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Are Acquiring-Firm Shareholders Better Off after an Acquisition?

ELLEN B. MAGENHEIM
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Out of the massive amount of research on acquisitions that has been conducted over the past 20 years, some consensus on major issues has emerged. But perhaps surprisingly, several key issues remain in dispute. On the positive side, early theoretical contributions showed that diversification through mergers was an inefficient method for spreading risks (Levy and Sarnat, 1970; Smith, 1970; Azzi, 1978), and empirical findings have corroborated this result (Smith and Schreiner, 1969; Mason and Goudzwaard, 1976). All observers have found that shareholders of acquired companies enjoy substantial immediate gains from the acquisitions, and no disagreement exists on this point. But the pattern of results with respect to the returns to acquiring-firm shareholders has been varied. One study claims to find positive gains; another records negative returns. Nor do reviewers of this literature reach a consensus (e.g., compare Mueller, 1977, 1980; Scherer, 1980, pp. 138-141; Halpern, 1983; Jensen and Ruback, 1983).

This lack of consensus carries over into the explanations for why acquisitions occur. One group of observers sees acquisitions as a means for improving the allocation of assets by transferring assets to more capable management or achieving other synergistic gains from the transfer of control (Manne, 1965; Mandelker, 1974; Dodd and Ruback, 1977). Adherents to this view claim that the existing evidence indicates that acquiring-firm shareholders

are slightly better off or, at minimum, no worse off as a result of acquisitions (Halpern, 1983; Jensen and Ruback, 1983).

Although this interpretation of the evidence, if valid, would appear to vindicate a liberal antimerger policy (acquired-firm shareholders are better off; acquiring-firm shareholders are not worse off), it still raises fundamental questions about the theory of the firm and the market for corporate control, which feed back onto the broader policy issues. Acquired-firm managers may sometimes be unwilling partners to an acquisition, as in a hostile takeover, but acquiring-firm managers need never be. Why do the latter enter so readily into the market for corporate control, given its well-known large risks and apparently modest returns?

Several observers have answered this question by hypothesizing that managers undertake acquisitions which increase their utility but do not necessarily increase shareholder wealth (Mueller, 1969; Firth, 1980; Amihud and Lev, 1981; Greer, 1984). To the extent that these hypotheses are valid, the possibility must be entertained that acquisitions neither enhance acquiring-firm shareholder wealth nor confer broader social benefits. Thus, the issue of what the gains to acquiring-firm shareholders are is central to both the theory of the firm and public policy regarding acquisitions.

For this reason, the seemingly contradictory results regarding the effects of acqui-

sitions on acquiring-firm shareholders and the lack of consensus among observers of what the results signify are disconcerting. It is the thesis of this paper that disagreement regarding the impact of acquisitions on acquiring-firm shareholders stems in part from the different methodologies individual studies have used. Measures of the impact of an acquisition on acquiring-firm shareholders are quite sensitive to the choice of methodology. In effect, authors have been asking different questions about the performance of acquiring-firm shares and, not surprisingly, have come up with different answers. We shall show that when one attempts to ask the same question in each study, the results turn out to be far more consistent than was heretofore apparent.

To do so, we reexamine the basic methodology used to measure the effects of acquisitions, placing particular emphasis on the pattern of returns to acquiring-firm shareholders before and after the acquisition (the first section). In the second section, we demonstrate the sensitivity of the results to the choice of methodology, i.e., to the particular question asked, using data for 78 mergers and takeovers in the years 1976 to 1981. In the light of the methodological issues raised in the first two sections, we reexamine the results of several published studies in the third section. Conclusions follow.

METHODOLOGICAL ISSUES IN MEASURING THE EFFECTS OF ACQUISITIONS

The basic assumption underlying the use of stock market data to estimate the effects of acquisitions is, of course, that share prices reflect future profit and dividend streams, and that any changes in future profit and dividend streams an acquisition is expected to bring about are reflected in changes in the prices and returns of the company's shares. Granting this assumption, one can test for the *expected* effect of an acquisition on future profit and dividend streams by measuring the change in returns to acquiring-company shareholders

accompanying an acquisition. To measure such a change, two questions must be answered: When is the effect of the acquisition on stockholder returns to be measured? How is the effect of the acquisition separated from other coterminous events that affect stockholder returns?

The first question could be easily resolved if all of the relevant information regarding an acquisition were to become public on the day the acquisition is announced and the market could be assumed to adjust fully in that day to the new information. But news of an acquisition is known to leak into the market prior to the first public announcement, and it is unrealistic to assume that the market is capable of predicting the full future consequences of an acquisition immediately upon learning of it. The latter point is a key part of our critique of the existing literature and requires some elaboration.

Robert Shiller (1981) has shown that swings in stock market prices exceed by factors of five and more those which should have occurred given the actual movements in dividend streams that occur. In a bull market, prices rise by far more than subsequent increases in dividends will warrant; in a bear market, they fall too far. The market has historically continually shifted from being too optimistic in bull markets to being too pessimistic in bear markets. Shiller (1984, 1986) hypothesizes that the behavior of individuals in the stock market is best explained through the psychology of fads and bandwagon movements.

Shiller's findings and his explanation of them are particularly relevant to the literature on mergers and takeovers, since it is well known that acquisition activity has been highly correlated with stock market activity.¹ Mergers and takeovers have occurred most frequently at times when stock market prices are rising and the market in general is known to be overly optimistic about the future performance of companies. Since acquisition and stock market activity seem to respond to the same underlying economic environment and psychological factors (Geroski, 1984), it is reasonable to suppose, or at least prudent to

allow for the possibility, that the stock market might be overly optimistic in its evaluation of acquisitions at the time they are first announced. Shiller's results, combined with the positive correlation of acquisition and stock market activity, suggest the importance of tracing the effects of an acquisition's announcement on a stock's price over a long enough period to ensure that any changes in stock prices are an unbiased reflection of the future effect of the acquisition on profits and dividends.

The second conceptual issue to be resolved is the separation of the effects of the acquisition from other coterminous events, i.e., the prediction of what the return on the firm's shares would have been in the absence of the acquisition, over whatever period is chosen to record this event. The counterfactual can never, of course, be truly predicted. Three approximations have been employed in the literature: (1) to assume the firm's returns postevent would have been the same as its returns preevent in the absence of the acquisition, (2) to select a control group and assume the firm's returns postevent would have been the same as those of the control group firm(s), or (3) a combination of (1) and (2), i.e., to assume that the change in returns of the acquiring firm following the acquisition's announcement would have been the same as the change in returns for the control group firm(s) for the same time period. The difference between this predicted change and the change actually observed is attributed to the acquisition. The third method is obviously the best. If one simply compares a firm's postevent performance to its preevent performance, one ignores all of the other events that may be occurring coterminously with the acquisition and affecting its returns. But if one predicts a firm's returns in the postevent period entirely from the control group (method 2) one ignores any systematic difference between the merging firm(s) and the control group that may exist. This latter point proves to be very important because, as we shall see, there are sizable differences between the performance of acquiring firms and the usually employed control groups over the preevent period.

If all events other than the acquisition that affect a firm's returns have the same effect on the firm's control group, then one should be able to isolate the effect of an acquisition by predicting the *change* in returns for the acquiring firm from the observed change in returns for the control group firms, and calculating the difference between observed and predicted returns as the effect of the acquisition. The most frequently employed control group in acquisition-stockholder returns studies is the market portfolio, the returns on all securities each weighted by its aggregate market value.

