

Leveraged Buyouts: A Comparison of OTC With Exchange Listed Companies

Dr. M. Fall Ainina, Finance, Wright State University
Dr. Nancy Mohan, Finance, University of Dayton
Dr. Peter W. Bacon, Finance, Wright State University

Abstract

This paper studies alternative segments of the LBO market for the period 1980-1988. The sample, segmented by trading location and by size and year of the buyout offer, consists of 442 announcements: 161 over-the-counter (OTC) firms and 281 exchange listed firms. On average, the prediction errors for the entire sample for a -1, +1 window is 14.37 percent. Additionally, we find significant prediction errors for both OTC and exchanged listed firms. However, there are significant differences between the returns earned by shareholders of OTC vs. exchanged listed companies and these differences vary by year.

Introduction

Leveraged buyouts (LBOs), as a financial phenomenon, have received a considerable amount of attention by academic researchers. Numerous articles focus on justifying the process, documenting shareholder returns, identifying wealth transfer effects (if any), and developing a going private profile. Most of the published studies examine exchange listed companies. Lehn and Poulsen (1989) do include over-the-counter (OTC) buyouts; however, their study does not compare exchange listed versus over-the-counter buyouts. Our study contributes to the LBO literature by providing such a comparison. Articles appearing in the financial press suggest that the LBO middle market may be less competitive, hence returns to shareholders in the middle market category could be smaller than those published in prior studies.¹ Although middle market LBOs are not strictly OTC, for purposes of this paper we use both trading location and size of the LBO offer as market qualifiers.

I. Background and Related Literature

By definition, a leveraged buyout occurs when a public company or a segment of a public company is purchased using primarily debt financing. A going private buyout involves the leveraged buyout of a public company, that is, all public stock is purchased and the stock is no longer required to be registered with the SEC. Usually, at the conclusion of the transaction, company ownership is shared by management and an outside group of investors who have supplied or arranged the necessary financing. Thus, management is a

negotiator for both sides of the transaction.

Going private LBOs have received intense public scrutiny due to a potential breach of fiduciary duty by management. The lower the buyout price (and thus returns to public shareholders) the higher the potential rewards to incumbent management. Recognizing this potential conflict of interest, several researchers have suggested both practical and theoretical justifications for such transactions. In particular, a firm going private would (a) reduce the agency costs associated with the separation of management and control², (b) generate tax savings associated with higher depreciation and interest charges³, and (c) eliminate the need to submit to expensive public reporting requirements.⁴

Management should be willing to share the potential savings generated from going private with public shareholders in order to complete the transaction. In most LBOs, management does not own a controlling block of shares of the public company.⁵ Therefore, in order to preclude a rival takeover bid from being successful, management must be willing to offer a substantial or at least a reasonable premium to the public shareholders.⁶

Empirically, "gains-sharing" in going private transaction is well documented. In a study of firms going private during the time period 1973-1980, DeAngelo, DeAngelo and Rice (1984) find that public shareholders experience an average wealth change in excess of 22 percent over a two-day period surrounding the announcement date. In an updated study of LBOs occur-

ring between 1982-1985, Torabzadeh and Bertin (1987) find that public shareholders realize a positive excess return of 23.26 percent. More recently, Lehn and Poulsen (1989) report a slightly lower abnormal return--16.3 percent (-1, +1 window) for a sample of firms announcing LBOs during 1980 to 1987.⁷

The smaller average abnormal return reported by Lehn and Poulsen is puzzling. The difference in reported returns may be due to sampling errors or fundamental changes in the LBO market. Lehn and Poulsen's sample is much larger than that reported in prior studies--244 versus 72 for DeAngelo, DeAngelo and Rice and 48 for Torabzadeh and Bertin. Prior studies referenced the *Wall Street Journal* to collect the sample, a method which may create a sample dominated by larger, well known companies. In this respect, the Lehn and Poulsen's more recent sample may be more representative of the entire LBO market. Another source for the difference in reported returns may be the longer and more recent period analyzed by Lehn and Poulsen (1980-1987). However, the second explanation is not consistent with the financial press speculation on buyout premiums. Many analysts who follow LBOs report that the trend is to overpay for LBOs suggesting that premiums should be increasing over time, not decreasing.

