The Post-Merger Performance of Acquiring Firms: A Re-examination of an Anomaly

ANUP AGRAWAL, JEFFREY F. JAFFE, AND GERSHON N. MANDELKER

ABSTRACT

The existing literature on the post-merger performance of acquiring firms is divided. We re-examine this issue, using a nearly exhaustive sample of mergers between NYSE acquirers and NYSE/AMEX targets. We find that stockholders of acquiring firms suffer a statistically significant loss of about 10% over the five-year post-merger period, a result robust to various specifications. Our evidence suggests that neither the firm size effect nor beta estimation problems are the cause of the negative post-merger returns. We examine whether this result is caused by a slow adjustment of the market to the merger event. Our results do not seem consistent with this hypothesis.

MERGERS ARE ONE OF the most researched areas in finance, yet some basic issues still remain unresolved. While most empirical research on mergers focuses on daily stock returns surrounding announcement dates, a few studies also look, in passing, at the long-run performance of acquiring firms after mergers. Some conclude that these firms experience significantly negative abnormal returns over one to three years after the merger (for example, Langetieg (1978), Asquith (1983), and Magenheim and Mueller (1988)). These findings led Jensen and Ruback (1983, p. 20) to remark: "These post-outcome negative abnormal returns are unsettling because they are inconsistent with market efficiency and suggest that changes in stock prices during takeovers overestimate the future efficiency gains from mergers." Ruback (1988, p. 262) later writes: "Reluctantly, I think we have to accept this result—significant negative returns over the two years following a merger—as a fact."

However, a conclusion of underperformance is not clearly warranted based on prior research. First, the results are not all one-sided. Langetieg (1978) finds that post-merger abnormal performance is not significantly different

from that of a control firm in the same industry. He appears to place more weight on this finding than on the one mentioned above. Neither Mandelker (1974) nor Malatesta (1983) find significant underperformance after the aquisition. In addition, using Magenheim and Mueller's sample but employing a different methodology, Bradley and Jarrell (1988) do not find significant underperformance in the three years following acquisitions. Recently, using a multifactor benchmark, Franks, Harris, and Titman (1991) also do not find significant underperformance over three years after the acquisition.

Furthermore, recent studies typically examined post-merger returns as part of a larger study focusing on announcement period returns. Hence, they generally do not provide thorough analyses of the long-run performance of acquirers. In particular, one problem with prior studies is that they do not properly adjust for the firm size effect.[1] Evidence in Dimson and Marsh (1986) suggests that an adjustment for firm size is important in studies of long-run performance. This adjustment is likely to be particularly important in a study of mergers since acquirers are usually large firms. In addition, none of the previous studies allows for month-to-month shifts in beta. The resulting bias can be significant when abnormal returns are cumulated over a long period.

A finding of underperformance has three important implications. First, the concept of efficient capital markets is a major paradigm in finance. Systematically poor performance after mergers is, of course, inconsistent with this paradigm. Second, much research on mergers examines returns surrounding announcement dates in order to infer the wealth effects of mergers. This approach implicitly assumes that markets are efficient, since returns following the announcement are ignored. Thus, a finding of market inefficiency for returns following mergers calls into question a large body of research in this area. Third, a finding of underperformance may also buttress certain studies (e.g., Ravenscraft and Scherer (1987) and Herman and Lowenstein (1988)) showing poor accounting performance after takeovers. However, the evidence is not one-sided here (see, e.g., Healy, Palepu, and Ruback (1992)).

The purpose of this paper is to provide a thorough analysis of the post-merger performance of acquiring firms. We present evidence on two issues. First, after adjusting for the firm size effect as well as beta risk, our results indicate that stockholders of acquiring firms experience a statistically significant wealth loss of about 10% over five years after the merger completion date. This finding is based on a nearly exhaustive sample of mergers over 1955 to 1987 between NYSE acquirers and NYSE/AMEX targets. The result is robust to a variety of specifications and does not seem to be caused by changes in beta. Second, we test whether the market is slow to adjust to the merger event. Under this hypothesis, the long-run performance would reflect

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[1] To our knowledge, only Franks, Harris, and Titman (1991) adjust for firm size. However, we later point out that their results are specific to their sample period (1975–1984). In addition, while prior studies find negative performance after mergers but not after tender-offers, Franks, Harris, and Titman mix the two samples.

that part of the net present value of the merger to the acquirer that is not captured by the announcement period return. Our results are not consistent with this hypothesis.

The structure of the paper is as follows. The data are discussed in Section I. Our methodology is described in Section II. The results are presented in Section III and our conclusions appear in Section IV.

I. Data

Our database of mergers and tender offers was obtained by a two-step process.[2] First, a list of all the firms that disappeared from the files of the Center for Research in Security Prices (CRSP) over the interval from January 1955 to December 1987 was prepared. Second, the *Wall Street Journal Index* was consulted to determine which of these firms disappeared due to tender offers or mergers. An event was classified as a tender offer if the acquiring firm purchased at least 60 percent of the target firm's shares by tender offer and later bought the remaining shares through a clean-up merger. The sample consists of 937 mergers and 227 tender offers.[3] This represents nearly the entire population of acquisitions of NYSE and AMEX firms by NYSE firms over the period 1955 to 1987.[4]

Our study focuses on two dates, the date when the *Wall Street Journal* first mentions a bid involving the acquiring firm and the date when the acquired firm is delisted. These dates are referred to as the announcement date and the completion date, respectively.

