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## New Evidence and Perspectives on Mergers

Gregor Andrade, Mark Mitchell, and Erik Stafford

**E**mpirical research on mergers and acquisitions has revealed a great deal about their trends and characteristics over the last century. For example, a profusion of event studies has demonstrated that mergers seem to create shareholder value, with most of the gains accruing to the target company. This paper will provide further evidence on these questions, updating our database of facts for the 1990s.

But on the issue of why mergers occur, research success has been more limited. Economic theory has provided many possible reasons for why mergers might occur: efficiency-related reasons that often involve economies of scale or other “synergies”; attempts to create market power, perhaps by forming monopolies or oligopolies; market discipline, as in the case of the removal of incompetent target management; self-serving attempts by acquirer management to “over-expand” and other agency costs; and to take advantage of opportunities for diversification, like by exploiting internal capital markets and managing risk for undiversified managers.

Most of these theories have been found to explain some of the mergers over the last century, and thus are clearly relevant to a comprehensive understanding of what drives acquisitions. In addition, some of these reasons for mergers appear to be more relevant in certain time periods. For example, antitrust laws and active enforcement have made merger for market power difficult to achieve since the 1940s. The heyday of diversification mergers was in the 1960s, and there is evidence to suggest many of those mergers were ultimately failures. Mergers as instruments

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for market discipline do not seem to appear on the radar until the 1980s, but although it is customary to label the 1980s as the era of hostile takeovers, only 14 percent of deals in that decade involved hostile parties.

A recent strand of the literature, exemplified by Mitchell and Mulherin (1996), has tried to address the issue of why mergers occur by building up from the two most consistent empirical features of merger activity over the last century: 1) mergers occur in waves; and 2) within a wave, mergers strongly cluster by industry. These features suggest that mergers might occur as a reaction to unexpected shocks to industry structure. We believe this arena is a potentially fruitful one to explore from both a theoretical and empirical point of view. It also seems to correspond to the intuition of practitioners and analysts that industries tend to restructure and consolidate in concentrated periods of time, that these changes occur suddenly, and that they are hard to predict. However, identifying industry shocks and documenting their effect is challenging.

In this paper, we provide evidence that merger activity in the 1990s, as in previous decades, strongly clusters by industry. Furthermore, we show that one particular kind of industry shock, deregulation, while important in previous periods, becomes a dominant factor in merger and acquisition activity after the late 1980s and accounts for nearly half of the merger activity since then. In fact, we can say without exaggeration or hyperbole that in explaining the causes of mergers and acquisitions, the 1990s were the “decade of deregulation.”

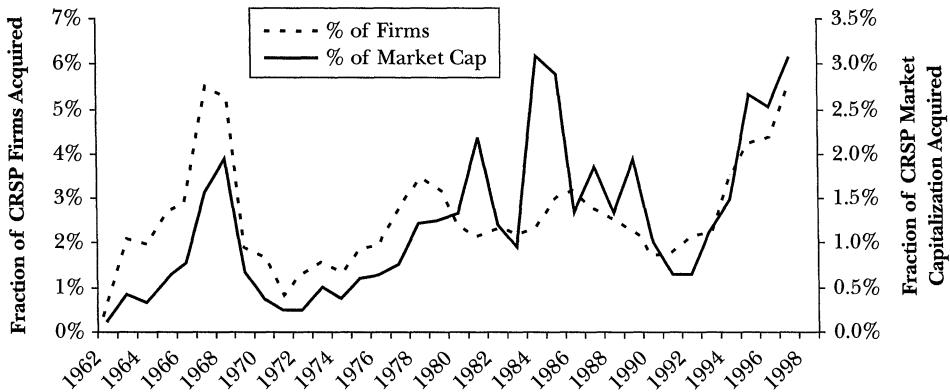
Of course, in the end, knowing that industry shocks can explain a large portion of merger activity does not really help clarify the mechanism involved, which brings us to the issues we know least about: namely, what are the long-term effects of mergers, and what makes some successful and others not. Here, empirical economists, and we include ourselves in this group, have had very little to say. We hope that over the next decade merger research will move beyond the basic issue of measuring and assigning gains and losses to tackle the more fundamental question of how mergers actually create or destroy value.

## **Mergers in the 1990s: What’s New?**

Many of the results discussed here have been reported by other authors, using different samples, and over various time periods. In this paper, we document merger activity using the stock database from the Center for Research in Security Prices (CRSP) at the University of Chicago. This database contains pricing information for all firms listed in the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and Nasdaq. We focus on mergers where both the acquirer and the target are publicly traded U.S.-based firms.

Figure 1 displays two different measures of annual merger activity. The dotted line represents the number of firms acquired during the year expressed as a fraction of the beginning-of-year number of firms in CRSP. The solid line gives a sense for the values involved, obtained by dividing the aggregate dollar value of

Figure 1  
Aggregate Merger Activity



mergers over the year by the total beginning-of-year market capitalization of the firms listed on CRSP.<sup>1</sup> The evidence is entirely consistent with the well-known view that there have been three major waves of takeover activity since the early 1960s. Interestingly, the 1960s wave contained many more deals, relative to the number of publicly available targets, than the 1980s. However in dollar terms, the 1980s were far more important, as large multi-billion dollar deals became common. On a value-weighted basis, the 1980s were truly a period of massive asset reallocation via merger, and as reported by Mitchell and Mulherin (1996), nearly half of all major U.S. corporations received a takeover offer. It is astounding that the merger and acquisition activity in the 1990s seems to be even more dramatic and widespread, with number of deals comparable to the 1960s, and values similar to the 1980s.<sup>2</sup>

For the remainder of the paper, we will focus on the 26 years beginning in 1973, since that is the period during which Nasdaq firms are fully incorporated into CRSP, an event which drastically altered the size and composition of the sample. This results in about 4,300 completed deals. Table 1 reports key descriptive statistics and characteristics for our merger sample, broken down by decade.<sup>3</sup>

The evidence in Table 1 suggests that mergers in the 1980s and 1990s are different in many ways. The first key distinction is the overwhelming use of stock as a method of payment during the latter decade. About 70 percent of all deals in the 1990s involved stock compensation, with 58 percent entirely stock financed. These numbers are approximately 50 percent more than in the 1980s.