Our study reexamines the returns received by public shareholders in LBOs and provides support for the lower returns reported by Lehn and Poulsen. Additionally, we explore whether the returns are affected by the size (as measured by the value of the initial bid), exchange listing, or the year of the buyout. The paper is organized as follows. In part II we discuss the basic data and methodology. The empirical results are presented in part III and the summary follows in part IV.

II. Data and Methodology

Our sample consists of 442 firms announcing a leveraged buyout during the time period of 1980-1988.⁸ For this study, a leveraged buyout is defined as taking a company private primarily through the use of debt. There are 281 announcements for exchange listed companies and 161 for OTC companies. Our primary source for announcements is *Mergers and Acquisitions Data Base*. We augmented this list of announcements by referencing Lehn and Poulsen [1989] and *Mergerstat Review 1988*. Daily stock prices were obtained from the *CRSP Daily Master File*, (*NYSE-ASE* and *OTC Files*).

A standard event-time methodology similar to the one used by Dodd et al. (1983) and Peterson (1987) was used to generate the normal returns. For each security "j" in the sample, the prediction error (PE) on event day t is:

$$PE_{jt} = R_{jt} - (a_j + b_j R_{mt}), \quad [1]$$

where

R_{jt} = rate of return for security

R_{mt} = rate of return for the CRSP equally weighted index on day t.

The coefficients are the ordinary least square estimates of firm j's market model parameters using an estimation period from t=-120 to t=-30 relative to t=0 being the initial announcement day.

The daily average predication error for date t is

$$APE_t = (1/N) \sum_{j=1}^N PE_j, \quad [2]$$

where N is the number of securities in the sample. The predication error for each security and for each day was standardized by the square root of the forecasted variance and is reported as:

$$SPE_{jt} = PE_{jt}/S_{jt} \quad [3]$$

where

$$S_{jt} = [S_j^2 [1 + (1/ED) + (R_{mt} - R_m)^2 / \sum_{k=1}^{ED} (R_{mk} - R_m)^2]]^{1/2},$$

S_j^2 = the residual variance for security j of the market model regression;

ED = the number of observations in the estimation period;

R_{mt} = the return on the market index at event date t (testing period);

R_m = the average return on the market index over the estimation period;

R_{mk} = the return on the market index on day K (estimation period).

If the standardized prediction errors (SPE) are assumed to be normally distributed, we can use the following test statistic:

$$Z = \sum_{j=1}^N SPE_j / \sqrt{N}. \quad [4]$$

III. Empirical Results

This section is divided into several parts. In part A, we present some descriptive data on the LBO market as

represented by our sample. In the second part of the analysis we consider the trading location as a variable affecting abnormal returns received by shareholders. The abnormal returns for the total sample and for each year are reported in part C. In the final part of the analysis, we consider the impact of the initial offer size on the abnormal return received by shareholders.

A. Descriptive Data

TABLE 1
Frequency of LBO Announcements by Year

Year	Number
1980	17
1981	15
1982	32
1983	42
1984	91
1985	73
1986	73
1987	59
1988	40

TABLE 2
Distribution of Announcements
by Size of Initial Offer

Size of Initial Offer	Number*	Average
under 50 Million	147	\$ 20.9
between 50-500 Million	183	206.6
between 500 and 1 Billion	33	690.5
over 1 Billion	41	3,091.0
Overall average		\$ 471.3

*The initial value could not be determined for 19 exchange listed and 19 OTC companies.