II. Methodology

Beginning with Fama, Fisher, Jensen, and Roll (1969), event studies in finance measure stock performance after substracting a benchmark return based on beta risk. This adjustment seems to be sufficient in most of the studies, which examine short-run returns over several *days* surrounding an event. However, when investigating long-run returns over several *years*, Dimson and Marsh (1986, especially Fig. 1) present persuasive evidence that measured performance can be significantly affected by the firm size effect.

The size bias in long-term returns is especially important if the sample is clustered in a certain size category. Over 60% of our sample of acquiring firms is clustered in the top 3 deciles of the population of firms on the NYSE,[5]

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[2] The sample was kindly supplied by Robert Harris.

[3] The sample sizes in some of our tables are somewhat lower since data for firm size, beta estimation, etc., are not available for all firms.

[4] The data set does not include acquisitions where the acquirer is on the AMEX. However, this restriction represents a loss in the sample size of less than 6%.

[5] About 30% of the sample falls in the top decile, 15% in decile 9, and 16% in decile 8.

based on the market value of their equity at the end of the year of completion of the merger. Given such a strong clustering, an explicit adjustment for firm size seems to be important.[6]

We employ two alternative methodologies, each of which adjusts for both beta risk and market capitalization. For both methods, we form the following set of size control groups. At the end of each calendar year, all stocks on the NYSE are ranked according to their market capitalization and allocated to 10 decile portfolios.[7] For each month over the following year, the return on each decile portfolio is computed as the equally weighted average return across all securities in the portfolio.[8]

A. Method #1

We first use the methodology of both Dimson and Marsh (1986) and Lakonishok and Vermaelen (1990). These two studies measure a stock's abnormal performance, ϵ_{it}, as:

$$\epsilon_{it} = R_{it} - R_{st} - (\beta_i - \beta_s)(R_{mt} - R_{ft}),^9 \tag{1}$$

where R_{it} = the return on security i over month t.

R_{st} = the equally weighted average return during month t on the control portfolio of all firms in the same size decile as firm i, based on the market value of equity at the end of the previous year.[10]

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[6] Following Rozeff and Zaman (1988), we also considered an adjustment for the price-earnings (p-e) ratio effect. However, our sample is almost uniformly distributed over the 10 p-e deciles of all firms on the NYSE. This implies that the empirical regularity concerning p-e ratios is unlikely to explain the post-acquisition performance. Hence, we do not pursue it further.

[7] If the total number of securities at the end of any year is not divisible by 10, the portfolios of the largest and smallest size securities are allocated extra securities.

[8] As securities drop out from one month to the next, the equally weighted average return is calculated using the remaining securities.

[9] Equation (1) follows from the return-generating process:

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \epsilon_{it}, \tag{A}$$

where α_i is a function only of firm size. This is a plausible process since the extensive literature on the size effect suggests that excess returns from the CAPM are strongly related to firm size.

One way of explaining the size effect is to postulate that small firms are more responsive to some priced size factor than are large firms. This is reflected in the following model:

$$R_{it} - R_{ft} = \beta_{im}(R_{mt} - R_{ft}) + \beta_{is}(R_t^s - R_{ft}) + \epsilon_{it}, \tag{B}$$

where R_t^s is the return on some unspecified size factor. (Alternatively, there could be many size factors in (B).) Assuming that β_{is} is a function only of firm size leads to equation (1) as well. Although equation (B) has not been studied in depth, the work of Chan, Chen, and Hsieh (1985) suggests that betas on a variety of factors are negatively related to firm size. At any rate, equation (B) is a sufficient, but not necessary, condition for equations (A) and (1).

[10] We also perform all subsequent tests by redefining R_{st} as the value-weighted average return during month t on the control portfolio. The results are almost identical.

β_i = the beta of security i. We estimate β_i using monthly data over the period from month $+1$ to month $+60$ after the merger completion.[11,12]

β_s = the beta of the control group. We estimate β_s over months $+1$ to $+60$ relative to the completion month.

R_{mt} = the return on the market index. We report results using the NYSE value-weighted index. Results are similar with the NYSE equally weighted index.

R_{ft} = the risk-free rate in month t, as measured by the yield on a one-month Treasury bill.

The average abnormal return (AAR) over all stocks in month t is:

$$\text{AAR}_t = \frac{1}{N_t} \sum_{i=1}^{N_t} \epsilon_{it},$$

where N_t is the number of securities in the sample with a return in event month t. The cumulative average abnormal return (CAAR) from event month t_1 to t_2 is:

$$\text{CAAR}_{t_1}^{t_2} = \sum_{t=t_1}^{t_2} \text{AAR}_t$$

Test statistics for abnormal returns between t_1 and t_2 follow the crude dependence adjustment method of Brown and Warner (1980, pp. 251–252, especially equations A.5 and A.6). In addition, test statistics using the portfolio approach of Jaffe (1974) and Mandelker (1974) are computed as well. These results are generally quite similar to those using the Brown and Warner technique. To conserve space, only the latter are reported.