Perhaps related to the predominance of stock financing, note the virtual

<sup>1</sup> Both measures are expressed as percentages of total CRSP firms, to control for the overall growth in the number of firms listed over the sample period.

<sup>2</sup> Our data only goes to 1998. However, the wave has continued, and in fact, 1999 is reported to be the largest year ever for U.S. mergers, on a total dollar value basis.

<sup>3</sup> See Schwert (2000) for similar descriptive statistics and characteristics for mergers during 1975-1996 involving exchange-listed (NYSE and AMEX) targets.

*Table 1*  
**Characteristics and Descriptive Statistics by Decade, 1973–1998**

	1973–1979	1980–1989	1990–1998	1973–1998
<i>N</i>	789	1,427	2,040	4,256
All Cash	38.3%	45.3%	27.4%	35.4%
All Stock	37.0%	32.9%	57.8%	45.6%
Any Stock	45.1%	45.6%	70.9%	57.6%
Hostile Bid at Any Point	8.4%	14.3%	4.0%	8.3%
Hostile Bid Successful	4.1%	7.1%	2.6%	4.4%
Bidders/Deal	1.1	1.2	1.0	1.1
Bids/Deal	1.6	1.6	1.2	1.4
Own Industry	29.9%	40.1%	47.8%	42.1%
Premium (Median)	47.2%	37.7%	34.5%	37.9%
Acquirer Leverage > Target Leverage	68.3%	61.6%	61.8%	62.9%
Acquirer <i>Q</i> > Target <i>Q</i>	68.4%	61.3%	68.3%	66.0%
Relative Size (Median)	10.0%	13.3%	11.2%	11.7%
Fraction of Acquirer Announcement Returns < -5%	14.9%	17.0%	19.4%	17.5%
Fraction of Acquirer Announcement Returns > 5%	9.6%	11.3%	10.7%	11.1%

disappearance of hostility in the takeover market. We define a bid as hostile if the target company publicly rejects it, or if the acquirer describes it as unsolicited and unfriendly. Only 4 percent of transactions in the 1990s involved a hostile bid at any point, compared to 14 percent in the 1980s, and a hostile bidder acquired less than 3 percent of targets.<sup>4</sup> Consistent with this more “friendly” atmosphere, the average transaction in the 1990s involved only one bidder, and 1.2 rounds of bidding, far less than during the 1980s.

The evidence for the 1980s by itself is interesting, because it suggests that the hostility of takeover activity during that time was less severe than generally believed. Mitchell and Mulherin (1996) report that 23 percent of the firms in their sample receive a hostile bid at some point during the 1980s; however, their sample only includes firms listed in the Value Line Investment Survey, which are generally larger, better-known companies. During the same period, only 14 percent of the firms in our sample receive a hostile offer. Since we include all publicly traded firms, the contrast in these two results suggests that hostile activity was practically nonexistent among the smaller, lesser-known companies.

Finally, the 1990s continue a trend, begun in the 1970s, of an ever-increasing percentage of mergers where both parties are in the same industry (defined at the

<sup>4</sup> Schwert (2000) questions the bifurcation of mergers into friendly and hostile categories. He performs numerous analyses to show that hostile deals, as described in the press, are no different from friendly deals in economic terms, that is, based on accounting and stock performance data.

*Table 2*  
**Top Five Industries Based on Average Annual Merger Activity**

<i>1970s</i>	<i>1980s</i>	<i>1990s</i>
Metal Mining	Oil & Gas	Metal Mining
Real Estate	Textile	Media & Telecom.
Oil & Gas	Misc. Manufacturing	Banking
Apparel	Non-Depository Credit	Real Estate
Machinery	Food	Hotels

2-digit SIC code level), now nearly half. The picture of mergers in the 1990s that emerges is one where merging parties, often in closely related industries, negotiate a friendly stock swap.

Of the recent empirical findings highlighted in the literature, one of the most interesting is the presence of industry clustering in merger activity. Mitchell and Mulherin (1996) document industry clustering by target firms for the 1980s and Andrade and Stafford (1999) document industry clustering by acquiring firms during the 1970-1994 period.<sup>5</sup> Although merger and acquisition activity, as discussed above, occurs in readily identifiable waves over time, these waves are not alike. In fact, the identity of the industries that make up each merger boom varies tremendously. A simple way to see that is to compare the level of merger activity in each industry over time. If we rank industries in each decade by the market values of all acquired firms, and then correlate these ranking across decades, we find that the correlations are negligible—that is, industries that exhibit high levels of merger activity in one decade, are no more likely to do so in other decades. As Table 2 illustrates, there is no overlap between the top five industries, ranked by merger values, of the 1980s and 1990s.

If mergers come in waves, but each wave is different in terms of industry composition, then a significant portion of merger activity might be due to industry-level shocks. Industries react to these shocks by restructuring, often via merger. These shocks are unexpected, which explains why industry-level takeover activity is concentrated in time, and is different over time, which accounts for the variation in industry composition for each wave. Examples of shocks include: technological innovations, which can create excess capacity and the need for industry consolidation; supply shocks, such as oil prices; and deregulation.<sup>6</sup>

<sup>5</sup> There is also evidence of clustering in earlier periods. See Nelson (1959) for evidence on the first half of the twentieth century, and Gort (1969) for the 1950s.

