John J. McConnell
Mehmet Ozbilgin
Purdue University

Sunil Wahal
Emory University

Spin-offs, Ex Ante*

Cusatis, Miles, and Woolridge (1993) report large positive excess returns following spin-offs over the period 1965–88. We investigate whether a trading strategy based on this ex post analysis would have earned excess returns on an ex ante basis over the period 1989–95. When compared with the matched firm benchmark used by Cusatis et al. and the Fama and French (1993) 3-factor model, the strategy does not beat the benchmark. When compared with size- and book-to-market-matched portfolios, the strategy typically beats the benchmark. On an ex ante basis, post-spin-off returns provide a shaky basis for rejecting the efficient market hypothesis.

I. Introduction

Cusatis, Miles, and Woolridge (1993) present evidence that a strategy of investing in either parent companies that undertake spin-offs of subsidiaries or the spun-off subsidiaries themselves provides superior investment performance. Cusatis et al. do not directly tout their findings as the discovery of a "beat the market" strategy. Their primary interest is in identifying the source of the well-documented stock price effect associated with the announcement of corporate spin-offs (Hite and Owers 1983; Miles and Rosenfeld 1983; Schipper and Smith 1983). Nevertheless, coincident with and subsequent to publication of their results, the popular press has picked up on the idea that a strategy of buying spun-off entities once they begin trading as independent stocks provides a route to superior portfolio performance. In recommending this strategy, the press often cites the Cusatis et al. study to support the idea (Serwer 1992; Taub 1993; Michels and Neumeier 1994; Gutner 1996; Sivy 1996; Hayes 1997; and Siwolop 1997, among others). Additionally, the popular press has reported that some portfolio managers have implemented such a strategy (Henriques 1991; Ellis 1993).

* We thank Eugene Fama for providing us with the monthly factors of the Fama and French (1993) three-factor model, an anonymous referee, and Ron Harris for computational assistance.

(*Journal of Business*, 2001, vol. 74, no. 2)

0021-9398/2001/7402-0003$02.50

In this study, we investigate whether a strategy of buying parents and subsidiaries after spin-offs over the 7 years following the completion of the analysis reported by Cusatis et al. would have earned excess returns. We adopt the perspective of an investor who has access to the Cusatis et al. study, who hopes to capitalize on the results by following a strategy based on those results, and who accepts the buy-and-hold performance benchmark employed by Cusatis et al. as reasonable. It turns out that this apparently straightforward and simple exercise is fraught with ambiguities.

Cusatis et al. present performance results over intervals of 6, 12, 24, and 36 months following spin-offs, but they do not recommend a specific investment strategy. During the period covered by their study, for 24- and 36-month intervals following spin-offs, the average excess returns for both parents and subsidiaries are large and typically statistically significant. During the period covered by our study, however, the results depend very much on the holding period employed. For example, if the investor had elected to buy at the spin-off date and hold for 36 months, the average excess return would have been 5.1% for parents and −20.9% for subsidiaries. In comparison, if the investor had held for 24 months, the average excess return would have been 19.2% for parents and 5.8% for subsidiaries. Moreover, even over the 24-month holding period, the large average excess return for parents results from the extraordinary performance of one firm, which earned an excess return of 2,272%. Thus, for our investor, realized returns would have depended on both the choice of the holding period and the comprehensive execution of the trading strategy. Failure to include the one extreme outlier would have doomed the parent firms' 24-month return to −9.3%. In short, if an investor had access to the Cusatis et al. results and had accepted their benchmark as reasonable, the appropriate implementation of a strategy would have been less than clear-cut and the results of the effort would have very much depended on the way in which the strategy had been implemented.

There are two other related questions that arise during the course of our apparently straightforward exercise. First, there is the vexatious question of the appropriate way in which to measure excess returns and whether our conclusions depend on the methodology employed. Cusatis et al. analyze buy-and-hold returns and compare them with returns from a sample of industry- and size-matched stocks. To address the question of whether our conclusions depend on the way in which performance is measured, we also calculate cumulative monthly returns and compare those with returns from the same set of industry- and size-matched stocks. We further analyze parent and subsidiary returns against size- and book-to-market-matched portfolios and against the Fama and French (1993) three-factor model of stock returns. Perhaps

not surprisingly, the size and sign of excess returns over various intervals depends on the way in which performance is measured.

The second vexatious question is what the appropriate level of statistical significance should be when concluding that the strategy beat the benchmark. For an investor who adopted the strategy on an ex ante basis, merely beating the benchmark might very well be sufficient to conclude that the strategy was a success. At a different level, studies of long-run, postevent stock returns have been used to reject the semistrong form of the efficient market hypothesis. Cusatis et al. can be interpreted in that vein. Typically, rejection of the efficient markets hypothesis (or any hypothesis) requires that the null be rejected (at least) at the 0.05 level of statistical significance. Against this criterion, the strategy of buying parents and their spun-off subsidiaries provides highly ambiguous results. When the benchmark is a set of industry- and size-matched stocks, the null is never rejected at the 0.05 level. With the Fama and French three-factor model, the null is also never rejected at the 0.05 level. With the size- and book-to-market-matched portfolio procedure, which Lyon, Barber, and Tsai (1999) report is the most powerful in terms of rejecting the null hypothesis of no excess returns, the null is rejected over most (but not all) intervals considered. Given this ambiguity in our results, we conclude that long-run returns from spin-offs provide a shaky basis for rejecting the semistrong form of the efficient market hypothesis.

In Section II, we review the Cusatis et al. study in greater detail. In Section III, we describe our sample and the Cusatis et al. procedure that was used to generate performance benchmarks. In Section IV, we present our initial empirical results in which performance is based on buy-and-hold returns in comparison with industry- and size-matched stocks. Section V considers cumulative monthly returns and other performance benchmarks. In Section VI, we consider the extent to which the difference in excess returns between the Cusatis et al. study and ours results from the differences in takeover activity and takeover premiums between the two time periods considered. Section VII concludes.

II. Prior Investigations of Spin-off Stock Performance

Cusatis et al. (1993) compile a sample of spin-offs that took place over the period 1965–88 by examining the *Moody's Dividend Record,* the Center for Research in Security Prices (CRSP) *Master File,* and the *CCH Capital Changes Reporter.* To be included in Cusatis et al.'s sample for further investigation, a spin-off candidate had to satisfy four criteria. (1) The distribution of stock in the subsidiary had to be fully nontaxable. (2) The distribution of stock had to be voluntary. (3) Stock prices for the parent and the subsidiary (after the spin-off) had to be

available from one of the following sources: the *CRSP Monthly Returns File,* the *Bank and Quotation Record,* the *COMPUSTAT PDE Tape,* Standard and Poor's (S&P) *Daily Stock Price Record,* or the *Wall Street Journal* (*WSJ*). (4) The shares of the spun-off entity could not have been trading prior to the spin-off announcement. These criteria yielded a sample of 146 "pure" spin-offs, the bulk of which occurred during the second half of the period studied, with 116 of the 146 occurring during the interval 1978–88, for an average of just under 12 per year.

In conducting their analysis, the primary concern of Cusatis et al. was to identify the source of the announcement period gains associated with spin-off announcements (as documented, e.g., in Hite and Owers 1983; Miles and Rosenfeld 1983; Schipper and Smith 1983).[1] Determining whether a strategy of buying spin-off parents and/or subsidiaries provided superior returns was a secondary concern (see, e.g., Cusatis et al. 1993, pp. 293–94). In conducting their analysis, Cusatis et al. compute buy-and-hold returns for both the parent and the subsidiary. For parents, they compute returns beginning with the ex date; for subsidiaries, they compute returns beginning with the initial listing date. They compare these returns with the buy-and-hold returns of a sample of size-matched stocks from the same industries. They refer to the average difference between the buy-and-hold returns of the parents' (subsidiaries') stocks and the buy-and-hold returns of the matching stocks over the T months following the spin-off as the matched-firm-adjusted return for time T ($MFAR_T$).

Cusatis et al. discover the following. For parents, over the 36 months following the ex date, the cumulative MFAR is 18.1% (t-statistic = 1.59). This excess return is actually a drop-off from the cumulative MFAR of 26.7% over the first 24 months following the ex date (t-statistic = 2.55). Furthermore, over the first 24 months following the ex date, excess returns to parents accrete relatively uniformly: over months 1–6, the cumulative MFAR is 6.8% (t-statistic = 1.75); over months 7–12, it is 5.34% (t-statistic not given); and over months 13–24, it is 12.6% (t-statistic not given).

For subsidiaries, over the 36 months following the initial listing date, the cumulative MFAR is 33.6% (t-statistic = 2.31). Over the 24 months following the initial listing date, it is 25.0%. Most of the excess return occurs over months 13–24, where the MFAR is 19.6% (t-statistic not given). Indeed, over the first 6 months following the ex date, the MFAR is −1.0% (t-statistic = −0.19); over the first 12 months following the ex date, the cumulative MFAR is only 4.5% (t-statistic = 0.58).

1. More recent studies of announcement period returns for spin-offs include Allen et al. (1995), Daley, Mehrotra, and Sivakumar (1997), Wruck and Wruck (1997), Gilson et al. (1997), Desai and Jain (1999), and Krishnaswami and Subramanian (1999).

Because Cusatis et al. also determine that a disproportionate fraction of the firms (both parents and subsidiaries) in their sample are merged or acquired following the spin-off, they interpret their results to imply that "spinoffs create value primarily by providing an efficient method of transferring control of corporate assets to acquiring firms" (p. 310). They do not present their results as a guide to a beat-the-market strategy, although they do allow that "the superior mean returns after the spinoff . . . suggest that . . . event studies underestimate the value created through spinoffs" (p. 310).