More formally, the returns for a given firm i are predicted from the characteristic line

$$E(R_i) = R_f + \beta_i [E(R_m) - R_f] \quad (11.1)$$

where $E(R_i)$ and $E(R_m)$ are the expected returns for firm i and the market portfolio, respectively, R_f is the return on a riskless ($0 = \beta$) asset, and β_i is the covariance of i 's returns with the market portfolio divided by the variance of the market portfolio. Equation (11.1) is one of the central results of the capital asset pricing model (CAPM). It states that the return on any firm i 's shares, R_{it} , varies directly with the return on the portfolio of all shares, R_{mt} , and thus that changes in R_{it} can be predicted from changes in R_{mt} if β_i is unchanged.² The β_i term can be estimated from a time-series regression of R_{it} on R_{mt} or, as is frequently done, from a regression of $(R_{it} - R_{ft})$ on $(R_{mt} - R_{ft})$. By Equation (11.1), the intercept of this equation should equal zero. But if the intercept is not constrained to equal zero, regressions of the following sort typically yield nonzero estimates of $\hat{\alpha}_i$:

$$(R_{it} - R_{ft}) = \hat{\alpha}_i + \hat{\beta}_i (R_{mt} - R_{ft}) + e_{it} \quad (11.2)$$

Now $\hat{\alpha}_i$ is basically the average residual from the characteristic equation (11.1) for firm i implied by the CAPM. As such, it is a measure of the performance of the company over the sample period used to estimate β_i (Jensen, 1969), and has been so used in some acquisition studies (e.g., Wes-

ton, Smith, and Shrieves, 1972). A company with $\hat{\alpha}_i > 0$ has on average earned higher returns than are predicted by the CAPM. If $\hat{\beta}_i$ were not affected by the acquisition, one way to estimate the effects of the acquisition would be to estimate $\hat{\alpha}_i$ from data from before the acquisition and again from data following its announcement. The change in $\hat{\alpha}_i$ between the two periods would then be an estimate of the effect of the acquisition on firm i 's returns assuming all other effects are captured through the movement of $(R_{mt} - R_{ft})$ over the two periods. Alternatively, one can estimate (11.2) by using preevent data, and then use the $\hat{\alpha}_i$ and $\hat{\beta}_i$ estimated from the preevent data to predict R_{it} from the postevent R_{mt} and R_{ft} . The difference between the actual and predicted R_{it} based on the preevent $\hat{\alpha}_i$ and $\hat{\beta}_i$ is a second measure of the effect of the acquisition on shareholder returns.

Both $\hat{\alpha}_i$ and $\hat{\beta}_i$ are likely to vary with the choice of time period used to estimate them. If this variation is random, measures of the effects of acquisitions are not biased by the choice of time period for estimating $\hat{\alpha}_i$ and $\hat{\beta}_i$, although the power of the tests is weakened. But there is considerable evidence, reviewed later, that acquiring firms earn substantial, positive abnormal returns over a period running anywhere from 18 to 66 months prior to the acquisition announcements. Given this evidence, the estimates one obtains of the effects of acquisitions are sensitive to how the preevent data are treated when estimating $\hat{\alpha}_i$ and $\hat{\beta}_i$. Studies differ widely as to how they treat the preevent period when estimating the $\hat{\alpha}_i$ and $\hat{\beta}_i$ used in predicting postevent performance, and this difference will be shown to have a significant influence on one's evaluation of the impact of the acquisition on stockholder returns.

Although substantial excess returns for acquiring firms have been estimated over prolonged preevent periods in several studies, little attention has been paid to these returns. Perhaps the neglect of the returns to acquiring firms prior to acquisitions can be explained by the prevailing view among many of those working in this area that it is deficiencies in the *acquired*

firm's performance that precipitate acquisitions. But if managers undertake acquisitions which worsen the performance of their companies' shares, it is logical to assume that they would choose to announce the acquisitions at times when the performance of their shares is above average. Also, the above-normal return performance of acquiring-firm shares prior to acquisitions may signal above-normal profit flows which can be used to finance the acquisitions. Thus, the above-normal performance of acquiring firms' shares over sustained intervals prior to their making an acquisition may explain why these particular firms' managements have chosen to make an acquisition at these particular points in time. Whether or not this conjecture regarding causality is correct, it seems obvious that one should take into account this preevent performance of the acquiring firms when measuring the change in performance the acquisitions bring about.

We face now three conceptual problems: (1) How does one pinpoint the first arrival of information concerning the acquisition to the market? (2) Over what period should the preevent performance of the firm be measured to determine the change in performance caused by the acquisition? (3) How long a period after this event should one allow to measure the full effect of the acquisition on the acquiring firm's returns?

Somewhat surprisingly, the first question is the easiest to answer. While acquisition announcements do not seem to have had a large, systematic impact on acquiring-firm share prices, they have a predictable and large positive impact on acquired-firm share prices owing to the substantial premiums offered. An individual with nonpublic information of an acquisition will make a more certain and substantial gain by purchasing the shares of the to-be-acquired firm. Thus, the date of the first impact of the acquisition on firm share prices can be determined by examining the share price performance of the acquired firm. The month (day) in which its returns begin the sustained rise that culminates in the acquisition can be taken to be the point in time at which knowledge of the acquisition reaches the market. Most studies

seem to indicate that information of an acquisition reaches the market in the month of the announcement or the month before. No study which we have seen presents evidence suggesting that information of the acquisition reaches the market more than four months prior to its announcement. Thus, we should expect to see the effects of acquisitions on acquiring-firm share prices commencing over a short time interval prior to the announcement month.

The question of what preevent period should be used against which to measure postevent performance is obviously somewhat arbitrary. It seems to us more reasonable to judge the effect of an acquisition against the period immediately preceding the market's learning of the acquisition than against a period some distance removed, since the acquiring firm's performance over the three preceding years is more relevant than over the interval four to six years before the acquisition, if one wishes to measure the *change* in performance caused by the acquisition.

If Equation (11.2) estimated on preevent data is used to predict post-acquisition performance, then an improvement in performance upon the market's obtaining information of an acquisition should appear as an upward movement in the residuals one obtains when preevent estimates of $\hat{\alpha}_i$ and $\hat{\beta}_i$ are used to predict postevent performance. Should one observe a systematic rise (fall) in the cumulative residuals from (11.1) commencing around the time of the acquisition, one might reasonably attribute this movement to the acquisition. As long as the cumulative residuals continue the rise (fall), which commenced with the acquisition, one can assume that the market is continuing to reevaluate the expected effects of the acquisition on the acquiring firm's performance. When the rise (fall) stops, the adjustment process is complete.

On the other hand, the market may reevaluate a firm's prospects as a consequence of an acquisition at almost any point in time following its announcement at which new information is received (e.g., a manager leaves; a contract is lost). If all subsequent movements in share prices not caused by the acquisition are assumed to

be random, then a prudent strategy for ensuring that all possible effects on share prices caused by the acquisition are captured is to measure the acquiring firm's postevent performance over as long a period as possible. Here again, as we shall show, one's interpretation of the effects of an acquisition is in some cases sensitive to just how long an interval one allows the market to complete its evaluation after the acquisition.

ESTIMATES OF THE EFFECTS OF ACQUISITIONS ON THE PERFORMANCE OF A SAMPLE OF ACQUIRING FIRMS

In this section, we examine the implications of the methodological issues just discussed for a specific sample of acquiring firms. A description of the sample is presented, and the techniques for measuring returns are discussed. Particular emphasis is placed on the sensitivity of the conclusions to the choice of a time period for measuring the market model, and the length of time over which postevent returns are measured.

Description of the Sample

The sample of 78 acquiring firms is composed of companies completing takeovers valued at \$15 million or more. Of the 78 acquiring firms, 51 entered into mergers and 26 into tender offers.³ All of the firms are listed on the New York or American Stock Exchanges. To ensure data availability, only firms listed on Price-Dividend-Earnings (PDE) tapes are included. The sample period begins in 1976. To ensure three full years of postevent data, we specify 1981 as the end of the sample period. Announcement and completion dates and the mode of acquisition in each case were checked in the *Wall Street Journal*.

These acquisitions span a more recent time period than do samples previously analyzed. We describe here some characteristics of this sample. The distribution of initial bid announcements is reported in Table 11.1. These bids were made within an active market for acquisitions.⁴ The

Table 11.1 Distribution of Initial Announcement of Acquisition Bid by Year

Year	Number of Acquisition Bids
1976	9
1977	9
1978	21
1979	18
1980	7
1981	14

level of acquisition activity intensified in the mid 1970s following a fairly placid period; the end of the sample period coincides with a leveling off in the number of transactions recorded (W. T. Grimm, 1984). This wave of activity coincides with a periodically depressed stock market which makes it an anomaly among acquisition waves.

On average, 16 weeks elapsed between the bid announcement and completion of the transition; the median level is 13 weeks. The length of the interval ranges from 1 week or less in three cases to more than 80 weeks in two cases. The average ratio of the preevent equity value of acquiring to acquired firm is 3.77. The average percentage premium over stock value paid by sample firms is 81%, and the average value of the premium paid to acquired-firm shareholders is \$191.58 million.