<sup>6</sup> Another potential explanation for why mergers occur in waves and cluster by industry might be that mergers are examples of “information cascades” (Bikhchandani et al., 1992). The basic idea is that an action, in this case a merger, informs agents in similar circumstances about the profitability of similar actions, in this case other mergers. Hence, once there is a first merger in an industry, the likelihood of other similar mergers occurring goes up, which would explain clustering. However, the theory says nothing about what precipitates that first “triggering” merger in an industry. As discussed later, there is strong evidence, both in this paper and others, that merger activity is related to specific industry shocks,

The view that merger activity is the result of industry-level shocks is not new. Among others, Gort (1969), Jensen (1986), Morck, Shleifer and Vishny (1988), and Jensen (1993) all hypothesize as much. However, recently there has been evidence successfully tying mergers to specific shocks. Mitchell and Mulherin (1996) show that deregulation, oil price shocks, foreign competition, and financial innovations can explain a significant portion of takeover activity in the 1980s. In the introduction to *Mergers and Productivity*, a collection of in-depth case studies of mergers, editor Steven Kaplan (2000) concludes, “a general pattern emerges from these studies. It is striking that most of the mergers and acquisitions were associated with technological or regulatory shocks.”

Of the shocks listed above, deregulation is an ideal candidate for analysis. First, it creates new investment opportunities for the industry. Second, it potentially removes long-standing barriers to merging and consolidating, which might have kept the industry artificially dispersed. Finally, it is fairly well-defined in time and in terms of parties affected, so empirically we know where and when to look.

We classify the following industries as having undergone substantial deregulation since 1973: airlines (1978), broadcasting (1984 and 1996), entertainment (1984), natural gas (1978), trucking (1980), banks and thrifts (1994), utilities (1992) and telecommunications (1996). We define a ten-year period around each of these events (three years before to six years after) as a “deregulation window.” Figure 2 displays, for each year, the percentage of total merger activity represented by mergers in industries in the deregulation window. During most of the 1980s, this percentage hovers around 10–15 percent. After 1988, however, deregulated industries account for nearly half of all annual deal volume, on average.<sup>7</sup> This is consistent with the evidence in Table 2 that banking and media/telecommunications are two of the most active industries in the 1990s.

It is clear that deregulation was a key driver of merger activity over the last ten years. Whether rightly or wrongly—and the jury is still out on the efficiency benefits and value enhancements brought about in these industries—the fact is that deregulation precipitated widespread consolidation and restructuring of a few industries in the 1990s, frequently accomplished through merger.

In our view, the industry shock explanation for mergers has added substantially to our understanding of mergers, not so much how mergers create value, but rather why and when they occur. The results presented here update and expand the evidence on industry shocks with specific emphasis on deregulatory events.<sup>8</sup> Future empirical research on mergers should attempt to control for industry shocks.

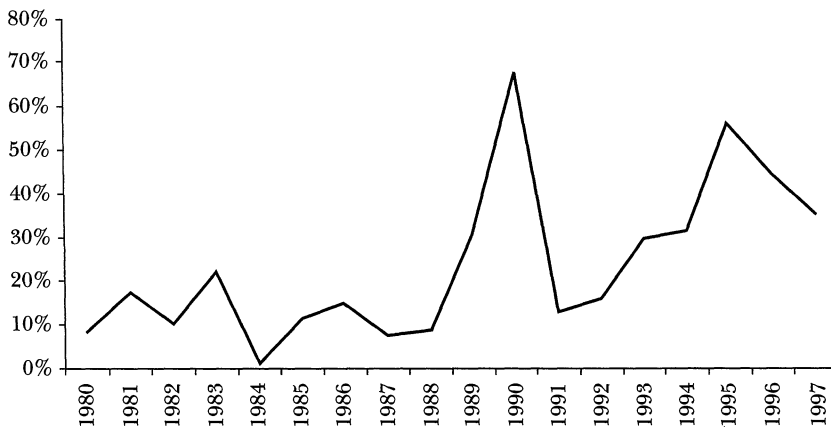
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such as deregulation. We therefore believe that the industry shocks better account for the fundamental forces behind merger activity.

<sup>7</sup> Per our readings of industry analyst reports, deregulation shocks often extend well beyond the direct industries targeted. We did not, however, attempt to measure the indirect impact of deregulation shocks on related industries.

<sup>8</sup> Also, see Mulherin and Boone (2000) for an analysis of industry shocks and mergers in the 1990s.

Figure 2

**Annual Value of Mergers in Deregulated Industries as a Percent of Total Merger Value****Winners and Losers in the Merger Game**

Mergers represent massive reallocations of resources within the economy, both within and across industries. In 1995, the value of mergers and acquisitions equaled 5 percent of GDP and was equivalent to 48 percent of nonresidential gross investment. From the firm's perspective, mergers represent quite extraordinary events, often enabling a firm to double its size in a matter of months. Consequently, measuring value creation (or destruction) resulting from mergers and determining how this incremental value is distributed among merger participants are two of the central objectives in finance and industrial organization merger research.

**Stock Market Reaction to Merger Announcements**

The most statistically reliable evidence on whether mergers create value for shareholders comes from traditional short-window event studies, where the average abnormal stock market reaction at merger announcement is used as a gauge of value creation or destruction. In a capital market that is efficient with respect to public information, stock prices quickly adjust following a merger announcement, incorporating any expected value changes. Moreover, the entire wealth effect of the merger should be incorporated into stock prices by the time uncertainty is resolved, namely, by merger completion. Therefore, two commonly used event windows are the three days immediately surrounding the merger announcement—that is, from one day before to one day after the announcement—and a longer window beginning several days prior to the announcement and ending at the close of the merger.

