 1 (1992).

[62] *See* Knapp, *supra* note 56.

[63] *See* Slovin *et al.*, *supra* note 56.

did not lead to higher returns for the merging firms or their rivals.[64,65]

The potentially anticompetitive effects of retailing mergers have also been analyzed using the event study technique. Hosken and Simpson examined stock market reactions around the time of six grocery store mergers from 1986 to 1995.[66] The transactions raised possible local market power issues where horizontal overlaps occurred.[67] Each of the markets was at least moderately concentrated, with changes in concentration, as measured by the Herfindahl index, ranging from 200 to 900 and the post-merger levels of the index ranged from 1350 to 3000. The authors examine the stock returns of the merging firms and rivals of the merging firms, as well as the stock prices of grocery retailers located in areas unaffected by the merger. The latter stock price movements help to control for the possible efficiency-signaling effect of the merger. The authors do not find persuasive evidence that the transactions had an anticompetitive effect.[68] Rival firms' stock prices did not rise in 4 of 6 cases and in the other two cases the increase was not statistically significant. In addition, the authors found little effect of the extent of horizontal overlap on the own-firm abnormal stock returns.

Stock market event analysis techniques have also been used to examine the effects of potentially anticompetitive business combinations from long ago. Banerjee and Eckard examine the stock market price effects of 41 industrial or mining trust combinations formed between 1897 and

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[64] Slovin *et al.* examine merger attempts (not completed mergers) and use all airline firms in defining rivals. These factors may be reasons for the differences from the prior literature, although Knapp, *supra* note 56, also used a broadly defined set of rivals and found significant positive effects on rival firm stock prices at the time of the mergers. Another possibility is that the results are sensitive to the choice of an event window; Slovin *et al.* provide no discussion of such sensitivity.

[65] Whinston & Collins, *Entry and Competitive Structure in Deregulated Airline Markets: An Event Study Analysis of People Express*, 23 RAND JOURNAL OF ECONOMICS 445 (Winter 1992) also use a stock market event approach to examine the airline industry, but they study 24 entry events rather than mergers. They find that the entry by People Express in 1984/85, mainly at Newark, resulted in significant market value losses by incumbents on the entered routes ($6 to $12 million per route entered), and also caused those incumbents to lower fares (by 20 to 35 percent) and to offer greater flight frequencies compared to Newark airport averages.

[66] Hosken & Simpson, *Have Supermarket Mergers Raised Prices? An Event Study Analysis*, INTERNATIONAL JOURNAL OF ECONOMICS AND BUSINESS (forthcoming 2001).

[67] Such anticompetitive effects might not be incorporated into the stock prices if investors thought that the regulatory agency (the FTC) would require divestitures to alleviate any anticompetitive effects. The authors argue that during this period the FTC did not require significant divestitures in the retailing industries and that such divestitures only occurred after 1995. (It is posssible that the FTC did not consider the anticompetitive potential of the grocery mergers to be very great, but did consider that to be true in the post-1995 retailing mergers it reviewed. This alteration in approach may have been due to a change in perspective by the agency or simply a differing facts related to the specific mergers.)

[68] The stock market abnormal returns data for the announcement of the 1988 American Stores/Lucky's merger in Southern California came closest to indicating an anticompetitive effect. There, the rivals' returns were positive and significant at the 15% level and the own-firm effect of the event was positive and significant after adjusting for the extent of horizontal overlap. The California Attorney General blocked that transaction.

1903.[69] This time period was characterized as one of relative macroeconomic stability when the antitrust laws were not binding constraints on trust combinations. Thus, it serves as a useful testing ground for examining the effects of trust combinations. They find that around the formation dates of the trusts, the stock prices of the trust participants rose (15%), and (contrary to the normal results) the stock prices of their rivals fell (-7%). This pattern of returns hardly seems consistent with a formation of a dominant firm that provides a price umbrella for rivals, and the authors argue that the stock price patterns also do not seem consistent with expectations that predation would occur after the formation of the trusts. Thus, they conclude that the mergers were likely to be procompetitive on average. This finding is strengthened further if the tobacco trust is not considered. It is possible that the tobacco trust was unique in following a predatory strategy during this period. Given the paucity of data on companies during this period and the inferential nature of the predation evidence, the results are not definitive; but they lead one to question the traditional stories regarding the injurious nature of trusts during the late 1890s and early 1900s.

The stock market merger event results spanning the past thirty years indicate that there are probably small net gains to shareholders from mergers on net and that the target firms gain the vast bulk of the returns. Studies applying stock market merger event techniques to examine potential market power provide a wide variety of results. The large sample work on U.S. or Canadian mergers has been controversial and has not produced a consensus regarding the market power effects of most mergers. The more detailed small sample work has produced some evidence of horizontal mergers that had no apparent anticompetitive effect (grocery stores) and some horizontal mergers where such effects were perhaps large (certain airline mergers).

The stock market merger event approach is not the only means of examining the effects of mergers on the merging firms and on other groups. Those effects have also been addressed through large sample studies (*i.e.*, large numbers of mergers in one or more industries) that examine accounting profitability and other measures of merger effects. It is to those studies that we now turn our attention.

V. LARGE SCALE STUDIES OF MERGERS

These studies examine large samples of mergers attempting to discern their effects on either profits, price-cost margins, prices, costs, market share, or productivity. Many of the studies reviewed here examine samples of mergers that occurred across a range of industries, while others examine multiple mergers within one industry. These studies often compare profitability data from merging or acquiring firms with a control group of companies for a period of years both before and after the mergers and acquisitions. Some early studies relied only on accounting profitability data and,

[69] Banerjee & Eckard, *Are Mega-Mergers Anticompetitive? Evidence From the First Great Merger Wave*, 29 RAND JOURNAL OF ECONOMICS 803 (Winter 1998).

therefore, suffered from several infirmities.[70] Other, more recent, studies combine accounting profitability analysis with other forms of financial analysis to provide a more robust result. Still other studies focus on changes in other measures of performance (Tobin's q,[71] market share changes, price index changes, or plant efficiency) and are not subject to the specific criticisms aimed at pre-merger versus post-merger profit studies.

Multi-Industry Studies

In one fairly extensive study of mergers using accounting profitability measures, Mueller *et al*.[72] compared data for large samples of merging and nonmerging companies over a 5-year post-acquisition period. The authors found no support for the hypothesis that merging firms were more profitable after merger than their nonmerging counterparts. Because of accounting method difficulties and potentially mismatched control groups, this study may not, however, provide particularly reliable results.[73]

To address some of the problems of prior accounting data studies, Ravenscraft and Scherer[74] employed disaggregated Line of Business data for 1975 to 1977. They find that firms acquired in the 1960s and early 1970s tended to have above-average profits before acquisition and experience profit declines following acquisition. The profit decline appeared regardless of the accounting methods used to record the merger, although it was greatest where the acquiring firm used purchase accounting (as

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[70] Accounting data, for example, may not reveal the true economic rate of return for a firm. Fisher & McGowan, *On the Misuses of Accounting Rates of Return to Infer Monopoly Profits*, 73 AMERICAN ECONOMIC REVIEW 82 (March 1983), convincingly demonstrate that because accounting depreciation schedules do not accurately reflect the decline in market value of a firm's investments over time, accounting data can provide a very distorted picture of a firm's true economic rate of return. Whether this holds true for large samples of firms is less clear; *see* Long & Ravenscraft, *The Misuse of Accounting Rates of Return: Comment*, 74 AMERICAN ECONOMIC REVIEW 494 (June 1984). In addition, the firm level profitability data may be too aggregated to discern the effects of acquisitions of particular lines of business. Moreover, because asset values are "written-up" at the time of purchase, accounting principles give a downward bias to the calculation of certain post-merger profitability measures and can bias these studies against showing either efficiencies or market power effects from mergers. More generally, the choice of merger accounting treatment (purchase or pooling of interest) could significantly affect the accounting measurements. That will not be so true in the future because in June 2001, the Financial Accounting Standards Board disallowed the use of pooling-of-interests accounting, requiring purchase accounting.

[71] Tobin's q is the market value of assets divided by their replacement cost.

[72] THE DETERMINANTS AND EFFECTS OF MERGERS: AN INTERNATIONAL COMPARISON (Mueller ed. 1980).

[73] For a review of this study, *see* Fisher & Lande, *Efficiency Considerations in Merger Enforcement*, 71 CALIFORNIA LAW REVIEW 1610 (December 1983).

[74] RAVENSCRAFT & SCHERER, MERGERS, SELL-OFFS, AND ECONOMIC EFFICIENCY (1987).

opposed to pooling-of-interests).[75] The authors argue that the profit decline was likely due to a loss of managerial control by the acquiring firms (mostly conglomerates, in this sample) or to the use of acquired firms as "cash cows."

Ravenscraft and Scherer also compare the post-merger profitability of different types of mergers. They find that horizontal and related-business mergers tended to be more profitable than conglomerate mergers. They further find that negotiated mergers tended to be more profitable than mergers conducted by tender offer.[76] Among tender offer mergers, no significant differences in profitability appeared between mergers resulting from hostile takeovers and those from takeovers by "white knights."[77]

In part, as a reaction to the work of Ravenscraft and Scherer, a new genre of study appeared that combines the analysis of accounting and financial data with stock market analysis of merger effects. One early entry in this new field was Ravenscraft and Pascoe[78], who examined 244 mergers occurring between 1963 and 1977. The authors compared operating income to sales ratios before and after the mergers and found that the abnormal returns of the stocks of the merging firms provided a better guide to the likely outcome of the merger than did guessing alone.[79]

Similarly, Healy, Palepu and Ruback[80] combined financial accounting analysis and stock market event study techniques to examine the post-merger outcomes of 50 large mergers occurring

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[75] A similar result has been found for UK mergers from 1948 to 1977. Dickerson *et al.* examined pre-merger and post-merger profitability for 2,941 acquiring firms relative to those for nonacquirors. Looking at several years before and after the mergers, they find lower annual returns for acquiring firms (13.5 percent versus 16.4 percent return on net assets for nonacquirors) after controlling for firm size class, financial leverage, internal growth rates, company fixed effects, and time. They note that the results are not sensitive to the choice of accounting profit measure. Dickerson, Gibson & Tsakalotos, *The Impact of Acquisitions on Company Performance: Evidence from a Large Panel of UK Firms*, 49 OXFORD ECONOMIC PAPERS 344 (1997).

[76] This result differs from the bulk of the stock market event literature which consistently finds that the market more often approves of hostile cash bids than friendly stock-based acquisitions. Perhaps the difference in vintage of the mergers studied is one explanation for the difference in findings, apart from the difference in research approach.

[77] These authors also found (pp. 69, 101-103) that target companies purchased via tender offers had pre-tender accounting profit rates that were about one percentage point (eight percent) below a control group norm. Thus, the companies acquired via tender offers were marginal underperformers. Following the tenders, the acquired lines of business that were associated with those companies produced profits that were 3.1 points below the norm. Most of the decreased post-tender profitability appeared to be accounted for by asset value write-ups following the merger.

[78] Ravenscraft & Pascoe, Can the Stock Market Predict Merger Success? (mimeo, University of North Carolina and Center for Economic Studies, Bureau of the Census, 1989).

[79] The model used by Ravenscraft and Pascoe adjusted for macroeconomic activity levels, the type of merger (i.e., horizontal or vertical), the characteristics of the offer (e.g., tender offer, cash payment, etc.), whether partial or full divestiture later occurred, and industry specific effects.

[80] Healy, Palepu & Ruback, *Does Corporate Performance Improve after Mergers?* 31 JOURNAL OF FINANCIAL ECONOMICS 135 (1992).

between 1979 and 1984. The authors focus on a comparison of premerger net cash flow returns with post-merger cash flow returns relative to those cash flow returns for the rest of the industry. The authors find that industry-adjusted net cash flow rates of return are around 3 percentage points higher after the merger. These increases in cash flow returns are also significantly correlated with the stock market's net positive response to the merger announcements. As is normally found, it appears that the target firm shareholders tend to capture most of those value increases. But if net cash flow returns are higher after the mergers, why are they higher? The authors investigate several possibilities and conclude that operating efficiencies are the most likely explanation. Other explanations for improved cash flow after the mergers (e.g., labor expropriation, R&D reductions, or market power) do not appear consistent with other financial evidence or are too small to matter.[81]

Sirower and O'Byrne[82] also examine stock market performance and accounting performance for merging firms, but use a different accounting measure -- economic value added.[83] Using 1970 to 1989 data for 41 mergers in which the buyer was not a frequent acquirer and the target was relatively large, they follow the firms' accounting performance for five years and compare it to the short-run predictions of the stock market around the time of the merger. They find that (1) accounting returns show that a large majority of deals lose money relative to alternative investments, and (2) the accounting outcomes match the short-run stock market predictions in 66 percent of cases and explain 46 percent of the variation in the market. Thus, the market predicts actual outcomes with some accuracy.

Kaplan and Weisbach[84] take a slightly different approach by focusing on divestitures. They examine the post-acquisition experience of 271 large acquisitions occurring between 1971 and 1982. Of these acquisitions, 44 percent (119) were divested by 1989. The authors focus on two definitions of acquisition failure: (1) the publicly stated reason for the divestiture is unsatisfactory performance, or (2) the acquisition is divested at an accounting loss relative to the acquirers' net book value of the assets.[85] The results imply that only 37 percent of the acquisitions that were subsequently divested could be categorized as clearly "unsuccessful." But acquirers did often overpay for their purchases and the acquisition targets, as usual, walked away with most of the money. Adjusted by the return on the S&P 500, the mean sale price of the divested units is 90 percent of the purchase price, reflecting a loss relative to alternative investments, but a smaller loss than might have been implied by previous

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[81] See Healy *et al.*, pp. 153-158. Similar findings for a sample of 30 large bank mergers during 1982 to 1987 are reported by Cornett & Tehranian, *Changes in Corporate Performance Associated with Bank Acquisitions,* 31 JOURNAL OF FINANCIAL ECONOMICS 211 (April 1992).

[82] Sirower & O'Byrne, *The Measurement of Post-Acquisition Performance: Toward a Value-Based Benchmarking Methodology*, 11 JOURNAL OF APPLIED CORPORATE FINANCE 107 (Summer 1998).

[83] Economic value added is defined as net operating profit after taxes minus a capital charge reflecting a normal return to invested capital.

[84] Kaplan & Weisbach, *The Success of Acquisitions: Evidence from Divestitures,* 47 JOURNAL OF FINANCE 107 (March 1992).

[85] Neither definition is perfect as the authors take pains to discuss.

literature. Diversifying acquisitions were sold off at a greater rate than were related acquisitions (the firm was 42% more likely to divest a diversifying acquisition than a related acquisition), but the reasons seemed to stem from refocusing of the firm rather than from systematic failure of the diversifying acquisitions.[86] Kaplan and Weisbach also make use of stock market event analysis around the time of the acquisition to determine whether the stock price movements are correlated with their ex post measures of acquisition success. They find (as did Ravenscraft & Pascoe, and Sirower & O'Byrne) that the market did anticipate the acquisition successes and failures to some extent. In their regression model, acquirers' stock returns were more negative for those acquisitions that later turned out to be unsuccessful. The market signals are quite noisy, however.

Several large-scale studies of mergers in a set of general industries eschewed the examination of profits or stock market reactions altogether, in favor of a focus on other indices of post-merger success or efficiency. In the first of these general merger studies, Mueller[87] examined post-merger changes in market share and found significant declines in market share among lines of business that were acquired from 1950 to 1972, as compared to those among a minimal-acquisition control group. The decline was steepest for lines involved in conglomerate mergers. These results support those of Ravenscraft and Scherer, who also found relatively little beneficial effect of mergers during the pre-1977 period.[88]

Stewart and Kim[89] also avoided a focus on profits in their study of merger effects in industry generally. They examine the relationship between price index changes and merger activity in 119 three-digit U.S. manufacturing industries during 1985 and 1986. Using Census and BLS data, the authors control for average variable labor and material cost changes, the change in inventory to sales ratios (to proxy demand conditions), industry concentration, and industry merger intensity. Various interactions of these variables are included in the model predicting price changes. Both horizontal and nonhorizontal merger intensity are examined. The authors find that over the two year period, horizontal merger intensity may have led to price increases on the order of 1.5 percentage points above those that otherwise would have occurred (prices increase 1% under the "no horizontal merger" scenario versus 2.5% actual). Nonhorizontal merger activity in general led to the opposite result, as

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[86] Acquisitions were defined as "related" if the firms listed a common 3 or 4 digit industry as one of their top 4 lines of endeavor.

[87] Mueller, *Mergers and Market Share*, 67 REVIEW OF ECONOMICS AND STATISTICS 259 (1985).

[88] McGuckin also examined the post-merger market share change in 133 horizontal mergers that occurred between 1972 to 1982. Using 5-digit census categories to define markets, he finds that the combined market share of the firms declined in the first 5 years after the merger, but then the combined firm's shares rose above premerger levels during the next 5 years. He reports some evidence that price-cost margins rose more after the mergers in those industries that had slightly higher concentration levels. McGuckin did not, however, use control groups or industry averages to control for industry-wide or economy-wide effects in either the market share or price-cost margin comparisons. *See* McGuckin, *Merger Enforcement: Out of the Courtroom After 75 Years* 35 ANTITRUST BULLETIN 677 (Fall 1990).

[89] Stewart & Kim, *Price Changes and Mergers in U.S. Manufacturing 1985-86*, in EMPIRICAL STUDIES IN INDUSTRIAL ORGANIZATION: ESSAYS IN HONOR OF LEONARD W. WEISS 77-96 (1992).

price increases were reduced from a predicted 3.2% to 2.5%.[90]

Mergers might also affect plant level efficiency and that issue has been examined in a large scale study of 28,000 manufacturing plants covering 1977 to 1987. McGuckin and Nguyen focused on ownership change rather than just mergers.[91] They found that most transferred plants tended to have above average productivity prior to ownership changes, and they improved productivity still further after the transfer to new owners. For larger plants, many tended to be underperformers prior to ownership change and those plants also improved productivity under new ownership. Thus, the majority of asset transfers appeared to be efficiency enhancing.