It is tempting to interpret the Cusatis et al. results as evidence contrary to the efficient market hypothesis. It is easy to classify their results as part of the growing literature that specifically tests the efficient market hypothesis by analyzing "long-run" returns following certain corporate events. These events include earnings announcements (Ball and Brown 1968; Bernard and Thomas 1990), mergers and acquisitions (Agrawal, Jaffe, and Mandelker 1992; Loughran and Vijh 1998; Rau and Vermaelen 1998), initial public offerings (Ritter 1991; Loughran and Ritter 1995; Brav and Gompers 1998; Carter, Dark, and Singh 1998), seasoned equity offerings (Speiss and Affleck-Graves 1995; Lee 1997), new listings on the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX) (Dharan and Ikenberry 1995), open market share repurchases (Ikenberry, Lakonishok, and Vermaelen 1995), stock splits (Ikenberry, Rankine, and Stice 1996), proxy contests (Ikenberry and Lakonishok 1993), equity carveouts (Vijh 1999), and dividend announcements (Michaely, Thaler, and Womack 1995).[2] Indeed, in his review of this literature, Fama (1998) lumps in the study by Cusatis et al. with a set of studies that purport to identify "underreaction" on the part of investors to corporate events. Fama (1998) goes on to question the validity of the Cusatis et al. results and those of other studies that use similar empirical methodologies. We will come to the question of alternative methodologies and performance benchmarks later, but that is not our initial focus. Our initial interest is in determining whether the Cusatis et al. results are replicable on an out-of-sample set of spin-offs. That is, ex ante could an investor have devised a profitable trading strategy based on the ex post results of Cusatis et al., assuming that the investor accepts their performance benchmark as reasonable?

2. Given the rate at which this set of literature is evolving, there are almost certainly other studies and topics that we have failed to cite. We apologize to those authors. Our oversights are unintentional. A separate set of related literature examines whether the "excess" long-run performance reported by these various studies is robust to alternative procedures used to measure performance (Barber and Lyon 1997; Kothari and Warner 1997; Lyon, Barber, and Tsai 1999; Mitchell and Stafford 2000).

III. Sample Selection

To compile our sample, we mimic the steps employed by Cusatis et al. (1993): we use *Moody's Dividend Record,* the *CRSP Monthly Master File,* and the *CCH Capital Changes Reporter* to identify firms' distributions of the stock of other corporations. For the period January 1989–December 1995, we identify 381 distributions. From these, we exclude all distributions for which we can find no information describing the transaction in the *CCH Capital Changes Reporter* (89); distributions for which a description is not available in the *WSJ* (24); taxable distributions (115); distributions classified as a return of capital (20); involuntary distributions (1); distributions by firms for which stock prices are not available in the CRSP *Monthly Master File,* the *WSJ,* the S&P *Daily Stock Price Record,* the *Bank and Quotation Record,* and the COMPUSTAT *PDE Tape* (15); distributions in which the stock of the spun-off subsidiary was trading prior to the announcement of the spin-off (19); and distributions of a security other than common stock (2 distributions of warrants).[3] The sample includes 96 spin-offs for which there are 80 parents and 96 subsidiaries. The sample contains only 80 parents because one company had 3 spin-offs, 2 companies had 2 spin-offs, and 12 parent company stocks ceased trading because the companies were taken over at or near the ex date. The 96 spin-offs over the 7 years of the sample imply an average of just over 13 spin-offs per year (in comparison with the 12 spin-offs per year during the latter half of the period studied by Cusatis et al.)

As shown in panel A of table 1, the spin-offs are spread reasonably evenly through time, although there is some diminution during 1991 and 1992 relative to the other 5 years. To identify matching stocks, we follow the Cusatis et al. procedure. For parents, matching stocks are selected as of the ex date of the spin-off according to market value (i.e., number of shares times the closing price on the ex date) and four-digit Standard Industrial Classification (SIC) code. Subsidiaries are matched as of the first listing date. For each parent and subsidiary, we identify all stocks with the same four-digit SIC code. We then select the one with the closest market value so long as the market value is within $\pm 25\%$ of that of the parent-subsidiary firm. If there is no matching stock within the same four-digit SIC code and within $\pm 25\%$ of the market value of the parent (or subsidiary), the match is based on the three-digit code, then the two-digit code, and, finally, the one-digit code.[4] Panel A of table 1 gives the average market values and book-

3. The initial sample also included eight issues of "tracking" or "targeted" stock. Such securities did not exist during the period considered by Cusatis et al. (1993).

4. For one stock, we could find no match within $\pm 25\%$ of the market value in the four-, three-, two-, or one-digit numbers SIC code. For this stock, we expanded the matching interval to $\pm 80\%$ and identified a match in the same four-digit classification.

TABLE 1 **Descriptive Statistics for Size- and Industry-Matched Spin-off Parents and Subsidiaries**

A. Average Market Value of Equity and Book-to-Market Ratios

Year	Number of Parents	Average Market Value of Parents ($ Million)	Average Book-to-Market Ratio of Parents	Number of Subsidiaries	Average Market Value of Parents ($ Million)	Average Book-to-Market Ratio of Parents
1989	11	1,104.35	1.97	16	381.44	.66
1990	10	1,137.49	.58	12	383.55	.63
1991	7	1,107.69	.46	8	326.27	.43
1992	8	2,008.91	.67	9	442.05	.78
1993	14	815.47	.68	15	510.52	.60
1994	16	3,783.87	.47	18	641.93	.52
1995	14	3,401.23	.48	18	270.57	.53

B. Results of Size and Industry Matching

	Parents	Subsidiaries
Number of firms matched at the four-digit SIC level	42	52
Number of firms matched at the three-digit SIC level	10	17
Number of firms matched at the two-digit SIC level	19	22
Number of firms matched at the one-digit SIC level	9	5
Total number of firms	80	96

NOTE.—SIC = Standard Industrial Classification.

to-market ratios of parents and subsidiaries by year. Panel B shows the number of matches at the four-digit, three-digit, two-digit, and one-digit SIC levels.[5]

IV. Empirical Results

A. *Methodology*

For parents, raw buy-and-hold returns are computed for each stock i as

$$R_{i,T} = \left[\prod_{t=1}^{T}(1 + r_{i,t})\right] - 1, \tag{1}$$

where $r_{i,t}$ is the return on stock i in month t relative to the spin-off ex date, where XD signifies the ex-date month. The return over the first partial month is considered to be the return in month XD. The interval XD-6 includes the first partial month's return and the returns over the next 5 months. The average of the N individual buy-and-hold returns for the T months following the ex date is calculated as

$$\overline{R}_T = \frac{\sum_{i=1}^{N} R_{i,T}}{N}. \tag{2}$$

Buy-and-hold returns are calculated for the matching stocks ($R^m_{i,T}$), as in equations (1) and (2). Matched-firm-adjusted returns are calculated as the average of the differences in the buy-and-hold returns over the T months following the ex date as

$$\overline{\text{MFAR}}_T = \frac{\sum_{i=1}^{N}(R_{i,T} - R^m_{i,T})}{N}. \tag{3}$$

To judge the statistical significance of the MFARs, a t-statistic is calculated as

$$t = \frac{\overline{\text{MFAR}}_T}{s/\sqrt{N}}, \tag{4}$$

5. Parents tend to trade on the NYSE and AMEX (60 out of 80 stocks), whereas subsidiaries are evenly split between the combination of the NYSE-AMEX (47 out of 96) and the NASDAQ. Parents represent 36 different SIC categories, and subsidiaries represent 37 different categories, but parents and subsidiaries do not necessarily come from the same category.

where s is the standard deviation of $MFAR_T$s for the N firms in the sample.

For subsidiaries, raw returns and MFARs are calculated in the same way except that the calculations begin with the initial listing date, ID. (Again, our procedure mimics that of Cusatis et al.)

B. The Portfolio Strategy

To determine whether a particular strategy "beats the market" on an ex ante basis, it is necessary to spell out in advance precisely what that strategy is. Because the primary focus of Cusatis et al. (1993) is not the development of a beat-the-market strategy, they do not spell out what such a strategy might be. On the one hand, they note that the highest average excess returns are generated over a 24-month holding period following the spin-off. On the other hand, they present and discuss returns for the first 36 months following the ex date, and various writers in the popular press appear to imply that a 36-month holding period following the ex date is a good strategy (Serwer 1992; Ellis 1993; Michels and Neumeier 1994). We should recall, however, that in the Cusatis et al. study, subsidiaries actually show negative MFARs over months ID-6, and at least one writer in the popular press has proposed that investors buy spin-offs 6 months after the ex date (Gutner 1996). Thus, based on the results of Cusatis et al., for parents, the best strategy would have been to buy at the spin-off date and then hold for 24 months; for subsidiaries, the best strategy would have been to wait 6 months after the spin-off and then buy and hold for the next 30 months. Nevertheless, for comparison, we present results over the same intervals, as do Cusatis et al.

Table 2 presents the average raw returns and average MFARs for intervals of 6, 12, 24, and 36 months following the ex date for parents (panel A) and the initial listing date for subsidiaries (panel B). In calculating average raw returns and average MFARs, if a stock in the sample stops trading for any reason, the buy-and-hold return is computed using the last available stock price, and this return is used for performance measurement purposes for all subsequent intervals. If a matching stock stops trading for any reason, a new matching stock is chosen to replace that stock based on the same criteria used to select the original matching stock.

For mean-variance investors, the average return is the relevant measure of performance. Nevertheless, to give further information about the distribution of returns, the table also presents the medians, minima, and maxima MFARs along with the fraction of MFARs that are positive for both parents and subsidiaries over intervals of 6, 12, 24, and 36 months following the spin-offs.

