DETERMINANTS OF SHAREHOLDER WEALTH EFFECTS ON EQUITY CARVE-OUTS: AN EXPLORATORY STUDY

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ABSTRACT

DETERMINANTS OF SHAREHOLDER WEALTH EFFECTS ON EQUITY CARVE-OUTS: AN EXPLORATORY STUDY

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An equity carve-out (ECO) refers to the issue of equity through a subsidiary, rather than through the parent company. Recent empirical studies have documented significantly positive stock price reactions for parent firms that issue equity through an ECO. This is in contrast to the observed negative price reaction to a seasoned equity offering by the parent firm.

Previous research has presented several explanations to account for these positive abnormal returns. In general they relate to information asymmetry, performance and riskiness. The information asymmetry is reduced between managers and new investors because new investors perceive management is not withholding vital information about the project due to the listing requirements by the SEC. Also, given the fact that different markets have more or less stringent listing requirements, higher abnormal returns are possible. The improved performance relates to restructuring of managerial responsibilities and compensation, which is usually tied directly to the earnings performance of the subsidiary, as opposed to the parent firm. Companies that are listed in different industries may develop expertise that allows them to raise funds more efficiently than the other partner. If subsidiaries develop these skills, it may provide an explanation to the positive returns associated with ECOs. Finally, the differential risk that

may exist between parent and subsidiary firms may influence the manner in which parent firms issue their equity. The larger the difference (ie. parent high risk, subsidiary lower risk), the more the incentive for the parent firm to issue through the subsidiary. However, empirical studies to date have not documented which of these factors affect the size of the market reaction.

Our study uses a large sample of 237 ECOs over the period 1965-1993 and includes offers on both the NYSE and NASDAQ. We use cross sectional regressions to determine which firm characteristics affect the size of the markets reaction to the issue.

Consistent with other studies, we report significant positive abnormal returns to the parent firms that announce an ECO. Univariate regressions show that bond rating and EPS have significant explanatory power. Other variables, such as the percentage carved-out in the subsidiary, the exchange in which the subsidiary is listed, the size of the issue, and the relatedness of parent/subsidiary industries do not appear to affect the market reaction. These results support the contention that there is a risk differential between the parent and subsidiary firms. This means that high-risk parent firms with low-risk subsidiaries will be more inclined to issue equity through the subsidiary.

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1. INTRODUCTION

It has been well documented in finance literature that publicly traded firms experience a strong negative stock price reaction surrounding the announcement of a seasoned equity offering. For example, Masulis and Korwar [1986], Mikkelson and Partch [1986] and Asquith and Mullins [1986] document negative abnormal returns ranging from -3.25% to -3.56%. Managers wishing to avoid this drop in stock price may consider other alternatives that would provide a more positive reaction to their decision.

One such alternative is an Equity Carve-Out (ECO), which is an initial public offering of equity to the public by a privately held subsidiary. In an ECO, the parent firm relinquishes a portion of the control of the subsidiary by issuing subsidiary common shares to the market. In exchange the parent firm receives the funds it requires and, not only avoids the significant negative price reaction surrounding the announcement, but usually experiences significant positive returns from the event. ECOs have become an increasingly popular means of raising equity financing since the 1960s.

Finance literature, however, has not precisely documented the source of these gains. Schipper and Smith [1986] attribute the benefits of an ECO to several factors. First, the degree of asymmetric information about the subsidiary is reduced in order to meet the SEC requirements for reporting financial activities. Therefore investors have more information upon which to base their investment decisions and can better estimate the market value of the subsidiary. Secondly, managerial performance may improve under the new firm structure because managerial incentives are usually tied directly to the performance of the subsidiary, as opposed to the performance of the parent firm. Klein, Rosenfeld and Beranek (1991) contend this occurs only if the carve-out is a permanent event, and not a transition event. Their results infer that equity carve-outs are a temporary form of asset restructuring, with potential benefits from the termination of the minority interest and the show-casing of the subsidiary for a future sell-off.

Although other studies have provided possible explanations for the abnormal return associated with ECOs, they have not tested which factors affect the size of these returns. Furthermore, previous studies focus only on ECOs listed on the NYSE, while none have used a complete sample that spans the past three decades. Our study attempts to reduce this gap currently existing in the finance literature. Our sample of equity carve-outs consists of 237 events, specifically 190 NYSE/ASE and 47 NASDAQ events, ranging from 1965 to 1993. Based on standard event study methodology, abnormal and cumulative abnormal returns are found to be significantly positive for both the NYSE and NASDAQ samples. The results for the NYSE sample are consistent with previous research. Also, comparison tests between the two samples report that the returns are significantly different, with the NASDAQ sample providing higher abnormal returns than the NYSE sample. Using proxy variables as an estimation of the influencing factors, we perform a series of cross sectional regressions. The proxy variables for riskiness and performance of the parent firm (ie. bond rating and earnings per share) are found to have a significant influence on the abnormal returns. All other control variables are shown to have no effect.

The remainder of the thesis is organized as follows. Section 2 provides a review of related literature. Section 3 outlines the data collection procedures and provides summary statistics on the sample. Section 4 describes the empirical methods, provides an explanation of the variables used in the cross sectional regressions and discusses the empirical model. Section 5 presents the results and section 6 provides a brief conclusion.

2. RELATED WORK

2.1 Positive Returns Associated with Equity Carve-Outs

An equity carve-out is defined as an initial public offering (IPO) made by a privately owned subsidiary of a parent firm. When a parent firm performs an equity carve-out, that portion of the subsidiary sold to the market forms a publicly held minority interest. In many cases, even when a substantial portion of the subsidiary is sold, the parent firm still maintains voting control of the subsidiary. (see Schipper and Smith [1986]) Recent studies have documented significantly positive stock price reactions when firms issue equity through an equity carve-out (see Table 1). Schipper and Smith [1986] report a significant abnormal return of 1.83% for a five day window surrounding ECO announcements over the period from 1965 to 1983. Similarly, Klein, Rosenfeld and Beranek [1991] and Slovin, Sushka and Ferraro [1995] report abnormal returns of 2.75%, and 1.23% respectively.