In a closely related vein, Makismovic and Phillips[92] examine 35,000 plants that were transferred from 1974 to 1992 in the U.S. manufacturing sector. About half of the plants were transferred via asset sales and the other half via mergers; 45% to 50% of the plants were transferred to other firms in the same four-digit industry. The paper first describes the activity by seller and buyer characteristics. Among the interesting descriptive results are that anywhere from 3% to 6% of plants are reallocated in any year, with the reallocation being more intense when aggregate industrial production is high. Multi-segment firms (conglomerates) tend to sell their smaller, less productive divisions and to do so when demand is high and their other divisions are doing well. The conglomerates are less reticent to sell assets than are single division firms. Buyers of assets tend to be the larger, more productive firms. The authors also estimate the productivity of the assets and then examine changes in the productivity of the assets after the sale. On this score, the authors find that asset transfers generally result in productivity increases as assets are transferred to those who can manage them most efficiently. The average productivity increase appears to be quite substantial. Most mergers appear to raise post-merger asset productivity, but for the subsample of whole firm acquisitions, particularly those that do not increase the firms' segment capacity, the productivity of the assets falls. Thus, most asset transfers during these 2 decades were efficiency enhancing, but certain mergers did not improve asset efficiency. Mergers and acquisitions by firms that were initially less efficient lead to actual declines in productivity.[93]

Banking Market Mergers

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[90] In general, the effects of both horizontal and nonhorizontal merger intensity seemed to be most pronounced in the "moderately concentrated" industries, in which four-firm concentration ranged between 25% and 60%. This study is carried out at a relatively high level of aggregation, so individual industry factors could not be examined in detail. In addition, the products examined are likely to be nonhomogeneous, making price and output indices less meaningful than they are in studies that are more industry specific such as those discussed in section VI.

[91] McGuckin & Nguyen, *On Productivity and Plant Ownership Change: New Evidence from the Longitudinal Research Database* 26 RAND JOURNAL OF ECONOMICS 257 (Summer 1995).

[92] Maksimovic & Phillips, *The Market for Corporate Assets: Who Engages in Mergers and Asset Sales and are There Efficiency Gains?* JOURNAL OF FINANCE (December 2001 forthcoming).

[93] One might expect that these kinds of deals would eventually get undone by an efficient market process.

From the large scale studies of multiple industries, we move on to the studies of multiple mergers in particular industries. Perhaps the most often studied of these industries is banking. Because they are regulated, banks produce an unusual wealth of performance data. This has, for better or worse, made banking the subject of particularly intense academic scrutiny.[94] Three studies focusing on large samples of banking mergers take differing approaches to the estimation of postmerger effects, but none of the three find much evidence of net efficiencies from the mergers. Rhoades[95] examined 898 horizontal bank mergers from 1981 through 1986 and compared the change in bank efficiency ratios of the merged firms to that of all other banks that did not merge during the period. Rhoades uses two measures of bank efficiency: (1) the change in the ratio of total expenses to assets, and (2) the change in the ratio of total assets to operating revenues. Using OLS and logit regression analyses, he found no evidence that the expense ratios of the banks declined three years after the merger, nor did an efficiency ranking of the merged banks rise relative to that of nonmerging counterparts.[96] Thus, he concludes that there are likely no efficiencies on average from the 1980s mergers.

Berger and Humphrey[97] examined as many as 57 large bank mergers occurring from 1981-1989. Using a multiproduct translog cost function, they define an efficient cost frontier for banking firms. The banks are ranked based on their closeness to the efficient frontier and the authors test to see if the merged firms improve their relative ranking after the merger. The authors find that, although acquired banks tended to be purchased by more efficient banks, the more efficient buyer did not pass on its cost efficiency characteristics to the merger partner. The combined bank's efficiency rating did not improve after the merger relative to its counterparts whether that efficiency is measured by efficiency relative to an efficient-firm frontier, scale efficiency, return on assets, average total cost per dollar of assets, or average operating cost.[98] The authors argue that even if any gains in productive efficiency exist, they are lost due to scale diseconomies associated with the merger.[99]

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[94] Only the airline and hospital industries can rival banking in the number of academic studies of mergers performed within a particular industry.

[95] Rhoades, *Efficiency Effects of Horizontal (in-market) Bank Mergers,* 17 JOURNAL OF BANKING AND FINANCE 411 (April 1993).

[96] The regression model controls for the merger/nonmerged status of the bank, the deposit overlap of the banks, total assets size, the loan/asset ratio, deposit growth, the number of branches, large deposit to total deposit ratio, and 50 state dummies.

[97] Berger & Humphrey, *Megamergers in Banking and the Use of Cost Efficiency as a Defense,* 37 THE ANTITRUST BULLETIN 541 (Fall 1992).

[98] These comparisons of performance improvements are made via regressions that control for various premerger characteristics including: the extent of difference in performance between the acquiring bank and the target bank, the amount of overlap in the banks' deposit areas, the extent of retail deposits, firm size, market share, and market concentration.

[99] There has recently been a number of studies of the effects of large banking mergers on cost efficiency, profit efficiency, revenues, and prices. For a review, *see* Akhavein, Berger & Humphrey, *The Effects of Megamergers on Efficiency and Prices: Evidence from a Bank Profit Function*, REVIEW OF INDUSTRIAL ORGANIZATION 12 (continued...)

Peristani[100] confirmed those results in his examination of the outcomes of over 1,000 bank mergers that occurred in the 1980s. Using data for up to 16 quarters before and after the mergers and focusing mainly on translog cost efficiency estimates, he found that merged banks did not improve their x-efficiency rank following mergers relative to nonacquiring banks. Banks did, however, on average move closer to efficient scale following mergers, compared to the control banks. Using cross-section regressions to try to explain the postmerger changes in costs or profits that he observed, he found that market concentration growth was negatively related to profit changes. In summary, he found relatively little in the way of cost efficiency gains from 1980s bank mergers.

A somewhat different result, however, was obtained by Akhavein *et al.* who examined profit efficiency (not cost efficiency) for 57 large bank mergers from the 1980s.[101] Compared to all large banks, they found substantial gains to the merging banks, not from market power, nor from cost reductions, but rather from improved technical profit efficiency due to shifts in product mix toward loans and away from securities. Why one would need mergers to accomplish these changes in product mix is unclear, but the product mix changes apparently did not happen to the same extent in the nonmerged control sample. The authors use a regression model to explain the change in profit efficiency following the merger, and their model is found to explain 80 percent of the variance in profit efficiency.[102] They find that the profit efficiency gains are due to the improved use of both banks' assets as both banks are "awakened" to available profit opportunities by the merger. The profit efficiency gains did not appear related to either market concentration or to bank market share and the authors found only very small effects on loan and deposit rates following mergers, although their price data were rather crude.

Because price data used in the banking merger studies was often imperfect, one study was done to examine more reliable survey data concerning the price effects of recent large banking mergers. Using banks as the unit of observation, Prager and Hannan[103] examine a cross-section of local banking markets and compare those markets in which a merger occurred between 1992 and mid-1994 with

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[99](...continued)
(February 1997), esp. 98-105. The recent consensus seems to be that: (1) bank mergers have the potential to lower costs (based on the cost function characteristics), but that does not appear to have actually happened; (2) prices paid to depositors are slightly lower following mergers; thus there is a market power effect even in the set of mergers allowed by the regulatory authorities, and (3) mergers have allowed banks to better allocate resources to obtain higher revenues for a given price and cost structure.

[100] Peristiani, *Do Mergers Improve the X-Efficiency and Scale Efficiency of U.S. Banks? Evidence from the 1980s*, 29 JOURNAL OF MONEY, CREDIT, AND BANKING 326 (August 1997).

[101] They used the same large merger data set as Berger & Humphrey, *Megamergers in Banking and the Use of Cost Efficiency as a Defense*, 37 THE ANTITRUST BULLETIN 541 (Fall 1992).

[102] It is suprising that the model can predict the source of 80 percent of post-merger gains. One would not expect bank managements to fail to observe such large consistent profit opportunities.

[103] Prager & Hannan, *Do Substantial Horizontal Mergers Generate Significant Price Effects? Evidence from the Banking Industry*, 46 JOURNAL OF INDUSTRIAL ECONOMICS 433 (December 1998).

markets where no such activity occurred. Finding an adverse effect on consumers in the merger markets might be surprising since each merger was allowed by the regulatory authorities. In addition to using 412 banks in nonmerger areas as statistical controls, the authors controlled for bank asset size, changes in bank size, changes in average area personal income, MSA-specific effects, and regional effects in their model of deposit pricing. The authors find that, for the 26 banks in markets where substantial horizontal mergers occurred, (that is, market concentration rose significantly), rates paid to depositors on NOW accounts or Money Market Deposit Accounts (MMDAs) fell 8 to 15% relative to the rates paid by banks in markets where mergers did not occur. Rates on all accounts fell significantly from 1991 to 1994, but they fell more in those areas where mergers occurred. For example, rates paid on MMDA accounts in late 1991 were about 5 percent. By November 1993 rates paid to customers would have been about 2.6 percent in nonmerger areas, but only 2.4 percent in areas where a merger occurred. Half of the price differential occurred prior to the merger and the other half occurred after the merger. Small increases in local market concentration, however, did not appear to have this adverse effect on depositors. Indeed, rates paid to depositors appeared to rise in those markets.

This and other banking industry literature on mergers has recently been surveyed by Berger, Demsetz, and Strahan.[104] They note that although there has been considerable merger activity in the industry, concentration in most local banking markets has actually fallen slightly in the last decade. Their extensive review concludes that prices become somewhat less favorable for customers when concentration increases or when mergers result in large concentration increases. The evidence of higher prices due solely to market concentration is, however, perhaps somewhat weaker in the 1990s than it was for earlier periods. They also note that mergers appear to be associated with enhanced profit efficiency and portfolio diversification. Cost efficiency may have improved on average after some 1990s bank mergers,[105] although the evidence from the 1980s was that cost efficiency was not improved after mergers. It does appear that cost efficiency improves after mergers in cases where the merging banks are particularly inefficient prior to the merger. The authors also note that availability of services to small customers is unlikely to change much due to mergers, and while large merging banks may tend to reduce their small business loan activity after the merger, other banks tend to fill that void. On average, they do not see large effects (for good or ill) from mergers. Perhaps the absence of any large negative effects (especially price effects) should not be too surprising given that the mergers have all been reviewed and allowed by bank regulators. The weakness of the evidence regarding beneficial cost efficiency effects, on the other hand, is a bit more surprising. Given the received wisdom in the literature that banks generally are not very efficient, mergers would have seemed to be one means of weeding out the laggards.[106]

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[104] Berger, Demsetz & Strahan, *The Consolidation of the Financial Services Industry: Causes, Consequences, and Implications for the Future*, 23 JOURNAL OF BANKING AND FINANCE 135 (1999).

[105] Rhoades, *The Efficiency Effects of Bank Mergers: An Overview of Case Studies of Nine Mergers*, 22 JOURNAL OF BANKING AND FINANCE 273 (1998).

[106] Calomiris would argue that bank mergers have been more efficient than Berger et al. realize because the correct comparison should be to other banking systems and the consolidation of U.S. banking over the past several years has (continued...)

Hospital Market Mergers

As with banking, the hospital industry has, at various times, been regulated at the state and federal level. This resulted in the production of publicly available data on hospital performance in a few states and on a national level. Thus, the industry has come under the focus of researchers who have attempted to discern the effects of mergers. Again, as with banking, the hospital industry has peculiarities (such as nonprofit status, and entry and price regulation) that may make any results unique to the industry.

One study found significant cost reductions associated with mergers. Sinay[107] examined changes in costs that occurred on average after merger events for a sample of 131 hospitals that merged between 1987 and 1990 and 131 comparable control hospitals. He estimated a translog cost function for each of three years (one year before and two years after the merger) for the merging hospitals and for the control hospitals. The changes in the coefficients of the cost functions following the mergers imply that the hospitals became more efficient after the mergers compared to the control group hospitals that did not merge (the merged firms became more scale efficient after the mergers).

Cost and price reductions associated with mergers were also found by Connor *et al.*[108] who examined the effects of hospital mergers on cost per admission, average revenue per admission, and markups. They examined a panel of 3,500 hospitals from 1986 to 1994 including 122 within-market horizontal mergers. Using a regression model that controlled for the characteristics of the HSA-based market, hospital, patient population, area demographics, and area of the country, Connor *et al.* report that average costs and prices (total revenue divided by all admissions regardless of payer category) rose five percent less for the merging hospitals compared to the non-merged hospitals in the sample. The savings were found to be larger for hospitals merging further in the past, indicating perhaps that the efficiencies associated with a merger take some time to appear. The authors also found that the beneficial effects of mergers were larger if (1) the hospitals were of equal size, (2) pre-merger service duplication was high, and (3) occupancy rates pre-merger were low. The beneficial effects of mergers were smaller or absent if the merger involved a teaching hospital or if it occurred in a market where concentration was high. This last result is based on a small number of observations and may not be

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[106](...continued)
made U.S. banking relatively much more efficient when compared to the European industry. *See* Calomiris, *Gauging the Efficiency of Bank Consolidation During A Merger Wave*, 23 JOURNAL OF BANKING & FINANCE 615 (1999).

[107] Sinay, *Pre- and Post-Merger Investigation of Hospital Mergers* 24 EASTERN ECONOMIC JOURNAL 83 (Winter 1998).

[108] Connor, Feldman & Dowd, *The Effects of Market Concentration and Hospital Mergers on Hospital Costs and Prices,* 5 INTERNATIONAL JOURNAL OF THE ECONOMICS OF BUSINESS 159 (1998). Also *see* Connor, Feldman, Dowd & Radcliff, *Which Types of Hospital Mergers Save Consumers Money?* 16 HEALTH AFFAIRS 62 (December 1997).

particularly reliable.[109] In addition to examining the effects of mergers, the authors also looked at changes in cross-section results over time and found that although increased competition was associated with increased costs in 1986, by 1994 this relationship had altered significantly such that more competitive areas were associated with lower prices and costs. They attributed this change to the growth of managed care over the period.

Quite different results were found by Krishnan who studied the price effects of hospital mergers that occurred in Ohio and California during 1994 to 1995.[110] He found significant price increases following mergers even when the market structure was not altered due to the acquisition. The twenty-two mergers that occurred in Ohio during that period tended to alter market structure as local hospitals combined. By contrast, the fifteen mergers that occurred during that period in California were mainly chains buying individual hospitals - transactions that did not alter local market structure. The pricing of individual diagnosis related groups (DRGs) is examined in markets defined by hospital-level patient flow statistics. Analyses of the Ohio mergers indicate that post-merger percentage price increases by the merging hospitals are substantial and that they are greater where DRG market shares rose substantially as a result of the merger. A similar result was obtained for the price effects of concentration changes. A regression analysis using data for 23 high-volume DRGs is also undertaken. The author models post-merger relative price changes as a function of the level of (and post-merger changes in) market share of the hospital in the DRG, market concentration, length of stay, managed care percentage, hospital size (based on discharges), a residual from a pre-merger price regression, and fixed effects dummies for each DRG and hospital. Indicator variables are also included for whether the hospital was involved directly in a merger, and whether the hospital was located in a market where a merger occurred. Patient level data are not available in Ohio, so the author could control for hospital characteristics, but not severity of illness, which is included in the California regression analysis. The regression results imply that higher post-merger market share of the merging firms is associated with larger relative post-merger price increases than in otherwise comparable DRG markets. The authors find that in Ohio, merging firms raised prices per patient 16.5 percentage points more than did nonmerging hospitals. In California (where market structure was not affected by the mergers), acquired hospitals raised prices 12 percentage points more than did non-acquired hospitals. Although market share changes appeared to matter, concentration changes did not affect relative pricing in the regression analyses.[111]

Rather than asking about post-merger prices or costs, Ho and Hamilton ask whether M&A

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[109] In both studies the HSA market concentration levels may not have been correctly calculated due to a lack of complete data on ownership of the various hospitals in the AHA data set (*see* Connor *et al.* 1998, p. 164). The authors argue that their concentration data are likely to be correlated with correctly calculated concentration, however.

[110] Krishnan, *Market Restructuring and Pricing in the Hospital Industry*, 20 JOURNAL OF HEALTH ECONOMICS 213 (March 2001).

[111] Krishnan's results raise several questions: why do nonmerging firms in the merger markets not raise price very much post-merger (the Ohio result). Do mergers purely invest the merging firms with greater unilateral market power or does quality also improve? Also, why would prices rise so much in instances where the structure of the market was not affected (the California result)?

activity in hospitals has reduced the quality of care provided to patients.[112] For California consolidations from 1992 to 1995 the answer to the authors' question appears to be "yes" for one measure of quality and "perhaps" for most other measures. The authors examined the probabilities that three different adverse events might occur based on whether the hospital had been involved in a consolidation. The adverse events (i.e., the measures of quality) were: inpatient mortality for heart attack and stroke patients (which was never affected), readmission rates for heart attack patients, and discharge within 48 hours for normal births. The regression model controlled for comorbidities, patient volume, transfers, type of insurance payer, patient age categories, gender, year and racial dummies (and C-section for newborn discharge). Three types of transactions were distinguished - mergers of two local independent hospitals, buy-outs of a local by a system, and buyouts of a system by another system. In concentrated markets, consolidating hospitals may have discharged mothers sooner,[113] but for other quality indices, the effects are less consistent across types of consolidations.

Other Markets

The beer industry has also attracted the interest of researchers, because it has a long-running history of consolidation. Tremblay & Tremblay do not look at the aftermath of mergers, but rather estimate the probability that a beer manufacturer will buy another beer producer or sell itself.[114] They examine beer industry mergers between 1950 and 1983, a period of substantial consolidation when 74 horizontal purchases and 22 horizontal sales occurred. They model the probability of buying or selling as a function of market share growth over the preceding two years, industry concentration, industry scale economies, the firm's capacity utilization, market share, percentage GNP change, the number of potential buyers and sellers, and a firm-specific antitrust dummy indicating that the antitrust agencies would likely block any merger involving the firm. They find that market share growth, market share level, percent change in GNP, and an antitrust enforcement dummy are significant in many specifications. Their results indicate that the buyers are the firms that have grown in market share recently and the sellers are those whose share has fallen. Thus, they conclude that mergers in the beer industry over this period fostered efficiency by facilitating the transfer of assets to more efficient firms (managers). They did not confirm this prediction, however, by examining the actual change in prices, profits, output, quality, or market share for beer producers following the mergers.

Beer is not the only beverage category in which merger activity has been scrutinized. Asset acquisitions (not always mergers) in a soft drink beverage category have also been studied. Saltzman

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[112] Ho & Hamilton, *Hospital Mergers and Acquisitions: Does Market Consolidation Harm Patients?* 19 JOURNAL OF HEALTH ECONOMICS 767 (2000).

[113] This effect may be largely caused by tighter utilization controls used by the acquiring chain hospitals. If so, the effect is not due to a market structure change, but rather due to a particular type of ownership change.