Table 3 displays announcement period abnormal returns for both acquirers and targets, as well as for the acquirer and target combined. The average announcement period abnormal returns over the three-day event window for the target and

*Table 3*  
**Announcement Period Abnormal Returns by Decade, 1973–1998**

	1973–79	1980–89	1990–98	1973–98
Combined				
[–1, +1]	1.5%	2.6% <sup>a</sup>	1.4% <sup>a</sup>	1.8% <sup>a</sup>
[–20, Close]	0.1%	3.2%	1.6%	1.9%
Target				
[–1, +1]	16.0% <sup>a</sup>	16.0% <sup>a</sup>	15.9% <sup>a</sup>	16.0% <sup>a</sup>
[–20, Close]	24.8% <sup>a</sup>	23.9% <sup>a</sup>	23.3% <sup>a</sup>	23.8% <sup>a</sup>
Acquirer				
[–1, +1]	–0.3%	–0.4%	–1.0%	–0.7%
[–20, Close]	–4.5%	–3.1%	–3.9%	–3.8%
No. Obs.	598	1,226	1,864	3,688

*Note:* Statistical significance at the 5 percent level is denoted by <sup>a</sup>.

acquirer combined are fairly similar across decades, ranging from 1.4 percent to 2.6 percent, and averaging 1.8 percent overall for 3,688 completed mergers. In addition, the combined average abnormal returns over this event window are reliably positive, suggesting that mergers do create shareholder value on average. When the event window is expanded to begin 20 days prior to the merger announcement and end on the merger closing date, the combined average announcement period abnormal return is essentially identical at 1.9 percent. However, statistical precision is considerably reduced as the event window is lengthened to an average of 142 days, and this estimate cannot be reliably distinguished from zero.

Target firm shareholders are clearly winners in merger transactions. The average three-day abnormal return for target firms is 16 percent, which rises to 24 percent over the longer event window. Both of these estimates are statistically significant at the 1 percent level. In 1998, the median equity market value for target firms was \$230 million, such that a 16 percent announcement period abnormal return corresponds to \$37 million for target firm shareholders over a three-day period. Another benchmark to gauge the magnitude of this return is the average annual return for all publicly traded firms, which is around 12 percent. In other words, over a three-day period, target firm shareholders realize a return equivalent to what a shareholder would normally expect to receive over a 16-month period.

The average announcement period abnormal return estimate for target firms is remarkably stable across decades. This is interesting in the light of the evidence on clustering of merger activity. Each decade is associated with merger activity concentrated in different industries, but the target firms consistently have abnormal returns of 16 percent in the announcement period. Together, these two observations suggest that merger premia are fairly similar across different types of merger transactions.

The evidence on value creation for acquiring firm shareholders is not so clear cut. The average three-day abnormal return for acquirers is –0.7 percent, and

over the longer event window, the average acquiring firm abnormal return is  $-3.8$  percent, neither of which is statistically significant at conventional levels. Although the estimates are negative, they are not reliably so. Thus, it is difficult to claim that acquiring firm shareholders are losers in merger transactions, but they clearly are not big winners like the target firm shareholders.

The results in Table 3 are consistent with results presented in earlier summary papers by Jensen and Ruback (1983) and Jarrell, Brickley and Netter (1988). Mergers seem to create value for shareholders overall, but the announcement-period gains from mergers accrue entirely to the target firm shareholders. In fact, acquiring firm shareholders appear to come dangerously close to actually subsidizing these transactions. However, the picture is not quite complete. The full sample results hide an important distinction based on the financing of these transactions. In particular, mergers financed with stock, at least partially, have different value effects from mergers that are financed without any stock.

From the acquiring firm's perspective, stock-financed mergers can be viewed as two simultaneous transactions: a merger and an equity issue. On average, equity issues are associated with reliably negative abnormal returns of around  $-2$  to  $-3$  percent during the few days surrounding the announcement. Many models have been developed to explain this finding, mostly focusing on information differences between managers and outside investors (Myers and Majluf, 1984). The basic idea is that managers are more likely to issue equity when they perceive that it is overvalued by the stock market than when undervalued. Consequently, investors observing an equity issue bid down the stock price. Therefore, it is important to separate the stock-financed mergers from the others before making final judgement on the value effects for shareholders, especially for the acquiring firms.

Table 4 displays average announcement period abnormal returns for subsamples split on the basis of whether any stock was used to finance the merger transaction. Interestingly, the negative announcement period stock market reaction for acquiring firms is limited to those that finance the merger with stock. Acquiring firms that use at least some stock to finance their acquisition have reliably negative three-day average abnormal returns of  $-1.5$  percent, while acquirers that abstain from equity financing have average abnormal returns of  $0.4$  percent which are indistinguishable from zero. These findings are consistent with the notion that the announcement period reaction for the acquirer to a stock-financed merger represents a combination of a merger announcement and an equity issue announcement.

Target firm shareholders also do better when there is no equity financing. The three-day average abnormal return for target firms is  $13$  percent for stock-financed mergers and just over  $20$  percent for mergers financed without stock. Interestingly, this is not merely a manifestation of larger deals having smaller premia and a greater tendency to be stock-financed. After controlling for deal size, this difference remains ( $11.3$  percent for large stock deals and  $17.8$  percent for large non-stock deals). Financing also has a significant impact on inferences about overall value creation from mergers. The combined average abnormal returns for

*Table 4*  
**Announcement Period Abnormal Returns for Sub-Samples, 1973–1998**

	<i>Stock</i>	<i>No Stock</i>	<i>Large Targets</i>
Combined			
[−1, +1]	0.6%	3.6% <sup>a</sup>	3.0% <sup>a</sup>
[−20, Close]	−0.6%	5.3%	6.3%
Target			
[−1, +1]	13.0% <sup>a</sup>	20.1% <sup>a</sup>	13.5% <sup>a</sup>
[−20, Close]	20.8% <sup>a</sup>	27.8% <sup>a</sup>	21.6% <sup>a</sup>
Acquirer			
[−1, +1]	−1.5% <sup>a</sup>	0.4%	−1.5%
[−20, Close]	−6.3%	−0.2%	−3.2%
No. Obs.	2,194	1,494	511

*Note:* Statistical significance at the 5 percent level is denoted by <sup>a</sup>.

stock-financed mergers are zero, suggesting that this subset of mergers do not increase overall shareholder value. On the other hand, the combined three-day abnormal returns for mergers financed without any stock are reliably positive at 3.6 percent.