Klein, Rosenfeld and Beranek [1991] contend that ECOs are not a permanent event, but are rather intended as a temporary restructuring for the specific purpose of obtaining financing, and positioning the subsidiary for a future sell-off or re-acquisition. They report that 85% of their 52 firm sample enters into a secondary event within three years of the ECO. Also, significant abnormal return of 1.98% for the parent firm surrounding the secondary event are reported (see table 1). When only subsequent sell-offs are taken into account, Klein, Rosenfeld and Beranek [1991] report significant returns of 3.67% over a five day window.

TABLE 1

Summary of Results from Previous Research on Equity Carve-Outs

Study	Event Date	CPE (%)	t-statistic	Sample Size	Sample dates
1. Schipper and Smith (1986)					
Return to parent	[-44, -5]	3.13	1.544	76	1965 - 1983
firms from ECO	[-4, 0]	1.83*	2.552		
announcements	[1,40]	-0.5	-0.251		
2. Klein, Rosenfeld and Beranek (1991)					
a) Return to all parent	[-40,-5]	2.11	0.80	52	1966-1988
firms from ECO	[-4,0]	2.75**	3.24		
announcements	[-1,0]	1.06$	1.87		
	[1,40]	1.00	0.39		
b) Return to parent	[-40,-5]	0.47	0.19	42	1966-1988
firms from ECOs	[-4,0]	2.68**	2.93		
that have a	[-1,0]	0.93	1.52		
subsequent event[1]	[1,40]	0.79	0.28		
c) Return to parent	[-40,-5]	-0.13	-0.48	42	1966-1988
firms from the	[-4,0]	1.98*	2.07		
subsequent event[1]	[-1,0]	1.18	1.83		
	[1,40]	-1.94	-0.67		
3. Slovin, Sushka and Ferrarto (1995)					
a) Return to parent	[-10,-1]	1.27	1.07	32	1980-1991
firms from ECO	[0,1]	1.23*	2.32		
announcements	[2,11]	-0.49	-0.40		
b) Return to rival firms	[-10,-1]	0.08	0.06	32	1980-1991
of parent firm from an	[0,1]	0.21	0.37		
ECO announcement	[2,11]	0.06	0.04		
c) Return to rival	[-10,-1]	0.02	0.02		
frms of subsidiaries	[0,1]	-1.11*	-2.47	36	1980-1991
performing ECOs	[2,11]	-0.11	-0.10		

$, *, ** Significance Levels at the 10%, 5% and 1% Level

[1] Subsequent events includes a re-acquisition or sell-off of the subsidiary firm
CPE = Cumulative prediction error

Other studies by Jain [1985], Hite, Owers and Rogers [1987], Sicherman and Pettway [1992]. Powers [1994] and Slovin, Sushka and Ferraro [1995] have also documented significant positive returns associated with asset sell-offs, but not as high for the secondary events studied by Klein, Rosenfeld and Beranek [1991].

The abnormal returns associated with equity carve-outs have been explained by three possibly influential factors. These factors are asymmetric information, performance level of the parent firm, and differential risk between the parent firm and its subsidiary.

2.1.1 Asymmetric Information

Information asymmetry exists when the degree of information relating to a situation, event or organization is not equally distributed. Thus, one set of individuals may profit from this additional information over the other sets. In relation to equity carve-outs, asymmetric information may exist in two situations: first between managers and new investors, and secondly between investors in different markets, such as NYSE and NASDAQ.

The availability of relevant information plays a significant factor in determining why subsidiaries may be more efficient in raising funds than their parent companies. Myers and Majluf [1984] developed a framework to explain the difference between management and new investors' asymmetry, and thus the significant negative returns associated with equity offerings by parent firms. These significant abnormal returns are reported in studies by Mikkelson and Partch [1985], Masulis and Korwar [1986], Mikkelson and Partch [1986], and Asquith and

Mullins [1986]. The main argument offered by Myers and Majluf [1984] was that managers with favourable inside information would not invest in certain positive NPV projects because it would be more costly to old shareholders to issue the shares than to abandon the project. This is because new investors, knowing that management held inside information pertaining to the new project, would perceive this information as negative and thus undervalue the issue. Therefore, the issue would be undervalued by more than the NPV of the project.

Schipper and Smith [1986] contend that the level of asymmetric information about the issuer (the subsidiary) is reduced in an ECO because the subsidiary itself becomes publicly owned. Therefore, the subsidiary must meet the SEC requirements for disclosure and reporting of financing activities. As a result, investors have access to more detailed information (eg. financial reports, bond ratings, etc.) about the subsidiary and can better estimate its value, growth potential and riskiness than when it was a part of the parent company. Therefore, the subsidiary stock issue represents a claim on only the subsidiary's assets, and not those of the parent firm. This implies that the asymmetry of information that usually exists between management and new investors with regular equity offerings is reduced for equity carve-outs.

Nanda [1991] extends the Myers and Majluf [1984] framework to explain the significant positive returns associated with performing an equity carve-out. In this case, Nanda states that, by having the subsidiary issue the equity, it is perceived that management is not withholding information from investors due to the SEC requirements on release of information

As a result, there is less asymmetric information between management and new investors, which translates into less undervaluing of issues.

The issue of information asymmetry also extends to the type of market on which a firm is listed. Affleck-Graves, Hedge, Miller and Reilly (1993) note that different markets have different listing requirements, some more stringent than others. As a result, the level of information disclosed may vary significantly from one market to another. They document an underpricing for IPOs of 2.16%, 4.86% and 5.56% for firms listed on AMEX, NYSE and NASDAQ respectively. It has not yet been documented whether or not returns to ECOs differ across exchange listings.

2.1.2 Performance Level

The ability of a firm to perform effectively within an industry implies continued operations and profits for shareholders. Schipper and Smith [1986] contend that equity carve-outs may serve to improve managerial performance through the restructuring of managerial responsibilities and corporate focus, and thus improve the subsidiary's returns. They report that, for a sample of 59 equity carve-outs, 11 ECOs were performed for the specific intention of improving the corporate focus and environment. Schipper and Smith [1986] also stated that to maximize the benefit from asset management restructuring, subsidiaries implemented or altered the compensation plan of their managers. This was accomplished in such a manner that managerial compensation was based on the share price or earnings level of the subsidiary, as opposed to that of the parent firm. This accounted for 95% of their sample.