Methodology for Measuring Abnormal Returns

To measure the effect of acquisitions on stock price returns, we follow the Fama, Fisher, Jensen, and Roll (1969) event study technique. This technique relies on the use of the market portfolio as a control group to capture the effect of marketwide fluctuations in stock prices. Any remaining unexplained abnormal performance can be attributed to the effect of a specific event—in this case, an acquisition bid announcement.

We estimated the following market model using ordinary least-squares regression.⁵

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} \quad (11.3)$$

where

R_{it} = return on stock i at time t

R_{mt} = return on the market portfolio at time t

e_{it} = homoscedastic, normally distributed, serially uncorrelated, zero-mean-error term with variance $\hat{\sigma}^2(\hat{e}_{it})$

The coefficient on R_{mt} , β_i , measures the sensitivity of the i th firm's return to fluctuations in the market index. The intercept measures the risk-free return plus the average abnormal performance of the firm over the sample period used to estimate (11.3). The error e_{it} measures that part of R_{it} which is due to neither movements in the return on the market portfolio nor to the firm's average abnormal return.

Each R_{it} is calculated from monthly data taken from the PDE tapes, with stock prices adjusted for splits and dividends. The New York Stock Exchange equally weighted index is used as a proxy for the market portfolio. Monthly residuals for each firm i are calculated as $\hat{e}_{it} = R_{it} - \hat{R}_{it}$. From these monthly residuals for each firm, average abnormal returns are calculated for each time t :

$$AR_t = \sum_{i=1}^I \frac{\hat{e}_{it}}{I}$$

where I is the total number of firms and $t = 0$ is the event date, i.e., the month of the initial announcement. This yields, for each time period, a measure of the average divergence between actual and forecast returns, adjusted for each firm's normal level of performance and for marketwide fluctuations. Cumulated average abnormal returns are then calculated as

$$CAR_{xy} = \sum_{t=x}^y AR_t$$

where x and y are the start and end dates of the cumulation period. To test the statistical significance of the average and cumulative average abnormal returns, we

construct a test statistic following the commonly used procedure (Linn and McConnell, 1983; Malatesta, 1983).

Results

In this section, the sensitivity of conclusions regarding the effect of acquisitions on firm returns to the time period used to estimate the market model coefficients and the length of the postevent measurement period is shown. We first review what we define as our basic case; then we show how results change with the choice of different estimation periods. To understand these changes more fully, we examine how $\hat{\alpha}$, the measure of the firm's abnormal performance over the estimation period, varies with the choice of time period.

To allow for information reaching the market prior to an acquisition's announcement, all preevent periods are ended four months prior to the announcement month, an interval which seems prudent on the basis of existing studies (see the third section). Consistent with previous research, we find significant positive gains being earned in the two years preceding the event. During the period $[-24, -4]$ acquirers earn returns that are 18.4% in excess of the expected returns based on their performance over the $[-60, -25]$ period (Table 11.2). These abnormal returns are significant at the .05 level. The pattern of returns for each firm was examined over this preevent period. Of the 78 firms, 71 experienced a preevent upward trend in abnormal returns which, on average, began at $t = -33$. For the 48 merging firms, this upward trend began, on average, at $t = -29$; for 21 firms making tender offers the upward movement begins, on average, at $t = -36$.

The returns for the $[-3, -1]$ period, measured by using coefficients estimated from $[-60, -4]$, introduce a trend of negative but insignificant returns that continues for the two years following the event. In the third postevent year, however, significant losses of -9% occur. A pattern emerges in which acquirers earn substantial positive gains until shortly before the

Table 11.2 Cumulative Average Abnormal Returns: All Sample Firms

Forecast Period	Estimation Period	
	$[-60, -25]$	$[-60, -4]$
$[-24, -4]$.1839 (3.4161) ^a	
$[-3, -1]$	—	-.0148 (-.5683)
[0]	—	.0019 (-.3386)
[1, 6]	—	-.0336 (-1.273)
[7, 12]	—	-.0121 (-.6261)
[13, 24]	—	-.0096 (-.3403)
[25, 36]	—	-.0883 (-2.115)
$[-3, 36]$	—	-.1565 (-1.2364)

^aThe numbers in parentheses are the test statistics which are distributed standard normal.

event, following which returns begin to drop.

Breaking the full sample down by type of transaction, we see similar patterns (Table 11.3). Firms engaging in tender offers and mergers earn large positive gains prior to the event; the level ranges from 28% for the former group to 12.7% for the latter. Around the event month and over the next three years, a mixed pattern is observed. Bidders in tender offers experience a sharp drop in returns in the second year after the event, a sharp rise in the third year. In the third year, $[24, 36]$, acquiring firms in mergers exhibit a significant decline in returns. Despite these differences, we confine most of our attention to the combined sample of 78 acquisitions, since we do not have enough observations on tender offers to undertake a meaningful separate analysis for this group. For both groups of acquiring firms the pattern emerges that the preevent period is one of positive abnormal performance; returns in the postevent period reflect a lower level of performance.

The high performance in the three years

Table 11.3 Cumulative Average Abnormal Returns by Mode of Acquisition

Forecast Period	Estimation Period			
	[-60, -25]		[-60, -4]	
	Mergers	Tender Offers	Mergers	Tender Offers
[-24, -4]	.1271 (1.9472) ^a	.2804 (2.6400)	—	—
[-3, -1]	—	—	-.0300 (-.9918)	.0122 (.3078)
[0]	—	—	-.0037 (-.6769)	.0138 (.4500)
[1, 6]	—	—	-.0495 (-1.3182)	.0022 (-.1339)
[7, 12]	—	—	-.0252 (-.6257)	.0209 (.0968)
[13, 24]	—	—	.0281 (1.0110)	-.0908 (-1.0091)
[25, 36]	—	—	-.1971 (-3.709)	.1309 (1.7843)
[-3, 36]	—	—	-.2774 (-2.6039)	.0892 (.5633)

^aThe numbers in parentheses are the test statistics which are distributed standard normal.

prior to the event suggests that the treatment of this period in estimation of the market model coefficients may significantly affect the measurement of abnormal returns. Since the intercept measures firm performance over the estimation period, an intercept calculated from this period of above-normal performance is larger than if calculated from a lower-performance period. With a higher benchmark the residuals calculated relative to this “normal” performance level are lower.

Table 11.4 provides evidence of how the performance benchmark embodied in $\hat{\alpha}_i$ varies with differences in the estimation period. The first estimate of mean $\hat{\alpha}$ is

.0091, based on [-60, -25]. It is small relative to the estimate of .0134 calculated from the period [-60, -4], reflecting the upward trend in returns that begins approximately three years prior to the event. While the first estimation period stops short of much of the rise in returns, the second period captures most of it. The estimates from [-36, -4] are from a period of almost exclusively higher returns and are much larger. The mean $\hat{\alpha}$ from [-36, -4] is double that estimated over [-60, -25]. The measures in the last two rows are based largely on the postevent periods over which lower average returns are observed. The mean $\hat{\alpha}$ from [-36, -4] is more than double that of the postevent period [4, 36].

These differences in $\hat{\alpha}$ lead one to expect sizable differences in the residuals from the market model depending on the choice of estimation period, and one observes them (Table 11.5). The cumulative residuals are uniformly lower when measured against the last 33 months of the preevent period [-36, -4] than when measured against the last 57 months [-60, -4]. Acquiring-

Table 11.4 Average Intercepts by Estimation Period, All 78 Firms

Estimation Period	Mean $\hat{\alpha}$	$\hat{\sigma}_{\hat{\alpha}}$
[-60, -25]	.0091	.0150
[-60, -4]	.0134	.0127
[-36, -4]	.0181	.0189
[-3, 36]	.0107	.0147
[4, 36]	.0080	.0300

Table 11.5 Cumulative Average Abnormal Returns Based on Selected Estimation Periods: All Sample Firms

Forecast Period	Estimation Period		
	[-60, -4]	[-36, -4]	[13, 36]
[-3, -1]	-.0148 (-.5683) ^a	-.0298 (-.7743)	—
[0]	.0019 (-.3386)	-.0028 (-.4784)	—
[1, 6]	-.0336 (-1.2730)	-.0620 (-1.7100)	-.0175 (-.8249)
[7, 12]	-.0121 (-.6261)	-.0508 (-1.5890)	-.0146 (-.7386)
[1, 12]	-.0457 (-1.3429)	-.1128 (-2.3328)	-.0321 (-1.1057)
[13, 24]	-.0096 (-.3403)	-.0940 (-1.5520)	—
[25, 36]	-.0883 (-2.1150)	-.1826 (-4.5930)	—
[-3, 36]	-.1567 (-1.2464)	-.4221 (-4.9307)	—

^aThe numbers in parentheses are the test statistics which are distributed standard normal.

firm shareholders experienced an insignificant decline in returns of 15.67% over the period [-3, 36] as measured against the acquiring-firms' performance over [-60, -4]. They experienced a significant decline in returns almost three times greater than that when returns are measured against performance over [-36, -4].