[114] Tremblay & Tremblay, *The Determinants of Horizontal Acquisitions: Evidence from the U.S. Brewing Industry,* 37 JOURNAL OF INDUSTRIAL ECONOMICS 21 (September 1988).

et al.[115] use a unique data set and regression techniques to examine the effects of various 1980 to 1991 transactions on both the prices and quantities of carbonated soft drinks sold in local markets. They find that horizontal combinations of brands at a particular bottler (*e.g*., the local Coke bottler buying the rights to bottle Dr Pepper) are associated with 3 to 12 percent higher soft drink prices and lower output, while vertical events (*e.g.*, parent Coke buying the local Coke bottler) are associated with 4 percent lower prices (but a melange of output results). Consolidation of "third bottlers" (non-Coke or non-Pepsi bottlers) leads to a variety of, sometimes counterintuitive, results depending on the size of the consolidation. The sensitivity of the main results is examined in some detail.

The large scale studies examined in this section provide a variety of results. The multi-industry studies find that mergers are unprofitable in a significant percentage of instances. On the other hand, the multi-industry studies of plant transfers seem to indicate that such transfers have been efficiency enhancing in the majority of instances, particularly where the buyer was more efficient that the seller prior to the transfer. The multi-merger studies in individual industries also provide a range of different results. Banking mergers are found to produce some gains related to shifts in product mix, but they still appear to result in small price increases and relatively little in the way of efficiency enhancement. Mergers in hospitals are found to reduce costs; but they may also raise prices, particularly in the more concentrated markets. There is even some evidence that hospital mergers may have been associated with price increases where market structure did not change at all following the merger. In the beer industry, mergers appear to have facilitated efficient reallocation of resources. In sum, a wide range of interesting results, but not a strong pattern.

VI. RECENT CASE STUDIES (CLINICAL STUDIES) OF MERGERS

The large scale, multi-merger studies cannot often delve into the details of individual transactions. Certainly such detail is impossible to provide in multi-industry studies. This more detailed examination has to occur in smaller scale studies that dig into individual transactions a bit more deeply. Although the results from examination of individual transactions cannot be as readily generalized as might the results from large-scale, multi-industry studies, these case studies might help provide insight into the motives behind particular transactions and perhaps help researchers devise better techniques to incorporate those insights into larger scale studies. It is to the smaller scale case studies that we now turn.

Case studies come in many varieties. Some researchers focus mainly on trade press accounts and interviews with executives of the merging firms to determine the results of a merger or acquisition. Other studies examine accounting and financial information to reach a less subjective conclusion. Still other studies examine stock market reactions at the time of the event or following the event to track the possible effects of the merger. A few studies use econometric models, control groups of non-merging firms, and pre- and post-merger price, cost, and quality data to measure the effects of the

[115] SALTZMAN, LEVY & HILKE, TRANSFORMATION AND CONTINUITY: THE U.S. CARBONATED SOFT DRINK BOTTLING INDUSTRY AND ANTITRUST POLICY SINCE 1980, (Bureau of Economics, Federal Trade Commission, 1999).

mergers. The best studies use objective data and multiple approaches to control for factors that might have affected the firms' performance in the absence of the merger or acquisition.[116] In this section, we report on some case study evidence for several industries focusing on airlines, hospitals, and banking. These industries have produced most of the studies not only because a significant amount of consolidation occurred there, but because publicly available data exist on cost and pricing in the industries.

Airline Industry Merger Case Studies

Several case studies have focused on mergers in the airline industry. Werden *et al*.[117] examine two mergers in the airline industry (Northwest/Republic and TWA/Ozark) and find that these mergers resulted in higher prices and worse service. The authors estimated equations for revenue per passenger for several hundred city-pairs both before and after the merger. The equations adjusted for cost and demand variables as well as concentration levels. They used the premerger data from city-pairs that were not affected by the merger as a control group to compare with the affected markets. The Northwest/Republic merger led to significant overall fare increases (5 to 6 percent) and service reductions. Although the TWA/Ozark merger led to only a small overall fare increase (1.5 percent), there was a significant service reduction.[118]

These same mergers were reviewed by Brueckner, Dyer, and Spiller[119] who applied their model of airline pricing to simulate the price effects of the mergers. Their model of pricing was designed to examine the potential for additional network efficiencies as the merger allows more effective use of a hub-and-spoke system. Thus, the authors focus on 4-segment flights that go through a hub, but do not originate or end at a hub. They find that weighted average fares for 4-segment flights would fall by about 1 to 3 percent after the merger due to the network efficiency effects of the merger. However, in those city pairs where the merger partners had previously competed, the merger would tend to raise fares by as much as 6.5 percent. Thus, the effects of a loss of competition appear to overwhelm the

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[116] For a discussion of some early merger case studies that tended to be done with less objective data, *see* Fisher & Lande, *Efficiency Considerations in Merger Enforcement*, 71 CALIFORNIA LAW REVIEW 1580 (December 1983) at 1619. The best case studies use control groups and models of expected outcomes to allow the researcher to have more confidence that any observed effects are truly due to the event of interest.

[117] Werden, Joskow & Johnson, *The Effects of Mergers on Economic Performance: Two Case Studies from the Airline Industry*, 12 MANAGERIAL AND DECISION ECONOMICS (1991).

[118] Borenstein, *Airline Mergers, Airport Dominance,and Market Power*, 80 AMERICAN ECONOMIC REVIEW 400 (May 1990), studies the same airline mergers and finds that following the Northwest/Republic merger in 1986, the merging firms' fares rose relative to industry averages, the market share of the merged firms rose, and service quality fell relative to the average. Borenstein found no such effects for the TWA/Ozark merger. He attributes the lack of effects to the general weakness of traffic in the St. Louis market after the merger.

[119] Brueckner, Dyer & Spiller, *Fare Determination in Airline Hub-and-Spoke Networks*, 23 RAND JOURNAL OF ECONOMICS 309 (1992).

efficiency gains due to more effective use of the network.[120]

Kim and Singal[121] examine 14 airline mergers between 1985 and 1988. Using control groups, the authors examine the relative fare changes that occurred around the time of the merger on routes served by the merging firms.[122] They find that, on average, relative fares on the merging firms' routes six to nine months after the merger rose by about 10 percent for both merging firms and their rivals. The behavior of fares in mergers involving failing firms differed significantly from the behavior of fares in other mergers. Failing airlines had prices that were much lower than average before the mergers (possibly reflecting perverse end-game behavior). As a result, those mergers involving failing firms ultimately produced much larger percentage fare increases than did mergers involving only viable firms. The fare increases, however, took longer to occur after the announcement of the acquisition.

The authors also used a regression approach to examine the relationship between concentration changes on a route and the effects of the mergers on relative fares. They examine four subsamples of the data based on the relationship of a route to a hub of one of the merger partners and whether the merging firms have overlaps on a particular route. Although relative fares rose more overall where concentration was higher, the pattern found was surprising. On those routes with competitive overlaps, relative fares did not change or decreased as concentration rose (implying efficiencies may have occurred on net after the merger). However, the relationship between relative fares and concentration was positive following mergers on the much larger set of routes served by the merging firms where they never competed with each other prior to the merger. The authors attribute this effect to the market-power enhancing effects of increased contact among the various rival airlines after the merger. The increased contact may provide the rival firms with more opportunities to discipline each other's pricing moves.

In a follow-up paper examining the same 14 mergers, Singal[123] analyzes the stock price movements of merging firms and rival firms using relatively standard stock market event study techniques with several alternative event windows. Singal first calculates the abnormal returns relative to the market as a whole and the airline industry, in particular. He finds a common result - target firm shareholders gain about 18 percent, acquiring firm shareholders gain about 1.5 percent, and the net gain is about 4 percent. Rival firms as a group gain nothing, but the distribution of gains and losses appears to indicate that some are harmed by improved efficiency of the merging firms whereas others gain due to market power effects. These abnormal stock market returns for the firms involved in the

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[120] Other stock market event evidence regarding these cases is listed in section IV. B.

[121] Kim & Singal, *Mergers and Market Power: Evidence from the Airline Industry*, 83 AMERICAN ECONOMIC REVIEW 549 (June 1993).

[122] The control group for each merger-affected route included about 200 routes of similar distance that were not served by either of the merging firms.

[123] Singal, *Airline Mergers and Competition: An Integration of Stock and Product Price Effects,* 69 JOURNAL OF BUSINESS 233 (April 1996).

merger and their rivals are then hypothesized to depend on market concentration (a proxy for market power) and the number of airports common to the merging firms (a proxy for the consolidation efficiency potential of a merger). Singal finds that the merging firms' stock market returns are perhaps higher if they have common airports, but returns are not higher due to concentration increases. In contrast, rival firms' abnormal returns are higher where market concentration is higher and are lower where more common airports exist. The author interprets his results as implying that mergers result in both enhanced efficiency by the merged firm and increased market power, with a small and insignificant net positive effect on the stock prices of the average rival firm. The increased market power effects benefit the rival firms, but not the merger partners because the gains to the dominant merging firm are dissipated by fringe expansion. Focusing on price data, Singal finds price increases of 9 to 10 percent on the routes affected by the mergers around the event date compared to a sample of unaffected market routes. Using these price change data, he calculates profit changes around the time of the merger and into the future. He finds that the stock market abnormal returns are positively correlated with the calculated short-term profit changes, implying that the stock market results correctly anticipated changes in future cash flows.[124]

The Northwest/Republic, TWA/Ozark, and US Air/Piedmont mergers were revisited by Morrison who looked at the longer-run price effects of the mergers using control routes eight years before and after the 1986/87 mergers.[125] The first two mergers involved carriers that shared hubs (Minneapolis-St. Paul and St. Louis, respectively). In the third merger, the firms did not share a hub. Morrison finds that for all three mergers the level of competition faced by these air carriers before the mergers was considerably greater than that faced by other carriers on comparable control routes. Thus, the mergers would have tended to move these carriers closer to the industry average competition level. The average post-merger price effects varied substantially across the mergers. Prices fell 15 percent relative to the control routes following the TWA/Ozark merger, but relative prices rose 2.5 percent in the case of Northwest/Republic and 22.8 percent for the US Air/Piedmont merger.

Recently, Kole and Lehn[126] examined the USAir/Piedmont deal from late 1987. They did not use an econometric model or control group to allow for comparisons across other firms in the industry, but rather take an accounting/interview approach to the case study. They find that the merger looked like a natural fit, but that it ended badly because of culture conflicts in the two firms and because

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[124] Slovin *et al.* is unique among airline merger event studies in that they found that airline mergers did not lead to market power effects in the deregulated airline industry. Singal suggests that the differing results may be due to: (1) different baselines for comparison (Singal uses close rivals in city-pair markets, whereas Slovin *et al.* use all other U.S. airlines as rivals in a national airline market), and (2) Slovin examines merger attempts, not just successful mergers; perhaps introducing unnecessary noise into the model. *See* Slovin, Sushka & Hudson, *Deregulation, Contestability, and Airline Acquisitions*, 30 JOURNAL OF FINANCIAL ECONOMICS 231 (1991).

[125] Morrison, *Airline Mergers: A Longer View*, JOURNAL OF TRANSPORT ECONOMICS AND POLICY 237 (September 1996). Morrison (p. 239) intentionally used a sparse econometric specification arguing that such a specification avoids imputing the effects of the merger to other changes that may have been induced by the merger.

[126] Kole & Lehn, *Workforce Integration and the Dissipation of Value in Mergers*, in (Kaplan ed.) MERGERS AND PRODUCTIVITY 239, National Bureau of Economic Research Conference, University of Chicago (2000).

USAir management spread an inflated pay structure to the newly acquired employees. One commentator opined that the virtual absence of airline mergers during the 1990s might have been caused by a recognition of the types of irreversible integration problems discovered by Kole and Lehn.[127]

Hospital Merger Case Studies

Bogue *et al.*[128] used a survey of surviving firms to examine the after-effects of 60 hospital mergers that occurred between 1983 and 1988. Survey respondents were asked about pre-merger and post-merger characteristics of the acquired and acquiring hospitals and the markets they served and the post-merger use of the assets (in particular whether the hospital campuses both offered acute care after the transaction). American Hospital Association data were also used to track the hospital characteristics. The authors find that 42% of the time both hospitals retained acute care use post-merger and that another 41% of the time the acquired assets were converted to alternative inpatient uses such as psychiatric or long-term care. The facilities were closed 17 percent of the time. There was a much higher probability of post-merger closure or conversion if the hospitals had been directly competitive prior to purchase and if the market generally was considered competitive. In cases where both hospitals retained acute care services after the transaction, respondents were much less likely to say that the hospitals were directly competitive or that the market overall was highly competitive. The authors caution against drawing anything more than tentative conclusions from their exploratory study, but they argue that the early evidence indicates that mergers represent a means of profitably reconfiguring and consolidating assets, whether the strategy is one of system expansion or competitor elimination.

The consolidation of several hospitals in St. Louis and Philadelphia during the mid-1990s was examined by Wicks *et al.*[129] who, like Bogue, relied heavily on a survey approach, interviewing fifteen to twenty participants in each of the health care markets a few years after the consolidation began. In addition to the survey information, the authors also compared time series data for several measures of revenues (prices), output, efficiency, and capacity utilization for the hospitals in the two cities. The authors argued that if mergers were the reason for any improvements in performance, then such improvement should have occurred in St. Louis before it occurred in Philadelphia because the merger activity began there a year earlier. The merger activity in both cities lead to the formation of hospital systems of various sizes, some including 12 campuses, others as few as two or three. The authors find that most of the trends that existed prior to the mergers continued and the mergers did not appear to

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[127] Airline merger discussions reappeared, however, in 2000 with proposals for a United/USAir merger and an American/TWA deal, among others. The United/USAir transaction was withdrawn by the parties in July 2001 after opposition from the Justice Department.

[128] Bogue, Shortell, Sohn, Manheim, Bazzoli & Chan, *Hospital Reorganization After Merger*, 33 MEDICAL CARE 676 (1995).

[129] Wicks, Meyer & Carlyn, Assessing the Early Impact of Hospital Mergers: An Analysis of the St. Louis and Philadelphia Markets, Economic and Social Research Institute (January 1998).

alter the trajectory of prices or cost efficiency for the hospitals in the cities. The authors conclude, based largely on the interview information, that hospital system formation was largely a reaction to managed care inroads and represents an attempt to avoid further price reductions by strengthening hospitals bargaining positions relative to that of the managed care plans. Each system attempts to be sufficiently large that major insurers cannot provide viable benefits packages unless the system is included. In both cities, the largest employers were characterized as largely passive observers in the health care cost containment effort and not major factors in the consolidations. The authors do not believe the mergers led to significant efficiencies that would not have otherwise occurred, at least so far. They hold out some hope that such efficiencies may develop in the future as the hospitals move further toward integration, consolidation, and facility closure.

Consolidations of five hospitals in the Boston Metro area were examined by Barro and Cutler.[130] They first discuss the factors that have caused hospital consolidation nationally in the hospital industry including: prospective payment, managed care, and technology changes (less invasive procedures necessitating fewer and shorter stays as inpatients, and greater use of pharmaceutical rather than medical therapies). These factors have lead to a vastly reduced demand for acute care hospital stays and thus to the need for hospital consolidation and closure. The authors describe this process in Massachusetts over the past 20 years and discuss in more detail the consolidation of hospitals in the metropolitan Boston area into 5 major groups in the 1980s and 1990s. They present information on human input use by hospitals in the late 1980s and characterize the mergers as being motivated by a desire for facilities reduction (closure as acute facilities and modifications to specialty medical use), scale economies, or networking. Although the authors describe the five consolidations, they do not present any data regarding pre-merger versus post-merger results. Thus, the reader is left without much information about whether the mergers worked, other than general opinions about whether the hospital administrators viewed the mergers as achieving their goals. There is no discussion of price changes following the mergers. The authors assume that mergers that raise post-merger market share will enhance the firms "market power," but no evidence of that power is presented. Due to a lack of data, the authors cannot examine post-merger scale economies or costs (with the exception of the Atlanticare/Metro West merger), although that is presumably one of the factors driving the consolidation. They do note that Massachusetts has had smaller cost increases than the national average for the past 15 years, but whether that can be attributed to merger activity in Massachusetts is debatable. In the end, you have little basis for judging the welfare effects of the mergers.[131]

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[130] Barro & Cutler, *Consolidation in the Medical Marketplace in Massachusetts*, in (Kaplan ed.) MERGERS AND PRODUCTIVITY 9, National Bureau of Economic Research Conference, University of Chicago (2000).

[131] The Boston area consolidations were associated with a smaller number of beds, perhaps less hospitals, and perhaps a more efficient mix of services. Some scale economies may have been achieved by the consolidations of close-by hospital campuses (e.g., Massachusetts General/Brigham and Womens; Beth Israel/Deaconess; and the formation of the Boston Medical Center).

Unique among the hospital case studies discussed here is work by Vita and Sacher[132] who focus on pre-merger and post-merger data, rather than upon surveys of the industry participants. They examine the 1990 merger of the two largest hospitals in the three-hospital Santa Cruz, California area. The authors define a control group of similarly situated hospitals as well as a regression model to control for demand and supply factors (including the hospitals' case-mix, the percentage of patients covered by Medicare/MediCal, and a host of other determinants) other than the merger that should affect the price of hospital services. Using quarterly data from 1986 to 1996 on non-Medicare average revenues, they find that the merger was associated with an increase in the market price of in-patient services on the order of $500 to $1,000 per admission (15 to 30 percent) relative to changes at the control hospitals. They also find no evidence that this price increase was associated with post-merger quality improvement.

Banking Services Merger Case Studies

A previous section discussed several of the larger scale banking merger studies. Recently some smaller scale studies have also appeared. Rhoades summarized the results of nine horizontal banking merger studies done by several economists at the Federal Reserve.[133] Using common methodologies, the economists examined nine relatively large 1990s horizontal bank mergers to determine whether common threads could be found among the post-merger performance of the firms. For each merger the analyst examined costs, 16 financial ratios, econometric estimates of efficiency and scale economies, and stock market price effects relative to control groups. Depending upon the weight you might give to various measures of bank performance, anywhere from four to nine of the mergers were successful. No clear patterns emerged from the nine cases other than the fact that costs were reduced in each case and at least one measure of total efficiency was improved in every case.[134]

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[132] Vita & Sacher, *The Competitive Effects of Not-for-Profit Hospital Mergers: A Case Study*, 49 JOURNAL OF INDUSTRIAL ECONOMICS 63 (March 2001). Also *see*, Simpson, *Geographic Markets in Hospital Mergers* (Bureau of Economics, Federal Trade Commission, Working Paper No. 237, February 2001) (examining aspects of the same Santa Cruz, CA merger).