Nanda [1991] suggests that the method of financing chosen by the parent firm reveals information not only about the performance level of the subsidiary, but also about the value of the parent company. Nanda explains that parent firms perform an ECO when they believe the parent is undervalued by the market, while their subsidiary is overvalued In contrast, those firms that issue seasoned equity offerings are those parent firms which are currently overvalued. As mentioned in the previous section, this may result in significant underpricing of the issue. Thus an equity carve-out may reveal information about the true value of the parent company's assets, as well as providing investors with information to estimate the true value of the subsidiary firm. (see Schipper and Smith [1986]) Interestingly, Jain [1985] states firms that are experiencing liquidity problems, and thus poor performance, may utilize the sell-off approach to generate cash. Those firms that maintain financial slack may use spin-offs to generate positive returns for their shareholders, given that no cash is required. In both cases, equity carve-outs provide an effective alternative given the fact that funds are raised, the parent firm experiences no decline in stock price and the parent firm maintains control of the subsidiary.

Slovin, Sushka and Ferraro [1995] also found that the use of an ECO has a substantial impact on the returns achieved by rival firms of subsidiaries in the same industry, but little impact on the rivals of the parent firm. Rivals of the subsidiaries experience a significant negative return of -1.11% for a two day window, which translates into an aggregate loss in shareholder wealth of $2.5 billion. Thus, the performance level of the parent firm, and its decision to utilize equity carve-outs may have a significant influence on external market conditions.

Finally, the performance of the parent firm may affect the abnormal returns of the parent firm because of the relatedness of the parent and subsidiary firms. In many cases, the parent and subsidiary firms are in separate industries. Therefore, through the performance of equity carve-outs, subsidiaries utilize industry specific skills that the parent firm does not possess. This enables the raising of capital more efficiently than if the parent firm had used a seasoned equity offering. In contrast, Sicherman and Pettway [1987] find significant positive returns for sell-off events in which the buyer and seller are in related industries.

2.1.3 Risk

Subsidiaries may experience positive abnormal returns in relation to the equity carve-out due to differential risk between parent and subsidiary firms. As a result of the announcement of an ECO, the parent firm must disclose information concerning the subsidiary (Schipper and Smith[1986]). In doing so, investors can more properly evaluate the risk and the appropriate cost of capital associated with the subsidiary. In many cases, the perceived risk of the subsidiary may be less than the current risk of the outstanding debt of the parent firm. Consequently, investors view the reduction in risk as a positive sign (ie. better able to meet debt and interest payments), and are more willing to invest in the subsidiary's initial public offering than the seasoned equity offering of a parent firm.

Reinganum [1990] documents a difference in the level of liquidity risk that is assigned to small firms listed on different exchanges. This explanation is related to that of information asymmetry between the markets, given that there are different listing requirements between the markets. As a result, the less stringent listing requirement on the NASDAQ market translates into a large number of small firms on the market, and therefore greater liquidity. Thus, the returns associated with liquidity risk are greater on the NYSE as opposed to the NASDAQ market for small firms.

2.2 Associated Costs of Equity Carve-Outs

It was mentioned above that when an equity carve-out is performed, a minority interest in the subsidiary is held by the public. This method provides additional flexibility over spin-off[1] and asset sell-off strategies given that the control of the subsidiary is maintained. Schipper and Smith [1986], however, state that having a publicly held minority interest is a potentially costly situation, and represents a possible reason for a parent firm to "undo" an ECO (ie. perform a re-acquisition, or sell-off). The costs are generated from such things as having the board of directors monitor all transactions between the subsidiary and the parent firm, the printing of annual reports, and analyst presentations. Klein, Rosenfeld and Beranek [1991] perceive this as a good reason not to perform an equity carve-out in the first place. Finally, other costs involve the time spent by management in marketing the new shares, and the greater under-writing costs involved.

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1 Studies performed by Smith and Smith [1983], Hite and Owen [1983], Miles and Rosenfeld [1983] and Slovin, Sushka and Ferraro [1995] report significant positive returns associated with spin-offs

Although other studies have provided possible explanations for the abnormal return associated with ECOs, they have not tested which factors affect the size of the market's reaction. Futhermore, there has not been a recent study to provide a comprehensive analysis of all equity carve-outs over the past three decades, and past studies have only looked at ECOs performed on the NYSE. Our study attempts to reduce this gap currently existing in the finance literature. We use a large sample consisting of 237 events, specifically 190 NYSE/ASE and 47 NASDAQ events, ranging from 1965 to 1993. Based on standard event study methodology, abnormal and cumulative abnormal returns associated to parent firms listed on the NYSE and NASDAQ markets are calculated. A comparison test between the returns for the NYSE and NASDAQ markets is also performed. Finally, using proxy variables as an estimation of the influencing factors (ie. information asymmetry, performance, and riskiness), we perform a series of cross sectional regressions on the abnormal returns.

3. DATA AND SAMPLE COLLECTION

3.1 Data Sources

Although other studies have provided possible explanations for the abnormal return associated with ECOs, they have not tested which factors may determine the size of the abnormal returns. Futhermore, previous studies focus only on ECOs performed on the NYSE, while none provide a complete sample over the past three decades.

We have complied a comprehensive database spanning the period from 1965 to 1993 for NYSE events and from 1981 to 1993 for NASDAQ events. This database contains the name of the parent and subsidiary firms in the ECO events, and the announcement date for each event. The following sources were used:

1. A sample of 132 carve-out events were gathered from the Klein, Rosenfeld and Beranek[1991] study and a list provided by Schipper and Smith, based on their 1986 study. The data range from 1965 to 1983 and represent NYSE/ASE events.

2. 76 NYSE/ASE events during 1991 and 1993 were gathered from *Mergers & Acqusitions*, May/June 1992 and 1994 editions. 14 ECOs performed on a global basis (ie. American Parent Firms with foreign subsidiaries) were incorporated (see Millman [1993], Star [1991] and Fikre [1991]).