Table 11.5 reveals that the choice of preevent period against which postevent performance is measured can have a significant effect on one's conclusions as to the change in performance following an acquisition. Several studies measure acquiring-firm postevent performance not against a preevent period, however, but against a subsequent postevent period.⁷ But the average performance of acquiring firms in the postevent periods is systematically lower, as measured by $\hat{\alpha}$, as is evident in Table 11.4. Thus, use of postevent-period estimates of the market model yield systematically higher residuals than do preevent estimates. The third column of Table 11.5 reports the cumulative residuals for the first 12 postannouncement months measured against the acquiring

companies' predicted performance from [13, 36]. They are an insignificant -3%. In contrast, if the acquiring companies' performance over these 12 months is measured against how they did over the last 33 months of the preevent period, one observes a significant 11% lower return in the first year after the announcements. The differences in estimates of postevent normal returns, depending on choice of base period against which performance is judged, are depicted in Figure 11.1.

Acquiring firms performed substantially better over the period [-24, -4] than they did over [-60, -25]. If we define the latter as normal, then acquiring firms exhibit above-normal performance starting between two and three years before the acquisition announcements, an interpretation which is consistent with that of other studies reviewed later. Assuming this preevent performance is above normal, then acquiring firms must eventually exhibit some worsening of performance postevent. At some point in time, the market must adjust fully to whatever it is that causes the above-normal performance. A key methodological issue in judging the ef-

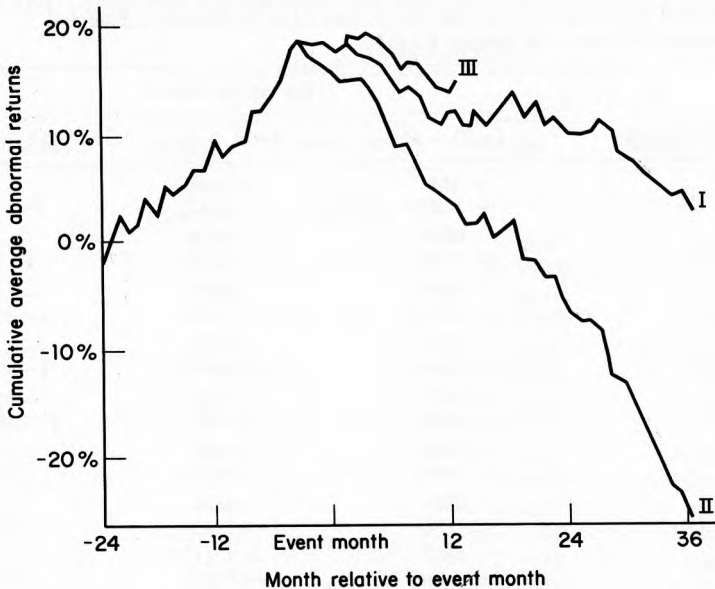


Figure 11.1. Month relative to event month. For all three cases, errors in $[-24, -4]$ are calculated relative to performance in $[-60, -25]$. For case I, errors in $[-3, 36]$ are based on $[-60, -4]$; for II, they are based on $[-36, -4]$. Case III is identical to case I for $[-24, 0]$; errors for $[1, 12]$ are calculated relative to performance in $[13, 36]$.

facts of acquisitions is the relationship between this point in time and the announcement month.

To begin to answer this question, one must explain why acquiring firms earn above-normal returns long *before* an acquisition. One possible explanation is that managers choose to acquire other companies when their own firms and their shares are doing relatively well. If this assumption is valid, the next question is whether the acquisitions are announced toward the beginning, middle, or end of these periods of above-normal performance. This is the kind of counterfactual question that never can be answered in a merger study. Our acquiring firms exhibit an upward trend in returns for roughly three years prior to the announcements. If the announcements come in the middle of the period of above-normal performance, then comparison of the first three postevent years with the last three preevent years would be appropriate.

Bradley and Jarrell's calculation of postevent performance in their comment

(Chapter 15) effectively assumes that the announcements occur at the end of the period of above-normal performance. That the acquiring companies' period of above-normal performance just happens to end around the time the acquisitions are announced strikes us as an unlikely coincidence. Their estimate of the cumulative return to acquiring-firm shareholders over the three postevent years, which is almost identical to our estimate of -15.65% using the $[-60, -4]$ interval as benchmark, we thus regard as an upper-bound measure of acquiring-firm performance. The -42.2% estimate using the interval $[-36, -4]$ as benchmark, which implicitly assumes that the announcements occur in the middle of the above-normal performance period, is perhaps a reasonable lower bound.⁸

Our main results are summarized in Table 11.6, in which we again break out the merger and tender offer subsamples. If one assumes that the market's adjustment to news of an acquisition takes place entirely within the announcement month,

Table 11.6 Cumulative Average Abnormal Returns for Different Time Periods

Cumulation Period	Estimation Period [-60, -4]		
	All Firms	Mergers	Tender Offers
[0]	.0019 (-.3386)	-.0037 (-.6769)	.0138 (.4500)
[-3, 6]	-.0465 (-1.4039)	-.0832 (-1.7776)	.0282 (.2070)
[-3, 12]	-.0586 (-1.4932)	-.1084 (-1.7885)	.0491 (.2229)
[-3, 24]	-.0682 (-1.3513)	-.0803 (-.6900)	-.0417 (-.4920)
[-3, 36]	-.1565 (-1.2464)	-.2774 (-2.6039)	.0892 (.5633)
	Estimation Period [-36, -4]		
[0]	-.0028 (-.4784)	-.0070 (-.8527)	.0065 (.4637)
[-3, 6]	-.0946 (-1.8993)	-.1144 (-1.4770)	-.0514 (-1.004)
[-3, 12]	-.1454 (-2.4746)	-.1692 (-1.8976)	-.0859 (-1.2304)
[-3, 24]	-.2394 (-2.8866)	-.2125 (-1.4076)	-.2857 (-2.7711)
[-3, 36]	-.4220 (-4.9307)	-.4909 (-4.2564)	-.2734 (-2.1715)

The numbers in parentheses are the test statistics which are distributed standard normal.

then acquisitions have no significant impact on acquiring-firm shareholders. If, however, one allows the market three years following the announcement to evaluate an acquisition's effects, then acquiring-firm shareholders are significantly worse off following an acquisition than they would have been had the acquiring firms continued to perform as they had over the three years (i.e., the [-36, -4] interval) prior to the acquisition. The hypothesis that acquiring-firm shareholders are better off as a result of acquisitions fares better if one uses the longer preevent period [-60, -4] and, in general, if one uses shorter post-event periods.

Studies on this subject vary considerably in their choices of pre- and postevent-period lengths when estimating the effects of acquisitions. We favor a longer postevent period, because we doubt that all relevant information regarding an acquisition's likely effects reaches the market in the an-

ouncement month, and that the movements of stock prices in the few months surrounding an acquisition are, necessarily, unbiased estimates of the future consequences of the acquisitions.

Both the merger and tender offer subsamples reveal substantial declines in the stockholder returns over the three years following the announcement month, as judged against the [-36, -4] time-period performance. For the merging firms, the biggest decline occurs in the third year following the announcement; for the tender offer bidders, in the second. We do not place much weight on this difference. Indeed, we anticipate significant changes in stock market values for individual companies at different points of time following the initial announcement as additional information reaches the market. This anticipation is what leads us to favor a relatively long postevent interval for measuring the effects of acquisitions.