TABLE 3
Distribution of Announcements
According to Trading Location

Trading Location	Number
Exchange Listed	281
OTC	161
Total	442

Descriptive data are provided in Tables 1-3. In Table 1, we show the breakdown of LBOs by year. The sample is not evenly divided over the entire 9-year period: the three-year period 1984-1986 represents 54 percent of the entire 9-year sample. This is not unexpected since the LBO phenomenon was not common until several specialists firms became actively involved. A size distribution is shown in Table 2. This table shows the predominance of smaller firms in our sample. Table 3, which classifies announcements by company's common stock trading location, also illustrates the strong presence of OTC companies. In our study, slightly over 36 percent of the stock is traded in the over-the-counter market.

B. Prediction Errors and Trading Location

The prediction errors and the associated z statistics are shown in Table 4 for the entire sample and also for the exchange listed and OTC categories. Also, in Table 4, the cumulative prediction errors (CPEs) for -1, +1 and -10, +10 windows are shown. For the entire sample, the prediction errors follow a standard pattern: most of the significant prediction errors occur by day +1 with relatively small fluctuations occurring after day +1. This pattern is shown in Figure 1 which plots the CPEs through day +10. For the total sample of announcements, the CPEs for a -1, +1 window is 14.37%. Our results are, then, consistent with the lower returns reported by Lehn and Poulsen.

The inclusion of middle market LBOs in the sample may explain the lower returns. Therefore we compared the prediction errors for the OTC and exchange listed firms. Table 4 provides the daily prediction errors and associated z statistics for the subsamples. Although the PEs for both the exchange listed and the OTC companies are significant over the entire period, there are more days when the PEs for the OTC stocks are not significant.⁹ A somewhat surprising result occurs when comparing the PEs for trading locations over a specified event window. This comparison is shown in Figure 2 as a graph of the cumulative prediction errors for both OTC and exchange listed stocks. Notice that in Figure 2 the cumulative prediction errors for OTC and exchange listed stocks are roughly equivalent until Day 0. After Day 0 the OTC stocks exceed the abnormal return for the exchange listed stocks. Also the OTC residuals drift upward while the exchange listed residuals drift downward.

To facilitate comparisons, cumulative prediction errors for two event windows -1, +1 and -10, +10 were determined. The CPEs and associated standardized t-statistics appear in Table 5. For both windows the CPEs for the OTC stocks exceed the CPEs for the exchange listed securities and, the differences, using a standard t-test, are statistically significant. To consider the effect of