TABLE 2 **Average Raw and Matched-Firm-Adjusted, Buy-and-Hold Returns for Spin-offs that Occurred over the Period January 1989 through December 1995**

			MFARs							
	Mean Number of Stocks	Mean Parent Stock Raw Returns (%)	Matching Parent Stock Raw Returns (%)	Mean (%)	Minimum (%)	Twenty-Fifth Fractile (%)	Median (%)	Seventy-Fifth Fractile (%)	Maximum (%)	% Positive
Panel A—parents (months relative to ex-date [XD]):										
6	80	17.77	9.13	8.64	−154	−15	3	18	684	58
		(1.94)	(2.98)	(.91)						
12	80	35.33	21.85	13.48	−379	−14	4	34	963	54
		(2.60)	(3.05)	(.90)						
24	80	79.09	59.88	19.21	−606	−49	0	37	2,272	50
		(2.66)	(4.78)	(.59)						
36	80	108.62	103.48	5.14	−2,220	−53	12	69	1,358	56
		(4.12)	(3.12)	(.13)						

Panel B—subsidiaries (months relative to initial listing date [ID]):										
6	96	21.23	12.33	8.90	−191	−36	−1	30	730	50
		(2.36)	(3.05)	(.90)						
12	96	29.30	22.09	7.21	−241	−49	4	48	734	52
		(2.78)	(3.51)	(.61)						
24	96	54.59	48.84	5.75	−830	−70	0	74	734	49
		(3.86)	(3.78)	(.29)						
36	96	79.32	100.19	−20.87	−1,213	−120	2	90	759	51
		(4.69)	(4.50)	(.75)						

NOTE.—Panel A (panel B) shows the average raw and matched-firm-adjusted, buy-and-hold returns. (MFARS) of spin-off parent (subsidiary) stocks for the 6, 12, 24, and 36 months following the ex-date of distribution (initial listing date). Panel A (panel B) also shows the minima, twenty-fifth fractiles, medians, seventy-fifth fractiles, and maxima of MFARs for parent (subsidiary) stocks along with the fraction of MFARs that are positive. For parents (subsidiaries) the matched firms are selected based on market value of equity on the ex-date of distribution (initial listing date) and the industry classification. The month of the distribution ex-date for parents (XD) and the month of the initial listing date (ID) for subsidiaries are considered to be month 1 for buy-and-hold return calculations. The matching stock returns are computed contemporaneously with those of each parent and subsidiary stock. The MFARs are obtained by subtracting the matching stock returns from the parent and subsidiary stock returns for a given return interval. The mean MFARs represent the equal-weighted average of the individual MFARs. If a parent stock or a subsidiary stock stops trading for any reason, the buy-and-hold return is computed using the last available stock price, and this return is used for all subsequent intervals up to 36 months. If a matching stock stops trading, a new matching stock is chosen to replace that stock based on the same criteria used to select the original matching stock. The *t*-statistics are in parentheses.

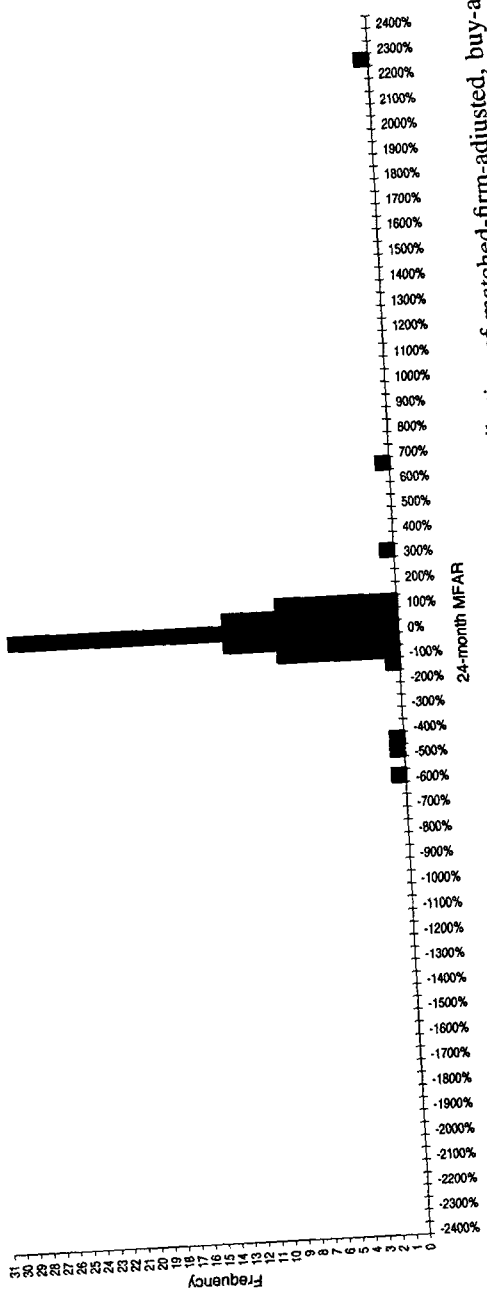
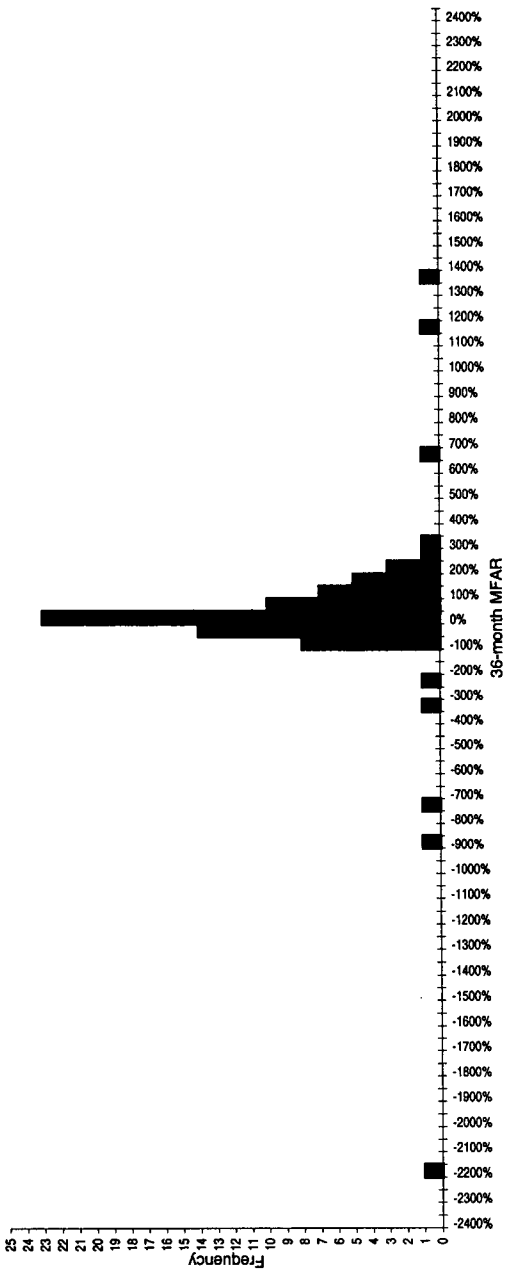


FIG. 1.—Frequency distributions of parent firm MFARs. Panel A, Frequency distribution of matched-firm-adjusted, buy-and-hold returns (MFARs) of spin-off parent stocks for the 24-month period following the ex-date of the spin-off.



Panel B, Frequency distribution of matched-firm-adjusted, buy-and-hold returns (MFARs) of spin-off parent stocks for the 36-month period following the ex-date of the spin-off.

C. *Parent Company Excess Stock Returns*

As shown in panel A of table 2, for parent company stocks, regardless of the interval considered, average raw buy-and-hold returns are impressive. Likewise, the average MFAR of 19.2% over months XD-24 is eye-catching. However, the *t*-statistic for this mean MFAR is only 0.59. Furthermore, the median MFAR is 0%, and 50% of the individual MFARs are negative. What gives rise to this peculiar combination of results?

What is happening is that the average MFAR for months XD-24 is pulled up by one very large positive outlier of 2,272%. As shown in panel A of figure 1, this one very positive MFAR is indeed unusual. When that one observation is dropped from the analysis, the distribution of MFARs is more symmetric and the mean MFAR becomes −9.3% (*t*-statistic = −0.58%). The extreme positive MFAR results from Republic Industries, a stock that went from $3.50 to $82.43 (on a split-adjusted basis) over the 24 months following the spin-off.[6]

The average MFAR for parents over the 36 months following the ex date is a much less impressive 5.1% (*t*-statistic = 0.13). However, the median MFAR over this interval is now 12%, and 56% of the MFARs are positive. Now what is happening? Over the interval XD-36, the mean MFAR is pulled down by one very large negative MFAR of −2,220%. The distribution of MFARs in panel B of figure 1 shows the degree to which this one observation is an extreme outlier. When this observation is removed from the calculations, the mean MFAR becomes 33.3% (*t*-statistic = 1.10). This outlier results from the performance of one of the matching stocks, Micron Technology Inc., which went from $15.50 to $384.38 (on a split-adjusted basis) over the 36 months following the spin-off. For both 24- and 36-month MFARs, the medians are, of course, unchanged by deletion of the outlier.

Thus, the best strategy for parents suggested by the Cusatis et al. results, buying at the spin-off date and holding for 24 months, would also have provided a substantial positive average excess return to an investor who had chosen to follow that strategy over the 7 years following the completion of the Cusatis et al. analysis. However, successful implementation of this strategy required comprehensive execution—had the investor "missed" one extremely successful parent company stock, the strategy would have underperformed the Cusatis et al. benchmark.