3. 10 additional events were collected from searches performed on the *Wall Street Journal Index* and *Dow Jones News Retrieval Database*. All announcement, cross-checked in the Wall Street Journal Index.

4. 559 events were obtained from *The Securities Data Company* (Global Financing Database), dating from 1981 to 1993. This incorporates events with parent firms that are private, NYSE, NASDAQ or OTC listed. The filing date and effective date of the event, SIC code of parent and subsidiary, size of offering and the market listing of the subsidiary are included.

Seventy-one ECO events were duplicated in more than one source. This provided a means of validating data such as the parent and subsidiary names, and the filing dates utilized. In those circumstances where the dates were different for a duplicated event, the earliest date was employed. Twenty two cases were found where no filing dates could be established, while another 46 announcements were eliminated because the name of the parent firms were unknown. Events were also dropped from the sample if the parent firm was not listed on the NYSE/ASE or NASDAQ exchanges during the announcement period or there were too many missing returns in a particular event. In order to confirm that a parent firm was not listed on the NYSE or NASDAQ, each event was cross-referenced with the 1993 CRSP (Centre for Research on Stock Prices) header files for the NYSE and NASDAQ markets. This resulted in an additional 415 events being deleted. The final data sample consists of 237 equity carve-outs. The NYSE/ASE sample contains 190 events over the period of 1965 to 1993, while the NASDAQ has 47 events ranging from 1981-1993. A list of the equity carve-outs for the NYSE and NASDAQ samples are in appendix 1 and 2 respectively.

Information on daily equal weighted stock returns for firms listed on NYSE/ASE and NASDAQ markets was obtained from the CRSP (Centre for Research in Security Prices) tapes. The event window to capture the abnormal returns from the event entailed 45 days before and after the announcement of the equity carve-out. Two estimation periods were employed, a standard pre-event estimation period, as well as a split estimation period to control for any shift in the beta of the parent firm after the announcement of the carve-out.

Finally, for the purpose of running cross-sectional regressions, and thus determine influential variables for abnormal returns, firm-specific information was retrieved from the Compustat Tapes, ranging from 1973 to 1993. Moody's Industrial Survey (1965 to 1993) was used to supplement this data.

3.2 Sample Statistics

Table 2 reports the distribution of equity carve-outs by year. The total distribution is broken down into the following groups: NYSE/ASE, NASDAQ, and others (ie. Private or OTC). Schipper and Smith [1986] and Klein, Rosenfeld and Beranek [1991] both report that there were no equity carve-outs performed by publicly traded parent firms, during the period of 1973 to 1978. Klein, Rosenfeld and Beranek [1991] state that "the reason for this phenomenon is not clear, particularly since prior studies report no discernible slow-down in seasoned equity offerings over the same period (eg. Mikkelson and Partch, 1986)."

Table 2 indicates that the number of equity carve-outs performed on a yearly basis for both the NYSE and the total data set has been growing since 1983. The period from 1983 to 1993 accounts for 71.5% of the carve-outs on the NYSE, whereas the total data set incorporates 92% of those performed. The five year period from 1989 to 1993 also accounted for 58% of the carve-outs performed on the NASDAQ market. The accumulation of equity carve-outs performed on the NASDAQ and others (ie. private and OTC) dates back to 1981[2]. This distinguishes our sample from those in other studies in that it incorporates a great deal of recent data, which allows us to determine if recent economic conditions have influenced the abnormal returns surrounding the announcement of an equity carve-out. It also incorporates data from over three decades, which enables a more conprehensive analysis of equity carve-outs

Summary statistics about the proceeds of the offerings and the percentage of the subsidiary carved-out from the NYSE grouping are in tables 3A and 3B. Tables 4A and 4B report the bond rating quality and price earning ratios of parents firms within the NYSE grouping. The mean size of equity offerings is \$131.60 million, while the median is \$40 million. The range is from a low of \$1.33 million to a high of \$1,849.50 million. Given this large range for equity carve-outs, the size of the proceeds does not follow a normal distribution. Equity offerings of over \$100 million also accounted for 28% of all carve-outs. The percentage carved-out in subsidiaries by parent firms has a mean of 22.9%, with a max and min of 91.1% and 1.9% respectively (see table 3B). Out of a sample of 126 ECOs, 80% of the carve-outs involve parent firms that relinquish less than 50% of their equity position in the subsidiary. This allows parent firms to raise capital while maintaining control of their subsidiary.

[2] This represents the earliest data available from the Securities Data Ccompany database

TABLE 2

Distribution of Equity Carve-Outs by Year, for the Period 1965-1993

Year	Parent Firms Listed on NYSE used in Sample	Parent Firms Listed on NASDAQ used in Sample	Others*	Total Number of Carve-out Announcements
1965	2	-	-	2
1966	2	-	1	3
1967	4	-	-	4
1968	4	-	-	4
1969	4	-	2	6
1970	8	-	2	10
1971	10	-	3	13
1972	2	-	3	5
1973	0	-	-	0
1974	0	-	-	0
1975	0	-	-	0
1976	0	-	-	0
1977	0	-	-	0
1978	0	-	1	1
1979	3	-	1	4
1980	3	-	0	3
1981	8	2	15	25
1982	4	2	11	17
1983	19	3	53	75
1984	2	3	18	23
1985	11	2	25	38
1986	16	3	48	67
1987	13	3	29	45
1988	9	3	11	23
1989	7	6	8	21
1990	9	0	8	17
1991	13	9	37	59
1992	16	4	64	84
1993	21	7	75	103
Total	**190**	**47**	**415**	**652**

* This includes parent firms that are private or listed over the counter with subsidiaries performing equity carve-outs.
22 observations were deleted due to lack of event dates. The retrieval of ECOs listed on NASDAQ
and the majority of those private and OTC events were gathered from 1981 onward (Source: Securities Data Corporation)

TABLE 3

Summary Statistics of the Issue Size (IPO), and Percent Carved-Out of Subsidiaries found in the NYSE Sample, for the Period of 1965 to 1993.