Jensen and Ruback (1983) stress the importance of differentiating between mergers and tender offers in event studies, and some support for the position is present in our results. Acquiring-firm shareholders are noticeably better off in tender offers than they are in mergers. But the similarities between the two subsamples are also noteworthy. Both groups experience an upward trend in abnormal returns over roughly three years prior to the acquisition's announcement. Commencing roughly with the announcement, the paths of abnormal returns for the two groups are refracted. After another three years, both groups of shareholders are significantly worse off than they would have been had their companies continued to perform in the postevent period $[-3, 36]$ as they had prior to the event $[-36, -4]$.

If our study were the only one to expose such a pattern of returns, one might be inclined to dismiss the substantial differences between the post and preannouncement acquiring-firm share performances as *curiosa* of our sample. But as we shall now illustrate, the same pattern has been observed in several studies from different time periods and countries.

A REEXAMINATION OF THE LITERATURE

The results of the previous section indicate that, at least for our sample, acquiring firms do earn substantial, positive abnormal returns prior to the market's learning of acquisitions and that acquiring-firm shareholders are not better off, relative to this preevent performance, after information of the acquisition reaches the market. Moreover, whether the acquiring-firm shareholders are judged no better off or significantly worse off depends on both the pre- and postevent periods used in the comparison.

In this section, we further illustrate the importance of these methodological issues by examining results reported in several other studies. While all take inspiration from the CAPM, they actually differ in a surprisingly large number of respects, and

it is not possible to comment on each in detail. We focus upon the general patterns.

Our thesis emphasizes the possible importance of the return pattern both before and after an acquisition, and thus we exclude from consideration studies that leave out entirely or severely truncate these pre- and postevent periods (e.g., Halpern, 1973; Bradley, 1980; Dodd, 1980; Asquith et al., 1983). To facilitate comparisons, we focus upon only those studies that measure returns by months or days surrounding a single-event announcement, i.e., we do not consider studies which measure returns on an annual basis (Hogarty, 1970; Lev and Mandelker, 1972; and those in Mueller, 1980).

The first group of studies we wish to consider measures a firm's return performance in any day or month relative to that of a control group. Bradley (1980), Asquith (1983), and Asquith et al. (1983) use Center for Research in Security Prices excess returns and thus use as a control group companies with $\hat{\beta}$'s similar to those of the acquiring firms. The prediction in these studies is that an acquiring firm would earn a return each day equal to that of firms with similar $\hat{\beta}$'s. Of the three, only Asquith (1983) presents sufficient returns data before and after the announcement date to allow comparison with the other studies in this section.

Table 11.7 summarizes his main results. Asquith reports 22 months of returns data prior to the announcement day. The acquiring firms earn positive cumulative excess returns over this entire preannouncement period. Acquiring-firm shareholders enjoy cumulative abnormal returns above those earned by shareholders in the control group of 14% between the first month in Asquith's data series (-22) and the last month before the market learns of the merger (-2). The cumulative excess returns for acquiring-firm shareholders reach a peak of 14.5% above the control group on press day and level off through the period between announcement and consummation; 30 trading days after the merger a decline begins that continues for as long as Asquith reports figures (roughly 17 months

after announcement). An individual who purchased an acquiring firm's shares just prior to the first signs of market knowledge of the merger (-1) and held them throughout the period over which Asquith reports data would have experienced a cumulative return 7.2% below that of shareholders of nonacquiring firms with similar β 's over the same period.

An analogous procedure to that just described uses Fama-MacBeth residuals. These are calculated from the following equation:

$$e_{it} = R_{it} - \hat{\gamma}_{1t} - \hat{\gamma}_{2t}\hat{\beta}_i \quad (11.4)$$

where R_{it} and β_i are defined as before. The $\hat{\gamma}_{1t}$ and $\hat{\gamma}_{2t}$ parameters are the cross-section estimates of the intercept and slope from monthly regressions of average portfolio returns on average β . Thus, $\hat{\gamma}_{1t}$ and $\hat{\gamma}_{2t}$ differ from month to month, but for any single month they are the same for all firms. The acquiring firm's predicted return for each period t reflects market factors common to all firms. Thus the use of Fama-MacBeth residuals effectively treats the market portfolio as the control group. Table 11.7 summarizes the main results for three studies which employ Fama-MacBeth residuals (Mandelker, 1974; Ellert, 1976; Kummer and Hoffmeister, 1978). All three studies again exhibit positive premerger returns for acquiring-firm shareholders commencing in Ellert's study with the first month of data, some 100 months prior to the merger. Mandelker's study exhibits a leveling off and slight decline in returns commencing around the time of merger announcement, as Asquith's study did. Ellert's sample is more difficult to interpret, since it consists of firms whose mergers were challenged by the FTC or Justice Department. The firms, which eventually succeeded in consummating the mergers, experienced a very slight decline in returns relative to the market portfolio over the 48 months after the challenge to the merger was settled.

The Kummer and Hoffmeister (1978) results indicate substantial positive abnormal returns for acquiring-firm shareholders in the month the tender offer is

announced, followed by no clear pattern. It is the only study in Table 11.7 for which the acquiring-firm shareholders do better than their control group over the combined announcement-event-postevent period.

The four studies examined so far are similar in that they all measure a firm's excess return in any month relative to a control group's performance. Any inference regarding the *change* in acquiring-firm performance must be drawn by comparing the preevent performance of the acquiring firms relative to their control groups and their postevent performance relative to these control groups.

All four studies report positive, abnormal return performance for acquiring-firm shareholders over periods ranging from 17 to 100 months prior to announcement. All report a poorer relative performance for the acquiring companies' shares over the announcement-event-postevent period than observed for the preevent period. Indeed, only one study reports significant positive gains relative to the control group for this period (Kummer and Hoffmeister), but the abnormal gains they report for the 21 months commencing with an acquisition's announcement are only a third of the abnormal returns the same firms earned over the preceding 28 months. In the Mandelker and Ellert studies, the acquiring firms perform roughly the same as the control group firms following the merger announcements. In Asquith's study, the acquiring firms perform significantly worse than their control group after the mergers, where they had performed significantly better before.

Before turning to the next set of studies, let us briefly reconsider Mandelker's results. Although the general pattern of return performance in Mandelker's study resembles the others, the premerger rise in returns is much smaller. Mandelker's sampling of mergers stops in 1963. Unlike the other three studies, it does not include mergers from the peak years of merger and stock market activity, 1967-1969. Consistent with our earlier arguments that merging firms' returns may be particularly af-

Table 11.7. Before- and After-Acquisition Performance of Acquiring Companies in Nine Studies

Study	Time Period (Country)	Control Group Against Which Preacquisition Abnormal Performance Measured	Month Information of Acquisition Reaches Market (t_i)	Month in Which Cumulative Residuals Begin Upward Trend (t_u)	Cumulative Abnormal Returns at Month t_{i-1}	Control Group Against Which Postmerger Abnormal Performance Measured	Month Following Acquisition in Which Fall in Cumulative Residuals Stops (t_f)	Difference Between Cumulative Residuals in t_f and t_{i-1}	Last Month for Which Return Performance Reported (t_e)	Difference Between Cumulative Residuals in t_e and t_{i-1}	Notes
Asquith (1983)	1962–1976 (USA)	Companies with similar β s	-1	-22 ^a	14.0	Companies with similar β s	17	-7.2	17	-7.2	Returns reported in days. We have converted to months by dividing by 22 trading days per month. Interval between announcement day and merger completion assumed to equal 6 months.
Mandelker (1974)	1941–1963 (USA)	Fama-MacBeth residuals	-1	-17	3.5	Fama-MacBeth residuals	46	+0.2	46	+0.2	Mandelker's data centered around merger completion. We have assumed announcement is 6 months before completion.
Ellert (1976)	1950–1972 (USA)	Fama-MacBeth residuals	-3	-100 ^a	23.6	Fama-MacBeth residuals	82	-3.4	82	-3.4	Ellert's data centered around month a merger complaint is made by antitrust authorities. We assume announcement month is same as complaint month. Premerger returns are for all acquirors; postmerger for only those which completed the acquisition.
Kummer and Hoffmeister (1978)	1956–1974 (USA)	Fama-MacBeth residuals	0	-28	17.0	Fama-MacBeth residuals	No systematic movement following merger		20	+5.8	