[133] Rhoades, *The Efficiency Effects of Bank Mergers: An Overview of Case Studies of Nine Mergers*, 22 JOURNAL OF BANKING AND FINANCE 273 (1998).

[134] Calomiris argues that during merger waves, comparison of pre-merger and post-merger bank performance can provide misleading implications if stock market data are used or if the research does not control effectively for follow-on mergers that might undo any harm caused by an initial inefficient merger. *See* Calomiris, *Gauging the Efficiency of Bank Consolidation During A Merger Wave*, 23 JOURNAL OF BANKING AND FINANCE 615 (1999). To avoid these problems, Calomiris would use cross-regime comparisons of banking systems, perhaps on an international level. Based on broad measures and several case studies, he argues that U.S. bank profit performance has improved significantly and that markets for banking services are much more competitive in the 1990s than they were previously.

Calomiris and Karceski[135] discuss the consolidation of banking in the U.S. generally over the past twenty years and argue that it has likely been efficient even if the large sample studies of banking have so far failed to find such efficiencies. They also examine nine banking mergers from the mid-1990s. The mergers were located in Chicago, Detroit, St. Louis, and the Northeast. The cases involved buy-outs of entrenched management, mergers to avoid future hostile takeovers, purchases of specialty banks, geographic extensions, mergers to expand in-area market share or to achieve initial entry in an area, or expand the services that could be offered to customers (e.g., "relationship" banking offering multiple, high-margin financial products.). Most, but not all, of the acquiring firms thought some cost savings might be forthcoming from the mergers. As with most samples of mergers in any industry, the stock market reactions to the deals varied widely, with three receiving negative evaluations and six positive. The biggest winner and biggest loser were clearly identified by the market. The authors, however, place little faith in those reactions as predictions of success, in any event. They examine available accounting information on bank performance before and after the acquisitions to try to discern the effects of the mergers. One outstanding success appeared (First Bank/Boulevard), where a laggard bank was brought under new vigorous management, and one notable waste of shareholder resources occurred (First Chicago/Lake Shore) where management used a merger to further entrench itself. Other transactions were perhaps successes in the long run (or at least clearly not failures). One merger that did not work out in St. Louis (Roosevelt Bank) was later remedied by another bank buying out the "bad" acquirer. The measures of success or failure are many and varied, making it difficult to determine whether the transactions were successful and how successful. This is a problem inherent in the exercise. There are many ways to measure firm performance relative to control groups and unless the measures all tell a consistent story, it is hard to make blanket statements about the success or failure of a particular merger. The authors view a success from the firms' vantage point and not from an overall consumer welfare perspective. On the whole, the nine cases provide a wealth of detail, but they lead to little in the way of generalizable insights.

Mergers in a related area - automated teller machine (ATM) shared networks, have also been examined.[136] From 1986 to 1996, the number of ATM shared networks declined from 170 to about 50. Some of the remaining networks have very large shares of regional transactions. An annual survey conducted by a banking industry publication captured pricing and output data for four merging networks and 14 nonmerging networks during the 1991 to 1996 period. Prager compared average prices charged by the merging networks to those charged by nonmerging networks over the 1991 to 1996 period. Thus, experimental control was accomplished via the comparison of group means, rather than by use of an econometric model to hold constant other factors that might have affected the costs or demand of the networks. The comparison of the mean switch fees and interchange fees charged by the networks to their member banks provided no evidence that fees charged by merging networks increased relative to those charged by the nonmerging networks following the mergers. If anything,

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[135] Calomiris & Karceski, *Is the Bank Merger Wave of the 1990s Efficient?*, in (Kaplan ed.) MERGERS AND PRODUCTIVITY 93, National Bureau of Economic Research, Chicago (2000).

[136] Prager, *ATM Network Mergers and the Creation of Market Power*, ANTITRUST BULLETIN 349 (Summer 1999).

the results indicated the opposite. Nor did Prager find a significant reduction in transaction growth for the merging networks. Thus, the ATM network mergers captured by this survey did not appear to lead to customer losses.

Case Studies of Mergers in Other Industries

Empirically-oriented cases studies exist in a few other industries. One of the first systematic case studies of a merger involved examination of the post-merger market performance in the Federal Trade Commission's Xidex case.[137] Xidex produced two types of "nonsilver duplicating microfilm": diazo and vesicular. Xidex acquired a horizontal rival in each of the competing product lines; Scott Graphics (diazo) in 1976 and Kalvar Corp. (vesicular) in 1979. Each of the acquisitions raised Xidex's market share by about 10 percentage points in the overall nonsilver duplicating microfilm product market. The authors find that these acquisitions caused diazo and vesicular microfilm prices to rise more than they would have absent the merger. The Kalvar acquisition had a larger effect, possibly because that acquisition left Xidex with a near monopoly in vesicular microfilm. (The authors control for cost fluctuations by examining the relative winning competitive bids from GSA contracts for the two types of microfilm, which use similar inputs.) In addition, they find that the supra-competitive profits gained were sufficient to recoup the purchase price of the assets in two years.

In one of the first studies to use econometric techniques to control for non-merger effects, Schumann *et al.*,[138] estimated the effects of mergers in titanium dioxide, cement, and corrugated paperboard using an econometric model to control for cost and demand variations. The authors use time series data for each market to discern the effects of the various mergers. Using generalized reduced-form price equations, the authors find surprisingly large price effects. The merger of the 2nd and 4th largest U.S. producers (G+W/SCM) in the titanium dioxide industry may have led to a price increase on the order of 25 percent.[139] In the case of the Hawaiian cement merger, prices may have fallen 23 percent following the merger of Hawaii's only two cement producers. Even though the merger led to a "monopoly" in Hawaii, the post-merger price reduction may reflect efficiencies achieved by the merger that were not offset by anticompetitive effects because the ease of importing cement to the islands kept Hawaii from being a separate market for cement. The study of the paperboard merger (Weyerhauser purchased Menasha's west coast assets) indicates that a temporary "hold separate" remedy used in conjunction with the acquisition of one corrugating medium mill may have failed because it deterred vertical efficiencies while allowing any adverse horizontal effect of the merger. Prices rose 14 percent following the merger, but fell to preacquisition levels following removal of the hold-separate agreement.

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[137] Barton & Sherman, *The Price and Profit Effects of Horizontal Merger: A Case Study*, 33 JOURNAL OF INDUSTRIAL ECONOMICS 165 (December 1984).

[138] SCHUMANN, ROGERS & REITZES, CASE STUDIES OF THE PRICE EFFECTS OF HORIZONTAL MERGERS (Bureau of Economics, Federal Trade Commission, January 1992).

[139] The size and statistical significance of the effect of this merger in titanium dioxide appears to be sensitive to the way in which a demand factor, GNP, is entered into the equation that estimates the price of titanium dioxide.

Examining a transaction in the computer industry, Lys and Vincent use stock market event analysis to examine AT&T's purchase of NCR.[140] The authors examine the stock market reaction to 25 different "events" that were connected with the 1991 transaction. At the time of the merger, the market predicted that the deal would be a loser for AT&T shareholders and the market appears to have been correct in this instance. The authors conclude that the 1991 deal resulted in value reduction on the order of $4 to $6 billion. One major focus of the paper is on the question of accounting conventions used in conjunction with mergers. The authors believe that AT&T thought their accounting choice would fool investors and thus AT&T management paid a hefty premium to be able to use pooling of interests as opposed to purchase accounting when undertaking the transaction.

A transaction in the railroad industry has also been examined. Park, *et al*. compare the prices of grain before and after two mergers in the railroad industry - the September 1995 Burlington Northern/Santa Fe merger and the July 1996 Union Pacific/Southern Pacific merger.[141] Because contract data on rail prices do not exist, the authors use two approaches to estimate the price effect of the mergers. First, they use simulations to calculate the lowest network cost of shipments and to calculate the equilibrium prices that would occur if rival firms price at variable cost (the cost data exist from ICC records). They find that due to efficiencies from the use of more direct routes in the post-merger situation, costs would often fall as would prices (although the mergers would not always result in lower price-cost margins). As a more direct test, the authors also examine the price spreads for wheat in Houston and various locations in Kansas and find that the difference between the prices (which presumably represents the transportation cost component) fell after the mergers in 44 of 52 instances.[142] Based on their work and some previous literature, the authors conclude that competitive prices are likely to result from rail mergers so long as two railroads are available to shippers.[143]

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[140] Lys & Vincent, *An Analysis of Value Destruction in AT&T's Acquisition of NCR*, 39 JOURNAL OF FINANCIAL ECONOMICS 353 (1995).

[141] Park, Babcock & Lemke, *The Impact of Railroad Mergers on Grain Transportation Markets: A Kansas Case Study*, 35 TRANSPORTATION RESEARCH 269 (1999).

[142] The authors do not have access to negotiated prices, but rather use 1994 and 1998 data on list prices of wheat at various locations. They do not adjust for anything else that might have happened over the 1990s that would have lead to price or cost changes even if the mergers had never occurred. Thus, the link between the price reductions and the mergers is tenuous.

[143] This conclusion seems quite inconsistent with reports of major service disruptions and train crashes that occurred following the UP/SP merger. Perhaps the disruptions occurred outside the market for wheat or were only short-run logistics problems that were eventually solved, but the reports indicate problems that lasted over at least two years. For critiques of the merger, *see* Machalaba, Ties That Bind: After Crippling Chaos, Union Pacific Can See The Proverbial Light, *Wall Street Journal*, August 25, 1999, A-1; Pittman, Train Wreck: A Lesson on Megamergers at www.antitrust.org, 8-4-99; Kwoka & White, Manifest Destiny? The Union Pacific and Southern Pacific Railroad Merger, pp. 64-88, esp. pp. 84-86 in (Kwoka & White eds.) THE ANTITRUST REVOLUTION, ECONOMICS, COMPETITION, AND POLICY 3rd ed. (1999); and three different customer-industry trade press reports of early 1998 problems in Conrath & Widnell, *Efficiency Claims in Merger Analysis: Hostility or Humility*, 7 GEORGE MASON LAW REV. 685 (1999).

Kaplan provides case studies of mergers in several additional industries.[144] Many of the studies contained in the volume are mentioned elsewhere in this paper because they deal with hospitals, airlines, or banking - industries with a tradition of merger studies. The conference volume, however, covers even more ground. The various authors look in depth at over 20 recent (1985 - 1995 vintage) mergers in hospitals in Massachusetts, tires, banks, oil field services, tile, airlines, and prescription drugs. The goal is to look closely at a few mergers in the hope that insights obtained will help explain results from the large sample work done on mergers and takeovers during the past 20 years.[145] As with older style case studies, the work is potentially subject to author bias, and many of the studies do little to compare the post-merger performance with a benchmark of control firms or with an econometric model that would allow one to predict what would have happened "but for" the merger. On the other hand, the authors appear to bring objective data to bear on the issues when possible, pulling together stock market data, accounting information, interviews with business decision-makers to construct a coherent story of what happened before and after the mergers. Their main concern is with determining whether the transactions worked for shareholders (were they profitable endeavors?) and why they did or did not work. Many of the case studies provide examples of long term industry responses to changing environments or technologies (hospitals, banking, tires); some are stories of mistaken perceptions; still others are stories of merger ideas that looked good in principle, but went bad due to failure to appreciate the "corporate culture" aspects of mergers (Piedmont/USAir). Mergers are obviously riskier undertakings than simply buying assets. They require more planning, understanding, and luck to pull off. Even for managements who have done several mergers, each one appears to present new challenges and no assurance of success.[146] Sometimes mergers are done simply to make use of the firm's excess cash flow at the expense of the shareholders (*e.g.*, Premark's acquisition of Florida Tile is said to fall in this category). Kaplan concludes that technology changes and cost shocks explain much of the merger activity in the industries.[147]

The smaller scale case studies provide relatively little in the way of general lessons about merger effects, but one would not expect strong generalizations to come from studies of individual transactions. In airlines, prices rose in many instances following mergers, but in some cases they fell relative to what otherwise would have occurred. More efficient provision of service also seemed associated with the airline mergers due to improved network effects. During the 1980s and 1990s, hospital consolidations occurred as an essential part of a nationwide reduction in demand for hospital

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[144] MERGERS AND PRODUCTIVITY, (Kaplan, ed.), National Bureau of Economic Research Conference Report, University of Chicago (2000). Many of these merger case studies were done with more objective data than were available to the authors of the previous generation of case studies.

[145] The authors call these case studies "clinical" studies and many of the authors previously produced the larger sample evidence on mergers.

[146] Cooper Industries had reportedly successfully undertaken several acquisitions and had effectively imposed its management practices on the acquired firms. When Cooper acquired Cameron Iron Works, however, the attempted "Cooperization" failed.

[147] For those interested in the antitrust implications of the deals, no one seemed to find a merger that raised prices to customers, although the cases were not selected to provide examples of that effect and the authors were not mainly interested in finding such effects. (One commentator saw the drug mergers as anticompetitive, but the authors did not).

in-patient services. The small scale studies imply that the consolidations were inevitable and perhaps efficient, but one study found a substantial price-enhancing effect from a hospital consolidation. Small scale banking studies found more evidence of efficiency enhancement that did the larger scale banking studies, but the effects were not dramatically large. Perhaps the more favorable findings in the small-scale studies of bank mergers are due to the fact that bank mergers improved as time went by, with the 1990s ventures performing better than did those in the 1980s and the case studies tended to be focused on recent transactions. The small scale studies provide a range of evidence including one utter disaster for stockholders in AT&T's purchase of NCR. My review did not reveal an outstanding merger success in which shareholders make large gains and customers receive substantially lower prices and better service. Perhaps such cases exist, but they are not "news" and thus do not elicit the academic interest of the potentially bad outcomes. Or perhaps successes can never be as dramatic as failures - market forces tend to constrain the upside gains from good business decisions, but the downside losses are not so well cushioned.

VII. INDIRECT EVIDENCE FROM STRUCTURE-CONDUCT-PERFORMANCE (SCP) STUDIES

Although the traditional structure-conduct-performance evidence does not directly focus on a sample of mergers and acquisitions, we review this evidence since it is relevant for answering the general question, "Does market concentration seem to matter?" Unfortunately, this literature cannot directly answer the question, "Do increases in concentration brought about by horizontal mergers matter?"

A. Profit/Concentration Studies

Whether a relationship exists between concentration and market performance and what any such relationship might mean has been a matter of debate for several decades. Early work in this area focused on the relationship between concentration and profitability across many broadly defined industries. As of 1968, the prevailing view was that a stable relationship existed between these two variables and that the relationship implied that market power existed in many markets. This view implied that a fairly strict review of concentration increasing mergers was appropriate. Beginning about that time, "revisionists" in the economics profession began to raise nagging doubts about the robustness of the relationship, the accuracy of the data upon which it was based (especially the profitability data), and the policy implications that flowed from the empirical results. The early revisionists effectively argued that: (1) a relationship between concentration and profits could be due to efficiency and not market power, and (2) concentration may lead to some increased market power, but the process, on net, leads to lower prices because it leads to lower costs.[148]

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[148] This debate and the pre-1982 evidence are reviewed in Pautler, *The Economic Basis for Broad Based Horizontal Merger Policy*, 28 ANTITRUST BULLETIN 571 (Fall 1983). For a more recent review, *see* Schmalensee, *Inter-Industry Studies of Structure and Performance*, Vol. II HANDBOOK OF INDUSTRIAL ORGANIZATION (1989). The debate regarding the value of the traditional cross-section, multi-industry SCP empirical literature continues, with (continued...)

Later researchers, many using better accounting data from the FTC's Line of Business program and more fully-specified empirical models, found that even the existence of a relationship between concentration and profits was questionable. These researchers found that: (1) for line of business level data, higher concentration did not lead to higher industry profitability; rather, larger market shares were associated with increased firm profits; (2) increases in large rivals' market shares tended to reduce a firm's profits;[149] and (3) for industry level data over longer periods, concentration changes did lead to price/cost margin increases over time, but costs also fell resulting in lower net consumer prices.[150] The longer term industry-level results imply that while increased concentration might have some deleterious effects, it may be beneficial overall.[151] Going further, other researchers questioned the entire interpretation of multi-industry cross-section results, arguing that only within-industry price studies in local markets were likely to provide useful information.

Following Schmalensee's[152] lead, some profit/concentration literature has taken a different approach by trying to decompose the source of a firm's profit variation into three components: that due

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[148](...continued)
some reputable economists arguing that the traditional SCP evidence based on accounting profits may be close to useless. *See* Bothwell, Cooley & Hall, *A New View of the Market Structure-Performance Debate*, 32 JOURNAL OF INDUSTRIAL ECONOMICS 397 (June 1984). For a defense of the traditional approach, *see* Salinger, *The Concentration-Margins Relationship Reconsidered*, MICROECONOMICS 1990, 287 (1990).

[149] This relationship between price/cost margins and own-firm market share and rivals' market shares could imply pervasive efficient rivalry, potential large firm dominance, or both. *See* Ravenscraft, *Structure-Profit Relationships at the Line of Business and Industry Level*, 65 REVIEW OF ECONOMICS AND STATISTICS 22 (February 1983) and Kwoka & Ravenscraft, *Cooperation v. Rivalry: Price-Cost Margins by Line of Business*, 53 ECONOMICA 351 (1986). Studies using the FTC's Line of Business data have not been able to distinguish effectively between efficiency and anticompetitive explanations for the relationship between market share and price/cost margins, however.

[150] *See* Salinger, *supra* note 148, Salinger's price/cost margin data covering 1971 through 1984 yield the same general results as those found by Peltzman, *The Gains and Losses from Industrial Concentration*, 20 JOURNAL OF LAW AND ECONOMICS 229 (October 1977) in his landmark study of earlier years. Salinger's empirical model is not, however, very completely specified. Similar results indicating net price reductions associated with increased concentration for Canadian industries were obtained by Dickson, *The Relationship Between Concentration and Prices and Concentration and Costs* 23 APPLIED ECONOMICS 101 (1991).

[151] Since efficient increases in concentration can be achieved through internal expansion, Salinger, *supra* note 148, at 319, argues that the burden should be placed on firms to show that horizontal mergers should not be blocked. Peltzman, *Comments on The Concentration-Margins Relationship Reconsidered*, MICROECONOMICS 1990 329 (1990) argues that Salinger's evidence is more consistent with a policy that allows mergers, at least, in the absence of some compelling reasons to fear an anticompetitive outcome.