D. *Subsidiary Company Excess Stock Returns*

As shown in panel B of table 2, subsidiary stock average raw returns are also impressive over various intervals following the spin-off,

6. Republic Industries was not the target of a takeover.

though they are not as impressive as those of their parents. As regards the average MFAR, after the first 6 months it declines steadily. Unlike parent company MFARs, the distributions of MFARs for subsidiaries tend to be symmetric (as shown in panels A and B of fig. 2). And the medians are close to zero. For example, over the interval ID-24, the average MFAR is 5.8% (t-statistic = 0.29), the median MFAR is 0%, and 51% of the MFARs are negative. The largest positive MFAR is impressive at 734%, but that is offset by the largest negative MFAR of −830%.

Over the interval ID-36, for subsidiaries, the mean MFAR is −20.9% (t-statistic = −0.75), the median MFAR is 2%, and 51% of the MFARs are positive. The largest positive MFAR of 759% is more than offset by the largest negative MFAR of −1,213%. Figure 2 illustrates that the distribution of MFARs for subsidiaries is more symmetric and, therefore, less affected by outliers than the distribution for parents.

Finally, given that the average MFAR for subsidiaries declines after the sixth month, an investor who had followed the strategy of buying subsidiary stocks 6 months after the spin-off would have earned a negative excess return on his portfolio over every interval considered. Over the interval 7–24 months, the average MFAR was −3.3% (t-statistic = −0.24). Over the interval 7–36 months, the average MFAR was −21.3% (t-statistic = −0.99). Thus, if an investor had chosen the single best strategy for subsidiaries based on the results of Cusatis et al. (1993), that strategy would have been a big loser over the ensuing 7 years when measured against the Cusatis et al. benchmark.

In short, contrary to the time period considered by Cusatis et al., over the subsequent 7 years neither parents nor their spun-off subsidiaries consistently provided superior investment performance when compared with similar-sized companies from the same industries. There is superior performance over some holding periods, but that performance depends very much on the holding period considered. The one strategy that would have yielded superior returns for both parents and subsidiaries over the interval 1989–98 would have been to buy at the spin-off date and then hold for 24 months. The choice of that particular strategy, however, was not obvious from the Cusatis et al. analysis. To the extent that an investor would have chosen such a strategy, doing so would have been based, at least in part, on luck.

V. Other Performance Methodologies and Benchmarks

A. *Cumulative Monthly Returns*

In conducting our analysis, we have adopted the perspective of an investor who accepts the performance benchmark employed by Cusatis et al. (1993) as reasonable. That is, we tackle their results head on.

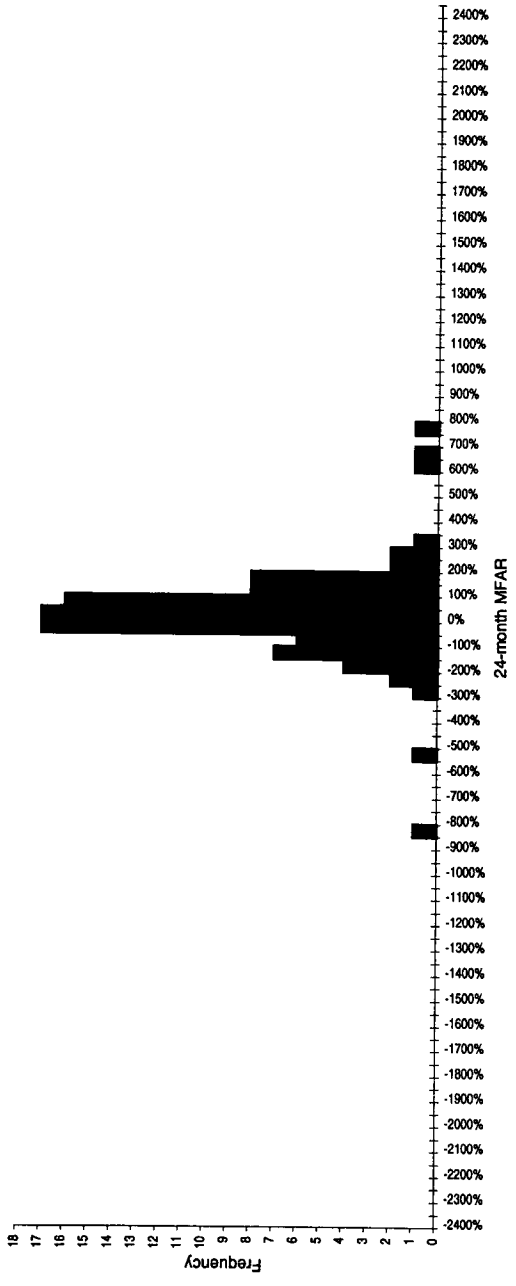
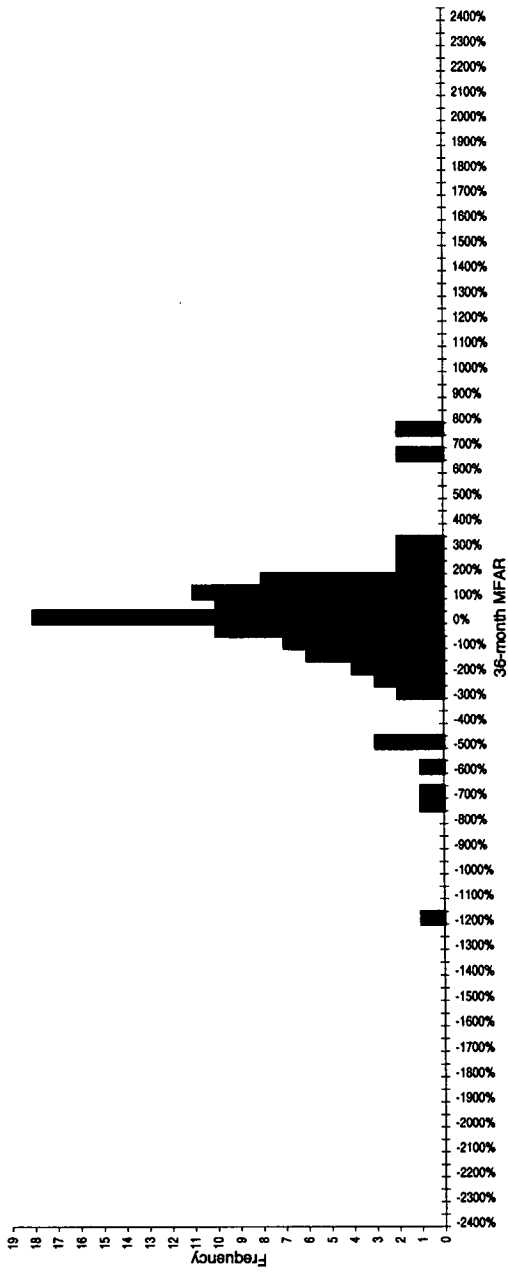


FIG. 2.—Frequency distributions of subsidiary firm MFARs. Panel A, Frequency distribution of matched-firm-adjusted, buy-and-hold returns (MFARs) of subsidiary stocks for the 24-month period following the initial listing date.



Panel B, Frequency distribution of matched-firm-adjusted, buy-and-hold returns (MFARs) of subsidiary stocks for the 36-month period following the initial listing date.

Fama (1998) and Mitchell and Stafford (2000) have argued that buy-and-hold returns provide an unreliable measure of performance. Fama argues that cumulative monthly returns provide a more reliable measure, especially when performance is measured over a long interval and when the return distribution is subject to the type of extreme skewness that we observe in stock returns following spin-offs.[7] To determine whether the results of our analysis result from the way in which returns are measured, we calculate cumulative monthly excess returns against our same sample of industry- and size-matched stocks.

We calculate cumulative matching-firm-adjusted returns (CMFARs) over the T months following the ex date for parents and the initial listing date for subsidiaries as

$$\text{CMFAR}_{i,T} = \sum_{t=1}^{T} (r_{i,t} - r^{m}_{i,t}), \tag{5}$$

where $r_{i,t}$ is the monthly return for the parent stock i or subsidiary stock i in month t, and $r^{m}_{i,t}$ is the return of the appropriate matching stock in the same month. If a stock is delisted prior to the performance interval of interest, the CMFAR through the delisting date is used for the entire interval. The t-statistics for the CMFARs are calculated as

$$t = \frac{\overline{\text{CMFAR}_T}}{s/\sqrt{N}}, \tag{6}$$

where $\overline{\text{CMFAR}_T}$ is the cross-sectional average of the $\text{CMFAR}_{i,T}$s in month T, and s is the standard deviation of the $\text{CMFAR}_{i,T}$s. Mean cumulative raw returns along with mean, median, maximum, and minimum CMFARs are presented in table 3 for parents (in panel A) and for subsidiaries (in panel B) for intervals of 6, 12, 24, and 36 months following the ex date (for parents) or following the first trading date (for subsidiaries).

Cumulative matching-firm-adjusted returns are strikingly different from MFARs. Presumably, this difference results from the dilution of the effect of outliers in the calculation of cumulative returns relative to their effect in the calculation of buy-and-hold returns. Nevertheless, the general conclusion that emerges with CMFARs is the same as when MFARs are used: strategies for buying the stocks of spin-off parents and subsidiaries that provided superior performance during the period analyzed by Cusatis et al. would not have yielded similarly positive performance over the subsequent 7 years when performance is measured relative to a sample of industry- and sized-matched stocks.

7. To the contrary, Barber and Lyon (1997) argue that buy-and-hold returns like those calculated by Cusatis et al. (1993) provide reliable inferences because they mimic returns that an investor could actually have achieved.

Let us consider certain specific results. For parents, consider the intervals XD-24 and XD-36. With buy-and-hold returns, the respective average MFARs are 19.2% (t-statistic = 0.59) and 5.1% (t-statistic = 0.13). With cumulative monthly returns, the CMFARs are −0.8% (t-statistic = −0.08) and −1.8% (t-statistic = −0.15). None of these is statistically different from zero, which may not be surprising. What may be surprising is that the signs of the excess returns are reversed.