Study	Time Period (Country)	Control Group Against Which Premerger Abnormal Performance Measured	Month Information of Merger Reaches Market (t_i)	Month in Which Cumulative Residuals Begin Upward Trend (t_u)	Cumulative Abnormal Returns at Month t_{i-1}	Control Group Against Which Postmerger Abnormal Performance Measured	Month Following Merger in Which Fall in Cumulative Residuals Stops (t_f)	Difference Between Cumulative Residuals in t_f and t_{i-1}	Last Month for Which Return Performance Reported (t_e)	Difference Between Cumulative Residuals in t_e and t_{i-1}	Notes
Dodd and Ruback (1977)	1958–1976 (USA)	Acquiring firm's performance relative to market portfolio –73 through –14	–1	–43	10.47	Acquiring firm's performance relative to market portfolio +14 through +73	60	– 1.85	60	–1.85	
Franks et al. (1977)	1955–1972 (UK)	Acquiring firm's performance relative to its industry, –29 through +8	–3	No systematic movement prior to merger	–0.3	Acquiring firm's performance relative to its industry, –29 to +8	15	– 2.4	40	–0.1	Sample is for acquisitions in brewing and distillery. Returns are measured net of industry index.
Langteieg (1978)	1929–1969 (USA)	Acquiring firm's performance relative to market portfolio and its two-digit SIC industry, –72 to –12	0	–60	13.58	Acquiring firm's performance relative to market portfolio and its two-digit SIC industry, +12 to +72	78	–29.0	78	–29.0	Langteieg's data centered around merger completion month. We have assumed announcement is 6 months before completion based on acquired-firm return performance.
Firth (1980)	1969–1975 (UK)	Acquiring firm's performance relative to market portfolio in 48 preceding months	–1	–48 ^a	1.5	Acquiring firm's performance relative to market portfolio in 48 preceding months (omitting –12 to +12)	1	– 7.4	36	–4.8	
Malatesta (1983)	1969–1974 (USA)	Acquiring firm's performance relative to market portfolio in 36-month period from –62 to –1	–4 (?)	–60 ^a (?)	3.6	Acquiring firm's performance relative to market portfolio in 36-month period in +13 to +60	12	– 7.7	12	–7.7	

Notes: Month 0 is the announcement month.

^aFirst month for which data are reported.

ected by stock market swings, both the more modest premerger increases and postmerger declines recorded by Mandelker may stem from his having employed a merger sample drawn from a more tranquil period of stock market-merger activity.

The last technique for estimating the effect of acquisitions we consider uses the residuals from some variant on Equation (11.5):

$$e_{it} = (R_{it} - R_{jt}) - \hat{\alpha}_i - \hat{\beta}_i(R_{mt} - R_{jt}) \quad (11.5)$$

Recall that the value of $\hat{\alpha}$ for the average firm is zero and that $\hat{\alpha}_i$ thus captures a firm's abnormal performance over the time period from which (11.5) is estimated. Thus, if (11.5) is estimated over a period prior to the event's announcement, the residuals from (11.5) at and after announcement do measure the *change* in performance for the firm relative to the pre-event period over which (11.5) was estimated. More generally, the inferences one draws from residuals from (11.5) are sensitive to the time period over which it is estimated.

This point is illustrated by the bottom five entries of Table 11.7. We first consider the study of Dodd and Ruback (1977) in some detail, since it clearly illustrates the issues. They estimate Equation (11.5) separately on data from $[-73, -14]$ and $[14, 73]$. If the pre- and post-tender offer performance of acquiring firms in their sample resembles that of the studies just discussed, then acquiring firms exhibit above-normal performance over some part, if not all, of $[-73, -14]$ and normal or below-normal performance over part or all of $[14, 73]$. The $\hat{\alpha}$'s from (11.5) over $[-73, -14]$ will be higher than those for $[14, 73]$.⁹ The residuals they report for $[-60, -1]$ are for $\hat{\alpha}$ and $\hat{\beta}$ estimated over $[-73, -14]$ and those for $[0, 60]$ from $[14, 73]$. Thus, the reported residuals for the preevent period are calculated against a benchmark of above-normal performance and are thus smaller than if they had been measured relative to a period of poorer performance. Residuals for the an-

nouncement month and postevent period are calculated against a benchmark of poorer performance than the preevent period and thus are certainly larger than they would be if they were measured against the acquiring firms' preevent performance.

That these inferences are likely to be valid can be seen by an examination of the cumulative residuals for the bidding firms in the Dodd and Ruback study (Figure 11.2).¹⁰ As with the studies using CRSP and Fama-MacBeth residuals, a period of sustained above-normal performance is observed commencing at *A* some 43 months prior to the initial tender offer month (*B*), where *normal* is now defined as how these firms did over the period $[-73, -14]$. Since acquiring-firm performance over $[-73, -14]$ is, if anything, above that predicted from the market portfolio and Equation (11.1), these residuals probably understate the extent of abnormal, positive performance of acquiring firms prior to the acquisitions. A period of gradual but sustained decline in share returns commences at *C*, month 6, about the time the takeovers are probably consummated.¹¹ It continues through month 60 and conceivably through 73. It is against this period of deteriorating performance $[14, 73]$ that the abnormal returns $[0, 60]$ are calculated. Thus, the level of returns in the interval $[0, 12]$ is judged relative to how the firms did from one to six years after the tender offers, not to how they did before. A comparison of Figures 11.2 and 11.1 reveals that Dodd and Ruback's acquiring-firm residuals pattern resembles the pattern for our sample when a postevent estimation period is used as benchmark (our case III). Had preevent period α 's and β 's been used by Dodd and Ruback, their postevent residuals probably would have exhibited a steeper decline, as with our cases I and II.¹²

Similar reasoning calls into question Dodd and Ruback's conclusion that acquiring-company shareholders are better off from the acquisitions on the basis of the statistically significant average residual of 2.83% in the announcement month. The rise in "abnormal" returns in month 0 stems in part from the switch at this month from the higher performance period

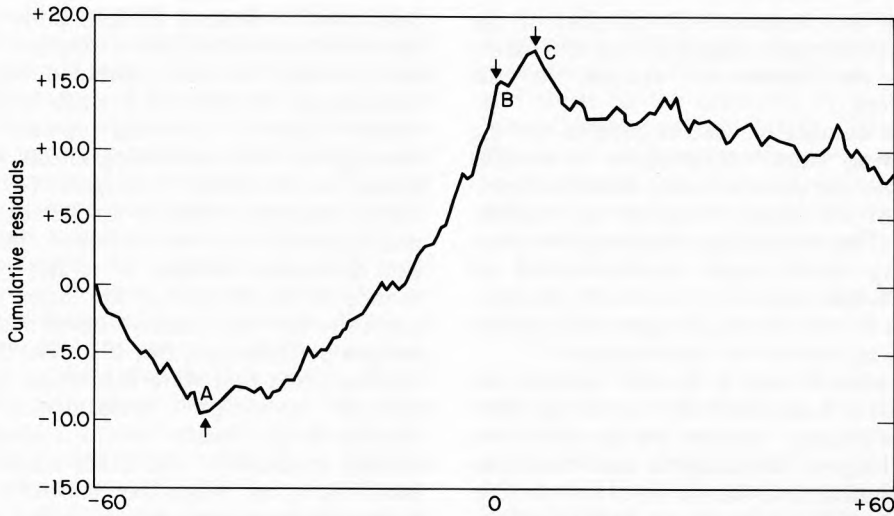


Figure 11.2. Plots of cumulative residuals for successful bidding firms. (Source: Dodd and Ruback, 1977.)

$[-73, -14]$ $\hat{\alpha}$'s and $\hat{\beta}$'s to the lower-period $[14, 73]$ estimates. That is, acquiring-firm shares appear to have gained in abnormal performance in month 0 partly because the benchmark of normality has shifted downward.

The importance of the treatment of $\hat{\alpha}$ and thus the choice of time period over which $\hat{\alpha}$ is estimated is further illustrated by Malatesta's (1983) study. Residuals over the period $[-60, -13]$ are calculated by using the first available 36 observations from the preceding 50 months. The cumulative average $\hat{\alpha}$ over $[-24, -4]$ is 10.7, and the forecast error is -1.6 . Thus, acquiring firms in Malatesta's sample also were earning significantly higher returns than the market portfolio prior to the market's learning of the mergers. The modest cumulative residuals Malatesta reports for the premerger period relative to the acquiring firms' performance over this period merely indicate that the above-normal performance for the acquiring firms was fairly uniform throughout the entire premerger period $[-62, -1]$ and thus is adequately represented by his $\hat{\alpha}$ estimates.