[152] Schmalensee, *Do Markets Differ Much*? 75 AMERICAN ECONOMIC REVIEW 341 (June 1985). Using line of business data and SIC-defined markets for 456 firms in 242 industries, Schmalensee, could explain about 20 percent of the variation in line of business profits mainly due to industry effects. Firm effects did not exist and market share effects were quite small. Interestingly, market concentration was negatively related to the industry level effects. Thus, his results tend to be inconsistent with both the traditional SCP and revisionist views. For a related approach obtaining different results (decomposing the variation in a firm's Tobin's *Q* reveals significant firm-level effects), *see* Wernerfelt & Montgomery, *Tobin's Q and the Importance of Focus in Firm Performance*, 78 AMERICAN ECONOMIC REVIEW 246 (March 1988).

to the firm, market concentration, and the firm's market share. This technique uses very sparse empirical models.[153] For example, Froeb and Amel[154] using data for multi-bank firms in Texas during 1982 to 1987, find that neither concentration nor market share matters, but that firm effects do matter (particular firms tend to have similar profits across many geographic markets). The authors take these results as evidence against the traditional SCP hypothesis, but neither are the results consistent with the revisionist view that market share is the key to explaining profitability variation.

The traditional multi-industry, cross-section, profit/concentration study, so popular in the economics profession from the 1960s through the early 1980s appears to be largely a thing of the past, at least among U.S. academics. The critiques of the methods used and of the data have been sufficient to cause the focus to shift toward other, potentially more reliable, methods.[155]

B. Price/Concentration Studies

Because one cannot tell whether a positive relationship between concentration and profits exists, and if it exists, whether it would be due to efficiency or market power, much of the structure/performance research in recent years shifted toward study of the relationship between price and concentration. If one can obtain transaction price data for homogeneous product markets, some of the theoretical ambiguity that exists for a profit/concentration relationship does not exist for a price/concentration relationship.[156] Several studies of price/concentration relationships indicate that

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[153] The models allow for "fixed" effects from three different sources: the firm, the firm's market share in the industry, and the industry itself. That is, if a firm sold 25 different products in 25 different industries, one might ask whether the firm's profit in industry *y* was due to special characteristics of the firm itself, the firm's market share in industry *y*, or simply to the fact that it was in industry *y*.

[154] Froeb & Amel, *Do Firms Differ Much?*, 39 JOURNAL OF INDUSTRIAL ECONOMICS 23 (March 1991).

[155] There has been a relatively recent revival of price-cost margin studies on the macroeconomic front. Researchers interested in determining whether profit margins are pro-cyclical or counter-cyclical have undertaken studies to estimate price-cost margins across many industries. Those margins are not measured directly, but rather, are inferred from theoretical considerations and estimation of industry labor and capital productivity. For a recent example of this approach covering 14 countries, *see* Martins, Oliveria, Scarpetta & Pilat, Mark-up Pricing, Market Structure, and the Business Cycle, OECD Economic Studies No. 27, (1996). Also *see*, Ghosal, *Product Market Competition and the Industry Price-Cost Markup Fluctuations: Role of Energy Price and Monetary Changes*, 18 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 415 (2000) who finds that changes in price-cost margins in the more concentrated segment of his 253 industry sample are less sensitive to business cycles than they are in the less concentrated industries.

[156] This is not to say that price/concentration studies are free from criticism. At a basic level, obtaining quality-adjusted transactions prices is often quite difficult. In addition, Kimmel has noted that a positive relationship between price and concentration may be found even in perfectly competitive markets if firms in smaller markets tend to have higher costs than firms in large markets. Thus, finding a positive relationship between price and concentration in a cross section study may not be evidence of a competitive problem, particularly if market-specific costs cannot be accurately measured and incorporated in the model. *See* Kimmel, A Fundamental Bias in Studying Effects of Concentration on Prices, (Discussion Paper Series 91-9 Economic Analysis Group, Antitrust Division, U.S. Department of Justice, August 1991). In addition, Froeb and Werden have argued that feedback from price to structure will cause price/concentration
(continued...)

prices are higher where concentration is higher or the number of sellers is lower. Such studies exist in a variety of industries, including banking, airline, cement, tax exempt bond underwriting, food retailing, gasoline retailing, ocean shipping, hospitals, and natural gas. Additional evidence of the effect also comes from certain auction markets.

Weiss[157] examines several price/concentration studies over the past twenty-five years in several industries and with one exception finds 1 to 5 percent price increases associated with ten percentage point increases in concentration. In one of the studies Weiss reviews, Brannman *et al*.[158] find a significant positive effect of the number of bidders on buying price (a negative effect on selling price) in auction markets for oil tracts, timber, and bond underwriting.

Several studies beyond those listed by Weiss have also found a significant positive relationship between concentration and price. For example, in the banking industry, numerous researchers (e.g., Neumark and Sharpe,[159] Hannan,[160] Hannan and Liang,[161] and Cyrnak and Hannan[162]) have found that increased concentration is associated with a small, but statistically significant, increase in bank rates charged on loans or a decrease in rates paid by banks to deposit customers.[163] The relationship

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[156](...continued)
studies to be subject to simultaneous equations bias similar to that plaguing profit/concentration studies. *See* Evans, Froeb & Werden *Endogeneity in the Concentration-Price Relationship: Causes, Consequences, and Cures,* 41 JOURNAL OF INDUSTRIAL ECONOMICS 431 (December 1993). For general arguments indicating that feedback should exist from the "toughness" of price competition to market structure, *see* SUTTON, SUNK COSTS AND MARKET STRUCTURE: PRICE COMPETITION, ADVERTISING, AND THE EVOLUTION OF CONCENTRATION (1991).

[157] WEISS, CONCENTRATION AND PRICES (1989).

[158] Brannman, Klein & Weiss, *The Price Effects of Increased Competition in Auction Markets*, 69 REVIEW OF ECONOMICS AND STATISTICS 24 (February 1987).

[159] Neumark & Sharpe, *Market Structure and the Nature of Price Rigidity: Evidence from the Market for Consumer Deposits*, 107 QUARTERLY JOURNAL OF ECONOMICS 657 (May 1992).

[160] Hannan, *The Functional Relationship Between Prices and Market Concentration: The Case of the Banking Industry*, (Audretsch & Siegfried eds.) EMPIRICAL STUDIES IN INDUSTRIAL ORGANIZATION: ESSAYS IN HONOR OF LEONARD W. WEISS 35-59 (1992).

[161] Hannan & Liang, *Inferring Market Power from Times-series Data: The Case of the Banking Firm,* 11 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 205 (June 1993).

[162] Cyrnak & Hannan, *Is the Cluster Still Valid in Defining Banking Markets? Evidence from a New Data Source*, 44 ANTITRUST BULLETIN 313 (Summer 1999).

[163] Hannan, *supra* note 160, for example, examines the functional relationship at different time periods and for different bank loan and deposit products. Using an interest rate model that controls for maturity, loan size, commitment status, bank size, SMSA population, area wages, and state business failure rates, as well as concentration, he finds the expected general positive relationship between various measures of concentration and lending rates and the expected negative relationship between rates paid on deposits and concentration. The relationships do not appear to be smooth
(continued...)

between concentration and rates paid to deposit customers in banking may be a bit weaker in the 1990s data than it was in prior periods,[164] but it still exists. In the airline industry, Borenstein,[165] Morrison and Winston,[166] Brueckner, Dyer, and Spiller,[167] Kim and Singal,[168] and Singal[169] all find that air fares are higher in more concentrated air travel markets.[170] Somewhat different results in airline markets were obtained by Evans and Kessides[171], however, who examined the fares charged for single carrier coach seats in 1988 on the top 1000 airline routes using a fixed effects model that accounts for route-specific effects. Unlike previous authors (who did not use a fixed-effects estimation approach), they find that route market share and route concentration are unimportant, but that airport market share and airport concentration significantly affect fares. According to the estimates, a market share two standard deviations above the mean is associated with coach fares that are 13 percent higher. In the natural gas transportation industry, Morris[172] finds that prices paid by industrial gas buyers tend to increase by 15 percent if the number of sellers in a local market falls by one. (The average number of sellers in such markets is 2.2). Similarly, in the ocean shipping industry where individual freight

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[163](...continued)
and monotonic, however, but rather change over the range of concentration, sometimes in surprising ways.

[164] *See* Berger, Demsetz & Strahan, *The Consolidation of the Financial Services Industry: Causes, Consequences, and Implications for the Future*, 23 JOURNAL OF BANKING & FINANCE 135 (1999).

[165] *See* Borenstein, *supra* note 118.

[166] Morrison & Winston, *The Dynamics of Airline Pricing and Competition*, 80 AMERICAN ECONOMIC REVIEW 389 (May 1990).

[167] *See* Brueckner, Dyer & Spiller, *supra* note 119.

[168] Kim & Singal, *Mergers and Market Power: Evidence from the Airline Industry*, 83 AMERICAN ECONOMIC REVIEW 549 (June 1993).

[169] Singal, *Airline Mergers and Competition: An Integration of Stock and Product Price Effects*. 69 JOURNAL OF BUSINESS 233 (April 1996).

[170] Brueckner, Dyer and Spiller find that moving from monopoly to two rivals reduces fares by 7 percent, while moving from two to three firms reduces prices an additional 3 percent. The addition of rivals beyond three has minimal effects. Evans, Froeb and Werden examine biases in OLS-estimated price/concentration relationships and argue that feedback effects and measurement errors are likely to cause those estimates to be biased downward. Using airline pricing data for 1984-1988 for 1,000 city-pairs, they find that OLS estimates of the effect of market concentration on fares may be biased downward by as much as 150 to 250 percent. Thus, prior research that does not effectively adjust for such biases could significantly underestimate the effects of concentration increases. *See* Evans, Froeb & Werden, *Endogeneity in the Concentration-Price Relationship: Causes, Consequences, and Cures,* 41 JOURNAL OF INDUSTRIAL ECONOMICS 431 (December 1993).

[171] Evans & Kessides, *Localized Market Power in the U.S. Airline Industry,* 75 REVIEW OF ECONOMICS AND STATISTICS 66 (February 1993).

[172] Morris, *The Relationship Between Industrial Sales Prices and Concentration of Natural Gas Pipelines* (Bureau of Economics, Federal Trade Commission, Working Paper No. 168, November 1988).

carriers are often affiliated through associations called conferences, Clyde and Reitzes[173] find that increases in market concentration on a route are associated with slightly higher freight rates, but higher conference market shares do not seem to be directly associated with higher freight rates. Likewise, Rosenbaum found a positive price concentration relationship in local cement markets from 1974 to 1989.[174] Cement-making technology improved over this period as new, larger, more efficient plants were brought on line. The author finds that while long-term movements to the new, larger scale cement-making technology lead to significant price and cost reductions, the associated increases in seller concentration also caused producer margins to rise. Consumers only obtained two-thirds of the cost reduction in the form of lower prices.[175] The recent literature on hospital pricing (with one exception) reports evidence that market concentration increases are associated with higher prices,[176] and a recent paper on consumer food products finds that pricing behavior varies substantially with concentration as "sales" during peak seasons are less deep for those products where market concentration is higher.[177]

On the other side of the ledger, Lynk finds that concentration increases over time in the beer industry were associated with declines in the price premiums of larger brewers and with output increases.[178] Dunne and Roberts[179] find no relationship between the number of rivals and pricing of

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[173] CLYDE & REITZES, THE EFFECTIVENESS OF COLLUSION UNDER ANTITRUST IMMUNITY - THE CASE OF LINER SHIPPING CONFERENCES (Bureau of Economics, Federal Trade Commission, December 1995).

[174] Rosenbaum, *Efficiency v. Collusion: Evidence Cast in Cement*, 9 REVIEW OF INDUSTRIAL ORGANIZATION 379 (1994).

[175] These cement industry results seem very consistent with Peltzman's (1977) argument that net efficiency increases stem from increases in concentration. Prices and costs fall as concentration changes, but margins rise. The author estimates simultaneous equations for cement output and price. The model produces a few counterintuitive results. In the price equation, increased wages are found to reduce price. In the output (demand) equation, the price of asphalt, a substitute for cement, obtains a negative sign. Otherwise, the results appear reasonable.

[176] *See* Keeler, Melnick & Zwanziger, *The Changing Effects of Competition on Non-profit and For-profit Hospital Pricing Behavior*, 18 JOURNAL OF HEALTH ECONOMICS 69 (January 1999); Connor, Feldman & Dowd, *The Effects of Market Concentration and Hospital Mergers on Hospital Costs and Prices,* 5 INTERNATIONAL JOURNAL OF THE ECONOMICS OF BUSINESS 159 (1998); and Kessler & McClellan, Is Hospital Competition Socially Wasteful? (undated mimeo, Stanford University, October 1998). Gaynor & Haas-Wilson, *Change, Consolidation and Competition in Health Care Markets*, 13 JOURNAL OF ECONOMIC PERSPECTIVES 141 (Winter 1999) provide a broader overview of recent evidence arguing that most hospital mergers are likely to be efficient, but that those in particularly concentrated markets may be welfare-reducing. For an opposing view and a critique of the concentration data used in the studies noted above, *see* Lynk & Neumann, *Price and Profit*, 18 JOURNAL OF HEALTH ECONOMICS 99 (January 1999).

[177] MacDonald, *Demand, Information, and Competition: Why Do Food Prices Fall at Seasonal Demand Peaks?* 48 JOURNAL OF INDUSTRIAL ECONOMICS 27 (March 2000).

[178] Lynk, *Interpreting Rising Concentration: The Case of Beer*, 57 THE JOURNAL OF BUSINESS 43 (January 1984). Consistent with Lynk's view, Tremblay and Tremblay suggest that horizontal mergers in the beer industry may have been motivated by a survival instinct that placed brewing assets in the hands of the most efficient managers. *See*

(continued...)

bread by bakeries,[180] and Newmark finds that the relationship between price and concentration in cement may be due to an error in specifying transportation costs rather than to avoidable concentration.[181] In addition, Anderson[182] and Newmark[183] review the literature on the relationship between concentration and price in the grocery retailing industry. Neither author finds that the relationship has been convincingly demonstrated.[184]

In a unique study of market structure and implied profit margins, Bresnahan and Reiss[185] examine the relationships between the numbers of firms, market size, and competition in five retail and professional industries that tend to be concentrated in localized markets. The data apply to isolated towns in the Western U.S. and the industries include doctors, dentists, druggists, tire dealers, and plumbers. They find that competitive conduct changes quickly and substantially when entry occurs, with the main effects occurring after the entry of the second or third firm. Further entry is less eventful, and three to five firms appears sufficient to reach an equilibrium. This result is generally consistent with that found in the experimental economics literature. The study is a very inventive use of cross-section data on market structures, population, and income in small markets to derive

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[178](...continued)
Tremblay & Tremblay, *The Determinants of Horizontal Acquisitions: Evidence from the U.S. Brewing Industry*, 37 JOURNAL OF INDUSTRIAL ECONOMICS 21 (September 1988).

[179] Dunne & Roberts, *Costs, Demand, and Imperfect Competition as Determinants of Plant-Level Output Prices*, (Audresch & Siegfried eds.) EMPIRICAL STUDIES IN INDUSTRIAL ORGANIZATION: ESSAYS IN HONOR OF LEONARD W. WEISS 13-33 (1992).

[180] Dunne and Roberts do find a close relationship between prices and average costs, leading them to conclude that the market is competitive and that profits have not simply been eroded by entry as might occur in a model of monopolistic competition. They suggest that markets for bakery bread are so easy to enter that the number of rivals is never likely to matter.

[181] Newmark, Price and Seller Concentration in Cement: Effective Oligopoly or Misspecified Transportation Costs? 60 ECONOMIC LETTERS 243 (1998).

[182] ANDERSON, A REVIEW OF STRUCTURE PERFORMANCE STUDIES IN GROCERY RETAILING (Bureau of Economics, Federal Trade Commission, 1990).

[183] Newmark, *A New Bottle for the Profits-Concentration Wine: A Look at Prices and Concentration in Grocery Retailing* (Raleigh, North Carolina: North Carolina State, September 1989).

[184] Cotterill, *A Response to the Federal Trade Commission/Anderson Critique of Structure-Performance Studies in Grocery Retailing* in (Cotterill, ed.) COMPETITIVE STRATEGY IN THE FOOD SYSTEM (Westview Press, 1993) provides a response to Anderson's review. Also *see*, Marion, *Competition in Grocery Retailing: The Impact of a New Strategic Group on BLS Price Increases*, 13 REVIEW OF INDUSTRIAL ORGANIZATION 381 (1998), who finds a positive correlation between changes in price and changes in concentration using 1977 to 1992 data for 25 cities after adjusting for cost changes and service quality. Similarly, in a later study Cotterill finds a positive correlation between price and concentration in 34 Southwestern cities in 1982. *See* Cotterill, *Market Power and the Demsetz Quality Critique: An Evaluation for Food Retailing*, 15 AGRIBUSINESS 101 (1999).

[185] Bresnahan & Reiss, *Entry and Competition in Concentrated Markets*, 99 JOURNAL OF POLITICAL ECONOMY 977 (1991).

implications about market power and entry over time. Because all the results are implications using the "available" data (the model has to allow you to derive implications about what the "right" data would have looked like), the study is not as convincing as it might otherwise be.[186]

C. Other Indirect Evidence

While expanded evidence on the effects of concentration on price is one advance in the empirical literature in the mid-1980s and 1990s, other indirect evidence on the potential effect of mergers may also be gleaned from studies focusing on the effects of market shares on industry performance or of concentration on productivity or efficiency measures. Fairly recently, empirical evidence has also emerged regarding the effects of multi-market contact on firm performance.

Mueller[187], for example, shows that for a sample of 472 firms, profit levels seemed to persist over the 1949-1973 period. That is, high profit firms retained those high profit rates and low profit firms remained in the low profit category more often than one would expect if competition existed and firms were able to mimic other successful firms. Mueller[188] indicated that concentration itself was unimportant in explaining profits, but that the relationship between market share and profitability is industry-specific. Mueller finds that market share matters in industries that are advertising- or patent-intensive, but not in other industries.[189]

McGahan and Porter expand upon Mueller's analysis, by examining the persistence of changes in profits.[190] The authors use 1981-1994 Compustat business segment profitability data to examine the sources of shocks to firms' profits. The conceptual argument is that if shocks are persistent due to firm effects, then the persistence may be due to firm efficiency. If, however, shocks tend to persist due to industry effects, then the most likely explanation is that rivals are unable to mimic the profitable firm and entry barriers support that persistence. The authors use a regression model to assign the persistence of profits to one of three sources: the business segment, firm, or industry. They find that

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[186] Bresnahan and Reiss would ideally like to examine the decline in accurately calculated price/cost margins as entry occurs in well-defined markets. Because they do not have such time series data (and are not sure it could be calculated), they combine cross-section data on numbers of firms, and potential demand (based on population and area demographics) with inventive use of theory to derive implications about price/cost margins and entry patterns.