The distributions of 24-month and 36-month CMFARs are given in figure 3. These distributions show the extent to which the effect of the outlier observations is curtailed with cumulative monthly returns relative to the distributions of buy-and-hold returns presented in figure 1. Even so, when the one large outlier, Republic Industries, is omitted from the calculations, the average of the CMFARs, for the 24-month and 36-month intervals following spin-offs, decline to −7.6% (t-statistic = −0.91) and −7.8% (t-statistic = −0.71). Thus, the deletion of the one major outlier reduces the CMFARs to even more negative levels. Failure to include this one big winner would have doomed the strategy of buying parents of spin-offs to substantially worse performance even when performance is measured with cumulative returns.

For subsidiaries, a similar reversal of fortune occurs. With cumulative monthly returns, every strategy would have been a winner. For example, the mean CMFAR for months XD-36 is 7.9% (t-statistic = 0.59) in comparison with the mean MFAR of −20.9% (t-statistic = −0.75). Or, if the investor had waited for 6 months to buy and then had held for the next 30 months, the cumulative average excess return would have been 4.0% (t-statistic = 0.33). This apparent reversal of fortunes arises because the one large outlier return in the analysis of MFARs for subsidiaries is one of the matching stocks. As shown in figure 4, the distributions of CMFARs for subsidiaries for 24 and 36 months following the spin-offs are much more compact than those computed with buy-and-hold returns, as presented in figure 2. Thus, the effect of outliers is reduced.

Nevertheless, when compared with a sample of sized-matched firms from the same industries, regardless of whether buy-and-hold returns or cumulative monthly returns are used for the comparison, on an ex ante basis, an investor would not have been able to profit from a strategy of buying spin-off parents and subsidiaries over the 7 years following the end of the period analyzed by Cusatis et al.—except, perhaps, by luck.

B. The Performance Benchmark: Size and Book-to-Market Portfolios

We have used the matching firm procedure (as implemented by Cusatis et al. 1993) to generate our performance benchmarks. We have done so because we have adopted the perspective of an investor who has

TABLE 3 **Average Raw and Matched-Firm-Adjusted Cumulative Returns for Spin-offs that Occurred over the Period January 1989 through December 1995**

	Number of Stocks	Mean Parent Stock Cumulative Raw Returns (%)	Mean Matching Stock Cumulative Raw Returns (%)	CMFARs						
				Mean (%)	Minimum (%)	Twenty-Fifth Fractile (%)	Median (%)	Seventy-Fifth Fractile (%)	Maximum (%)	% Positive
Panel A—parents (months relative to ex-date [XD]):										
6	80	13.39 (2.33)	9.34 (3.23)	4.06 (.66)	−170	−23	4	19	379	56
12	80	24.03 (3.40)	18.34 (3.92)	5.69 (.75)	−215	−13	4	26	417	54
24	80	44.55 (5.01)	45.34 (6.59)	−.80 (−.08)	−310	−41	−4	31	534	48
36	80	61.26 (6.15)	63.10 (7.68)	−1.84 (−.15)	−387	−47	6	39	471	54

Panel B—subsidiaries (months relative to initial listing date [ID]):										
6	96	15.97	12.06	3.91	−124	−35	−1	27	310	50
		(2.99)	(3.42)	(.63)						
12	96	22.46	19.19	3.27	−184	−35	−1	49	318	48
		(3.33)	(3.25)	(.40)						
24	96	47.52	36.59	10.93	−351	−54	2	67	448	53
		(5.23)	(4.40)	(.91)						
36	96	67.32	59.47	7.86	−368	−63	9	83	448	54
		(6.92)	(5.52)	(.59)						

NOTE.—Panel A (panel B) shows the average raw and matched-firm-adjusted cumulative returns (CMFARs) of spin-off parent (subsidiary) stocks for the 6, 12, 24, and 36 months following the ex-date of distribution (initial listing date). Panel A (panel B) also shows the minima, twenty-fifth fractiles, medians, seventy-fifth fractiles, and maxima of CMFARs for parent (subsidiary) stocks along with the fraction of CMFARs that are positive. For parents (subsidiaries) the matched firms are selected based on market value of equity on the ex-date of distribution (initial listing date) and the industry classification. The month of the distribution ex-date for parents (XD) and the month of the initial listing date (ID) for subsidiaries are considered to be month 1 for cumulative return calculations. The matching stock returns are computed contemporaneously with those of each parent and subsidiary stock. The CMFARs are obtained by subtracting the matching stock cumulative returns from the parent and subsidiary stock returns for a given return interval. The mean CMFARs represent the equal-weighted average of the individual CMFARs. If a parent stock or a subsidiary stock stops trading for any reason, the cumulative return is computed using the last available stock price, and this return is used for all subsequent intervals up to 36 months. If a matching stock stops trading, a new matching stock is chosen to replace that stock based on the same criteria used to select the original matching stock. The *t*-statistics are in parentheses.

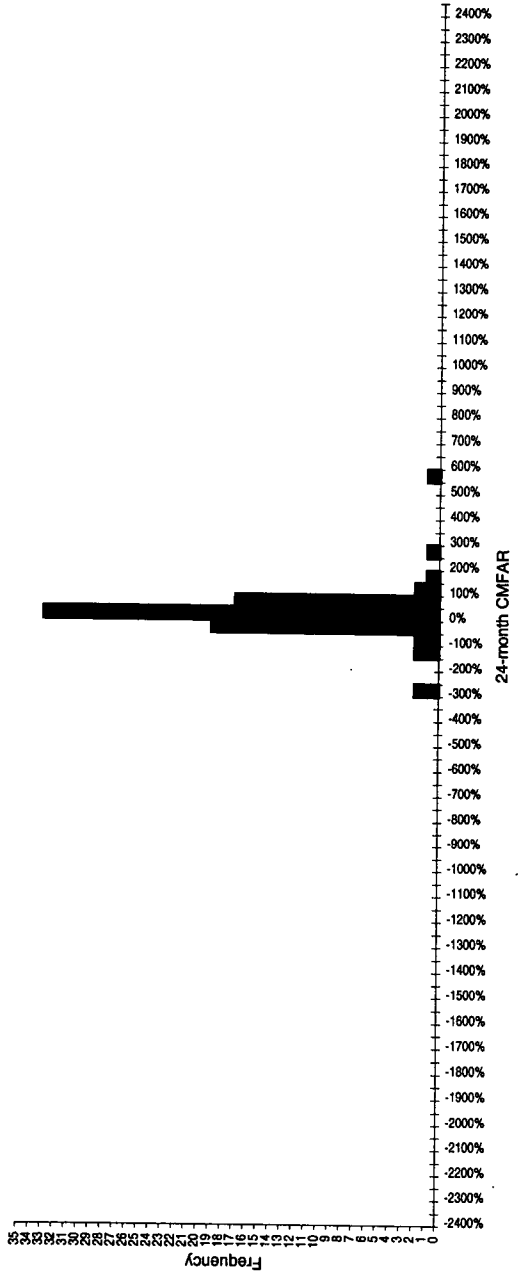
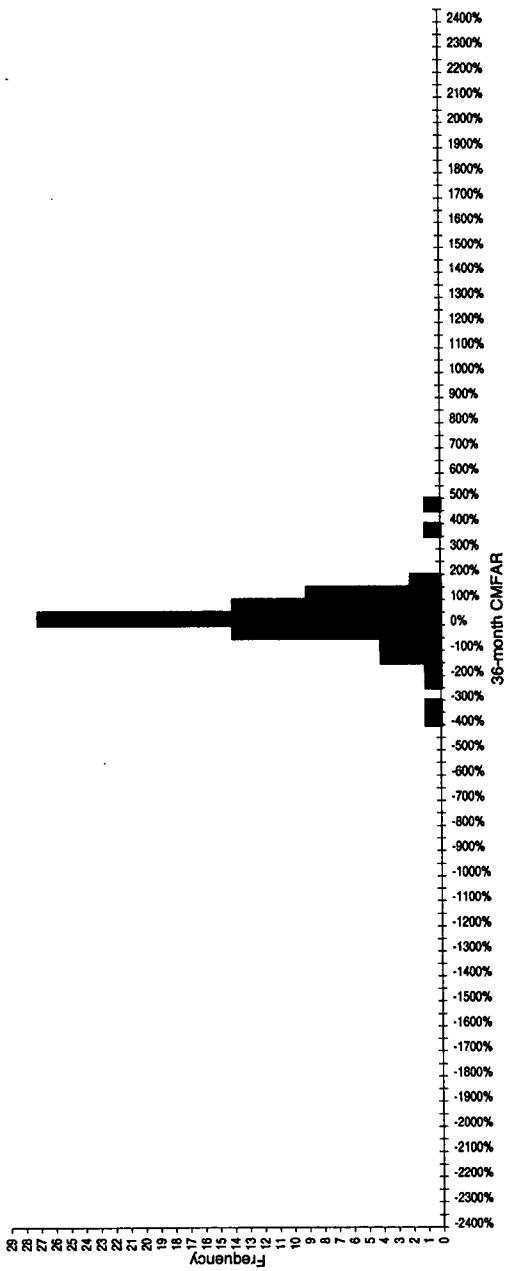


FIG. 3.—Frequency distributions of parent firm CMFARs. Panel A, Frequency distribution of matched-firm-adjusted, cumulative returns (CMFARs) of spin-off parent stocks for the 24-month period following the ex-date of the spin-off.



Panel B, Frequency distribution of matched-firm-adjusted, cumulative returns (CMFARs) of spin-off parent stocks for the 36-month period following the ex-date of the spin-off.