A. Proceeds of Offerings of Subsidiary Firms

Range (in Millions $)	Number of Events	Descriptive Statistics	(million $)
< 1	0		
1 < 5	10	Median	$ 40.80
5 < 10	13	Mean	$ 131.60
10 < 20	18	Std. Dev.	$ 254.94
20 < 35	15	Minimum	$ 1.33
35 < 50	14	Maximum	$ 1,849.50
50 < 100	21		
100 < 500	27		
≥ 500	8		
Total Known	**126**		
Not Known	**64**		
Total Sample Size	**190**		

B. Percentage of Subsidiary Carved-Out

Range (% Carved-Out)	Number of Events	Descriptive Statistics	(%)
< 10%	9		
10% < 20%	49	Median	22.90%
20% < 35%	28	Mean	32.32%
35% < 50%	15	Std. Dev.	22 94%
50% < 75%	15	Minimum	1.90%
≥ 75%	10	Maximum	91.10%
Total Known	**126**		
Not Known	**64**		
Total Sample Size	**190**		

TABLE 4

Summary Statistics of the Bond Rating Quality and PE Ratios of Parent Firms found in the NYSE Sample, for the Period of 1965 to 1993

A. Bond Rating Quality of Parent Firms

Range	Rating	Number of Events	Descriptive Statistics	
	No Debt	3		
AAA	Highest Grade	2	Median	11.00
AA+ to A-	High Investment Grade	37	Mean	11.23
BBB+ to BBB-	Medium Grade	26	Std Dev	4.17
BB+ to B-	Speculative Grade	47	Minimum	2.00
CCC+ to C	Highly Speculative Default	3	Maximum	21.00
Total Known		**118**		
Not Known		**72**		
Total Sample Size		**190**		

Note See appendix 3 for the full bond rating index, and related descriptions

B. Price Earnings Ratio of Parent Firms

Range (Price Earnings Multiple)	Number of Events
≥ 60	11
55 < 60	0
50 < 55	2
45 < 50	3
40 < 45	4
35 < 40	0
30 < 35	4
25 < 30	6
20 < 25	9
15 < 20	30
10 < 15	43
5 < 10	20
< 5	4
Net Loss	33
Total Known	**169**
Not Known	**21**
Total Sample Size	**190**

The average quality of the bond rating for NYSE parent firms (see table 4A), based on the Standard and Poor's bond rating index is a 'BBB' rating. Moody's corporate bond rating index would classify it as 'Baa2'(See Appendix 3). In both cases, the bonds are described as medium grade obligations, with adequate capacity to pay principal and interest. However, they are more vulnerable to changes in economic condition than bonds in category 'A'. Approximately 42% of the sample of 118 firms was of a speculative grade, while 3 firms were found to have no outstanding long term debt. The distribution of price earning ratios for parent firms (Table 4B) shows a clustering of firms between the 5 to 20 range, acccunting for 55% of the sample. This growth level is consistent with Schipper and Smith [1986] findings, whereby 56% of PE ratios for parent firm were also within the 5 to 20 multiple range. Schipper and Smith also reported that subsidiary firms on average were of a higher growth potential than the parent firms. Finally, the distribution of SIC codes for the parent and subsidiary firms of the NYSE sample can be seen in appendix 4. The percentage of subsidiary firms found in the same industry as their parent firms is about 50%. Also, using a two digit SIC code we find the parent and subsidiary firms of ECOs to be spread throughout 38 different industries, with the greatest concentrations found in the Chemicals/Phaceuticals/Plastics industry for parent firms and Oil and Petroleum for the subsidiaries.

4. EMPIRICAL METHODS AND ECONOMETRIC MODEL

4.1 Market Reaction to Announcements of ECOs

The dependent variable in our cross sectional regressions is the cumulative prediction error (CPE) surrounding the announcement of an ECO. In determining this variable, our methodology follows that of Schipper and Smith [1986]. First, prediction errors are calculated for each firm, on every trading day ($t=1,...T_j$) of the window surrounding the ECO as follows:

$$pe_{jt} = (R_{jt} - a_j + b_j R_{mt}) \qquad (1)$$

from the market model of:

$$R_{jt} = a_j + b_j R_{mt} + e_{jt} \qquad (1b)$$

where:

pe_{jt} = Daily prediction error on stock j for day t

R_{jt} = Return on stock j for day t

R_{mt} = Daily equal weighted returns of firms NYSE/ASE, and NASDAQ at day t

The a_j, b_j coefficients represent the intercept and slope for stock j and are estimates from the market model, calculated using an ordinary least squares (OLS) regression. Two different estimation periods are used, the first a pre-event estimation period consistent with other studies, where t= [-300,-45] trading days before the offering announcement (day 0). The second method attempts to incorporate post event changes in beta (β) by utilizing a split estimation period from [-173,-46] days before the announcement, and [46,174] days after the announcement.

The average prediction error (PE_t) represents a summation of all company prediction errors (pe_{it}) on a particular day t, divided by the number of companies (N_t) in the sample.

$$PE_t = \sum_{j=1}^{N_t} pe_{it} / N_t \qquad (2)$$

Similarly, the cumulative average prediction error (CPE_T) is calculated as follows:

$$CPE_T = \sum_{t=t_0}^{T} PE_t \qquad (3)$$

where CPE_T is the summation of all average prediction errors over an event window. The t-statistic is calculated for the average prediction error (PE_t) to test for the independence of these results. The following formula is used:

$$t = \left[\sum_{d=d_0}^{d_1} PE_d \right] \Big/ \left[(d_1 - d_0 + 1)(p) \right]^{1/2} \qquad (4)$$

where d_0 and d_1 represent the starting date and ending dates for the test period (event window), and where p is the variance of the average prediction errors, which can be expressed as follows:

$$p = \sum_{s=s_0}^{s_1} \left[PE_d - \left[\frac{1}{(s_1 - s_0 + 1)} \sum_{s=s_0}^{s_1} PE_d \right] \right]^2 \Big/ (s_1 - s_0) \qquad (5)$$

where s_0 and s_1 represent the estimation period over which the variance of the average prediction errors is calculated.