[187] MUELLER, THE DETERMINANTS OF PERSISTENT PROFITS (Bureau of Economics, Federal Trade Commission, 1983).

[188] MUELLER, PROFITS IN THE LONG RUN (Cambridge: Cambridge University Press, 1986).

[189] Pakes, *Mueller's Profits in the Long Run*, 18 RAND JOURNAL OF ECONOMICS 319 (Summer 1987). Mueller's work was done with the FTC's 1950 and 1972 Corporate Patterns data. A firm's market share was an amalgam of several lines of business and the models used did not control for many factors that might affect profits or market shares over time. Mueller did, however, use control groups to attempt to account for such changes.

[190] McGahan & Porter, *The Persistence of Shocks to Profitability*, 81 REVIEW OF ECONOMICS AND STATISTICS 143 (February 1999).

industry, firm, and business segment effects on profit persistence are all substantial, but industry effects are larger than the other components. Business segment and firm effects appear to be much more important for explaining variance from the norm in profits, but the persistence of that divergence from the norm is explained best by industry effects.

Rather than examining profits or prices, Caves and Barton[191] and Caves *et al.*[192] examine the relationship between market concentration and technical efficiency. They use 1977 plant-level input and output data to estimate stochastic frontier production functions for manufacturing establishments in six nations. After obtaining estimates for the level of technical efficiency or inefficiency of each plant, the authors search for the determinants of that inefficiency via regression analysis. Although the results vary considerably across nations and the international comparisons are unreliable, the authors suggest that the results are reliable for examining the determinants of interindustry differences in technical efficiency within one nation. Two fairly consistent results are found. First, increased domestic concentration is associated with reduced technical efficiency[193] and, second, larger plant scale improves efficiency in most nations. Other (weaker) evidence indicates that plant-level diversity may reduce efficiency, particularly in the United States.

The banking literature provides yet another source of indirect evidence on the effects of mergers. For example, Berger and Hannan[194] examine the relationship between cost efficiency and market concentration in the banking industry during the 1980s. Using a "distribution free" translog cost estimation technique,[195] they find (as had prior researchers) that efficiency was fairly low in the industry generally; the average bank was only 70 percent as efficient as the most efficient banks. After estimating an efficiency level for each bank, the authors regress the efficiency level on variables measuring market concentration, ownership status, takeover likelihood, bank branching regulation status, five regional dummies, and four size class dummies. The new result they obtain is that efficiency was lower when concentration was higher. The authors find this result regardless of the approach they use to measure efficiency, regardless of the particular way concentration enters the

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[191] CAVES & BARTON, EFFICIENCY IN U.S. MANUFACTURING INDUSTRIES (1990).

[192] CAVES *et al.*, INDUSTRIAL EFFICIENCY IN SIX NATIONS (1992).

[193] Although market concentration appears to be important across the six nations as a group, Caves & Barton, *supra* note 191, at 111 and 151, are not confident that competition is a particularly significant force driving improved efficiency in the U.S. sample.

[194] Berger & Hannan, *The Efficiency Cost of Market Power in the Banking Industry: A Test of the "Quiet Life" and Related Hypotheses*, 80 REVIEW OF ECONOMICS AND STATISTICS 454 (August 1998).

[195] For a description of the distribution-free estimation approach and how it differs from the stochastic efficient frontier approach, *see* Berger, *Distribution-Free Estimates of Efficiency in the U.S. Banking Industry and Tests of the Standard Distributional Assumptions*, 4 JOURNAL OF PRODUCTIVITY ANALYSIS 261 (1993). The distribution-free approach makes use of time series data for each bank to estimate efficiency in a way that does not require assumptions about the distributions of the error terms in the calculation of efficiency. Cross section analysis using efficient frontier techniques, on the other hand, requires that assumptions be made about the distributions to disentangle error due to inefficiency from error due to randomness effects.

model, and regardless of the estimation technique (OLS versus 2SLS). The magnitude of their preferred result, however, is hard to believe - they find efficiency losses due to concentration on the order of 8 to 32 percent compared to banks in unconcentrated markets. The authors obtained much smaller, although still significant, effects of concentration when using an older form of estimation (efficient frontier estimation). Among other results, the authors found that the threat of takeover improved the level of efficiency in banks and efficiency was higher in Eastern banks, in markets where branching was limited, and in small and large banks (mid-size banks were less efficient). The authors note (p. 464) that the common finding that mergers have not led to efficiency improvements may be driven by the fact that concentration increases tend to lead to cost inefficiency.[196]

Finally, one additional source of indirect evidence comes from studies examining multi-market contract. To the extent mergers increase the frequency with which rivals compete with each other in various local markets, they may alter the incentives of the firms to compete. Multi-market contact may allow more options for strategic behavior thereby reducing incentives for sharp price competition in one local market due to fear of retaliation in another local market. Fernandez and Marin[197], for example, examine 2,200 3-star or better hotels in Spain. About 40 percent of all such hotels are members of chains. The authors regress the price of a high season double room with bath on the number of stays in the city in 1994, local wages, distance to the nearest within-category rival, market concentration, hotel quality categories, hotel age, and extent of multi-market contact (MMC). The independent variables other than concentration all obtain significant coefficients. They find that prices for rooms are higher in those local markets whose firms are subject to more contact with rival firms in other local markets. Failure to consider multi-market contact biases the coefficient on concentration downward and inclusion of the MMC variable at least causes the concentration coefficient to reach marginal significance. Other studies of multi-market contact in airlines, cement, and banking have also found some effect.[198]

VIII. EXPERIMENTAL ECONOMICS EVIDENCE

Another source of indirect evidence on the effects of mergers comes from the economics

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[196] This banking evidence may not be very good indirect evidence of the effects of mergers because during the period when banking mergers were common, local market concentration tended to fall. This occurred because many mergers were not horizontal in nature, but rather were market extension mergers.

[197] Fernandez & Marin, *Market Power and Multimarket Contact: Some Evidence from the Spanish Hotel Industry*, 46 JOURNAL OF INDUSTRIAL ECONOMICS 301 (March 1998).

[198] Evans & Kessides, *Living by the Golden Rule: Multimarket Contact in the U.S. Airline Industry* 109 QUARTERLY JOURNAL OF ECONOMICS 341 (1994); Jans & Rosenbaum, *Multimarket Contact and Pricing: Evidence from the U.S. Cement Industry*, 15 INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION 391-412 (1996); and Pilloff, *Multimarket Contact in Banking*, 14 REVIEW OF INDUSTRIAL ORGANIZATION 163 (1999).

laboratory.[199] The economics lab provides a setting in which economic hypotheses can be tested under controlled conditions. If an economic theory fails to predict behavior in relatively simple laboratory settings (where, under the conditions specified in the theory, subjects take on the roles of buyers and sellers and are given financial incentives that attempt to mirror those in "real" markets), the applicability of the theory to more complex situations becomes suspect.

One general result from experimental analysis is that variations in the rules of exchange and the amount of information from one market setting to another invariably causes market performance to change (particularly when the number of buyers and sellers is small). A stark example using pure one-seller markets helps to make this clear. Smith and Williams[200] found that when only one seller exists, markets following the rules of exchange of large organized stock exchanges (double auctions) still converge to and stabilize at the perfectly competitive equilibrium. In contrast, if only one seller exists in a market that seems closer to traditional retailing (where the sellers post a "take-it-or-leave-it" price), the market more often achieves a price that is above the competitive price.[201]

Perhaps more important for day-to-day antitrust work is the fairly common finding that across a wide range of market settings, four sellers and four buyers are enough to reach competitive outcomes even in experiments that do not allow new entry. The result appears to hold most strongly when buyers and sellers do not have good information about the actions of the other market participants.[202] The "four is enough" maxim may not always hold, however. Davis and Holt[203] have shown, for example, that if one of the four firms has potential market power (i.e., it can unilaterally and profitably increase price), anticompetitive performance can occur in posted-offer markets. In their experiment, the anticompetitive effects primarily arise from the increased incidence of tacit collusion in which

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[199] For broader reviews, *see* Plott, *An Updated Review of Industrial Organization: Applications of Experimental Methods*, (Schmalensee & Willig eds.) Volume II, HANDBOOK OF INDUSTRIAL ORGANIZATION 1111 (1989), and Wellford, *Antitrust: Results from the Laboratory*, in Special Volume on MARKET POWER IN THE LABORATORY, RESEARCH IN EXPERIMENTAL ECONOMICS Vol. 9, (Isaac & Holt eds.) (forthcoming, 2001).

[200] Smith & Williams, *The Boundaries of Competitive Price Theory: Convergence, Expectations, and Transaction Costs*, 1 ADVANCES IN BEHAVIORAL ECONOMICS 31 (1989).

[201] Single-seller market experiments in which buyer demand is simulated often achieve a monopoly equilibrium. Where human subjects provide the demand, the markets less often exhibit a monopoly equilibrium. Whether a market experiment involving a single-seller results in a competitive or above competitive price seems to depend on the ability of buyers to reduce their demand below its “true” level if "the price is not right."

[202] One recent paper indicates that two competing bidders may not be enough to reach a competitive equilibrium in a Bertrand bidding game, but four is enough. *See* Dufwenberg & Gneezy, *Price Competition and Market Concentration: An Experimental Study*, 18 JOURNAL OF INDUSTRIAL ORGANIZATION 7 (2000).

[203] Davis & Holt, *Market Power and Mergers in Laboratory Markets with Posted Prices* 25 RAND JOURNAL OF ECONOMICS 467 (1994).

"signals" are sent between rival firms strictly through their pricing moves.[204]

This result leads us to one other general finding in experimental markets: the amount and timing of information seems to matter. Different types of signals can lead to differing outcomes and the outcomes are fairly sensitive to minor alterations in the design of the experiment. For example, Binger, *et al.*[205] find that explicit discussions among competitors about price facilitates collusion in some types of laboratory markets, while Holt and Davis suggest that nonbinding trade-press announcements of expected prices do not tend to lead to price increases.[206] The only conclusion coming from this line of research is that complete information tends to lead to collusive outcomes while incomplete information leads more readily to competitive (or noncooperative) outcomes.[207] If these common results could be extended to naturally occurring markets, one would be most concerned about monopoly outcomes in posted-price markets, where the number of sellers was small and the information among the sellers was perfect. In other markets, one would tend to be less concerned about extreme monopoly outcomes.

One final piece of relevant experimental literature directly examines mergers. Wellford[208] examined the effects of horizontal mergers in both concentrated and unconcentrated markets. The author examined markets with eleven firms in which the post-merger Herfindahl-Hirschman Index was 1150 and markets with five firms in which the post-merger HHI was 2800. The experiment allowed for scale economies in some markets and not in others, so the merger could lead to cost reductions in the scale economies treatment.[209] The author found no significant evidence of price increasing effects from the merger even in the concentrated markets where no cost savings resulted from the merger. The results also indicated that in both market structures any cost savings arising from mergers are

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[204] The impact of increased concentration on market performance is not as significant as the effect from increased market power (i.e., market dominance). At this point, it is unclear whether Davis & Holt's, *supra* note 208, result is due to the market power of one firm or whether it is due to the fact that no excess capacity exists at the equilibrium in their experiment. Various experimental outcomes appear to be sensitive to the existence of (or lack of) excess capacity in the experimental market equilibrium.

[205] Binger, Hoffman, Libecap & Shachat, *An Experimetric Study of the Cournot Model*, (University of Arizona, Working Paper 92-13, 1992).

[206] Holt & Davis, *The Effects of Non-Binding Price Announcements on Posted-Offer Markets*, 34 ECONOMIC LETTERS 307-310 (1990).

[207] Complete information in the laboratory generally refers to having information on the incentives of the buyers and sellers (their payout functions) and information about the previous decisions of both the buyers and sellers.

[208] Wellford, *Horizontal Mergers: Concentration and Performance*, TAKEOVERS AND HORIZONTAL MERGERS: POLICY AND PERFORMANCE (Ph. D. Dissertation, University of Arizona, 1990). Also *see* Wellford, *Antitrust: Results from the Laboratory*, in Special Volume on MARKET POWER IN THE LABORATORY, RESEARCH IN EXPERIMENTAL ECONOMICS Vol. 9, (Isaac & Holt eds.) (forthcoming, 2001).

[209] The experimental design begins with Cournot quantity choice markets with homogeneous products where entry and antitrust enforcement are absent. The results imply that four firms is enough to reach a competitive outcome even without the threat of entry or antitrust to discipline the market.

passed on to consumers. Thus, these experiments imply that efficiencies would tend to dominate any potential anticompetitive effects of increased concentration.

Although the economic laboratory cannot replicate the broad range of factors that exist in the business world, it does provide an innovative setting in which to examine antitrust issues. As the evidence continues to accumulate, it will help build a rigorous empirical foundation for our understanding of markets that can then be applied to the study of naturally occurring markets and perhaps to merger policy.

IX. CONCLUSION

The empirical literature in economics provides a variety of approaches to the study of mergers and acquisitions. The direct approaches include: (1) studies that use stock market data to determine the effects of an acquisition event on the merging firms and their rivals with an eye toward ultimately determining the welfare effects of the transaction (such studies may involve individual transactions or combine the analysis of many deals across industries); (2) large, multi-industry studies that review the accounting/finance performance measures of firms before and after the mergers adjusting for industry-wide or economy-wide effects; (3) studies of one or several mergers using a mixture of stock market returns, executive interviews, financial ratios, and pre-merger and post-merger accounting analysis to determine the effects of the mergers (particularly on shareholders); (4) studies of one or several mergers in a particular industry using econometric techniques to identify the changes in market price, output, and product quality that occurred as a result of the merger; and (5) studies of the effects of leveraged buy-outs on labor, investment, and other factors of interest.

Stock market studies consistently show significant gains to target firm shareholders and little or no gain to acquiring firm shareholders around the time that the mergers and acquisitions occur. The net effect on shareholder value appears to be positive, but small; being somewhat larger for hostile mergers financed with cash than for friendly mergers financed with stock.

Event studies using stock market data to focus on the market power aspects of mergers typically show gains to the shareholders of rival firms when mergers are announced, but no significant losses to the same shareholders when these mergers are challenged. In the mid-1980s, many economists interpreted this pattern of returns as evidence of the efficiency of the challenged mergers. More recent research, however, has provided alternative explanations for that pattern of returns, implying that the earlier interpretations may have been premature.

Large scale studies of mergers based on pre-merger and post-merger accounting/finance measures have not provided clear answers to questions about the efficiency and market power effects of mergers and acquisitions. The large scale multi-industry studies tend to show that many mergers

and acquisitions were not successful.[210] It is hard to know what to make of the findings, they may confirm the obvious - that many risky business decisions turn out to be errors after the fact. Unfortunately, these studies cannot tell us whether mergers and acquisitions were efficient on an *ex ante* basis. Indeed, stock market reactions at the time of the conglomerate merger boom (which many observers see as an error in hindsight) imply that the mergers were seen as value enhancing by investors. The large scale studies that attempt to estimate productivity changes following asset transfers also find gains from such activity, but how much of that is due to mergers as opposed to non-merger plant transfers is unclear. The single-industry studies of multiple mergers in hospitals indicate that mergers may be associated with cost reductions, although price enhancing effects are found if concentration is sufficiently high. The large-scale banking industry merger evidence also indicates that there are certain efficiency gains (based on product mix enhancements) associated with mergers, although the small and persistent adverse price effect still appears in the 1990s studies and direct cost reduction effects of mergers are not consistently observed. Review of the brewing industry mergers indicates that merger activity may have facilitated asset reorganization in an efficient manner.

An alternative line of research uses data from both before and after the merger and applies econometric techniques to estimate the effects of particular mergers. The econometric case studies show that mergers and acquisitions matter, but they do not always matter in the same way -- some appear to cause price increases, while others are associated with price reductions. To date, we have seen a number of such studies in airlines, banking, and hospitals indicating that mergers in those industries may have price enhancing effects (although some also were associated with cost reductions). In addition, evidence from the soft drink bottling industry indicates that certain consolidations of competing soft drink brands led to higher prices and reduced output. On the other hand, mergers in relatively highly concentrated cement, and corrugated medium markets were associated with price reductions. When more such studies exist in a wider variety of industries, they may be useful in identifying the set of factors that determine whether a merger is likely to have a beneficial or detrimental effect.

The recent merger literature also indicates that there may be firm-specific effects from mergers on industry pricing. That is, characteristics of the acquiring firm may matter even if the market structure is unaffected by the merger. For example, some research indicated that certain takeovers in

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[210] Based on work by Ravenscraft and Scherer, Kaplan and Wiesbach, Dickerson *et al.*, and Sirower, mergers "fail" 35% to 75% of the time ("success" in these studies is variously defined, but it always entails survival, profitability, retention of the assets, and sometimes requires that the merger outperform returns to alternative investments). In interpreting the large scale evidence on mergers one must consider the nature of mergers. They have much less predictable outcomes than do most other business investment projects. The fact that a sizeable percentage of mergers do not ultimately lead to positive outcomes (and that some appear to have been spectacular disasters) should probably not be too surprising. Whether this failure rate is "too high" depends on your view of the nature of business activity. *See* Ravenscraft & Scherer, MERGERS, SELL-OFFS, AND ECONOMIC EFFICIENCY (1987); Kaplan & Weisbach, *The Success of Acquisitions: Evidence from Divestitures*, 47 JOURNAL OF FINANCE 107 (March 1992); Dickerson, Gibson & Tsakalotos, *The Impact of Acquisitions on Company Performance: Evidence from a Large Panel of UK Firms*, 49 OXFORD ECONOMIC PAPERS 344 (1997); Sirower, THE SYNERGY TRAP: HOW COMPANIES LOSE THE ACQUISITION GAME (1997).

grocery retailing, that did not alter the structure of the local markets, still lead to higher prices.[211] Other work on bank mergers has found effects of the firm buying other banks even where the structure of the banking market did not change. Similar results were found for California hospital mergers. What this evidence might mean is unclear, but it raises one more area of research indicating that market structure alone does not seem to tell the whole story regarding merger effects.