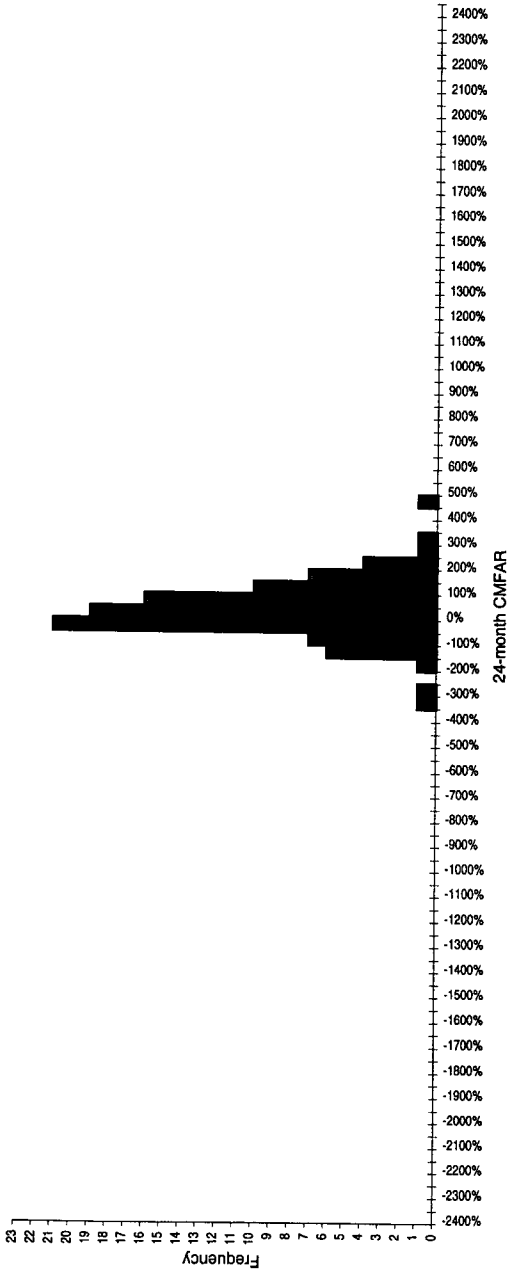
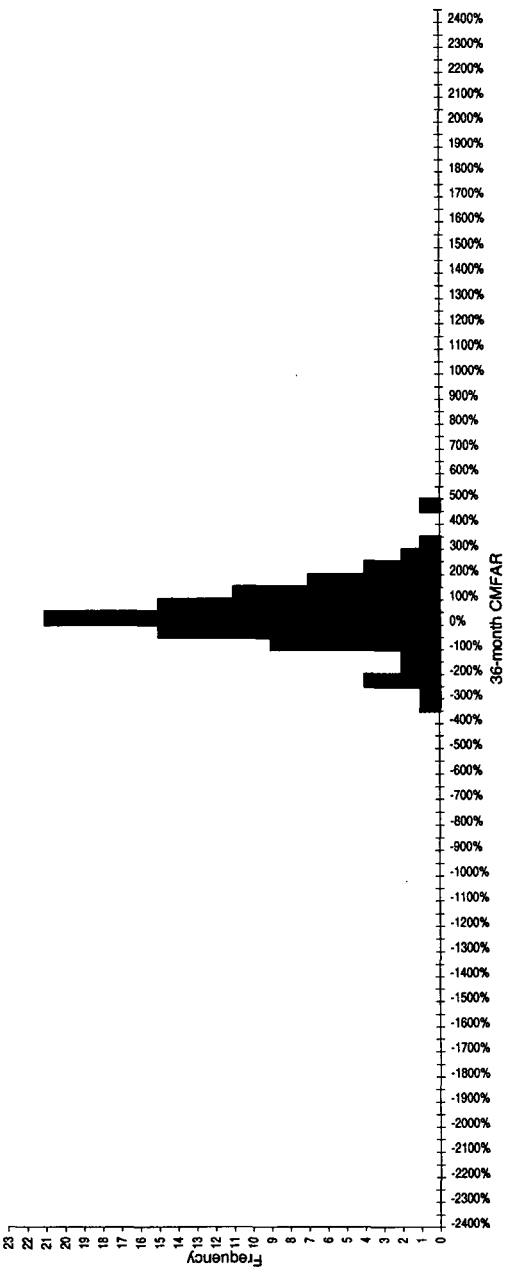


FIG. 4.—Frequency distributions of subsidiary firm CMFARs. Panel A, Frequency distributions of matched-firm-adjusted, cumulative returns (CMFARs) of subsidiary stocks for the 24-month period following the initial listing date.



Panel B, Frequency distribution of matched-firm-adjusted, cumulative returns (CMFARs) of subsidiary stocks for the 36-month period following the initial listing date.

access to their results and accepts their benchmark as reasonable. Lyon et al. (1999) show, however, that several other methodologies have greater power to reject a false null hypothesis than does the matching-firm procedure. That evidence raises the possibility that the use of a more powerful methodology could yield a different conclusion for our investor and for the efficient-market hypothesis. To address that possibility, we consider two additional benchmarks. First, we use a size and book-to-market matching portfolio procedure. Second, we use the Fama and French (1993) three-factor model.

To implement the size and book-to-market matching portfolio procedure, we calculate the market value of all NYSE and AMEX stocks as the product of the number of shares outstanding and the price per share at the end of April of each year from 1988 to 1998. Using these market values, we form 10 portfolios, with an equal number of stocks in each portfolio. Stocks with the smallest market values are placed into portfolio 1, and those with the largest market values are placed into portfolio 10. For each stock, we also calculate the book-to-market equity ratio using the most recently reported book value of equity prior to April of each year. Within each size-based decile, stocks are then sorted into five groups on the basis of their book-to-market equity ratios—stocks with the lowest ratios are placed into quintile 1, and those with the highest ratios are placed into quintile 5. These sorts yield 50 size and book-to-market portfolios for each year. We calculate equal-weighted monthly returns (R_t^p) for each of these 50 portfolios for each month t from January 1989 through December 1998.

Parent stocks are matched with a portfolio according to the parent stock's market value as of the April preceding the ex date and the book-to-market equity ratio as of the year-end prior to the ex date. A new matching size and book-to-market portfolio is selected as of each April thereafter.

Attaching subsidiary stocks to size and market-to-book portfolios is less straightforward because the book value of a subsidiary's equity typically is not available until several months after the initial listing date. As a proxy, we use the first available book equity value along with the first available market value of equity to match subsidiary stocks to size and book-to-market portfolios. As with parents, a new matching portfolio is selected for each subsidiary each April after the first year. For nine parents and nine subsidiaries, *Compustat* does not report book values. For these companies, we collect the book value of equity from various issues of *Moody's Manuals.*

To calculate buy-and-hold matching-portfolio-adjusted returns (BHMPARs), we calculate a buy-and-hold return for each parent stock ($R_{i,T}$) and its matching portfolio (R_T^P), as in equation (1). We then calculate the average BHMPAR for parent stocks, as in equation (3). If a stock discontinues trading, its matching-portfolio-adjusted return from

month XD through the delisting month is used as its BHMPAR for each interval thereafter. For subsidiaries, BHMPARs are calculated in the same way except that the calculations begin with the initial listing date.

Heretofore, when discussing the statistical significance of benchmark-adjusted returns, we have used the *t*-statistic because that is the statistic considered by Cusatis et al. When considering the statistical significance of the BHMPARs, we use *p*-values generated by means of a bootstrap procedure (as in Ikenberry et al. 1995). To generate *p*-values, we match each parent (and each subsidiary) stock in chronological time, beginning with the ex date (or listing date), with a randomly selected stock listed on the NYSE or the AMEX from the same size and book-to-market portfolio as the parent (or subsidiary) stock. We continue this matching procedure until all parents and subsidiaries are represented in their respective pseudoportfolios. Buy-and-hold matching-portfolio-adjusted returns (using the same size and book-to-market portfolios) are calculated for intervals of 6, 12, 24, and 36 months following the ex date (or the listing date) for parent (and subsidiary) pseudoportfolios. Thus, each pseudoportfolio yields one BHMPAR observation for each interval. This procedure is repeated 1,000 times to obtain empirical distributions of the BHMPARs. These distributions provide our *p*-values.

BHMPARs for parents (panel A) and for subsidiaries (panel B) for intervals of 6, 12, 24, and 36 months following spin-offs, along with their respective *p*-values, are presented in table 4. For both parents and subsidiaries, and regardless of the interval considered, the average BHMPARs are positive and substantial. All but one has a *p*-value of less than 0.05. For example, for parents, for the intervals XD-24 and XD-36, the average BHMPARs are 49.0% (*p*-value = 0.00) and 58.4% (*p*-value = 0.00). For subsidiaries, for the interval ID-24, the average BHMPAR is 23.9% (*p*-value = 0.02). The one interval for which the *p*-value is not less than 0.05 is for ID-36 for subsidiaries. For this interval, the average BHMPAR is 26.9%, with a *p*-value of 0.09.

As with the MFARs, the average BHMPARs are substantially influenced by the extraordinary performance of one stock. For parents, when the stock with the largest excess return is deleted, the average 24-month BHMPAR is reduced from 49.0% to 21.5% and the average 36-month BHMPAR is reduced from 58.4% to 43.0%. For subsidiaries, the effect is less pronounced; when the stock with the largest excess return is deleted, the average BHMPAR for 24 months declines from 23.9% to 16.4%, and for 36 months it declines from 26.9% to 19.4%.[8] Thus, the excess returns based on size and book-to-market portfolio benchmarks

8. Not shown in table 4 are excess returns for the interval 7–36 months. For subsidiaries, the average BHMPAR is 13.5% (*p*-value = .07).