Schipper and Smith (1986) follow a three step procedure from Patell (1976) to calculate the cumulative standardized prediction errors (CSPE). First, the standardized prediction error (pe_{jt}) is calculated as follows:

$$v_{jt} = pe_{it} / se_{jt} \qquad (6)$$

Secondly, the accumulation and normalization of each firm's standardized prediction errors over a specific window (ie. from day t_0 to day L) is computed:

$$w_{jl} = \left[\sum_{t=t_0}^{L} v_{jt} \right] \Big/ (L - t_0 + 1)^{1/2} \qquad (7)$$

Finally, W_{jL} is summed across all firms in the sample (N_l); the summation is divided by the corresponding cumulative standard deviations of the firms. The end result is the cumulative standardized prediction error statistic ($CPSE_l$), or Z-Score. This represents a test of whether or not, in a standardized normal distribution, the means are significantly different from zero.

$$CSPE_L = \left[\sum_{j=1}^{N_l} w_{jl} \right] \Big/ \left[\sum_{j=1}^{N_l} \operatorname{var}(w_{jl}) \right]^{1/2} \qquad (8a)$$

$$= \left[\sum_{j=1}^{N_l} w_{jL} \right] \Big/ \left[\sum_{j=1}^{N_l} \frac{M_j - 2}{M_j - 4} \right]^{1/2} \qquad (8b)$$

4.2 Factors Affecting Market Reaction to Announcements of ECOs

The cumulative prediction error (CPE) is the dependent variable in our cross sectional regressions. This value represents the abnormal returns to the parent firm determined for specific event windows, some of which include [-1,0], [-45,45], [-45,-5], [-4, 0], [-1,1], and [1,45]. The independent variables are proxies for those factors hypothesized to affect the size of the market reaction.

4.2.1 Information Asymmetry

Schipper and Smith [1986] explain that equity carve-outs reduce the degree of information asymmetry that exists between management and new investors through the release of information about the subsidiary. This fact is noticeable in the difference in abnormal returns between equity carve-outs by subsidiaries and seasoned equity offerings by parent firms. There may also be asymmetry regarding the reaction of different markets to the announcement of equity carve-outs. Our proxy for the level of asymmetric information about an issue is the EXCHANGE, a dummy variable indicating whether the ECO is listed on the NYSE or NASDAQ. This EXCHANGE is assigned a value of 0 if the subsidiary is listed on the NYSE; those on the NASDAQ a 1. Observations for the EXCHANGE variable were retrieved from the database provided by the Securities Data Company, and Moody's Industrial Survey. Previous studies by Stewart [1994] and Affleck-Graves, Hedge, Miller and Reilly [1993] have shown that more underpricing exists on the NASDAQ than the NYSE market for equity issues. We would thus expect a higher degree of information asymmetry for the NASDAQ market to be represented by a negative significant coefficient, and therefore higher abnormal returns.

4.2.2 Performance Level

The performance level of parent and subsidiary firms may also affect the abnormal returns around the announcement of an ECO. Schipper and Smith [1986] state that equity carve-outs influence the managerial performance due to the restructuring of managerial responsibilities and corporate orientation of the subsidiary. Managerial compensation is also usually tied more directly to the share price or earnings level of the subsidiary. Nanda [1991] also emphasizes that parent firms that pursue an equity carve-out tend to be those that view the parent firm as being undervalued, while the subsidiary as overvalued. Thus, we use EPS of the parent firm as a proxy variable for evaluating the profitability and overall performance of the firm. We expect that the higher the profitability/performance of the parent firm, the higher the associated abnormal returns of the parent firm. The earnings per share one year prior to the announcement are employed in our analysis, with the Compustat tapes and Moody's Industrial Survey providing the observations.

In several circumstances, parent and subsidiary firms are found to exist in different industries. As a result, each firm develops specific expertise that allows them to operate more effectively within that industry. In regards to equity carve-outs, a subsidiary firm may have better expertise to raise capital in their industry, and thus do so more cheaply. Therefore, to account for this difference in performance level, we use a comparison of SIC codes to estimate the relatedness of the parent/subsidiary industries. The INDUSTRY variable in the cross sectional regressions will represent any differences in 4-digit SIC codes. Those firms that are in the same industry are assigned a dummy variable of 1, otherwise 0. Sources of the observations were the database provided by the Securities Data Company and Moody's Industrial Survey. Based on the above theory, we expect subsidiaries in different industries to provide higher abnormal returns to the parent firms. In contrast to this argument, however, Sicherman and Pettway [1987] find that significant positive returns are associated with parent and subsidiary firms in the same industry, given a sell-off transaction.

4.2.3 Risk Level

The ability of a firm to meet its debt and interest payments is reflected in the rating assigned to its outstanding debt. The bond rating of a firm may provide an indication of the firm's overall financial condition, while also providing an estimation of the firm's riskiness. Also, if there is differential risk between parent and subsidiary firms upon the announcement of the ECO, in favour of the subsidiary, this may help to explain some of the significant abnormal returns attributed to parent firms of ECO events. To indicate the riskiness associated with the parent firm, we use the bond rating of the firm's outstanding debt that which has the largest market value. The bond rating is represented in the cross sectional regressions by the variable RATING. Appendix 3 provides a full description of the bond rating classification employed. The classification index was taken from the Standard and Poor's Compustat Services Manual, while the bond ratings were retrieved from the Compustat Tapes and Moody's Industrial Survey. We expect that firms which exhibit a high level of risk will avoid issuing their own equity due to the underpricing that is expected from the market. Therefore, as an alternative, the firm will issue security through a subsidiary of lower risk. This will result in a positive reaction (ie.less underpricing of the issue) by the market, and thus higher abnormal returns for the parent firm.

4.2.4 Control Variables

We control for two factors that according to previous studies might influence the size of the abnormal returns. The two control variables are the percentage carved-out in the subsidiary (%CARVE) and the size of the IPO made by the subsidiary (LOGSIZE).

Schipper and Smith [1986] report that a substantial number of parent firms performing an ECO maintain majority control of the subsidiary firm. This is done either by controlling over 50% of the shares outstanding in the subsidiary, or by issuing a special class of shares that enables the parent firm to own less than 50% of the subsidiary, but maintain voting control. The reasoning for this is to allow the parent firm the decision to later eliminate the potential costly publicly minority through a re-acquisition or sell-off of the assets. The observations for the %CARVE variable were collected from the Klein, Rosenfeld and Beranek [1991] study, the database provided by the Securities Data Company, and Moody's Industrial Survey We expect a relationship that demonstrates abnormal returns being larger for parent firms that issue a greater percentage of the subsidiary to the market. This is to compensate firms for having a potentially more costly minority interest.