B. Method #2

Our second approach combines the Returns Across Time and Securities (RATS) methodology of Ibbotson (1975) with an adjustment for firm size. For each month t relative to the month of completion, we estimate the following cross-sectional regression:

$$R_{it} - R_{st} = \alpha_t + \beta_t (R_{mt} - R_{ft}) + \cap_{it},^{13} \tag{2}$$

[11] We also estimate β_{it} for month t after ignoring the observation in month t. The results are similar.

[12] Our results are presented for the case in which a company must have at least 20 months of post-acquisition data. A hindsight bias could arise here since firms may drop out before registering 20 observations. Therefore, we re-estimate beta using shortened post-merger intervals, so that virtually no firm drops out. In addition, we used pre-merger data for estimating beta as well. Since the results are virtually identical, we do not present them. Furthermore, we also use the Ibbotson RATS procedure which eliminates the possibility of a hindsight bias, since no data requirements are imposed for including a firm in the sample. Again, the results are similar.

[13] When more than one firm makes an acquisition in the same calendar month, the dependent variable becomes an equally weighted portfolio of all firms whose completion dates are in the same calendar month.

where R_{it}, R_{ft}, R_{st}, and R_{mt} are as defined earlier. The constant α_t measures the average abnormal return across all firms in event month t.

The first approach (equation (1)) calculates a different beta for each security, implicitly assuming that each beta is constant over the entire post-completion period. The second approach (equation (2)) calculates a different beta for each month relative to the event, implicitly assuming that this beta is identical for all acquiring firms.

III. Post-Merger Performance of Acquiring Firms

A. Results on Performance for the Entire Sample

We first measured post-merger abnormal performance using formula (1) above. Results for our entire sample using the value-weighted market index are shown in Table I. The CAARs are significantly negative for holding periods of two, three, four, and five years. For the five-year period the CAAR

Table I
Post-Merger Performance of Acquiring Firms After Adjustment for Firm Size and Beta Risk

The abnormal return for firm i in month t is computed as in (1):

$$\epsilon_{it} = R_{it} - R_{st} - (\beta_i - \beta_s)(R_{mt} - R_{ft}),$$

where R_{it} and R_{st} are the stock returns on firm i and its size control portfolio s, respectively, in month t; β_i and β_s are their betas measured over 60 months after the merger; and R_{ft} and R_{mt} are the returns in month t on one-month Treasury bills and the NYSE value-weighted market index, respectively. The sample consists of 765 mergers between NYSE acquirers and NYSE/AMEX targets over 1955–87. The t-statistics for AAR and CAAR, shown in parentheses, are computed according to the crude dependence adjustment method of Brown and Warner (1980, pp. 250–252). The results are similar using the calendar portfolio approach of Jaffe (1974) and Mandelker (1974). The statistical significance of the difference of the percentage of positive residuals from 50% is tested using the z-statistic, shown in parentheses.

Months After Merger Completion	Average Abnormal Return (AAR)	Cumulative Average Abnormal Return (CAAR)	Percent of Positive CARs (%)
1–12	−1.53% (−0.98)	−1.53% (−0.98)	46.56% (−1.90)
13–24	−3.41 (−2.00)[b]	−4.94 (−2.10)[b]	47.67 (−1.26)
25–36	−2.44 (−1.73)	−7.38 (−2.72)[a]	46.39 (−1.91)
37–48	−1.29 (−0.54)	−8.67 (−2.62)[a]	44.98 (−2.61)[a]
49–60	−1.59 (−0.07)	−10.26 (−2.37)[b]	43.97 (−3.03)[a]

[a, b] Statistical significance in 2-tailed tests at the 1% and 5% levels, respectively.

is -10.26% ($t = -2.37$). These results are not driven by merely a few outliers. The percentage of positive abnormal returns over the five-year period is 43.97, which is significantly lower than 50 ($z = -3.03$). The median abnormal return over the five-year time period is -7.50%.

Results (not shown in the table) with the equally weighted market index are similar, with a CAAR over five years of -11.2%. We also find similar results (unreported) when the RATS method of formula (2) is used to calculate the abnormal returns.[14] The CAAR for the five-year period is -10.7% with the value-weighted index and -12.8% with the equally weighted index.

Our results are also robust to (a) changes in the time period used for estimating β (see footnote 12), (b) changes in the time period used for estimating the residual standard error for computing t-statistics, and (c) adjustment for firm size based on equity value of the acquirer at the end of the year of the completion of the acquisition rather than the end of the previous year. In addition, results not reported using up to 10 years of post-merger data indicate that the abnormal returns level off after the fifth year. This finding reduces the possibility that the model is mis-specified.

Since acquiring firms generally outperform the market prior to the merger, the underperformance subsequent to the merger may merely be an artifact of the mean-reversion in long horizon returns on individual stocks observed by DeBondt and Thaler (1985, 1987). However, Ball and Kothari (1989) and Chan (1988) find that mean-reversion all but disappears when β is allowed to vary over time. Since we use the Ibbotson RATS approach (equation (2)), which explicitly adjusts for shifts in beta over time, the work of Ball and Kothari (1989) and Chan (1988) suggests that the negative post-merger performance that we observe is not due to the mean-reversion. A recent paper by Chopra, Lakonishok, and Ritter (1992) disputes the results of Ball and Kothari and those of Chan. We leave the resolution of this dispute to future research.