LBO ANNOUNCEMENTS 1980-1988 Cum. Prediction Errors

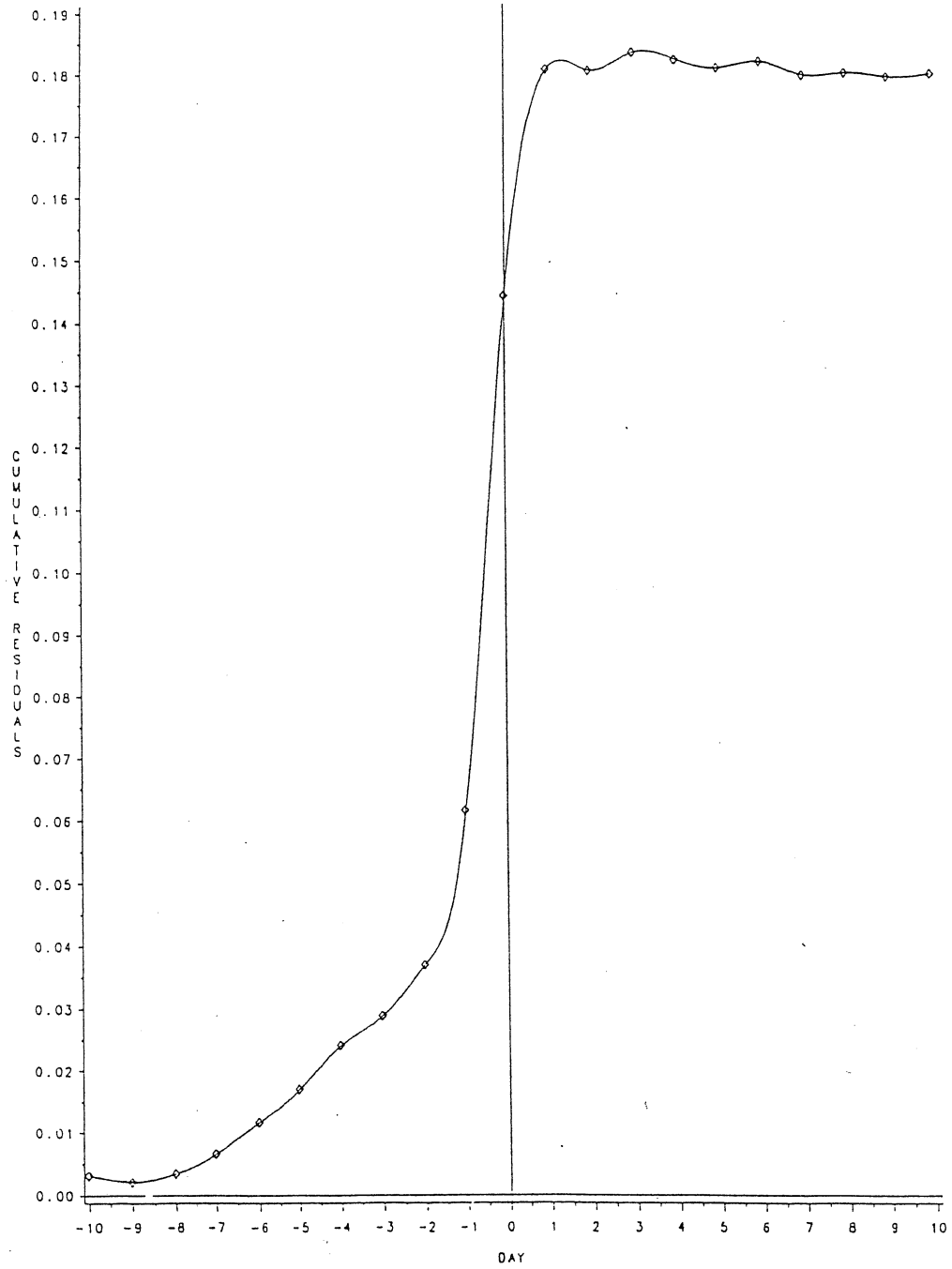


Figure 1

LBO ANNOUNCEMENTS 1980-1988
Cum. Prediction Errors by Trading Location
NYSE-ASE = 1 OTC = 2