The second control variable (LOGSIZE) is the natural log of the issue size of the equity carve-out. Over the past decade, the value of equity carve-outs has grown substantially. Schipper and Smith [1986] reported that the minimum to maximum range for their sample of 76 carve-outs was $300,000 to $112.2 million, during the period of 1963 to 1983. In comparison, Slovin, Sushka and Ferraro[1995] demonstrate a mean offering size of $166.47 million for ECO's ranging from 1980 to 1991. The mean size of our sample is $131.60 million (see table 3A), with a minimum and maximum of $1.33 million and $1,849.50 million respectively (time period from 1965 to 1993). This represents a significant jump in the size of issues and signifies that the asset size of issuing firms is increasing. Stewart [1994] states that a negative relationship exists between underpricing and the size of the regular offering. This can be explained as very large issues attracting more publicity than small ones, and thus less underpricing. To control for this fact, the natural log of the gross proceeds of issue (in millions of dollars) is employed. The sources for the issue size include Moody's Industrial Survey, and the database provided by the Securities Data Company.

4.3 Econometric Model

Cross-sectional regressions are performed on CPE values from parent firms listed on the NYSE. Four event windows are analyzed in greater detail, specifically [-1,0],[-45,45], [-4,0] and [-1,1]. The following model is utilized:

$$CPE_{i,t1,t2} = \alpha_i + \beta_1 EPS_i + \beta_2 Rating_i + \beta_3 \%Carve_i + \beta_4 Industryj + \beta_5 Logsize_j + \beta_6 Exchange_i + \varepsilon_i$$

Where:

$CPE_{j\,t1,t2}$ = Cumulative prediction errors for parent firm j, over a specific window period from t1 to t2.

EPS_j = Earnings per share before extraordinary items, not diluted, for company j.

$Rating_j$ = Standard and Poor's Bond rating of the outstanding debt of parent firm j. See appendix 3 for scale.

$\%Carve_j$ = Percentage of equity carved-out in subsidiary j and sold to the market by the parent firm.

$Industry_j$ = Dummy variable of the relatedness of parent and subsidiary firms. If standard industry code (SIC) matches for both firms, a 1 is assigned, otherwise 0.

$Logsize_j$ = Log normal of the equity issue made by subsidiary j, in millions of dollars

$Exchange_j$ = Dummy variable for the exchange listing of the subsidiary firm. Firms listed on NYSE are assigned a 0, otherwise 1.

We use both univariate and multivariate regressions to determine the effect of these factors on the abnormal returns earned at the time of the ECO announcement.

5. RESULTS

5.1 Sample Statistics

Tables 5 and 6 report the mean, median, standard deviation, minimum and maximum values, as well as the distribution pattern of CPEs for both the NYSE and NASDAQ markets over several event windows. The distributions of firms for each group exhibit similar patterns in windows [-4 ,0], [-1,0] and [-1,1]. When analyzing the window of [-45,45] for both the NYSE and NASDAQ groups, the distribution shows a concentration of observations at the extremities (ie. >20% and <-20% CPE) while there are very few observations between the -1% and 1% level. Also it is interesting that 44% of the ECOs in the NYSE sample have a CPE value between 0% and 5% for window [-4 to 0]. This is consistent with the 46% of ECOs in the same CPE range and window reported by the Schipper and Smith [1986] study. However, our median CPE for the NYSE group is approximately half of that calculated by Schipper and Smith [1986]. (0.89% vs. 1.6% for window [-4,0]).

5.2 Market Reaction to Announcements of ECOs

We used a ninety-one day window from [-45,45] surrounding the announcement date to estimate the prediction errors and cumulative prediction errors for both the NYSE and NASDAQ groupings. The methodology employed is consistent with that used by Schipper and Smith [1986].

However, we use different estimation periods. First we use a pre-event estimation period from [-300,-46] days prior to the ECO announcement. This is consistent with the

TABLE 5

Summary of Cumulative Prediction Errors for NYSE Parent Firms Reaction to Announcements of Subsidiary Equity Offering

CPE% Range			**Distribution of Observations for Event Window:** **[-45,45]**	**[-4, 0]**	**[-1, 0]**	**[-1, 1]**
	≥	20%	34	1	0	2
10%	<	20%	20	9	5	5
5%	<	10%	24	27	11	17
1%	<	5%	14	57	53	54
0%	<	1%	5	18	25	21
-1%	<	0%	4	13	34	26
-5%	<	-1%	21	41	52	44
-10%	<	-5%	24	19	8	17
-20%	<	-10%	16	3	2	4
	<	-20%	28	2	0	0
Total Sample			**190**	**190**	**190**	**190**
Median			0.35%	0.89%	-0.03%	0.21%
Mean			1.74%	0.83%	0.30%	0.44%
Standard Deviation			24.59%	5.89%	3.95%	5.50%
Minimum			-78.58%	-26.92%	-19.77%	-19.53%
Maximum			94.97%	25.45%	16.13%	32.54%

The market model parameters are estimated over 255 trading days, starting from -300 to -46 days before the equity carve-out announcement (day =0)

TABLE 6

Summary of Cumulative Prediction Errors for NASDAQ Parent Firms.
Reaction to Announcements of Subsidiary Equity Offerings

			Distribution of Observations for Event Window:			
CPE% Range			**[-45,45]**	**[-4, 0]**	**[-1, 0]**	**[-1, 1]**
	≥	20%	15	5	0	4
10%	<	20%	6	3	6	5
5%	<	10%	3	4	3	6
1%	<	5%	1	10	12	9
0%	<	1%	0	5	4	2
-1%	<	0%	2	3	5	6
-5%	<	-1%	3	12	15	10
-10%	<	-5%	2	4	2	5
-20%	<	-10%	5	1	0	0
	<	-20%	10	0	0	0
Total Sample			**47**	**47**	**47**	**47**
Median			5 13%	0 56%	0.15%	1 05%
Mean			4 04%	4 39%	1 88%	3 74%
Standard Deviation			36 79%	13 21%	6 37%	9 41%
Minimum			-98 24%	-18 49%	-9 56%	-10 00%
Maximum			79 85%	66 04%	19 49%	36 36%

The market model parameters are estimated over 255 trading days, starting from -300 to -46 days before the equity carve-out announcement (day =0) period used by previous studies. Secondly, a split estimation period of [-173,-46] days before and [46, 174] days after the announcement is used to capture any changes in β of the parent firm. Tables 7A, 7B, and figures 1A, 1B, 2 shows very little difference in abnormal returns across the two estimation periods.