B. Tender Offers

Prior research finds that acquirers underperform over the long-run after mergers, but not after tender offers. Therefore, this paper focuses on mergers. Nevertheless, for the sake of completeness, we next examine tender offers.

We measure performance using both equations (1) and (2) and using both a value-weighted and an equally-weighted market index. For all four methods, the CAARs (unreported) are small and insignificantly different from zero. Thus, we find no evidence of unusual performance for tender offers. This result is similar to previous findings that announcement period returns are

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[14] As discussed above, the RATS method allows β to change every month. While we find considerable variation in measured β from month to month, the average annual beta (i.e., the average of 12 successive monthly betas) remains a constant (to the first decimal place) 1.2 over the seven-year period from two years before to five years after the merger completion. Given this finding, it is not surprising that the results using this method are similar to those from equation (1).

higher for acquirers in tender offers than in mergers (see Jensen and Ruback (1983), especially Table 3).

Some authors (e.g., Hansen (1987)) have suggested that the form of financing serves as a signal that can explain the difference between tender offers and mergers in announcement period returns. Cash financing, which is typical in tender offers, is likely to occur when the acquirer is undervalued. Conversely, equity financing, which is typical of mergers, is likely to occur when the acquirer is overvalued.

Consistent with this signalling interpretation, we find (but do not report) that the long-run post-acquisition performance is worse for tender offers financed by equity rather than cash. However, only 18 tender offers are equity-financed, so firmer statistical inferences cannot be reached. Similarly, post-acquisition performance is worse for mergers financed by equity rather than cash. While these results are intriguing, a signalling explanation is not fully satisfying. In an efficient market, stock prices should adjust to corporate signals immediately, not slowly over a period of years. We leave a full treatment of this issue to further research.

C. Analysis of Subsamples

The above results indicate that the stocks of acquiring firms perform poorly after mergers. It can be instructive to examine whether this anomaly pervades our entire sample or is confined to certain subsamples. Accordingly, we next subdivide our results by time periods and by conglomerate vs. non-conglomerate acquisitions.

C.1. Subperiods

We first examine whether the underperformance is limited to acquisitions over certain time periods. We subdivide the sample into five subperiods: (1) the fifties, (2) the sixties, (3) the seventies, (4) the eighties,[15] and (5) the 1975–1984 sample period of Franks, Harris, and Titman (1991). The results[16] are shown in Table II. There is a distinct difference betweeen the performance in the decade of the seventies and the other decades. In the fifties, the sixties, and the eighties, the CAARs are significantly negative. During these decades, the average investor lost about 15 to 23% of their investment over the five years after the merger. However, in the seventies, the CAARs are insignificant.

One might have conjectured that underperformance would have occurred only in earlier time periods, since the capital markets as a whole have

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[15] Because we follow acquirers for five years after the merger and use the 1988 CRSP files, we are limited by the number of years we can include in the eighties. The last year of merger for which we can calculate five years of post-acquisition performance is 1983. For mergers that occurred up to 1984, we can calculate four years of post-acquisition performance, etc.

[16] Throughout the rest of the paper, only results from formula (1) are presented, since results from formula (2) are similar.

Table II
Post-Merger Performance of Acquiring Firms Over Different Decades

The abnormal return for firm i in month t is computed as in (1):

$$\epsilon_{it} = R_{it} - R_{st} - (\beta_i - \beta_s)(R_{mt} - R_{ft}),$$

where R_{it} and R_{st} are the stock returns on firm i and its size control portfolio s, respectively, in month t; β_i and β_s are their betas measured over 60 months after the merger; and R_{ft} and R_{mt} are the returns in month t on one-month Treasury bills and the NYSE value-weighted market index, respectively. The sample consists of 765 mergers between NYSE acquirers and NYSE/AMEX targets over 1955–87. The t-statistics for AAR and CAAR, shown in parentheses, are computed according to the crude dependence adjustment method of Brown and Warner (1980, pp. 250–252). The results are similar using the calendar portfolio approach of Jaffe (1974) and Mandelker (1974).

Months After Merger Completion	Mergers Completed During									
	1955–59 (N = 51)		1960–69 (N = 299)		1970–79 (N = 247)		1980–87 (N = 168)		1975–84 (N = 290)	
	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR
1–12	−2.4% (−0.86)	−2.4% (−0.86)	−1.8% (−0.56)	−1.8% (−0.56)	0.0% (−0.42)	0.0% (−0.42)	−2.8% (−0.73)	−2.8% (−0.73)	−0.9% (−0.30)	−0.9% (−0.30)
13–24	−4.0 (−1.06)	−6.4 (−1.36)	−4.1 (−1.14)	−5.9 (−1.21)	0.7 (0.55)	0.7 (0.09)	−7.6 (−3.53)[a]	−10.4 (−3.02)[a]	−3.4 (−1.50)	−4.2 (−1.27)
25–36	−5.0 (−2.09)[b]	−11.4 (−2.32)[b]	−4.4 (−1.79)	−10.3 (−2.02)[b]	0.1 (0.07)	0.8 (0.11)	−2.0 (−1.12)	−12.4 (−3.11)[a]	0.3 (−0.07)	−4.0 (−1.07)
37–48	−7.3 (−2.66)[a]	−18.7 (−3.34)[a]	−2.0 (−1.07)	−12.3 (−2.28)[b]	0.8 (0.91)	1.6 (0.55)	−1.4 (0.36)	−13.8 (−2.51)[b]	1.0 (1.66)	−3.0 (−0.10)
49–60	−4.5 (−0.94)	−23.2 (−3.41)[a]	−2.8 (−1.07)	−15.1 (−2.52)[b]	2.5 (2.03)[b]	4.1 (1.40)	−5.6 (−1.17)	−19.4 (−2.77)[a]	0.2 (1.50)	−2.8 (−0.58)

[a, b] Statistical significance in 2-tailed tests at the 1% and 5% levels, respectively.

probably become more efficient over time. However, since Table II shows that the underperformance in the 1980s is about as severe as the underperformance in the 1950s and 1960s, we cannot conclude that the anomaly has diminished in recent years.