TABLE 4 **Average Size and and Book-to-Market Matched Portfolio Adjusted Buy-and-Hold Returns for Spin-offs that Occurred over the Period January 1989 through December 1995**

	Number of Stocks	Mean Parent Stock Raw Returns (%)	Mean Matching Portfolio Raw Returns (%)	BHMPARs						
				Mean (%)	Minimum (%)	Twenty-Fifth Fractile (%)	Median (%)	Seventy-Fifth Fractile (%)	Maximum (%)	% Positive
Panel A—parents (months relative to ex-date [XD]):										
6	80	17.77	8.18	9.59 (.01)	−96	−20	−1	18	665	49
12	80	35.33	12.95	22.39 (.00)	−103	−21	2	22	939	53
24	80	79.09	30.14	48.96 (.00)	−125	−29	8	45	2221	55
36	80	108.62	50.19	58.43 (.00)	−199	−42	5	84	1343	53

Panel B—subsidiaries (months relative to initial listing date [ID]):										
6	96	21.23	8.74	12.49 (.00)	−59	−21	0	18	734	50
12	96	29.30	13.56	15.75 (.00)	−88	−33	−3	33	734	46
24	96	54.59	30.71	23.89 (.02)	−112	−52	−11	39	734	45
36	96	79.32	52.45	26.87 (.09)	−231	−73	−22	62	736	43

NOTE.—Panel A (panel B) shows the average size and book-to-market matched portfolio adjusted buy-and-hold returns (BHMPARs) of spin-off parent (subsidiary) stocks for the 6, 12, 24, and 36 months following the ex-date (XD) of distribution (initial listing date; ID). Size and book-to-market portfolios are formed by first sorting all NYSE-AMEX firms into 10 size-based portfolios at the end of April in each year from 1988 to 1997. Each size-based decile is then further stored into five portfolios based on the book-to-market ratios, using the most recently reported book values prior to April. This procedure results in 50 portfolios for which equally weighted monthly returns are calculated. Parent stocks are matched with a portfolio according to the parent stock's market value as of the April preceding the ex date and to the book-to-market equity ratio as of the year-end prior to the ex date. The first available book equity value along with the first available market value of equity is used to match subsidiary stocks to size- and book-to-market portfolios. A new matching size- and book-to-market portfolio is selected as of each April thereafter. *P*-values appear in parentheses.

are large. With or without outliers, an investor could have concluded that he had "beat the market" with a strategy of buying parents and subsidiaries following corporate spin-offs—regardless of the holding period considered. Evaluation of these results for the efficient market hypothesis is less clear-cut. In most, but not all, instances, the test statistics reject the null hypothesis of no excess returns at the 0.05 level of statistical significance. On that basis, the tests reject the semistrong form of the efficient market hypothesis. If, however, we impose a strict requirement that the null hypothesis be rejected at the 0.05 level over every interval considered, then the tests do not reject the semistrong form of the efficient market hypothesis.

C. *The Performance Benchmark: The Fama and French Three Factor Model*

We now consider excess returns when the Fama-French (1993) three-factor model is used as the performance benchmark. The three factors of the Fama and French model are the monthly returns on a size factor (small-market value stock returns minus large-market value stock returns), the monthly returns on a market-book factor (the return on high book-to-market stocks minus the return on low book-to-market stocks), and the monthly returns on a market factor (the return on a value-weighted portfolio index of all NYSE, AMEX, and NASDAQ stocks less the contemporaneous return on a 30-day T-bill).

We implement the Fama and French model, as in Loughran and Ritter (1995) and Ikenberry et al. (1995). In particular, the average monthly return on the portfolio of parent (subsidiary) stocks less the contemporaneous return on a 30-day T-bill is regressed against the contemporaneous returns of the three factors of the Fama and French model. New parent (subsidiary) stocks are added to the portfolio in the calendar month of the stock's ex date, XD (initial listing date, ID), and stocks are removed in the calendar month that marks either the end of the holding period of interest or when the stock is delisted. Regressions are estimated for holding periods of 6, 12, 24, and 36 months. The intercept of this regression represents the average monthly excess return earned by the parent or subsidiary stock portfolio.

The results for parents are presented in panel A of table 5, and results for subsidiaries are presented in panel B. To an extent, the results based on the Fama and French model lie between those produced with the matching firm procedure and those produced with the matching portfolio procedure. For each interval considered and for both parents and subsidiaries, the intercept is positive (in which case, the performance is better than when the matching firm procedure is used to identify a benchmark), but in no case is the t-statistic greater than 1.50, and most are much below that level (in which case, the performance is worse

TABLE 5 Fama-French Regressions of Spin-off Parent and Subsidiary Portfolios

	Coefficients Estimates				
	α	β_1	β_2	β_3	R^2
Panel A—parents (months relative to ex-date [XD]):					
6	.0074	1.3256	−.1713	.4609	.17
	(.76)	(4.28)	(−.42)	(1.02)	
12	.0072	1.0469	.5665	.0072	.43
	(1.48)	(6.85)	(2.87)	(.03)	
24	.0032	1.1170	.5554	−.1513	.69
	(1.06)	(12.11)	(4.88)	(−1.09)	
36	.0019	.8731	.8034	.2685	.45
	(.45)	(7.25)	(5.13)	(1.40)	
Panel B—subsidiaries (months relative to initial listing date [ID]):					
6	.0095	1.8024	1.5856	.6317	.40
	(1.29)	(4.66)	(5.26)	(1.86)	
12	.0041	1.3065	1.0046	.2191	.54
	(.82)	(8.28)	(4.92)	(.94)	
24	.0010	1.2782	1.1103	.1449	.64
	(.24)	(10.21)	(7.17)	(.77)	
36	.0024	.9244	1.0986	.4251	.46
	(.49)	(6.74)	(6.14)	(1.941)	

NOTE.—Panel A (panel B) shows the coefficients of the following time-series regression for spin-off parent (subsidiary) stocks over the holding periods XD-6, XD-12, XD-24, and XD-36 (ID-6, ID-12, ID-24, and ID-36):

$$(R_P - R_F) = \alpha + \beta_1(R_M - R_F)_t + \beta_2 \mathrm{SMB}_t + \beta_3 \mathrm{HML}_t + \epsilon_t$$

where $(R_P - R_F)_t$ is the average monthly return on the portfolio of parent (subsidiary) stocks less the contemporaneous return on a 30-day T-bill in calendar month t; $(R_M - R_F)_t$ is the return on a value-weighted portfolio index of all NYSE, AMEX, and NASDAQ stocks less the contemporaneous return on a 30-day T-bill; SMB_t is the difference between the value-weighted average return on the small-cap portfolios and large-cap portfolios; and HML_t is the difference between the value-weighted average return on the high book-to-market portfolios and low book-to-market portfolios. New parent (subsidiary) stocks are added to the portfolio in the calendar month of the stocks' XD (ID) and stocks are removed in the calendar month that marks either the end of the holding period of interest or when the stock is delisted. The t-statistics are in parentheses.

than when the size- and book-to-market-matching portfolio procedure is used to construct a benchmark).

For parents, for the 24-month holding period, the intercept is 0.0032 (t-statistic = 1.06), which implies a total excess return of 7.7% over the 24-month holding period. For the 36-month holding period, the intercept is 0.0019 (t-statistic = 0.45), which implies a total excess return of 6.8% over the 36-month holding period. Although the implied excess returns are not statistically significant based on conventionally required levels of significance, for many investors these excess returns

might be judged to be quite handsome. As might be anticipated, these results are highly sensitive to the one large outlier—Republic Industries. When that observation is omitted, the magnitude of the intercepts and their implied excess returns decline such that the implied excess return for the 24-month interval declines to 4.5%, and the implied excess return for the 36-month interval declines to 4.9%.

For subsidiaries, the intercept for the 24-month holding period is 0.0010 (t-statistic = 0.24), which implies a total excess return of 2.4% over the period ID-24. For the period ID-36, the intercept is 0.0024 (t-statistic = 0.49), which implies a total excess return of 8.6% over the 36-month period. For the interval of months 7–36, the intercept is considerably lower: 0.0014 (t-statistic = 0.30). For the 30 months 7–36, the implied total excess return is 4.1%.

Thus, when measured against the Fama and French three-factor model, the strategy of buying spin-off parents and subsidiaries over the period 1989–95 provided positive, albeit small, excess returns. In no case is the intercept of the Fama and French regression statistically significant at the 0.05 level. Whether the excess returns generated by the strategy are economically significant must lie in the eye of the beholder. To us, they look rather modest. However, if an investor had implemented the strategy on an ex ante basis over the time period considered and if the Fama and French model were considered the appropriate benchmark of performance, the investor could conclude that he had "beat the market." Taken as a whole, however, the results based on the Fama and French model cannot reject the semistrong form of the efficient market hypothesis.

VI. Takeover Frequency and Takeover Premiums

Cusatis et al. (1993) determine that a large fraction of the excess returns to the parents and subsidiaries in their sample results from the stocks of companies that were taken over or merged following the spin-off. Perhaps our results differ from theirs because the time period encompassed by our sample experienced an unusually low level of takeover activity or because the takeover premiums paid during our time period were unusually low. Cusatis et al. report that 14% of their 146 parent companies and 14% of their 131 subsidiaries were taken over or merged during the 36 months following the spin-off. These fractions are quite comparable to those experienced by our parents and subsidiaries. Of our 80 parents, 10, or 12.5% of the sample, were taken over or merged during the 36 months following the spin-off; of our 96 subsidiaries, 15, or 16% of the sample, were taken over or merged during the same 36 months. Thus, when we consider spin-off parents and subsidiaries, the difference in takeover frequency between the two time periods cannot explain the difference between our results and those of Cusatis et

al. Perhaps the difference results from a difference in the size of the takeover premiums paid in the two time periods.