Less direct evidence on the role of mergers and acquisitions comes from the structure-conduct-performance literature. Although the literature does not focus on merger effects, it does provide some information about the effects of market concentration on profits and prices. The profit/concentration studies using line-of-business accounting rates of return to measure performance do not support the standard structure-conduct-performance paradigm. These studies tend to find that increased concentration is not related to higher profitability. Further, this literature implies that if anything drives market performance it is probably large market shares, not market concentration. On the other hand, several studies of differing industries using price to measure performance suggest that increasing concentration may indeed lead to higher prices. This price evidence, while not without its own weaknesses, is probably more reliable than is the profit-based evidence.

Finally, we also briefly discussed evidence from the economics laboratory where economic theories can be put to more exacting tests. While many results are sensitive to the particulars of the experiment, two common results have emerged: (1) four firms seems to be enough to approach a competitive equilibrium in most (but not all) experimental markets, and (2) in markets with a small number of competitors, information among the players does seem to matter with more complete information leading to a higher probability of a collusive (monopoly) outcome.

The data appendix lists various information on merger and acquisition activity. Some of these data reveal general trends in mergers and aggregate concentration. Other data relate more directly to Federal Trade Commission and Department of Justice activity in the merger area (e.g., merger filings under the Hart-Scott-Rodino Act and FTC and DOJ requests for additional information concerning the merger). A few comments regarding the data are contained in the appendix.

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[211] LBO activity by the Haft family in certain grocery markets may have caused competition to become "softer" after the LBO occurred. *See* Chevalier, *Capital Structure and Product-Market Competition: Empirical Evidence from the Supermarket Industry*, AMERICAN ECONOMIC REVIEW 415 (June 1995).

DATA APPENDIX

The data on general merger activity levels are presented in Table 1 and Figures 1 and 2. These data indicate that markets for corporate assets were remarkably active over the last twenty years, with major merger waves occurring in the 1980s and 1990s. Depending on whether you care to measure the number of deals or the value of the assets transferred, you might think the 1980s wave peaked at different times - either in 1987 or 1989. Regardless of the measure you use, however, it is clear that merger activity was historically high from 1985 to 1989. That wave came to an abrupt halt in late 1989, and a new wave began to form in 1992 or 1993. This new 1990s wave took asset transfer activity to levels not seen before.[212] As a percentage of Gross Domestic Product, the dollar value of U.S. merger activity (as measured by MergerStat) hit 15% in the late 1990s.

Tables 2 and 3 indicate the industries where mergers have been most frequent in the past year.[213] Among the leading industries in year 2000 were computer-related hardware and software, financial intermediaries, and communication and broadcasting. In dollar value, merger activity was also significant in the oil & gas industry, although the absolute number of transactions was not large.

The substantial merger and acquisition activity of the last several decades did not, however, lead to a significant increase in the share of assets held by the largest firms. As Tables 4 and 4a indicate, whether measured by assets or value added, manufacturing concentration has risen only mildly or fallen over the past twenty years. Table 4 provides a measure of aggregate concentration in manufacturing assets for the top 100 and 200 firms. Over the entire period for which we have data, 1974 to 1998, the increases were 5.0% and 3.4%, respectively. Table 4a provides a slightly different measure of aggregate concentration based on value added for several firm groupings.[214] For those categories, aggregate concentration declined by 2.9% to 4.8% from 1977 through 1992.

The FTC has collected statistics on merger activity over the past twenty years in connection with its Hart-Scott-Rodino (HSR) merger reporting program. Under the program, firms are required to file their intention to merge if the transaction exceeds various thresholds for size and significance. Since 1978, most transactions over $15 million in value had to file. Recently (February 2001), that

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[212] Merger activity may have been greater in the period around 1900, when industrial consolidation occurred without the current constraints imposed by federal and state governments.

[213] Andrade & Stafford, Investigating the Economic Role of Mergers (mimeo, Harvard Business School, 1999) note that the industries in which mergers occurred over the past twenty five years changed markedly from period to period. Mergers in the 1970s and 1980s were associated with excess capacity in an industry, whereas this relationship reversed in the 1990s when mergers tended to occur more often in industries where demand was growing quickly. Jovanovic & Rousseau, Mergers and Technological Change: 1885-1998 (mimeo, University of Chicago, 2001), focus on technology shifts as the key factor causing merger activity to change across firms and industries.

[214] This Table is an updated version of Table 5 found in Eckard, *The Impact of the 1980's Merger Movement on U.S. Industrial Concentration*, 40 ANTITRUST BULLETIN 397 (Summer 1995). In that article, Eckard argued that aggregate concentration did not rise during the 1980s, nor did concentration in more narrowly defined markets. Using a Brookings data set, he found that concentration by industry, as measured by HHI or CR_p rose relatively little (about 2 or 3 percent) generally and rose little even in those industries that experienced considerable merger activity.

key threshold was raised to $50 million and indexed to inflation. Table 5 lists certain annual data on merger activity and merger enforcement actions and the monthly merger counts collected under this program are depicted in Figure 3.

The monthly data in Figure 3 reveal the previously mentioned waves and obvious local spikes in monthly transactions in November 1986 (494 transactions) and November 1989 (371 transactions. The November 1986 peak can most readily be explained by the passage of the 1986 Tax Act that repealed the "General Utilities" doctrine. This action returned firms to the pre-1935 regime in which shareholders were taxed twice on certain distributions from firms. Many deals may have been "hurried-up" to avoid the larger tax bite that would occur after 1986.[215]

The other obvious local merger peak in November 1989 (and the subsequent decline in transactions for two years after the peak) is harder to explain. The decline may have been occasioned by a change in administrations, by the demise of "junk bond" and bank financing,[216] by alterations in the tax laws that further limited the interest deductibility of mergers, by a general decline in economic activity,[217] or by the end of a cycle driven by technology or cost and demand shocks.

As with the MergerStat data presented in Table 1, the HSR data show a marked growth in merger activity over the period, but not all of the increase is real. Because firms were required to file merger plans based on nominal value thresholds that were not adjusted for inflation, the merger series had an artificial and growing upward bias over time. While this inflation bias cannot account for all of the general upward drift in merger activity, it does account for a nontrivial part of it.[218] This characteristic is not, however, unique to the HSR merger counts - MergerStat also uses a fixed dollar

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[215] For a discussion of the possible effects of the 1986 Tax Act, *see* Wood, *General Utilities Repeal: Injecting New Levies into M&A*, MERGERS AND ACQUISITIONS 44 (January/February 1987); Gleckman & Weiss, How Tax Reform Will Cool Takeover Fever, *Business Week* , September 22, 1986; Moore & Silvia, *The ABCs of the Capital Gains Tax*, 242 CATO POLICY ANALYSIS 19 (October 1995); and Auerbach & Slemrod, *The Economic Effects of the Tax Reform Act of 1986*, 35 JOURNAL OF ECONOMIC LITERATURE (June 1997) at p. 613.

[216] The demise of the junk bond market is recounted in Guillemin, *1989: A Turning Point in the Acquisitions Financing Market*, THE MERGER YEARBOOK (1990). The failure of two well-publicized leveraged buyouts involving Federated Department Stores and United Airlines occurred around this time.

[217] The recession, often associated with the Kuwait/Iraq Persian Gulf War, is dated from July 1990 to March 1991 (*Economic Report of the President*, February 1999, pp. 21, 258). Depending upon any lag in mergers, this recession may have occurred too late to be a plausible rationale for at least the first year of the merger decline. However, Auerbach & Slemrod, *The Economic Effects of the Tax Reform Act of 1986*, JOURNAL OF ECONOMIC LITERATURE (June 1997) at p. 613, speculate that macroeconomic conditions may have been the driving force behind mergers in the late 1980s because merger activity fell so suddenly in 1990 when macroeconomic conditions deteriorated.

[218] For example, a $15 million transaction in 1978 would correspond to a $38.3 million deal in 1999 based on the overall change in the Consumer Price Index. It appears that about 30 to 35 percent of HSR merger filings fell in the $15 million to $38 million range in recent years. Thus, the number of mergers recorded in 2000 is overstated by about 30 to 35 percent compared to the number that would have been recorded if 1978 real dollar thresholds had been used (the dollar value of reported mergers is also overstated but to a lesser extent because the “inappropriately” counted mergers are all relatively small in dollar value.)

threshold ($1 million) for inclusion in its merger counts.

The data in Table 5 also indicate that in the early years of the HSR program (1981-82), the antitrust agencies would receive 1000 to 1500 filings annually and firms did not tend to uniformly request early termination of the HSR waiting period. Beginning in 1983, however, requests for early termination rose markedly and the Agencies began to routinely grant those requests for over three-fourths of reported mergers.

As noted in Table 5 and in Figures 4 and 5, the percentage of mergers that have been subject to intensive scrutiny (i.e., second requests for information) under the HSR reporting system has declined over the past twenty years. In the early years, second requests were issued by the two antitrust agencies in 9 percent of transactions; but this percentage quickly fell to the 3 to 4 percent range in the 1980s and fell further to the 2 to 3 percent range of transactions in recent years. The percentages of deals that were subjected to second requests does not, however, tell much of the story of anti-merger enforcement. The basic standard used for deciding which mergers to review will affect the transactions that firms attempt, and this will, in turn, affect the deals that the Agencies must review. The types of cases that arrived on the Agencies' doorstep differed a good bit across the years. In the early 1980s, the agencies were just beginning to allow certain horizontal mergers involving relatively small market shares (by today's standards) that had been largely verboten for the prior 30 years. But by the 1990s, more substantial horizontal and network-related mergers were forthcoming. The change in the types of mergers seen by the antitrust agencies was likely due to many factors, including changes in technologies, changes in regulation of industries, and a slow evolution of generalized merger review standards.

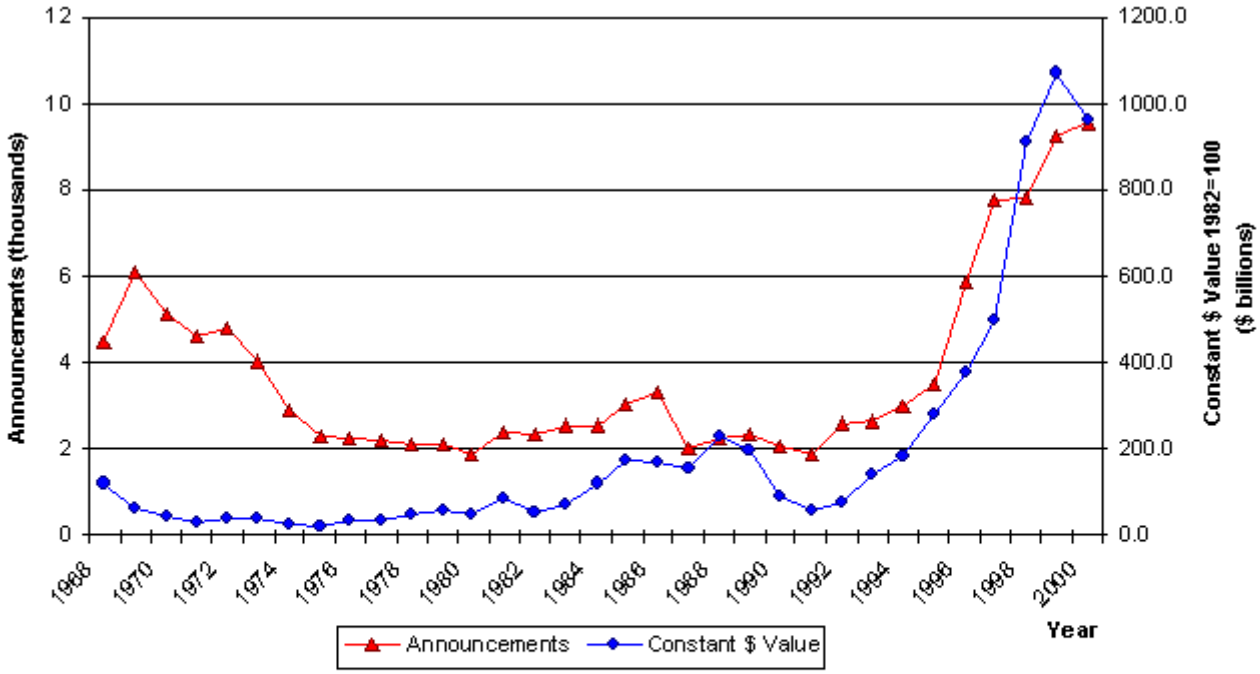
Table 1
Number of Mergers, Divestitures and Disclosed Value (1968-2000)

Year	*Net merger and acquisitions announcements*	*Number of transactions with purchase price disclosed*	*Total Divestitures*	*Divestitures as % of Total*	*Total dollar value paid ($ billions)*	*Constant dollar value * ($ billions)*
1968	4462	1514	557	12.5	43.60	119.1
1969	6107	2300	801	13.1	23.70	62.4
1970	5152	1671	1401	27.2	16.40	41.7
1971	4608	1707	1920	41.7	12.60	31.1
1972	4801	1930	1770	36.9	16.70	40.0
1973	4040	1574	1557	38.5	16.70	36.6
1974	2861	995	1331	46.5	12.50	23.8
1975	2297	848	1236	53.8	11.80	20.3
1976	2276	998	1204	52.9	20.00	32.9
1977	2224	1032	1002	45.1	21.90	33.8
1978	2106	1071	820	38.9	34.20	49.0
1979	2128	1047	752	35.3	43.50	56.1
1980	1889	890	666	35.3	44.30	50.3
1981	2395	1126	830	34.7	82.60	86.0
1982	2346	930	875	37.3	53.80	53.8
1983	2533	1077	932	36.8	73.10	71.9
1984	2543	1084	900	35.4	122.20	117.8
1985	3001	1320	1218	40.6	179.80	171.7
1986	3336	1468	1259	37.7	173.10	167.7
1987	2032	972	807	39.7	163.70	155.3
1988	2258	1149	894	39.6	246.90	228.6
1989	2366	1092	1055	44.6	221.10	194.6
1990	2074	856	940	45.3	108.20	90.8
1991	1877	722	849	45.2	71.20	58.5
1992	2574	950	1026	39.9	96.70	78.5
1993	2663	1081	1134	42.6	176.40	141.5
1994	2997	1348	1134	37.8	226.70	180.6
1995	3510	1735	1199	34.2	356.00	278.3
1996	5848	2658	1702	29.1	495.00	377.0
1997	7800	3013	2108	27.0	657.10	498.6
1998	7809	3091	1987	25.4	1191.90	911.9
1999	9278	3384	2353	25.4	1425.90	1072.1
2000	9566	3757	2501	26.1	1325.70	960.7

*Constant dollar value is the annual dollar value divided by the seasonally adjusted Producer Price Index, by Stage of Processing, Total Finished Goods (1982=100), Table B-65, p. 349, Economic Report of the President, January 2001.

SOURCE: Mergerstat® Review, 2001, pp. 2 and 9. The Mergerstat® Review Research Department tracks publicly announced formal transfers of ownership of at least 10 percent of a company's equity where the purchase price is at least $1,000,000, and where at least one of the parties is a U.S. entity. These transactions are recorded as they are announced, not as they are completed. Open market stock purchases are not recorded. For sellers in the database with competing bids, only the highest offer is included in the calculation. Cancelled transactions are deducted from total announcements in the period in which the cancellation occurred, resulting in net merger-acquisition announcements for that period. The statistics reflect completed or pending transactions as of the end of the applicable period.

Figure 1- Merger and Acquisition Activity (1968-2000)



SOURCE: Mergerstat© Review

Figure 2 - Merger and Acquisition Dollar Value as a Percentage of GDP (1968-2000)

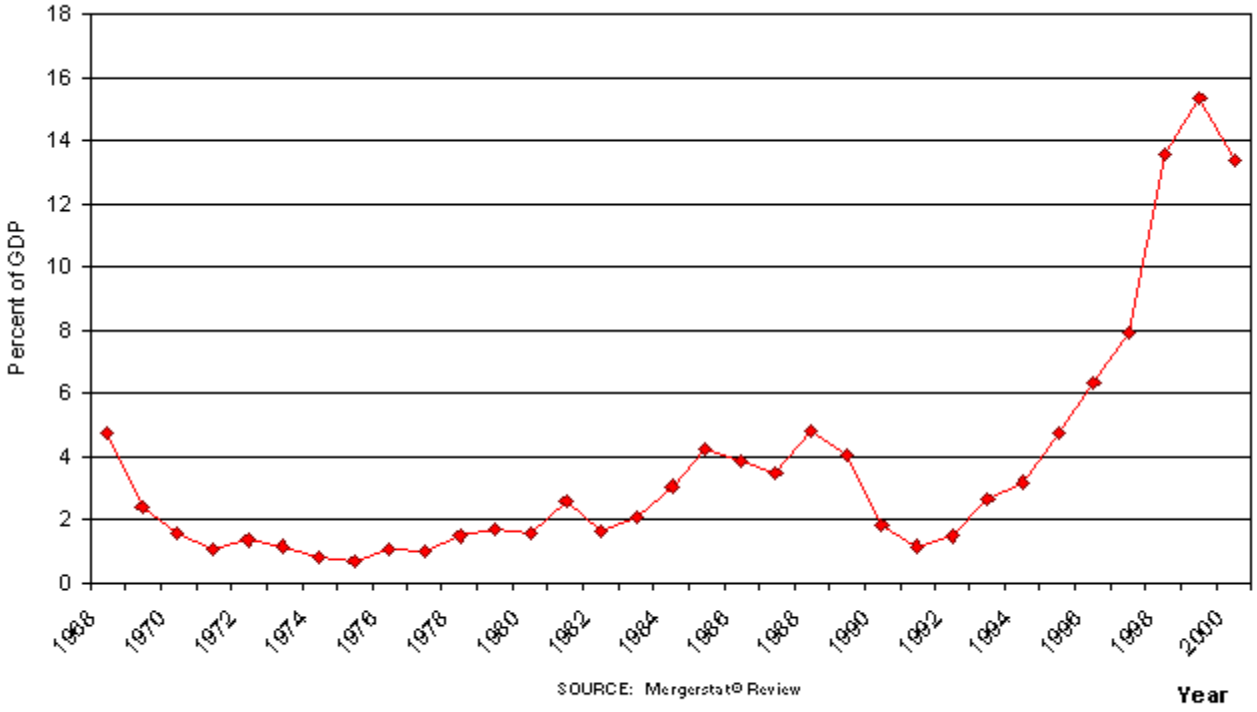


Table 2
Mergerstat Review Full Year Merger Industry Analysis (1999-2000)

	Number of Transaction		Total dollar value paid* (millions of dollars)				Average[3] Premium paid over market*			
Industry Sector	*1999*	*2000*	*1999*	*(base)[1]*	*2000*	*(base)[1]*	*1999*	*(base)[2]*	*2000*	*(base)[2]*
Agricultural production	29	28	16,301.3	(10)	4,843.9	(7)	43.8	(2)	45.1	(2)
Manufacturing[4]	2,444	2,443	405,041.0	(1,039)	491,294.9	(1,148)	43.2	(232)	49.2	(209)
Natural resources	96	113	40,778.1	(60)	68,057.3	(74)	36.9	(17)	34.3	(20)
Transportation	119	90	15,232.2	(51)	8,583.0	(35)	30.8	(11)	64.3	(8)
Communication & broadcasting	652	652	476,584.3	(271)	128,284.9	(305)	44.0	(32)	81.5	(17)
Utilities	218	154	86,385.7	(117)	53,980.7	(96)	36.0	(39)	45.1	(17)
Wholesale & distribution	432	363	12,755.0	(107)	14,771.7	(109)	39.8	(22)	60.8	(16)
Retail	529	404	30,728.8	(148)	11,363.7	(126)	66.7	(21)	58.6	(13)
Financial services	1,089	1,064	140,429.7	(448)	230,141.4	(421)	33.7	(164)	43.2	(139)
Other services	3,555	4,199	200,392.2	(1,115)	308,958.5	(1,424)	53.5	(176)	52.5	(126)
Real estate	115	56	1,265.5	(18)	5,462.9	(12)	20.8	(2)	25.5	(7)
Total	9,278	9,566	1,425,884.	(3,384)	1,325,734.0	(3,757)	43.3	(723)	49.2	(574)

* Based on those transactions supplying data.
[1] Number of transactions which disclosed a purchase price
[2] Number of acquisitions of publicly-traded companies where the premium over market was paid. Premiums can only be calculated on acquisitions of publicly-traded companies.
[3] Weighted average using base as weight, to be consistent with "total" average premium paid over market computed by Mergerstat Review.
[4] Includes petroleum refining.