The last two columns of Table II show the post-merger performance over the 1975–1984 time period of the recent paper by Franks, Harris, and Titman (1991). We find no abnormal performance during this time period, a result consistent with that of Franks, Harris, and Titman.[17] A breakdown (not reported) of our 33-year sample period into five-year subperiods (1955 to 1959, 1960 to 1964, etc.) shows that 1975 to 1979 is the only five-year period when the post-merger performance is significantly positive.[18] This period constitutes one half of Franks, Harris, and Titman's sample. Over the remainder of their sample period, 1980 to 1984, the post-merger performance is significantly negative. Thus, the performance over the combined period, 1975 to 1984, is insignificant. We conclude that Franks, Harris, and Titman's results are specific to their sample period.

C.2. Conglomerate vs. Non-Conglomerate Mergers

It is often claimed that conglomerate mergers are less likely to succeed, because managers of acquiring firms are not familiar with the target industry or they waste free cash flow on bad acquisitions (see Jensen (1986)). Since conglomerate mergers were quite frequent in the 1960s, our findings of significant negative returns for this period may merely reflect the performance of conglomerate mergers.

To examine this issue, we subdivide our sample into conglomerate and non-conglomerate mergers. A merger is defined as non-conglomerate if an acquirer and its target are in the same industry, as measured by their four-digit Standardized Industrial Classification (SIC) codes.[19] All other mergers are classified as conglomerate. In Table III we report the CAARs calculated after adjusting for both firm size and beta, as in equation (1). The CAARs for both groups of acquirers show negative performance over the five-year post-merger period. In contrast with popular belief, the underperformance of acquirers is worse in non-conglomerate mergers than in conglomer-

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[17] The closeness between our results and those of Franks, Harris, and Titman (1991) is not surprising since our methodologies are similar; both approaches adjust for size, though Franks, Harris, and Titman do not adjust for beta. Franks, Harris, and Titman adjust for dividend yield and past returns as well, though prior research indicates that these factors have lower explanatory power than do size and beta (see, e.g., Miller and Scholes (1982), Chan (1988), and Ball and Kothari (1989)).

[18] An examination of the 1975 to 1979 subperiod does not provide us with any explanation for its positive performance. For example, the percentage of conglomerate vs. non-conglomerate mergers, the relative size of the acquired vs. the acquiring firm, and the frequency of mergers were not unusual during this period. Furthermore, we did not find any news events (e.g., passage of takeover-related laws) during this period that could explain the unusual performance. Thus, the results of this subperiod may be just random variation.

[19] We repeat this analysis using the three-digit SIC code. The results are similar.

Table III

Post-Merger Performance of Acquiring Firms in Conglomerate and Non-Conglomerate Mergers

The abnormal return for firm i in month t is computed as in (1):

$$\epsilon_{it} = R_{it} - R_{st} - (\beta_i - \beta_s)(R_{mt} - R_{ft}),$$

where R_{it} and R_{st} are the stock returns on firm i and its size control portfolio s, respectively, in month t; β_i and β_s are their betas measured over 60 months after the merger; and R_{ft} and R_{mt} are the returns in month t on one-month Treasury bills and the NYSE value-weighted market index, respectively. The sample consists of 765 mergers between NYSE acquirers and NYSE/AMEX targets over 1955–87. The t-statistics for AAR and CAAR, shown in parentheses, are computed according to the crude dependence adjustment methods of Brown and Warner (1980, pp. 250–252). The results are similar using the calendar portfolio approach of Jaffe (1974) and Mandelker (1974).

Months After Merger Completion	Conglomerates ($N = 686$)		Non-Conglomerates ($N = 79$)	
	AAR	CAAR	AAR	CAAR
1–12	−1.5%	−1.5%	−1.5%	−1.5%
	(−0.92)	(−0.92)	(−0.42)	(−0.42)
13–24	−2.9	−4.4	−8.0	−9.5
	(−1.63)	(−1.80)	(−2.01)[b]	(−1.71)
25–36	−1.9	−6.3	−7.7	−17.2
	(−1.21)	(−2.17)[b]	(−2.91)[a]	(−3.08)[a]
37–48	−1.3	−7.6	−1.2	−18.4
	(−0.52)	(−2.13)[b]	(−0.17)	(−2.75)[a]
49–60	−1.0	−8.6	−7.1	−25.5
	(−0.20)	(−1.82)	(−1.51)	(−3.14)[a]

[a,b] Statistical significance in 2-tailed tests at the 1% and 5% levels, respectively.

ate mergers. The t-statistics are actually higher in magnitude for non-conglomerate mergers, even though they occur with lower frequency than conglomerate mergers in our sample.