Cusatis et al. do not report statistics regarding the size of takeover premiums, but they do calculate MFARs for parents and for subsidiaries excluding the takeover premiums received. For parents, the mean MFARs, excluding takeover premiums, for XD-24 and XD-36 are 22.2% (t-statistic = 2.11) and 11.7% (t-statistic = 1.03), respectively. These compare with the mean MFARs of 26.7% and 18.1% when takeover premiums are included. A comparison of these results implies that takeover premiums add about 4%–6% to parent MFARs.

For subsidiaries, Cusatis et al. report mean MFARs, excluding takeover premiums, for ID-24 and ID-36 as 20.0% (t-statistic = 1.94) and 24.3% (t-statistic = 1.71), respectively. For the same intervals, the mean MFARs, including takeover premiums, are 25.0% and 33.6%. Thus, for these intervals, the takeover premiums add about 5%–9% to the mean MFARs.

For the time period of our study, 1989–98, for parents, the mean MFARs, excluding takeover premiums, for ID-24 and ID-36 are 18.9% (t-statistic = 0.58) and 3.0% (t-statistic = 0.07), respectively. These compare with mean MFARs, including takeover premiums, for ID-24 and ID-36 of 19.2% and 5.1%, respectively. Over the period 1989–98, takeover premiums added roughly 1%–2% to MFARs for parents. For subsidiaries, the mean MFARs, excluding takeover premiums, for ID-24 and ID-36 are −5.6% (t-statistic = −0.32) and −35.4% (t-statistic = −1.35), respectively. These compare with mean MFARs, including takeover premiums, for ID-24 and ID-36 of 5.8% and −20.9%, respectively. During the time period considered by our study, takeover premiums added about 11%–15% to mean MFARs. These results imply that takeover premiums for parents of spin-offs were slightly higher during the period covered by Cusatis et al. than during the period covered by this study. By contrast, takeover premiums for subsidiaries were slightly lower during the period examined by Cusatis et al. than during the period covered by this study. That is, MFARs for our sample of subsidiaries are lower than the MFARs of the Cusatis et al. sample even though the takeover premiums are higher for our sample. Thus, differences in the magnitude of takeover premiums do not appear to explain the difference in performance between the 1965–88 interval and the 1989–95 interval.

VII. Summary and Conclusion

Studies of long-horizon postevent stock returns (such as Cusatis et al. 1993) have been interpreted as evidence against the semistrong form of the efficient market hypothesis. We examine long-run returns generated by a strategy of buying the stocks of parent firms that undertake

spin-offs or the stocks of the spun-off subsidiaries after the spin-off occurred. We consider the period 1989–95. We analyze this period because it follows and does not overlap with the period considered by Cusatis et al. Thus, we address the question of whether, on an ex ante basis, an investor could have beat the market based on an ex post analysis of the Cusatis et al. results.

We compare returns against three benchmarks: (1) size- and industry-matched stocks, (2) portfolios of stocks matched on size and book-to-market equity ratios, and (3) the Fama and French (1993) three-factor model. We analyze returns over various intervals up to 36 months following spin-offs. The conclusions that we draw from the analysis depend at least in part on the performance benchmark employed. In comparison with samples of industry- and size-matched stocks, the strategy of investing in spin-off parents and subsidiaries was, at best, a break-even proposition and, to the extent that the strategy "worked," it depended on the extraordinary performance of one outlier observation. In comparison with portfolios of stocks matched on the basis of size and book-to-market equity ratios, both spin-off parents and their spun-off subsidiaries were winners. Parents and subsidiaries beat their benchmarks by sizable margins over every post-spin-off interval considered. Here too, however, the superior performance frequently depended on the excess returns earned by one sample firm. Over many, but not all, intervals, these excess returns are statistically significant. In comparison with the Fama and French three-factor model, both parents and subsidiaries eked out positive excess returns, but over no interval were the excess returns close to statistically significant. Overall, from our perspective, the results of our analysis indicate that post-spin-off stock returns do not provide robust evidence against the semistrong form of the efficient market hypothesis.

References

Agrawal, A.; Jaffe, J.; and Mandelker, G. 1992. The post-merger performance of acquiring firms: A re-examination of an anomaly. *Journal of Finance* 47:1605–21.

Allen, J.; Lummer, S.; McConnell, J.; and Reed, D. 1995. Can takeover losses explain spinoff gains? *Journal of Financial and Quantitative Analysis* 30:465–85.

Ball, R., and Brown, P. 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research* 6:159–78.

Barber, B. M., and Lyon, J. D. 1997. Detecting long-run abnormal stock returns: The empirical power and specification of test-statistics. *Journal of Financial Economics* 43: 341–72.

Bernard, V., and Thomas, J. 1990. Evidence that stock prices do not fully reflect the implications of current earnings for future earnings. *Journal of Accounting and Economics* 13:305–40.

Brav, A., and Gompers, P. A. 1998. Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and nonventure capital-backed companies. *Journal of Finance* 52:1791–1821.

Carter, R. B.; Dark, F. H.; and Singh, A. K. 1998. Underwriter reputation, initial returns and the long-run performance of IPO stocks. *Journal of Finance* 53:285–311.

Cusatis, P.; Miles, J.; and Woolridge, J. R. 1993. Restructuring through spinoffs: The stock market evidence. *Journal of Financial Economics* 33:293–311.
Daley, L.; Mehrotra, V.; and Sivakumar, R. 1997. Corporate focus and value creation: Evidence from spinoffs. *Journal of Financial Economics* 45:257–81.
Desai, H., and Jain, P. C. 1999. Firm performance and focus: Long-run stock market performance following spinoffs. *Journal of Financial Economics* 54:75–101.
Dharan, B., and Ikenberry, D. 1995. The long-run negative drift of post-listing stock returns. *Journal of Finance* 50:1547–74.
Ellis, J. 1993. This new strategy can get you 50% in 16 months. *Money* (September), pp. 88–90.
Fama, E. 1998. Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics* 49 (September): 283–306.
Fama, E., and French, K. R. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33:3–56.
Gilson, S.; Healy, P.; Noe, C.; and Palepu, K. 1997. Information effects of spinoffs, equity carve-outs and targeted stock offerings. Working paper. Cambridge, Mass.: Harvard Business School.
Gutner, T. 1996. Pick your moment—and catch a rising spin-off. Ed. Amy Dunkin. *Business Week* (May 13), pp. 156–57.
Hayes, J. R. 1997. Wall Street loves split-ups. But what does the record show about them? *Forbes* (October 20), p. 215.
Henriques, D. B. 1991. Wall Street; The not-so-subtle lure of spinoffs. *New York Times* (June 23), p. 15.
Hite, G., and Owers, J. 1983. Security price reaction around corporate spin-off announcements. *Journal of Financial Economics* 12:409–36.
Ikenberry, D., and Lakonishok, J. 1993. Corporate governance through proxy contest: Evidence and implications. *Journal of Business* 66:405–35.
Ikenberry, D.; Lakonishok, J.; and Vermaelen, T. 1995. Market underreaction to open market share repurchases. *Journal of Financial Economics* 39:181–208.
Ikenberry, D.; Rankine, G.; and Stice, E. 1996. What do stock splits really signal? *Journal of Financial and Quantitative Analysis* 31:357–77.
Kothari, S. P., and Warner, J. 1997. Measuring long-horizon security price performance. *Journal of Financial Economics* 43:301–39.
Krishnaswami, S., and Subramanian, V. 1999. Information asymmetry, valuation, and the corporate spinoff decision. Forthcoming, *Journal of Financial Economics*. 53, no. 3: 73–112.
Lee, I. 1997. Do firms knowingly sell overvalued equity? *Journal of Finance* 52:1439–66.
Loughran, T., and Ritter, J. 1995. The new issues puzzle. *Journal of Finance* 50:23–51.
Loughran, T., and Vijh, A. M. 1998. Do long-term shareholders benefit from corporate acquisitions? *Journal of Finance* 52:1765–90.
Lyon, J. D.; Barber, B. M.; and Tsai, C. L. 1999. Improved methods for tests of long-run abnormal stock returns. *Journal of Finance* 54:165–201.
Michaely, R.; Thaler, R.; and Womack, K. 1995. Price reactions to dividend initiations and omissions. *Journal of Finance* 38:573–608.
Michels, A. J., and Neumeier, S. 1994. Spiffy returns from spinoffs. *Fortune* (April 18), pp. 31–32.
Miles, J., and Rosenfeld, J. 1983. The effect of voluntary spinoff announcements on shareholder wealth. *Journal of Finance* 38:1597–1606.
Mitchell, M., and Stafford, E. 2000. Managerial decisions and long term stock price performance. *Journal of Business* 73, no. 3:287–329.
Rau, P. R., and Vermaelen, T. 1998. Glamour, value and the post-acquisition performance of acquiring firms. *Journal of Financial Economics* 49:223–54.
Ritter, J. 1991. The long-run performance of initial public offerings. *Journal of Finance* 46:3–28.
Schipper, K., and Smith, A. 1983. Effect of recontracting on shareholder wealth: The case of voluntary spinoffs. *Journal of Financial Economics* 12:437–67.
Serwer, A. E. 1992. Super payoffs from spinoffs. *Fortune* (March 23), p. 34.
Sivy, M. 1996. Seven strategies to help you outrun the market. *Money* (June), p. 152.
Siwolop, S. 1997. Quiet spinoffs talk the loudest in returns. *New York Times* (February 23), sec. 3, p. 3.

Speiss, K., and Affleck-Graves, J. 1995. Underperformance in long-run stock returns following seasoned equity offerings. *Journal of Financial Economics* 38:243–67.

Taub, S. 1993. Why spinoffs are a whirl of an investment. *Financial World* (February 16), p. 12.

Vijh, A. 1999. Long-term returns from equity carveouts. *Journal of Financial Economics* 51:273–308.

Wruck, E., and Wruck, K. 1997. Codependent no more? How spinoffs affect parent and spinoff firms' performance. Working paper. Cambridge, Mass.: Harvard University.