Based on the announcement-period stock market response, we conclude that mergers create value on behalf of the shareholders of the combined firms.

### **Long-Term Abnormal Returns**

For many years, the traditional wisdom was that the announcement-period stock price reaction fully impounds the information effects of mergers. However, several recent long-term event studies measuring negative abnormal returns over the three to five years following merger completion cast doubt on the interpretation of traditional short-window event study findings. According to these studies, investors systematically fail to assess quickly the full impact of corporate announcements, with the implication that inferences based on announcement-period event windows are flawed, particularly those attempting to document the wealth effect of the event. In fact, some authors find that the long-term negative drift in acquiring firm stock prices overwhelms the positive combined stock price reaction at announcement, making the net wealth effect negative.

The most dramatic long-term abnormal performance comes from certain subsamples of acquiring firms. For example, Loughran and Vijh (1997) separately calculate long-term abnormal returns for acquiring firms using stock financing and those paying with cash over the period 1970-1989. They find that acquiring firms using stock financing have abnormal returns of −24.2 percent over the five-year period after the merger, whereas the abnormal return is 18.5 percent for cash mergers.

Another grouping that produces a large difference in long-term abnormal

returns is based on the book-to-market equity ratio. Firms classified on the basis of high book-to-market are commonly referred to as “value” firms, and tend to have higher returns on average. Firms identified as low book-to-market are referred to as “growth” or “glamour” firms, and have relatively low returns on average. Interpretations of these findings vary. For example, Fama and French (1992, 1993) argue that the relatively high returns of value firms are due to increased risk, perhaps related to distress. On the other hand, Lakonishok, Shleifer and Vishny (1994) argue that the differential returns of value and growth stocks are not related to risk, but instead arise because investors mistakenly estimate future performance by extrapolating from past performance. Using the value/growth distinction, Rau and Vermaelen (1998) calculate three-year abnormal returns of  $-17.3$  percent for glamour acquirers and  $7.6$  percent for value acquirers over the period 1980-1991.

There are a number of methodological concerns with long-term event studies (Barber and Lyon, 1997; Kothari and Warner, 1997; Fama, 1998; Mitchell and Stafford, 2000; Brav, 2000). These papers question every aspect of the long-term event studies, from the calculation of the point estimates to the assumptions required to assess statistical significance. The basic concern stems from all tests of long-term abnormal performance being joint tests of stock market efficiency and a model of market equilibrium (Fama, 1970). This problem is not a major one for short-window event studies where three-day expected returns are virtually zero regardless of what model of expected returns is used. Announcement period returns of 1 to 3 percent over three days are easy to reject as normal returns when the expected return is on the order of 0.05 percent. However, the model of expected returns becomes increasingly important as the holding period is lengthened, becoming crucial for multiyear horizons. Three-year expected returns can easily range from 30 percent to 65 percent, depending on the model used, making it very difficult to determine whether an abnormal return of 15 percent is statistically significant. The bottom line is that if long-term expected returns can only be roughly estimated, then estimates of long-term abnormal returns are necessarily imprecise.

An additional statistical concern with many long-term event studies is that the test statistics assume that abnormal returns are independent across firms. However, major corporate actions like mergers are not random events, and thus event samples are unlikely to consist of independent observations. As noted earlier, mergers cluster through time by industry. This clustering leads to positive cross-correlation of abnormal returns, which in turn means that test statistics that assume independence are severely overstated.

In addition to questioning the statistical reliability of long-term event studies, Mitchell and Stafford (2000) provide estimates of long-term abnormal returns that are robust to the most common statistical problems, including cross-sectional dependence. Table 5 displays three-year post-merger abnormal returns for 2,068 acquiring firms. The abnormal returns are calculated for both equal- and value-weight portfolios of acquiring firms in the three-years following the merger completion. First, the abnormal return estimates shown in Table 5 are considerably

*Table 5*  
**Three-Year Post-Merger Abnormal Returns for  
 Acquiring Firms, 1961 to 1993**

<i>Portfolio Composition</i>	<i>Equal-Weight</i>	<i>Value-Weight</i>
Full Sample	-5.0% <sup>a</sup>	-1.4%
Financed with Stock	-9.0% <sup>a</sup>	-4.3%
Financed without Stock	-1.4%	3.6%
Growth Firms	-6.5%	-7.2%
Value Firms	-2.9%	1.1%

*Source:* Mitchell and Stafford (2000).

*Note:* Statistical significance at the 5 percent level is denoted by <sup>a</sup>.

closer to zero than in most studies that use samples covering shorter time periods, and the dramatic differences in performance based on financing and the value/growth distinction are greatly reduced. Second, significant abnormal returns are only found for the equal-weight portfolios, suggesting that post-merger abnormal stock price performance is limited to the smallest acquirers. In fact, almost all reliable abnormal stock price performance comes from firms in the smallest quintile of firms. Fama and French (1993) report that the firms in the smallest quintile (based on NYSE breakpoints) account for only 2.8 percent of the value of the CRSP value-weight stock market, on average. Although this represents a large number of firms, it is not clear how economically important this portion of the market is for assessing overall stock market efficiency.