The residuals for months 1 through 60 are calculated from $\hat{\alpha}$ and $\hat{\beta}$ estimated from the first available 36 months in the interval

$[13, 60]$. The cumulative residuals over $[1, 12]$ are negative and significant even relative to the acquiring firms' subsequent performance in the postmerger period. While Malatesta does not report the $\hat{\alpha}$'s for the postmerger residuals, one presumes from Asquith's results that they would be substantially less than the 10.7% cumulative $\hat{\alpha}$ obtained prior to the mergers. Thus, the acquiring firms probably did even worse during the first 12 months after the announcements, compared with how they were doing before, than is implied by the residuals Malatesta calculates relative to the postmerger period's $\hat{\alpha}$'s and $\hat{\beta}$'s.

The importance of how one treats the $\hat{\alpha}$ estimates from Equation (11.5) is further illustrated by the results of Langetieg's (1978) study. Langetieg estimates a variant on Equation (11.5), which also controls for movements in acquiring-firm returns common to all firms in the acquiring firm's two-digit SIC industry. His measure of abnormal returns for firm i is the sum of $\hat{\alpha}_i$ and $\hat{\epsilon}_{it}$. Thus, although Langetieg estimates separate $\hat{\alpha}$'s and $\hat{\beta}$'s for the pre- and postmerger periods, his measures of abnormal returns do not suffer from the same problems as the Dodd and Ruback and Malatesta measures do, because Langetieg in-

cludes the respective $\hat{\alpha}$'s as part of the abnormal returns, thus building into his results the systematic change in the intercept.

The cumulative excess returns for the acquiring firms turn positive 60 months prior to the point in time when information of the merger reaches the market. Over these 60 months, shareholders of acquiring firms enjoy excess returns of 13.58% over what one predicts from movements in both the market portfolio and the acquiring firm's two-digit industry.¹³

In what is now a familiar pattern, we witness in Langetieg's data a leveling off of excess returns between the market's first knowledge of the mergers and their consummation, and then a sustained decline. The acquiring-firm returns decline continuously over the 72 months following a merger. A shareholder who bought into an acquiring firm just prior to the market's learning of the merger and held its shares for the next 78 months would experience a cumulative loss relative to the market portfolio and shareholders of other firms in the same industry of 29%.

Firth (1980) calculates the residual at month t from $\hat{\alpha}$ and $\hat{\beta}$ estimates for the 48 months immediately preceding t , when t varies from -48 to -13 . Thus, if acquiring firms earned above-normal returns uniformly over a substantial interval prior to the mergers, this fact would not be apparent in the residuals for the premerger period.

The residuals over the entire interval $[-12, 12]$ are calculated by using $\hat{\alpha}$'s and $\hat{\beta}$'s estimated from $[-60, -13]$. Thus, unlike the results in both Dodd and Ruback and Malatesta, the immediate pre- and postannouncement residuals are all calculated relative to the acquiring companies' premerger return performance. As it turns out, in Firth's study this difference does not prove to be important. The market adjusts fully in the announcement month, at which time the acquiring-firm shareholders suffer a significant 6.3% loss relative to premerger performance. The residuals for the postmerger months reveal no distinctive pattern.

The Franks et al. (1977) study of 94 ac-

quisitions by United Kingdom breweries and distilleries is difficult to analyze. They first present, for the combined merging companies, cumulative average residuals which "display a strong upward bias throughout, thus exhibiting effects which cannot be attributed to mergers" (1977, p. 1521). Since the residuals for the acquiring and acquired firms are combined, one cannot determine whether it is the performance of the former or the latter which accounts for this positive abnormal premerger performance. But if it were the acquiring firms that were exhibiting above-normal premerger performance, the Franks et al. results would correspond closely to those of the other studies we have discussed. When they control for industry performance, the acquiring firms exhibit no above-normal returns prior to the merger. But since the acquiring firms are part of the industry index, this choice of control group introduces a bias toward zero in the residual estimates.

Franks et al. estimate Equation (11.5) over the time period $[-29, 8]$, omitting an interval around the announcement, which "is adjusted on the basis of the resulting estimates of abnormal residuals" (p. 1515). Given that the excluded interval varies from firm to firm, it is difficult to determine against what yardstick abnormal performance is being gauged. Nevertheless, returns initially rise (from -4 through 0) and then decline, leaving acquiring shareholders no better off as a result of the mergers. "Indeed since some gain would have been anticipated as a result of premerger interests [of the acquiring firms in the targets], one could argue that there may have been losses exclusive of these interests" (p. 1523).

SUMMARY AND CONCLUSIONS

To acquire another firm, a buyer must pay a substantial premium over the current market value of the target. In our sample, this premium averaged 81% of the target firms' market value. Thus, over the period between the initial decision to acquire and

the completion of an acquisition, shareholders of acquired firms enjoy substantial increases in their wealth. The key question for the theory of the firm and for antimerger policy is whether these wealth increases measure net increases in wealth for society as a result of some synergistic efficiency gain, or mere wealth transfers from acquiring-firm to acquired-firm shareholders.

To answer this question, one must measure the effects of the acquisitions on acquiring-firm shareholder wealth. While it is reasonable to assume that the changes in acquiring-firm shareholder wealth related to the acquisition begin about the same time as the changes in acquired-firm shareholder wealth begin, somewhere between the announcement and four months before, it is arguable whether all changes in acquiring-firm wealth caused by the acquisition are complete by the date of its announcement or its completion. Conceivably, new information about its future consequences might reach the market at intermittent intervals for some time after the market's first knowledge of the acquisition. This consideration suggests that a longer-run perspective of the consequences of acquisitions for acquiring-firm shareholders might be appropriate than is warranted for acquired-firm shareholders.

Several studies have measured the performance of acquiring firms relative to the average firm in the stock market or in the acquiring firm's industry, both before and after acquisition announcements.¹⁴ A consistent pattern emerges. Acquiring firms begin to experience significant positive abnormal returns as early as 100 months prior to the acquisition announcements. The cumulative preacquisition gains of acquiring-firm shareholders are inevitably positive and are typically large.¹⁵

Starting around the time the market begins to learn of an acquisition, or at its consummation, the performance of the acquiring firm's shares begins to deteriorate relative to their preevent performance. In some cases, they exhibit a roughly normal postevent performance (e.g., Mandelker, 1974); in others, a significant relative decline (Langetieg, 1978; Asquith, 1983).¹⁶

A second set of studies measures an ac-

quiring firm's performance as a result of an acquisition, relative to this performance over another period, controlling for general shifts in the economy by using the basic CAPM equation (11.5). Given that the acquiring firm's performance relative to the market (or its industry) differs significantly over the pre- and postevent time intervals, estimates of "abnormal" returns to acquiring-firm shareholders are sensitive to the choice of time period over which the "normal" $\hat{\alpha}$ and $\hat{\beta}$ of Equation (11.5) are measured. Our own results indicate significant above-normal returns are earned by acquiring-firm shareholders over the immediate two to three years prior to the market's learning of an acquisition, relative to the performance of these firms in the three preceding years. Following the market's receipt of information of the acquisition, the acquiring firms' shareholders experience lower returns than they enjoyed over the preevent period. Moreover, the deterioration in performance is more dramatic if comparison is made with the immediate three years' performance than if comparison is with the five preevent years.

Our findings are consistent with those of other studies using Equation (11.5) and the CAPM, although comparisons are made difficult by the differing choices of time periods for estimating (11.5). A significant decline in acquiring-firm returns is observed by Firth (1980) in the announcement month and perhaps by Franks et al. (1977) in the first few months following the merger announcements. Malatesta (1983) observes a significant decline in acquiring-firm performance in the first 12 months after the announcement, relative to the acquiring companies' performance over a postmerger period; Dodd and Ruback (1977) record a steady decline in performance over 54 months following the acquisition's completion, again measured relative to the acquiring companies' own normal postevent performance. Since acquiring firms perform worse after acquisitions than before, when measured against the market, the decline in returns measured by Malatesta and Dodd and Ruback following the acquisitions is in all likeli-

hood considerably smaller than it would have been had these authors measured the decline against the predicted performance of acquiring firms on the basis of their preevent histories.