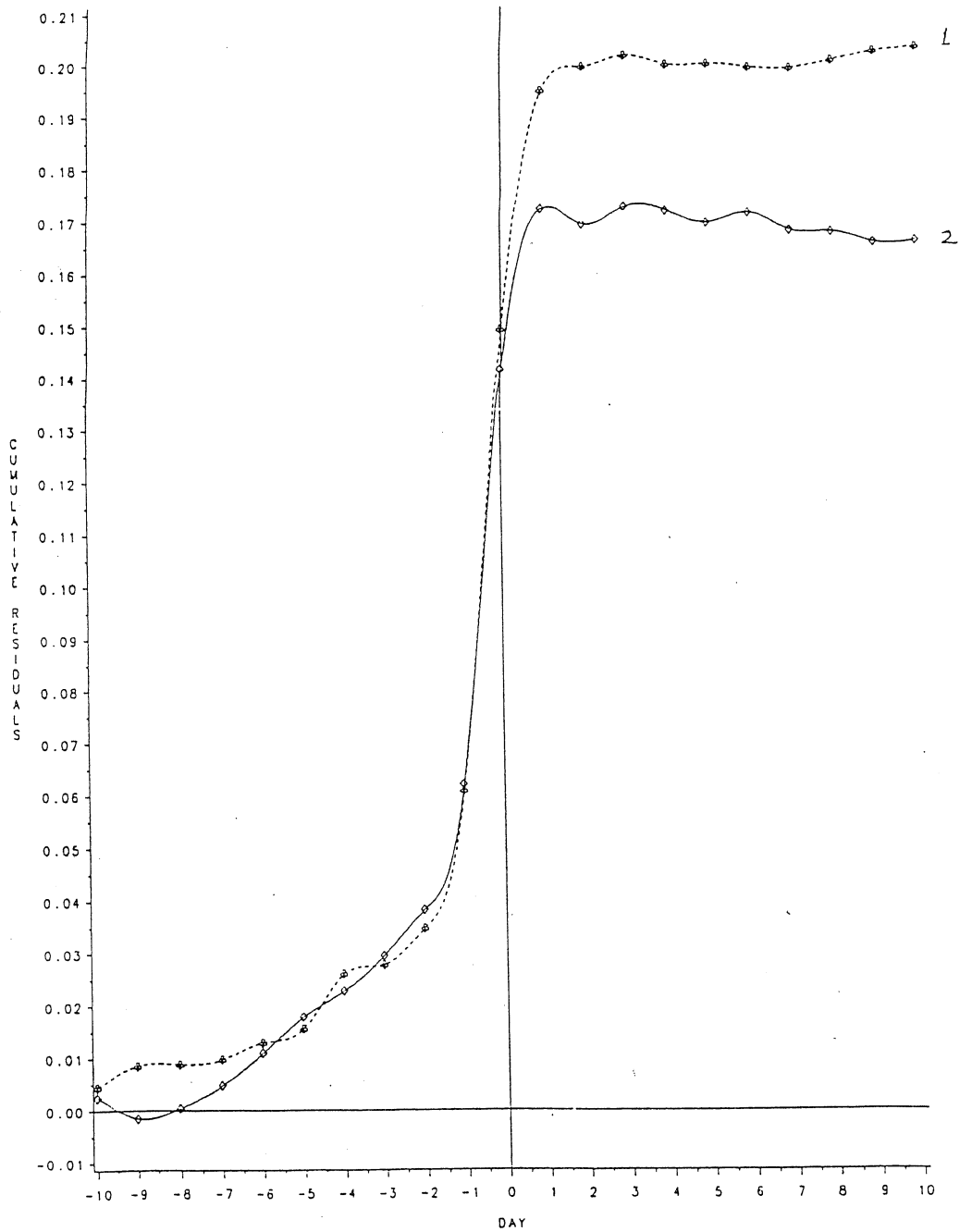


Figure 2

TABLE 4
Daily Average Prediction Errors (PE)

Day	Entire Sample (N=422)		NYSE-ASE Stocks (N=282)		OTC Stocks (N=161)	
	CPE	Z	CPE	Z	CPE	Z
-10	0.0031	2.74*	0.0024	2.52	0.0044	1.21
-9	-0.0010	-1.19	-0.0039	-2.04	0.0041	0.70
-8	0.0013	2.56*	0.0019	2.41	0.0001	1.05
-7	0.0031	3.05*	0.0043	3.51*	0.0009	0.42
-6	0.0051	4.61*	0.0062	4.78*	0.0031	1.33
-5	0.0053	6.07*	0.0068	5.17*	0.0026	2.66*
-4	0.0070	6.12*	0.0050	5.05*	0.0105	3.46*
-3	0.0048	6.02*	0.0066	6.60*	0.0016	1.25
-2	0.0080	7.82*	0.0086	7.43*	0.0069	3.13*
-1	0.0246	21.84*	0.0238	18.33*	0.0261	11.97*
0	0.0827	90.34*	0.0794	67.60*	0.0885	60.37*
1	0.0362	40.81*	0.0309	26.67*	0.0455	32.37*
2	-0.0002	1.58	-0.0030	-1.06	0.0046	4.03*
3	0.0029	6.80*	0.0033	6.96*	0.0021	2.06
4	-0.0011	-0.62	-0.0007	0.03	-0.0017	-1.07
5	-0.0013	-1.07	-0.0022	-1.64	0.0001	0.39
6	0.0009	1.16	0.0019	1.95	-0.0006	-0.64
7	-0.0022	-1.54	-0.0034	-2.04	-0.0000	0.13
8	0.0004	0.12	-0.0002	-0.09	0.0016	0.33
9	-0.0006	-1.05	-0.0019	-1.67	0.0017	0.45
10	0.0006	0.76	0.0004	0.35	0.0009	0.80