The long-run literature on abnormal stock price performance has added to the profession's knowledge of market efficiency and empirical asset pricing. This literature has not focused on long-term performance following mergers, per se, but rather has examined all types of corporate events ranging from initial public offering to stock splits. Given the serious methodological concerns with the long-run empirical literature as outlined above, we are reluctant to accept the results at face value. With respect to mergers, it is our view that the long-run abnormal performance results do not change our priors that result from the announcement-period analyses, namely, that mergers create value for the stockholders of the combined firms.

### **Pre- and Post-merger Profitability**

Operating performance studies attempt to identify the sources of gains from mergers and to determine whether the expected gains at announcement are ever actually realized. If mergers truly create value for shareholders, the gains should eventually show up in the firms' cash flows. These studies generally focus on accounting measures of profitability, such as return on assets and operating margins. Ravenscraft and Scherer (1989) and Healy, Palepu and Ruback (1992) are two operating performance studies that have been particularly influential in reinforcing

ing perceptions about the gains to acquiring firms. These two papers reach different conclusions about gains from mergers. However, each study has data limitations which raise concerns about the generality of the findings.

Ravenscraft and Scherer (1989) examine target firm profitability over the period 1975 to 1977 using Line of Business data collected by the Federal Trade Commission. The FTC collected data for 471 firms from 1950 to 1976 by the business segments in which the firms operated. Ravenscraft and Scherer find that the target lines of business suffer a loss in profitability following the merger. They conclude that mergers destroy value on average, which directly contradicts the conclusion drawn from the announcement-period stock market reaction.

Healy, Palepu and Ruback (1992) examine post-merger operating performance for the 50 largest mergers between 1979 and 1984. In particular, they analyze the operating performance for the combined firm relative to the industry median. They find that merged firms experience improvements in asset productivity, leading to higher operating cash flows relative to their industry peers. Interestingly, their results show that the operating cash flows of merged firms actually drop from their pre-merger level on average, but that the non-merging firms in the same industry drop considerably more. Thus, the post-merger operating performance improves *relative* to the industry benchmark.

The recent evidence on industry clustering of merger activity is important for interpreting the findings of operating performance studies. First, selecting an appropriate expected performance benchmark in the absence of a merger is crucial. Simply using the same firm's pre-merger performance will be unsatisfying if the merger transaction comes in response to an industry shock that changes the prospects for a meaningful fraction of the firms in the industry. An industry-based benchmark as employed by Healy, Palepu and Ruback (1992) will help absorb this effect. Second, the tendency for merger activity to cluster through time by industry means that a short sample period will contain observations from only a few industries, making it difficult to generalize from these samples. Finally, if there is a common shock that induces merger activity at a particular point in time, there is no reason for it to be limited to just one industry or to affect all firms in an industry. Therefore, controlling for industry may not be sufficient to account for all cross-sectional correlation. A sample spanning a longer time period allows for statistical techniques that are better able to account for cross-sectional dependence.

Table 6 reports results from a time series of annual cross-sections methodology, which is similar in spirit to one employed by Fama and MacBeth (1973). This methodology requires a longer time series, but the test statistics account for cross-sectional dependence in performance measures, and should therefore be immune to the effects of industry clustering of merger activity. The sample includes roughly 2,000 mergers from 1973 to 1998, for which accounting data are available on Compustat.

The first row of Table 6 replicates the main findings of Healy, Palepu and Ruback (1992) that post-merger operating margins (cash flow to sales) are on average improved relative to industry benchmarks. In particular, we report the

*Table 6*  
**Pre- and Post-Merger Abnormal  
 Operating Performance (AOP)**

$t - 1$	$t + 1$	$t + 2$
2.92% <sup>a</sup> [2,012]	3.27% <sup>a</sup> [2,101]	3.15% <sup>a</sup> [1,796]
$AOP(t + 1) = a + b AOP(t - 1)$		
$A$ 1.07% <sup>a</sup>	$b$ 0.804 <sup>a</sup>	$R^2$ 0.551 <sup>a</sup>

*Note:* Statistical significance at the 5 percent level is denoted by <sup>a</sup>.

average abnormal operating performance, where we measure abnormal operating performance as the difference between the combined firm's operating margin and the corresponding industry median operating margin.<sup>9</sup> The results suggest that the combined target and acquirer operating performance is strong relative to their industry peers prior to the merger, and improves slightly subsequent to the merger transaction.

The second row of Table 6 reports results from a regression analysis in which we regress the post-merger abnormal operating performance measure on the pre-merger abnormal operating performance measure.<sup>10</sup> The intercept measures the average post-merger abnormal operating performance after controlling for the persistence of this measure through time. On average, there is an improvement in operating margins following the merger, on the order of 1 percent, which is statistically significant at the 1 percent level.<sup>11</sup> The improvement in post-merger cash flow performance is consistent with the positive announcement-period stock market returns to the combined target and acquirer firms.

## Where We Stand

Earlier review papers of the evidence on mergers by Jensen and Ruback (1983) and in this journal by Jarrell, Brickley and Netter (1988) survey the pre-1980

<sup>9</sup> The pre-merger unit of observation is the sales-weighted average of the acquirer and target abnormal operating performance measures. Following the merger, the unit of observation is simply the acquirer.

<sup>10</sup> This analysis also uses the Fama and MacBeth (1973) time-series of cross-sections methodology.