SOURCE: Mergerstat® Review 2001, pp. 72 and 78, and 2000, p. 72.

Table 3
Merger Activity, Selected Industries (2000)

	Number		*Percent*	
	No.	*Value ($billion)*	*Percent of total number*	*Percent of total value*
Computer Software, Supplies & Services	2531	144.6	26.5	10.9
Leisure Equipment	276	119.0	2.9	9.0
Banking & Finance	309	118.3	3.2	8.9
Electronics	233	99.0	2.4	7.5
Communications	467	85.1	4.9	6.4
Brokerage, Investment & Management Consulting	522	82.1	5.5	6.2
Food Processing	113	80.7	1.2	6.1
Oil & Gas	92	67.2	1.0	5.1
Electric, Gas, Water & Sanitary Services	154	54.0	1.6	4.1
Electrical Equipment	295	53.9	3.1	4.1
Aerospace, Aircraft & Defense	36	50.3	0.4	3.8
Broadcasting	185	43.1	1.9	3.3
Drugs, Medical Supplies & Equipment	227	31.1	2.4	2.3
Insurance	233	29.8	2.4	2.2
Paper & packaging	41	27.5	0.4	2.1
Printing & Publishing	235	25.7	2.5	1.9
Office Equipment	102	21.6	1.1	1.6
Instruments & Photographic Equipment	157	16.9	1.6	1.3
Wholesale & Distribution	363	14.8	3.8	1.1
Total, selected industries	6571	892.7	68.7	67.3
Total	9566	1325.7	100.0	100.0

SOURCE: Mergerstat® Review 2001, p. 72.

Table 4

Aggregate Concentration Trends: Percentage Share of Manufacturing Assets by the Top 100 and 200 Manufacturing Firms for Manufacturing Corporations (1974-1998)

	Asset Size Group	
	Top 100	Top 200
1974	44.4	56.7
1975	45.0	57.5
1976	45.5	58.0
1977	45.9	58.5
1978	45.5	58.3
1979	46.1	59.0
1980	46.8	59.9
1981	46.8	60.0
1982	47.7	60.9
1984	48.9	60.7
1985	49.1	61.0
1986	49.4	61.1
1987	50.0	61.8
1988	49.0	61.1
1989	49.4	61.6
1990	49.8	61.8
1991	49.5	61.6
1992	49.3	61.4
1993	49.1	61.0
1994	48.0	60.1
1995	47.1	59.3
1996	47.1	59.1
1997	47.3	59.0
1998	46.6	58.6

SOURCE: Calculated by Quarterly Financial Report, Bureau of Census, Department of Commerce for Bureau of Economics, Federal Trade Commission. Figures are for the fourth quarter of each year. Values for fourth quarter 1983 will not be calculated due to changes in the QFR administrative procedures.

Table 4A

Aggregate Concentration Trends: Percentage Share of Manufacturing Value Added by the Top 50, 100, 150, and 200 Manufacturing Firms (1977-1992)

	1977	*1982*	*1987*	*1992*
Top 50	24.4	23.9	24.9	23.7
Top 100	33.4	32.8	33.4	32.2
Top 150	39.5	38.7	39.0	37.7
Top 200	43.8	43.2	43.2	41.7

SOURCE: U.S. CENSUS OF MANUFACTURES, CONCENTRATION RATIOS IN MANUFACTURING Subject Series MC87-5-6, at table 2 (1992). 1992 data from MC92-S-2 at http://www.census.gov/epcd/www/concentration.html.

Table 5
Hart-Scott-Rodino Summary of Transactions, Fiscal Year (Oct.-Sept.), 1979-2000

Year	Transactions Reported	Dollar Value ($ billions)	Adjusted transactions in which a second request could have been issued[1]	Investigations in which second requests were issued	FTC[2] second requests	FTC percent[3]	DOJ[2] second requests	DOJ percent[3]	Number of transactions involving a request for early termination[5]	Granted[5]	Denied[5]
1979	861	NA	NA	NA	63	NA	50	NA	123	60	62
1980	784	NA	NA	NA	31	NA	37	NA	100	75	22
1981	996	NA	762	69	34	4.5	35	4.6	164	135	26
1982	1203	74.0	713	65	39	5.5	26	3.6	222	142	63
1983	1093	80.6	903	34	12	1.3	22	2.4	606	495	103
1984	1340	153.6	1119	61	25	2.2	36	3.2	963	781	153
1985	1603	188.6	1301	67	24	1.8	43	3.3	1281	975	288
1986	1949	NA	1660	71	32	1.9	39	2.3	1639	1263	362
1987	2533	577.9	2170	58	18	0.8	40	1.8	2264	1752	512
1988	2746	350.7	2391	68	39	1.6	29	1.2	2440	1885	555
1989	2883	503.5	2535	64	35	1.4	29	1.1	2582	1937	645
1990	2262	302.6	1955	89	55	2.8	34	1.7	1975	1299	676
1991	1529	168.7	1376	64	33	2.4	31	2.3	1321	907	414
1992	1589	165.4	1451	44	26	1.8	18	1.2	1403	1020	383
1993	1846	222.3	1745	71	40	2.3	31	1.8	1689	1201	448
1994	2305	372.0	2128	73	46	2.2	27	1.3	2081	1508	573
1995	2816	508.9	2612	101	58	2.2	43	1.6	2471	1869	602
1996	3087	677.4	2864	99	36	1.3	63	2.2	2861	2044	817
1997	3702	776.6	3438	122	45	1.3	77	2.2	3363	2513	850
1998	4728	1436.1	4575	125	46	1.0	79	1.7	4323	3234	1089
1999	4642	1852.8	4340	111	45	1.0	68	1.6	4110	3103	1007
2000	4926	2990.7	4749	98	43	0.9	55	1.2	4324	3515	809

1 These figures omit from the total number of transactions reported all transactions for which the agencies were not authorized to request additional information. These include (1) incomplete transactions (only one party filed a complaint notification); (2) transactions reported pursuant to the exemption provisions of sections 7A(c)(6) and 7A(c)(8) of the Act; and (3) transactions which were found to be non-reportable. In addition, where a party filed more than one notification in the same year to acquire voting securities of the same corporation, e.g., filing for the 15% threshold and later filing for the 25% threshold, only a single consolidated transaction has been counted because, as a practical matter, the agencies do not issue more than one second request in such a case. These statistics also omit from the total number of transactions reported secondary acquisitions filed pursuant to Section 801.4 of the premerger notification rules. Secondary acquisitions have been deducted in order to be consistent with the statistics presented in most of the prior annual reports.

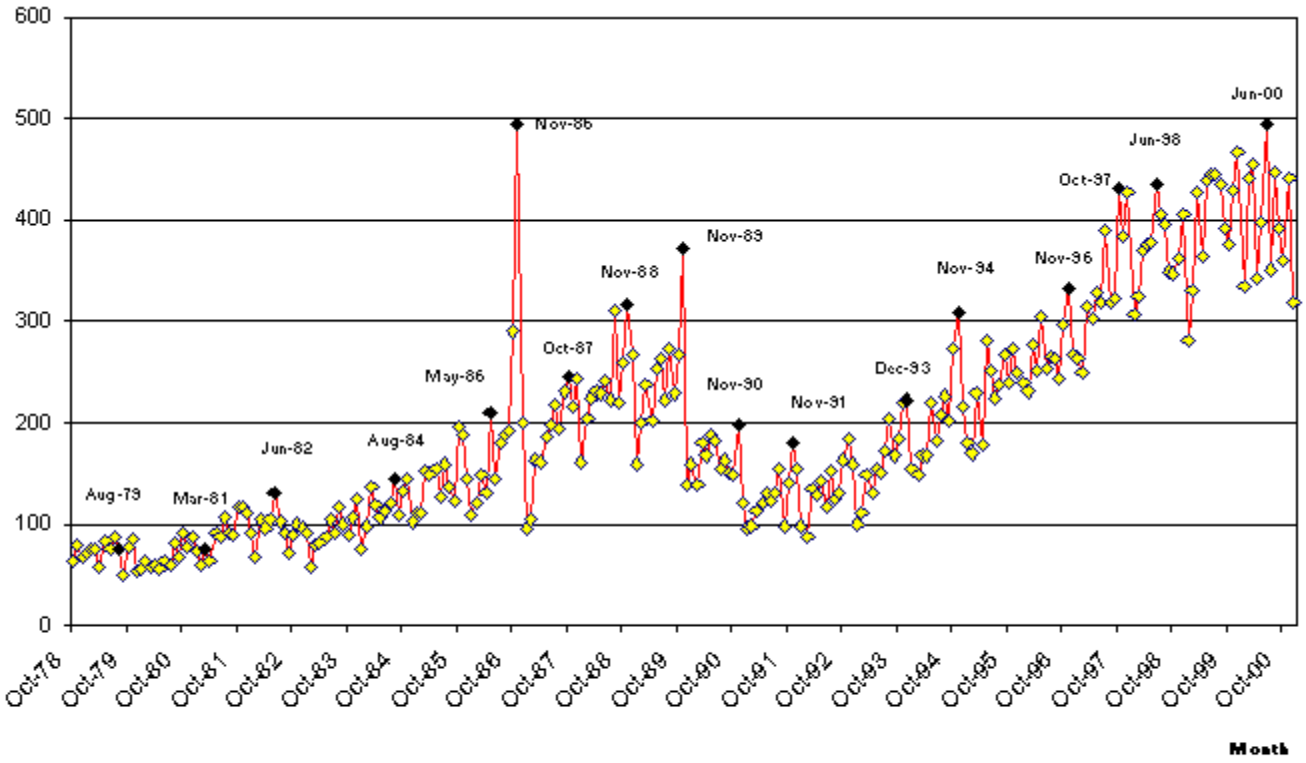
2. These statistics are based on the date the request was issued and not the date the investigation was opened. Second requests may not have been counted in precisely the same manner over time and across agencies, so the time series may not be fully consistent on those dimensions.

3. Second request investigations as a percentage of the total number of adjusted transactions.

4. These statistics are based on the date of the H-S-R filing and not the date action was taken on the request.

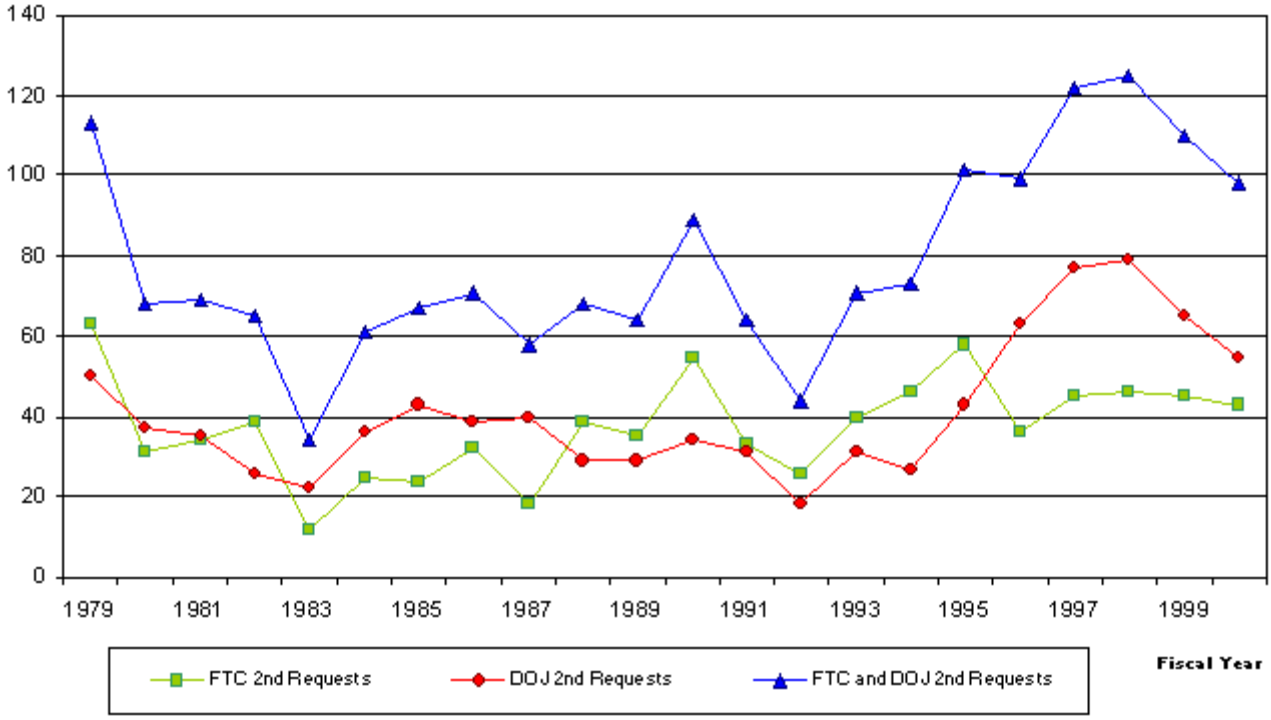
SOURCE: The data were compiled by the FTC's premerger notification office. Most of these data can be found in FTC HSR Annual Report to Congress for Fiscal Year 2000 and 1992 at http://www.ftc.gov/bc/hsr/hsrinfopub.htm

Figure 3 - Number of Mergers Reported to Government by Month (1978-2000)



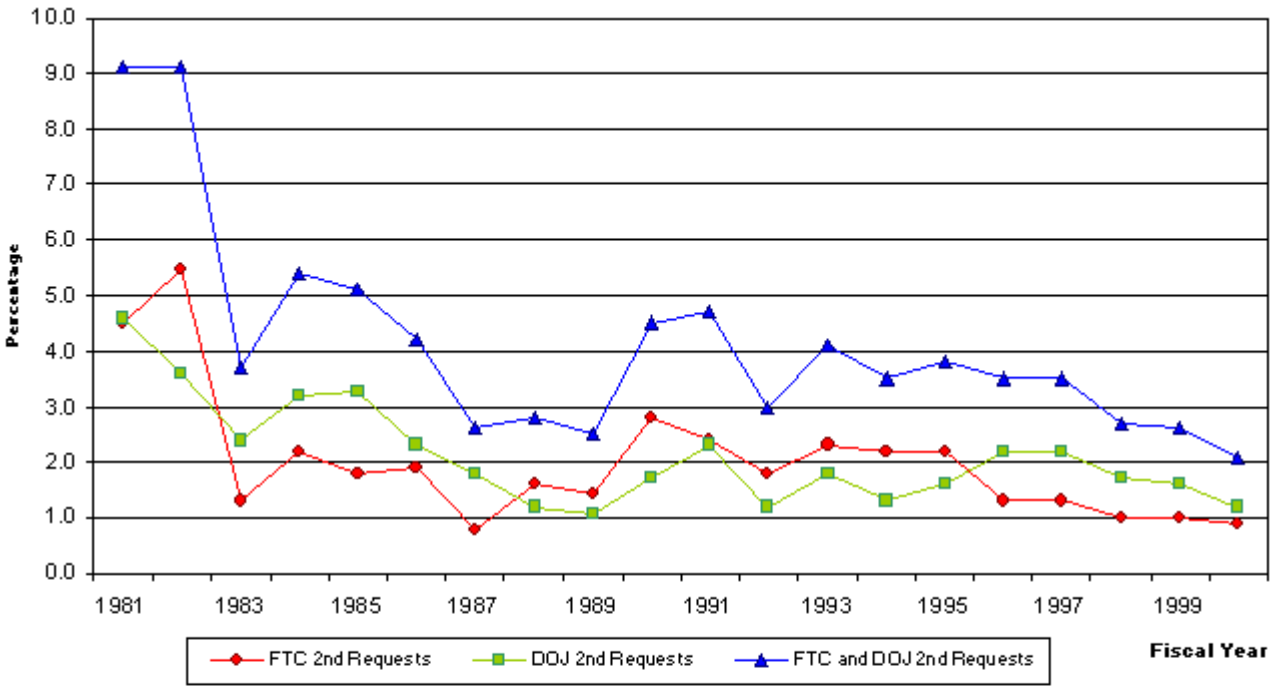
SOURCE: A count fo the number of transactions reported under the Hart-Scott-Rodino reporting requirements. Compiled by the FTC Premerger Notification Office.

Figure 4 - Number of FTC and DOJ Second Request Investigations under Hart-Scott-Rodino (FY 1979-2000)



SOURCE: Federal Trade Commission Premerger Notification Office

Figure 5 - Percentage of Mergers that Receive a Second Request for Information (FY 1981-2000)



SOURCE: FTC Premerger Notification Office

NOTE: The percentage is calculated by dividing the number of second requests for information by the number of transactions for which a 2nd request could have been issued.

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