Thus, the answer to the question posed in the title of this chapter, "Are acquiring-firm shareholders better off after an acquisition than they were before?" seems to be no, if by *before* we mean the three years or so prior to the time information reaches the market, and if by *after* we mean the three years or so after this point in time.

The evaluation of the effects of acquisitions on acquiring-firm shareholders' wealth presented here is considerably more negative than that found in some other parts of the literature. Others have reached more positive conclusions than we in part because they have posed different questions from ours. To the extent that one focuses on the acquiring companies' performance only at the time of the announcement (e.g., Dodd and Ruback, 1977; Bradley, 1980) and makes one's comparison not to the acquiring firms' own preevent performance but to that of the market portfolio (e.g., Mandelker, 1974; Kummer and Hoffmeister, 1978; Bradley, 1980), one obtains a more optimistic assessment of the performance of acquiring-company shares. Halpern (1983) ignores the evidence on postevent acquiring-company returns entirely in his survey; Jensen and Ruback (1983) clearly give more weight to the figures regarding the gains at the time of acquisition in their Table 3 than they do to the figures which include postacquisition performance in Table 4. Neither survey has much to say about the substantial positive abnormal returns acquiring-firm shareholders earn before the market learns of the acquisitions.

The stock market is subject to substantial swings in returns that cannot be justified by an application of the rational-expectations assumption to subsequent dividend streams. Acquisition activity is correlated with stock market activity and is arguably subject to the same underlying psychological factors and motivations. The

stock market may be over- or under optimistic about the future consequences of acquisitions at different points in time. Moreover, an acquisition is a sufficiently complex event that it might take the market more than a single month or year to form an accurate estimate of its future effect. These considerations suggest to us the need for a longer-run view of the consequences of acquisitions. But whether or not one agrees with us on this point, we do hope we have achieved our goal of demonstrating that one's answer to the question "Are shareholders of acquiring firms better off after an acquisition than they were before?" is sensitive to both the choice of time intervals over which before and after performance is defined and the choice of benchmark against which performance is measured.

NOTES

1. Nelson (1959, 1966); Melicher et al. (1983); Geroski (1984). Casual observation suggests that this correlation may have weakened in the most recent years. But the cited studies carry the analysis up through the midseventies. Since all of the empirical work discussed in this chapter, save our own, is from the period in which the positive correlation has been found to exist, our point with respect to the existing literature and its interpretation is valid even if it should prove that acquisition activity is no longer strongly correlated with stock market price movements.

2. Recent critiques by Roll (1977) and Levy (1983), among others, call into question some of the assumptions of the CAPM. While these papers pose serious challenges to many of the conclusions drawn from the CAPM, they carry less weight with regard to the literature on the effects of acquisitions. The market portfolio may be a reasonable choice as a control group for predicting changes in an acquiring firm's returns, even if it is not a reasonable portfolio for an individual to hold.

3. The total number of firms exceeds the number of firms involved in mergers and tender offers because one of the firms could not be classified.

4. The pattern of overall acquisition activity during the sample period can be seen in this record of completed acquisitions:

Year	Number of Acquisitions	Percent Change
1976	1145	16.7
1977	1209	5.6
1978	1452	20.1
1979	1564	7.7
1980	1583	1.2
1981	2314	46.2

Transactions counted here are valued at \$1 million or more; the list includes partial acquisitions (*Mergers and Acquisitions*, Winter 1984).

5. See Fama (1976) for a full description of the market model.

6. Each firm error \hat{e}_{it} is divided by its standard deviation $\hat{\sigma}(\hat{e}_{it})$, where

$$\hat{\sigma}(\hat{e}_{it}) = \left\{ S_i^2 \left[1 + \frac{1}{T} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{\tau=1}^T (R_{m\tau} - \bar{R}_m)^2} \right] \right\}^{1/2}$$

and

S_i^2 = error variance calculated from the market model regression for firm i

\bar{R}_m = average return on the market portfolio over the estimation period

T = number of months in the estimation period

The standardized errors $\hat{e}_{it}/\hat{\sigma}(\hat{e}_{it})$ are summed and divided by I , the total number of firms, to obtain AS_t , the average standardized error for each time period. We define z_t , the test statistic, as $z_t = \sqrt{I_t}(AS_t)$, where z is distributed as approximately a normal variable for large samples. To obtain the test statistic for the null hypothesis that the CAR_{xy} are insignificantly different from zero, we calculate

$$\bar{z} = \sum_{t=x}^y \frac{z_t}{(y-x+1)^{1/2}}$$

where z is also distributed approximately normally for large samples.

7. The typical justification for choosing a postevent period against which to measure postevent residuals is that the $\hat{\beta}$'s may change as a result of the acquisition. But those studies which test for shifts in the β_i report no *systematic* shifts in them (see the third section). Nor do we find any. For example, only two of the $\hat{\beta}$'s estimated over $[-3, 36]$ are significantly different from those estimated over $[-60, -4]$, one being larger, the other smaller. The other 76 insignificant changes divide almost evenly between increases and decreases.

8. Michael Jensen also argues that the postevent benchmark should be the normal performance of the acquiring firms, not their above-normal preevent performance. We thank Michael for his comment at the conference, which helped clarify our thinking on this point.

9. Although Dodd and Ruback (1977) report the differences between the $\hat{\beta}$'s for the two periods, they unfortunately do not report the differences in $\hat{\alpha}$'s (p. 358).

10. Dodd and Ruback (1977) do not report the cumulative residual series, so we have added the averages they do report to obtain Figure 11.2. Our Figure 11.2 corresponds to and resembles very closely their Figure 2.

11. Both Mandelker (1974) and Langetieg (1978) center their data around the consummation of the acquisition, not its announcement. Judging from the acquired firms' returns in these studies, information regarding the mergers would appear to reach the market about six months before the mergers are completed. In our sample, four months elapse on average between first announcement and consummation, which corresponds to these other studies if one allows two months for preannouncement information leakage. We assume the gap between announcement and consummation to be six months in the Mandelker, Langetieg, and Asquith studies.

12. The reason Dodd and Ruback (1977) give for using separate $\hat{\alpha}$ and $\hat{\beta}$ estimates from before and after the announcement is that for 34 of the 184 firms in their sample (18%), there is a significant change in $\hat{\beta}$ (pp. 358-359). But changes in $\hat{\beta}$ are equally divided between increases (10 for successful bidders) and declines (9). Thus, no *systematic* shift in residuals should result if preannouncement $\hat{\beta}$'s are used. But if postannouncement $\hat{\alpha}$'s are significantly lower than preannouncement $\hat{\alpha}$'s, postannouncement residuals are systematically raised by their choice of period against which to measure postannouncement performance.

13. Langetieg (1978) reports four sets of similar results (Table 1, p. 373). We quote from only the first set, using an equally weighted industry index.

Langetieg also reports residuals net of the market portfolio, industry index, and the performance of a "well-matched non-merging firm" (p. 371). The latter is selected from the acquiring firm's two-digit industry by the criterion that its residuals from the market portfolio regression (11.5) have the highest correlation with the residuals for the acquiring firm. This criterion for selecting a control group firm

biases Langetieg's findings for this comparison toward zero. With an infinitely large population from which to select control group firms, one would find for any acquiring firm a nonacquiring firm whose residuals correlate perfectly, leaving nothing to be explained. A two-digit industry is not an infinite population, but it is large enough to introduce serious bias toward zero. Nevertheless, the same preevent-positive-excess-returns, postevent-negative-excess-returns pattern appears even after netting out the movements in the control group returns (see Table 2, p. 377).

14. Since Langetieg (1978) adds $\hat{\alpha}_i$ back into his estimate of abnormal returns, his is really an estimate relative to both the market portfolio and the two-digit SIC industry and should be included with this group.

15. Other studies reporting substantial positive premerger returns for acquiring firms are Lev and Mandelker (1972) and Cosh et al. (1980).

16. Other studies reporting postmerger period declines include Hogarty (1970); Cosh et al. (1980); Dodd (1980); Jenny and Weber (1980); and Mueller (1980).

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