<sup>11</sup> The 1 percent increase in operating performance may be a lower bound on the gains to merger. Following Mitchell and Mulherin (1996) and Andrade and Stafford (1999), we have shown that industry shocks are a primary source of takeover activity. To the extent that the benchmark firms are also undertaking value-enhancing mergers or otherwise restructuring internally in response to industry shocks, the measured change in operating performance will be biased down.

and 1980s empirical literature, respectively, and conclude that mergers create value for the stockholders of the combined firms, with the majority of the gains accruing to the stockholders of the target. Both studies base their conclusion on the announcement-period stock price reaction to mergers. Our analysis of the immediate stock market response to more than 4,000 mergers completed during the 1973-1998 concurs with these prior reviews.

At the time of the Jensen and Ruback (1983) paper, the empirical literature largely consisted of computing the average returns to merger announcements. By the mid- to late 1980s, merger research as summarized by Jarrell, Brickley and Netter (1988) also studied the redistribution aspects of mergers. Specifically, were the gains to shareholders simply reflective of wealth transfers from bondholders, employees, or communities? Jarrell, Brickley and Netter argue that there is virtually no empirical evidence that gains to shareholders are due to losses from other stakeholders. They therefore conclude that the gains to shareholders must be real economic gains via the efficient rearrangement of resources. We are inclined to defend the traditional view that mergers improve efficiency and that the gains to shareholders at merger announcement accurately reflect improved expectations of future cash flow performance. But the conclusion must be defended from several recent challenges.

A first challenge is the research findings of a negative drift in acquiring firm stock prices following merger transactions, which would imply that the gains from mergers are overstated or nonexistent. As noted in our earlier discussion, we are very skeptical of these studies, which have been shown to be fraught with methodological problems. The fundamental problem is that to measure long-term abnormal returns reliably, one must first be able to measure long-term expected returns precisely—and no one has provided a convincing way to do this. Furthermore, the evidence on long-term returns conflicts with the results, reported here, that mergers improve the long-term cash flow performance of the merging parties, relative to their industry peers.

A second challenge is that the underlying sources of the gains from mergers have not been identified. Here, the large sample nature of most studies, which tend to combine transactions with different motivations, and the inherent noisiness of the accounting data, have made it nearly impossible for traditional research methods to address the issue. The positive effect of the merger is recognized by the stock market, but it is difficult for economic researchers to identify the sources of the gains with their much coarser information sets. In an attempt to overcome these limitations and to understand better the sources of value creation and destruction arising from mergers, there have recently been several studies that try to improve on the evidence arising from accounting-based data by examining more detailed information.

One set of studies have analyzed total factor efficiency and other productivity changes following mergers, using plant-level input and output data from the Longitudinal Research Database at the Bureau of the Census. The general conclusion is that ownership changes are positively related to productivity improvements

at the plant-level, but the relationship is not present in firm-level data. For example, McGuckin and Nguyen (1995) find that recently acquired plants experience productivity improvements, while the acquirer's existing plants suffer productivity losses, making the net change for the acquiring firm essentially zero. Schoar (2000) confirms this result.

Along these same lines, in 1996, the NBER commissioned a group of academic researchers headed by Steven Kaplan to conduct in-depth case studies of a small number of mergers. The studies were published in *Mergers and Productivity* (Kaplan, 2000). The purpose of the clinical research was to fill in the gaps left out by the prior large-sample stock returns and accounting performance studies. The studies revealed a richness in the economic data surrounding mergers that cannot be captured by large-sample studies. At the same time, these studies did not generate substantial insights into exactly how mergers create value, and thus do not satisfactorily fill the research gap as intended. This area of investigation is wide open, spanning the fields of corporate finance, industrial organization, organizations, and strategy.

A third challenge to the claim that mergers create value stems from the finding that all of the gains from mergers seem to accrue to the target firm shareholders. We would like to believe that in an efficient economy, there would be a direct link between causes and effects, that mergers would happen for the right reasons, and that their effects would be, on average, as expected by the parties during negotiations. However, the fact that mergers do not seem to benefit acquirers provides reason to worry about this analysis.

Part of the issue here may be that an acquiring firm can seek a merger for a mix of reasons. Many firms mention mergers as their main strategic tool for growth and success, and point to possible economies of scale, synergies, and greater efficiency in managing assets. Alternatively, there is the somewhat contradictory evidence that mergers can be evidence of empire-building behavior by managers. If mergers could be sorted by true underlying motivations, it may be that those which are undertaken for good reasons do benefit acquirers, but in the average statistics, these are cancelled out by mergers undertaken for less benign reasons.<sup>12</sup>

Furthermore, the mere presence of competing bidders (or the potential for them to appear) could allow targets to extract full value from the eventual winner. Of course this cannot fully explain why acquirers rarely gain, since many contests, particularly in the 1990s, only feature one bidder. Also, if the term synergy is to have any meaning in a merger context, then it should imply that there is a common gain from *uniquely* joining the target and bidder, a benefit that cannot be appropriated by competing acquirers. In that case, it is still puzzling that in the data, targets appear to keep all synergistic benefits of the pairing to themselves.

The hardest task here is to make an argument for what the abnormal returns

<sup>12</sup> For example, Mitchell and Lehn (1990) provide empirical evidence that there are both good and bad mergers from the viewpoint of the stockholders of the acquirer, where the bad acquirers are eventually punished in the takeover market itself.

for acquiring firms should be. An abnormal return reflects the unexpected future economic rents arising from the transaction. In other words, an abnormal return of zero reflects a fair rate of return on the merger investment from the acquirer's point of view. Empirical studies of other investment decisions, such as research and development, capital expenditures, joint ventures, and product introductions, typically report very small (less than 1 percent) abnormal returns at the announcement of the investment decisions.<sup>13</sup> In the light of such evidence, the announcement period abnormal returns of 0.4 percent for non-stock acquirers look pretty much the same as those for other types of investments. Ultimately, what the evidence shows is that it is hard for firms to consistently make investment decisions that earn large economic rents, which perhaps should not be too surprising in a competitive economy with a fairly efficient capital market.