*Significant at the 0.01 level.

Cumulative Prediction Errors

Entire Sample	-1,+1 14.37%	-10,+10 18.01%
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TABLE 5
Cumulative Prediction Errors By Trading Location

Interval	OTC	Exchange Listed	t ¹
[-1, +1]	16.02%	13.42%	-8.21*
[-10, +10]	20.38%	16.65%	-8.03*

¹t statistic testing for mean difference between exchange listed and OTC cumulative prediction errors.

*Significant at 0.01 level.

trading location in more detail, PEs were determined by trading location and by year. The results of this comparison appear in Table 6. From 1980 to 1984 the prediction errors for the exchange listed stocks are higher. However, the reverse is true after 1984.

TABLE 6
Cumulative Prediction Errors by
Trading Location By Year

Year	[-1 +1]		t ¹
	OTC	Exchange	
1980	11.42%	12.43%	.93
1981	10.61%	13.25%	1.69
1982	11.61%	15.13%	3.56
1983	7.88%	14.08%	6.33
1984	16.27%	19.20%	4.73
1985	12.85%	10.78%	-3.71
1986	17.10%	11.76%	-7.86
1987	23.76%	12.88%	-10.16
1988	19.71%	9.41%	-6.95

¹t statistic testing for mean difference between exchange listed and OTC cumulative prediction errors.

*Significant at 0.01 level.

For each year, we tested the hypothesis that the differences are significantly different from 0 by using a standardized t-test. Excluding 1980 and 1981, the hypothesis that the mean difference equals 0 can be rejected for each year.

C. Abnormal Returns By Year

The difference in abnormal returns cited by prior studies suggests buyout premiums may be decreasing over time. However, reports in the financial press suggests a considerable amount of money is deposited in LBO funds. The presence of such large LBO funds in connection with the active participation of investment banking firms in the LBO market suggest that premiums may be increasing over time. To investigate a changing premium possibility, the CPEs for the interval day -1 to day +1 and days -10, to +10 were determined for each individual year. The results of this analysis are shown in Table 7.

The range of CPEs are 11.54 to 17.84 percent for the -1, +1 window. For a -10, +10 window, the range is 11.38 to 22.12 percent. Although, there is no discernable pattern of increasing or decreasing the CPEs for

the three-day window or the 21-day window, the data in Table 7 show considerable variability in the prediction errors when they are reported by year. The question is why would prediction errors exhibit such variability?

The variability may be due to the underlying strength of the stock market. For example, there may be an inverse relationship between stock prices and premiums: when stocks are selling at low P/E multiples the premiums offered may be higher.¹⁰ Conversely, in a rising stock market shareholders may expect higher premiums. Finally, Table 7 shows that most of the CPEs occur during the three-day window -- the exception being 1982.

D. Size and Abnormal Returns

The size of the LBO may also affect the premium received by shareholders. For example, smaller companies may not be closely watched by arbitragers or less followed by analysts. Therefore, an initial announcement may not start a bidding contest. Thus the premiums necessary to purchase a smaller company may be lower. Conversely, the neglected firm effect may apply to the small LBO market. Then we would expect larger abnormal returns.