In addition, we examine (but do not report in the table) the performance of both conglomerate and non-conglomerate mergers for each of the four decades in our sample. For each of the decades except the seventies, the five-year performance is significantly negative for both types of mergers. In the 1970s, the results are insignificant for both types of mergers. These findings are consistent with those of the overall sample. In each decade, the five-year post-merger performance in the non-conglomerate sample is below that of the conglomerate sample. Consequently, the finding of negative post-merger returns is unlikely to be explained by the inferior performance of conglomerate mergers.

Finally, we consider the possibility that non-conglomerate mergers were concentrated in industries that underperformed over several years after the

merger. There are 79 non-conglomerate mergers in our sample. Of these, 23 mergers from 14 different industries took place in the sixties. Similarly, 24 mergers spanning 19 industries took place in the seventies, and 32 mergers in 18 industries took place in the eighties. Where multiple mergers do take place in a given industry in the same decade, they are often several years apart. Thus, it seems unlikely that concentration in poorly performing industries can explain the poor post-merger performance of acquirers in non-conglomerate mergers.

D. Underperformance and the Speed of Stock Price Adjustment to Merger News

Our finding of significant post-merger underperformance is consistent with two alternative hypotheses. The first hypothesis is that the market adjusts fully to merger news at the time of its announcement, and the subsequent underperformance occurs because of unrelated causes. The second hypothesis is that the market is slow to adjust to the merger announcement. In the latter case, the long-run post-merger performance would reflect that part of the net present value of the merger to the acquirer not captured by the announcement period return. Support for the latter hypothesis would be inconsistent with market efficiency and would also call into question much of the previous research on mergers based on announcement period returns. We investigate these two hypotheses below.

D.1. The Relation Between Announcement Period Returns and Post-Merger Returns

If the market adjusts slowly to information concerning the merger, we might expect the acquirer's announcement period return to be related to its post-merger return. Conversely, if the post-merger performance is unrelated to the impact of the merger, the acquirer's return after the merger completion should be unrelated to the return during the announcement period.

To investigate this issue, we examine the following relation:

$$\text{CAR}_{Ci} = b_0 + b_1 \text{CAR}_{Ai} + e_i,$$

where CAR_{Ci} is the cumulative abnormal return over the post-acquisition period for firm i. The period always begins with the month after the merger completion and, depending on the regression, ends from one to five years after the merger completion. CAR_{Ai} is the cumulative abnormal return for firm i over the announcement period, defined in one of two ways:

(1) The three-month period ending with the announcement month, which we designate as (A-2, A).
(2) The period from two months before the announcement month to the merger completion month, designated as (A-2, C).

Table IV shows the estimates of the coefficients b_0 and b_1 for these two sets of regressions. The estimates of b_1 are negative in most of the regressions and their absolute values generally increase with the length of the post-completion period. Both estimates of b_1 are strongly significant when the post-completion period is the full five years. In addition, the coefficients border on significance in three of the eight regressions covering the first four years. The evidence seems to indicate a negative relation between the market reaction to the announcement and the subsequent performance of the firm. However, when we examine these regressions by subperiods, we find that the coefficient b_1 is negative for the decades of the 1960s, 1970s, and 1980s but is statistically significant only for the 1960s. Thus, we cannot conclude that the negative relationship is pervasive over our entire sample period.

Table IV

Regression of the Performance of Acquiring Firms After Mergers on Their Announcement Period Performance

The table shows the estimated coefficients from the following regression:

$$\text{CAR}_{Ci} = b_0 + b_1 \text{CAR}_{Ai} + \epsilon_i,$$

where CAR_{Ci} and CAR_{Ai} are the cumulative abnormal returns of firm i measured over the post-merger and announcement periods, respectively. A and C denote the periods of announcement and completion, respectively, of the merger. The t-values are in parentheses. The abnormal return for firm i in month t is computed as in (1):

$$\epsilon_{it} = R_{it} - R_{st} - (\beta_i - \beta_s)(R_{mt} - R_{ft}),$$

where R_{it} and R_{st} are the stock returns on firm i and its size control portfolio s, respectively, in month t; β_i and β_s are their betas measured over 60 months after the merger; and R_{ft} and R_{mt} are the returns in month t on one-month Treasury bills and the NYSE value-weighted market index, respectively. The sample consists of mergers between NYSE acquirers and NYSE/AMEX targets over 1955–87.

CAR_{Ci} Measured Over Post-Merger Months	CAR_A Measured Over Months $(A\text{-}2, C)$		CAR_A Measured Over Months $(A\text{-}2, A)$	
	b_0	b_1	b_0	b_1
$(1, 12)$	-0.02 (-1.61)	0.05 (1.18)	-0.02 (-1.65)	0.01 (0.07)
$(1, 24)$	-0.05 $(-3.27)^a$	0.05 (0.76)	-0.04 $(-3.00)^a$	-0.21 (-1.88)
$(1, 36)$	-0.07 $(-4.19)^a$	-0.03 (-0.36)	-0.07 $(-4.06)^a$	-0.16 (-1.17)
$(1, 48)$	-0.09 $(-4.29)^a$	-0.19 (-1.81)	-0.09 $(-4.23)^a$	-0.29 (-1.78)
$(1, 60)$	-0.10 $(-4.18)^a$	-0.32 $(-2.84)^a$	-0.10 $(-4.13)^a$	-0.44 $(-2.43)^b$

[a,b] Statistical significance in 2-tailed tests at the 1% and 5% levels, respectively.