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## References

- Andrade, Gregor and Erik Stafford.** 1999. "Investigating the Economic Role of Mergers," Harvard Business School working paper.
- Barber, Brad M. and John D. Lyon.** 1997. "Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics." *Journal of Financial Economics*. 43, pp. 341-72.
- Bikchandani, Sushil, David Hirshleifer and Ivo Welch.** 1992. "A Theory of Fads, Fashion, Custom, and Cultural Change in Informational Cascades." *Journal of Political Economy*. 100, pp. 992-1026.
- Brav, Alon.** 2000. "Inference in Long-Horizon Event Studies: A Parametric Bootstrap Approach with Application to Initial Public Offerings." *Journal of Finance*. 55, pp. 1979-2016.
- Chan, Su, John Martin and John Kensinger.** 1990. "Corporate Research and Development Expenditures and Share Value." *Journal of Financial Economics*. 26, pp. 255-76.
- Fama, Eugene F.** 1970. "Efficient Capital Markets: A Review of Theory and Empirical Work." *Journal of Finance*. 25, pp. 383-417.
- Fama, Eugene F.** 1998. "Market Efficiency, Long-Term Returns, and Behavioral Finance." *Journal of Financial Economics*. 49, pp. 283-306.
- Fama, Eugene F. and Kenneth R. French.** 1992. "The Cross-Section of Expected Stock Returns." *Journal of Finance*. 46, pp. 427-65.
- Fama, Eugene F. and Kenneth R. French.** 1993. "Common Risk Factors in the Returns on Stocks and Bonds." *Journal of Financial Economics*. 33, pp. 3-56.
- Fama, Eugene F. and James MacBeth.** 1973. "Risk, Return, and Equilibrium: Empirical Tests." *Journal of Political Economy*. 71, pp. 607-36.
- Gort, Michael.** 1969. "An Economic Disturbance Theory of Mergers." *Quarterly Journal of Economics*. 83, pp. 624-42.
- Healy, Paul M., Krishna G. Palepu and Richard S. Ruback.** 1992. "Does Corporate Perfor-

<sup>13</sup> See McConnell and Muscarella (1985) for evidence on capital expenditure announcements and Chan, Martin and Kensinger (1990) on R&D investments.

mance Improve after Mergers?" *Journal of Financial Economics*. 31, pp. 135-75.

**Jarrell, Gregg A., James A. Brickley and Jeffrey M. Netter.** 1988. "The Market for Corporate Control: The Empirical Evidence Since 1980." *Journal of Economic Perspectives*. 2, pp. 49-68.

**Jensen, Michael C.** 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economic Review*. 76, pp. 323-29.

**Jensen, Michael C.** 1993. "The Modern Industrial Revolution, Exit, and Control Systems." *Journal of Finance*. 48, pp. 831-80.

**Jensen, Michael C. and Richard S. Ruback.** 1983. "The Market for Corporate Control: The Scientific Evidence." *Journal of Financial Economics*. 11, pp. 5-50.

**Kaplan, Steven N.** 2000. "Introduction," in Steven N. Kaplan, ed. *Mergers and Productivity*. Chicago: University of Chicago Press / NBER.

**Lakonishok, Josef, Andrei Shliefier and Robert Vishny.** 1994. "Contrarian Investment, Extrapolation, and Risk." *Journal of Finance*. 49, pp. 1541-1578.

**Loughran, Tim and Anand M. Vijh.** 1997. "Do Long-Term Shareholders Benefit from Corporate Acquisitions?" *Journal of Finance*. 52, pp. 1765-1790.

**McConnell, John and Chris Muscarella.** 1985. "Corporate Capital Expenditure Decisions and Market Value of the Firm." *Journal of Financial Economics*. 14, pp. 399-422.

**McGuckin, Robert and Sang Nguyen.** 1995. "On Productivity and Plant Ownership Change: New Evidence from the Longitudinal Research Database." *Rand Journal of Economics*. 26, pp. 257-76.

**Mitchell, Mark L. and Kenneth Lehn.** 1990. "Do Bad Bidders Become Good Targets?" *Journal of Political Economy*. 98, pp. 372-98.

**Mitchell, Mark L. and J. Harold Mulherin.** 1996. "The Impact of Industry Shocks on Takeover and Restructuring Activity." *Journal of Financial Economics*. 41, pp. 193-229.

**Mitchell, Mark L. and Erik Stafford.** 2000. "Managerial Decisions and Long Term Stock Price Performance." *Journal of Business*. 73, pp. 287-329.

**Morck, Randall, Andrei Shleifer and Robert W. Vishny.** 1988. "Characteristics of Hostile and Friendly Takeovers," in Alan J. Auerbach, ed. *Corporate Takeovers: Causes and Consequences*. Chicago: University of Chicago Press / NBER.

**Mulherin, J. Harold and Audra L. Boone.** 2000. "Comparing Acquisitions and Divestitures." *Journal of Corporate Finance*. 6, pp. 117-39.

**Nelson, R.** 1959. *Merger Movements in American Industry, 1895-1956*. Princeton: Princeton University Press / NBER.

**Rau, P. Raghavendra and Theo Vermaelen.** 1998. "Glamour, Value, and the Post-Acquisition Performance of Acquiring Firms." *Journal of Financial Economics*. 49, pp. 223-53.

**Ravenscraft, David J. and F. M. Scherer.** 1989. "The Profitability of Mergers." *Journal of Industrial Economics*. 7, pp. 101-16.

**Schwert, G. William.** 2000. "Hostility in Takeovers: In the Eyes of the Beholder?" *Journal of Finance*. 55, pp. 2599-2640.

**Schoar, Antoinette.** 2000. "Effects of Corporate Diversification on Productivity." MIT Sloan School Working Paper.