In Table 8, the abnormal returns for a -1, +1, and a -10, +10 window per size category is shown. An interesting observation is that the premiums are similar per size category except for the announcements of companies in the \$500 to \$1 billion bracket which is slightly lower. Apparently the data does not support a neglected firm effect in the LBO market.

IV. Summary

This study provides summary statistics on the LBO market and also investigates the influence of several variables on the abnormal returns earned by public shareholders. In particular, we consider size, trading location, and year of announcement.

The magnitude of the abnormal returns for the entire sample, 14.37 percent for a -1, +1 window, is similar to that reported by Lehn and Poulsen. Also, we report abnormal and significant returns earned by both OTC and exchange listed firms. Exchange listed firms provided higher returns when compared to OTC firms from 1980 to 1984. The reverse is true after 1984. However, size of the announced bid does not appear to affect the magnitude of the abnormal returns.

Footnotes

1. The middle market is defined as a transaction valued between \$1 and \$50 million. See, for example, *Mergers and Acquisitions* September/October 1988, p.55. However, in other articles middle market

TABLE 7
Cumulative Prediction Errors
by Year for [-1, +1] and [-10, +10] Intervals

	<u>-1, +1</u>	<u>-10, +10</u>
1988	12.51%	16.02%
1987	17.12%	22.06%
1986	13.73%	18.28%
1985	11.54%	11.38%
1984	17.84%	21.71%
1983	12.60%	16.98%
1982	14.14%	22.12%
1981	12.37%	15.06%
1980	12.08%	13.59%
Entire Period	14.37%	18.01%

transactions include purchase prices up to \$250 million. See, "A Concentration on Growth in the Smaller Buyout," *Mergers and Acquisition*, November/December 1987, p.61.

2. See Jensen and Meckling (1976) for a discussion of the principal agency costs associated with separation of ownership and control.
3. Lowenstein [1986] suggests the primary motivation of going private is the tax savings generated as a result of the process. A more detailed examination of the tax effect of going private is provided by Kaplan [1989].
4. Lowenstein casts doubt on the viability of this benefit. Average cumulative expenses to go private, for a large company, is well over \$10 million, an amount that would cover public reporting expenses for several years.
5. Ownership characteristics are discussed in DeAngelo and DeAngelo [1987]. In their study, the mean managerial stock ownership in a sample of 33 LBOs of public firms was 24.5%, the median was 15.4%. The authors state, "...the mean and median figures
6. What is a reasonable premium? Ross Johnson, chairman of RJR Nabisco, offered the company's public shareholders a 50% premium. He guessed wrong and started a bidding contest that put him on the defensive for his initial bid. Eventually the buyout premium, as measured against a prebid stock price, was nearly 100 percent. For a synopsis of the RJR leveraged buyout see RJR Holdings Capital Corp., Prospectus, May 12, 1989.
7. The primary objective of Lehn and Poulsen's research is not to report shareholder returns but to comment on the association of free cash flow with the likelihood of going private. The distribution of free cash flow, internally generated cash that cannot be profitably invested in the firm, is an agency cost issue. Failure to distribute the cash represents an agency cost. The authors find that the likelihood of going private and buyout premiums are highly

related to free cash flow.

8. Although some firms have multiple bidders and therefore subsequent announcements, we consider only the initial announcement for purposes of our study.
9. One explanation for the different pattern of significant abnormal returns may be the presence of multiple bidding for exchange companies which may not be true for OTC companies.
10. Perhaps the reasoning here is that high premiums are cheaper for lower stock prices (low P/E multiples). Consider the following restaurant analogy: 20% tip on a \$10 meal is more affordable than the same tip on a \$100 meal.

TABLE 8
Size And Abnormal Returns

Size of Initial Offer	Interval	
	1, +1	-10, +10
under \$50 Million	13.94%	17.46%
between 50 M & 500 M	15.86%	18.80%
between 500 M and 1 B	11.05%	13.93%
over 1 Billion	13.36%	19.65%

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