D.2. Relative Size of the Acquisition

The acquisition of a relatively large target is likely to be a more important economic event for the acquirer than is the acquisition of a relatively small target. Thus, if the post-merger underperformance reflects the impact of the merger, underperformance should be greater when the target is relatively large. In Table V we examine the effect of relative size on the post-merger performance of acquirers. We calculate the relative size of the acquisition as S_t/S_a, where S_t and S_a are the market values of equity of the target and acquirer, respectively, measured six months before the first public announcement about an acquisition involving the target firm. We then rank all the mergers by relative size and form quintile portfolios, where portfolio 1 consists of the mergers of the smallest relative size.

Portfolios 4 and 5 exhibit large underperformance, particularly over four to five years after the acquisition. However, the relationship is not monotonic, since large underperformance occurs for portfolio 2 as well. Furthermore, very few of the post-merger time periods in any of the five portfolios exhibit significant returns. Thus, the evidence here does not suggest that the acquirer's post-merger return is a function of the relative size of the acquisition.

This subsection and the previous one examine the hypothesis that the market is slow to adjust to the merger event. Taken together, our results do not support this hypothesis. This subsection finds no relation between post-merger abnormal returns and the acquisition's relative size, a result not consistent with slow adjustment to the merger event. The results of the previous subsection support a slow adjustment only for the decade of the 1960s.

IV. Conclusions

A number of studies report that acquirers exhibit significant underperformance after a merger. However, the issue has by no means been resolved, because of both methodological problems and conflicting results of prior studies. Using a nearly exhaustive sample of mergers over 1955 to 1987 between NYSE acquirers and NYSE/AMEX targets, this paper measures post-acquisition performance after adjusting for the firm size effect as well as beta risk. We use (1) the methodology of both Dimson and Marsh (1986) and Lakonishok and Vermaelen (1990) and (2) the Ibbotson (1975) RATS model with an adjustment for firm size. We find that stockholders of the acquiring firms suffer a statistically significant wealth loss of about 10% over the five years following the merger completion. This finding is robust to a variety of specifications and does not seem to be caused by changes in beta following the merger. Therefore, we conclude that the efficient-market anomaly of negative post-merger performance highlighted in Jensen and Ruback (1983) is not resolved. This conclusion runs contrary to Franks, Harris, and Titman's (1991) results which, as we show, are specific to their sample time period and are also due to their mixing of tender offers with mergers.

Table V
Post-Merger Performance of Acquiring Firms by the Relative Size of Their Acquisitions

The abnormal return for firm i in month t is computed as in (1):

$$\epsilon_{it} = R_{it} - R_{st} - (\beta_i - \beta_s)(R_{mt} - R_{ft}),$$

where R_{it} and R_{st} are the stock returns on firm i and its size control portfolio s, respectively, in month t; β_i and β_s are their betas measured over 60 months after the merger; and R_{ft} and R_{mt} are the returns in month t on one-month Treasury bills and the NYSE value-weighted market index, respectively. The sample consists of mergers between NYSE acquirers and NYSE/AMEX targets over 1955–87. The t-statistics for AAR and CAAR shown in parentheses are computed according to the crude dependence adjustment method of Brown and Warner (1980, pp. 250–252). The results are similar using the calendar portfolio approach of Jaffe (1974) and Mandelker (1974). Relative size of the acquisition is the ratio of the market value of equity of the target firm to that of the acquiring firm, as of six months before the first public announcement of an acquisition bid for the target.

Months After Merger Completion	Relative-Size Quintile Portfolios									
	Quintile 1 (Smallest)		Quintile 2		Quintile 3		Quintile 4		Quintile 5 (Largest)	
	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR
1–12	2.4% (1.51)	2.4% (1.51)	-5.4% (-2.93)a	-5.4% (-2.93)a	-0.9% (-0.30)	-0.9% (-0.30)	-1.7% (-0.23)	-1.7% (-0.23)	-5.9% (-1.38)	-5.9% (-1.38)
13–24	-1.1 (-0.32)	1.3 (0.84)	-3.7 (-1.55)	-9.1 (-3.17)a	-1.7 (-0.49)	-2.6 (-0.56)	-6.5 (-2.48)b	-8.1 (-1.91)	0.6 (0.26)	-5.2 (-0.79)
25–36	-1.5 (-0.23)	-0.2 (0.55)	-0.4 (-0.12)	-9.5 (-2.66)a	-2.3 (-0.95)	-4.9 (-1.00)	-3.5 (-1.95)	-11.7 (-2.69)a	-4.0 (-1.87)	-9.3 (-1.73)
37–48	-1.3 (-0.26)	-1.5 (0.35)	-1.9 (-0.41)	-11.4 (-2.51)b	2.9 (1.74)	-2.0 (0.00)	1.8 (0.42)	-9.9 (-2.12)b	-1.0 (0.22)	-10.3 (-1.38)
49–60	-2.0 (-1.00)	-3.4 (-0.14)	2.3 (1.51)	-9.1 (-1.57)	-0.3 (1.09)	-2.3 (0.49)	-0.1 (0.57)	-10.0 (-1.64)	-6.0 (-1.63)	-16.3 (-1.97)b

a, b Statistical significance in 2-tailed tests at the 1% and 5% levels, respectively.

The anomaly holds for the 1950s, 1960s, and 1980s but does not hold for the 1970s. Since the underperformance in the 1980s is as severe as the underperformance in the 1950s and the 1960s, the market does not appear to become more efficient over time. At this point, we do not know what causes the large negative returns after the merger. One possibility is that the market is slow to adjust to the merger event. If so, the long-run performance reflects that part of the NPV of the merger to the acquirer which is not captured by the announcement period return. However, our results do not seem to be consistent with this hypothesis. The resolution of this anomaly remains a challenge to the profession.

REFERENCES

Asquith, Paul, 1983, Merger bids, uncertainty and stockholder returns, *Journal of Financial Economics* 11, 51–83.

Ball, Ray and S. P. Kothari, 1989, Nonstationary expected returns: Implications for tests of market efficiency and serial correlations in returns, *Journal of Financial Economics* 25, 51–74.

Bradley, Michael and Gregg Jarrell, 1988, Comment, in John Coffee Jr., Louis Lowenstein, and Susan Rose-Ackerman, eds.: *Knights, Raiders and Targets* (Oxford University Press, Oxford, England), 252–259.

Brown, Steve and Jerold B. Warner, 1980, Measuring security price performance, *Journal of Financial Economics* 8, 205–258.

Chan, K. C., 1988, On the contrarian investment strategy, *Journal of Business* 61, 147–163.

———, Nai-Fu Chen, and David Hsieh, 1985, An exploratory investigation of the firm size effect, *Journal of Financial Economics* 14, 451–471.

Chopra, Navin, Joseph Lakonishok, and Jay R. Ritter, 1992, Measuring abnormal performance: Do stocks overreact? *Journal of Financial Economics* 31, 235–268.

DeBondt, Werner F. M. and Richard Thaler, 1985, Does the stock market overreact? *Journal of Finance* 40, 793–805.

———, 1987, Further evidence of investor overreaction and stock market seasonality, *Journal of Finance* 42, 557–581.

Dimson, Elroy and Paul Marsh, 1986, Event study methodologies and the size effect: The case of UK Press recommendations, *Journal of Financial Economics* 17, 113–142.

Fama, Eugene F., Lawrence Fisher, Michael C. Jensen, and Richard Roll, 1969, The adjustment of stock prices to new information, *International Economic Review* 10, 1–21.

Franks, Julian R., Robert S. Harris, and Sheridan Titman, 1991, The post-merger shareprice performance of acquiring firms, *Journal of Financial Economics* 29, 81–96.

Hansen, Robert G., 1987, A theory for the choice of exchange medium in the market for corporate control, *Journal of Business* 60, 75–95.

Healy, Paul M., Krishna G. Palepu, and Richard S. Ruback, 1992, Does corporate performance improve after mergers? *Journal of Financial Economics* 31, 135–175.

Herman, Edward and Louis Lowenstein, 1988, The efficiency effects of hostile takeovers, in John Coffee, Jr., Louis Lowenstein, and Susan Rose-Ackerman, eds.: *Knights, Raiders and Targets* (Oxford University Press, Oxford, England), 211–240.

Ibbotson, Roger G., 1975, Price performance of common stock new issues, *Journal of Financial Economics* 3, 235–272.

Jaffe, Jeffrey F., 1974, Special information and insider trading, *Journal of Business* 47, 410–428.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance and takeovers, *American Economic Review* 76, 323–329.

——— and Richard S. Ruback, 1983, The market for corporate control: The scientific evidence, *Journal of Financial Economics* 11, 5–50.

Lakonishok, Josef and Theo Vermaelen, 1990, Anomalous price behavior around repurchase tender offers, *Journal of Finance* 45, 455–477.

Langetieg, Terence C., 1978, An application of a three-factor performance index to measure stockholder gains from merger, *Journal of Financial Economics* 6, 365–383.

Magenheim, Ellen B. and Dennis C. Mueller, 1988, Are acquiring firm shareholders better off after an acquisition? in John Coffee, Jr., Louis Lowenstein, and Susan Rose-Ackerman, eds.: *Knights, Raiders and Targets* (Oxford University Press, Oxford, England), 171–193.

Mandelker, Gershon, 1974, Risk and return: The case of merging firms, *Journal of Financial Economics* 1, 303–335.

Malatesta, Paul H., 1983, The wealth effect of merger activity and the objective function of merging firms, *Journal of Financial Economics* 11, 155–181.

Miller, Merton H. and Myron Scholes, 1982, Dividends and taxes: Some empirical evidence, *Journal of Political Economy* 90, 1118–1141.

Ravenscraft, D. and F. M. Scherer, 1987, *Mergers, Selloffs and Economic Efficiency* (The Brookings Institution, Washington, DC).

Rozeff, Michael S. and Mir A. Zaman, 1988, Market efficiency and insider trading: New evidence, *Journal of Business* 6, 25–44.

Ruback, Richard J., 1988, Comment, in Alan J. Auerbach, ed.: *Corporate Takeovers: Courses and Consequences* (University of Chicago Press, Chicago).