Similar to Schipper and Smith [1986], table 7A and figure 1A present a series of positive daily prediction errors for the NYSE sample, starting at day -18 and continuing through until day 3. During this period, the CPE increased from -0.15% to 2.93%, and six days were shown to be significant at 10% or better (days -17,-12, -9, -7, -3 and -1). In comparison, the NASDAQ sample (see table 8 and figure 3) shows a sequence of positive returns starting at day -6 until day 3, of which five days are highly significant. This window reports an increase in CPE from -2.03% to 5.57%, a change of 7.54% in 10 days. The CPEs for the NYSE and NASDAQ markets, as seen in figure 1A and 3, show the NASDAQ prediction errors as being more volatile over the [-15,20] day window. Figure 4 provides a comparison of the CPE values of the NYSE and NASDAQ groups. First, this shows the initial reaction of the markets to the leakage of information before the announcement. Second, the effect of the announcement seems to have a much stronger impact on the NASDAQ market, in terms of higher initial returns in a shorter period of time (ie. see window [-5,5]). Finally, the figure suggests that it takes a longer period of time for the NASDAQ market to absorb all the information concerning the announcement than the NYSE market. The NYSE shows the CPE peaking at day 10 compared to day 24 for the NASDAQ. This is consistent with the NASDAQ market not being as efficient as the NYSE

Table 7 A

Daily Prediction Errors (PE) and Cumulative Daily Prediction Errors (CPE) for Parent Firms listed on the NYSE, with Announcements of Subsidiary Equity Carve-Outs for the period of 1965 to 1993.

Day	PE (%)	CPE (%)	Sign Rank Test	Number of Firms	Day	PE (%)	CPE (%)	Sign Rank Test	Number of Firms
-45	-0.08	-0.08	79 110 (	189	1	0.14	2.82	95 95	190
-44	-0.03	-0.11	84 105	189	2	0.01	2.83	85 105	190
-43	-0.01	-0.12	93 97	190	3	0.10	2.93	98 92)	190
-42	0.08	-0.04	87 103	190	4	-0.10	2.83	80.110	190
-41	-0.06	-0.10	88 102	190	5	-0.10	2.73	86 104	190
-40	-0.10	-0.20	80 110	190	6	0.09	2.82	92 98	190
-39	-0.03	-0.23	87 103	190	7	0.09	2.91	88 102	190
-38	-0.14	-0.37	80 110	190	8	0.14	3.05	98 92)	190
-37	0.17	-0.20	97 93	190	9	0.5**	3.55	92 98	190
-36	0.33*	0.13	98 92)	190	10	0.11	3.66	87 103	190
-35	-0.01	0.12	89 101	190	11	-0.51**	3.15	64 126 <<<	190
-34	-0.09	0.03	84 106	190	12	-0.12	3.03	86 104	190
-33	0.02	0.05	86 104	190	13	0.03	3.06	90 100	190
32	0.06	0.11	92 98	190	14	0.11	3.17	85 105	190
-31	-0.06	0.05	84 106	190	15	0.00	3.17	92 98	190
-30	-0.04	0.01	89 101	190	16	-0.49**	2.68	85 105	190
-29	-0.22	-0.21	82 108	190	17	0.40*	3.08	103 87	190
-28	0.12	-0.09	81 109	190	18	0.00	3.08	96 94	190
27	-0.16	-0.25	87 103	190	19	0.20	3.28	96 94	190
-26	0.18	-0.07	87 103	190	20	-0.26$	3.02	86 104	190
25	-0.01	-0.08	81 109	190	21	0.03	3.05	82 108	190
-24	-0.04	-0.12	82 108	190	22	-0.05	3.00	96 93	189
-23	-0.01	-0.13	90 100	190	23	-0.31$	2.69	81 108	189
22	0.05	-0.08	86 104	190	24	0.07	2.76	87·102	189
-21	-0.05	-0.13	81 109	190	25	-0.31$	2.45	77 112 (	189
-20	-0.01	-0.14	83 107	190	26	0.13	2.58	96 93	189
-19	-0.15	-0.29	78 112 (	190	27	-0.11	2.47	78 111 (	189
-18	0.14	-0.15	92 98	190	28	-0.16	2.31	80 109	189
-17	0.38*	0.23	99 91)	190	29	-0.05	2.26	84 105	189
-16	0.20	0.43	86 104	190	30	-0.21	2.05	84 105	189
-15	0.13	0.56	88 102	190	31	-0.27$	1.78	75 114 <	189
-14	0.02	0.58	79 111 (	190	32	-0.29$	1.49	81 108	189
-13	0.00	0.58	93 97	190	33	0.09	1.58	87 102	189
-12	0.32*	0.90	98 92)	190	34	-0.02	1.56	73 116	189
-11	0.04	0.94	95 95	190	35	-0.19	1.37	85 104	189
-10	0.06	1.00	96 94	190	36	0.15	1.52	85 104	189
-9	0.33*	1.33	89 101	190	37	0.19	1.71	90 99	189
-8	0.05	1.38	82 108	190	38	0.18	1.89	81 108	189
-7	0.55**	1.93	103 87	190	39	-0.11	1.78	88 101	189
-6	-0.01	1.92	91 99	190	40	0.17	1.95	91 98	189
-5	-0.05	1.87	84 106	190	41	-0.51**	1.44	71·118 <<	189
-4	-0.10	1.77	94 96	190	42	0.25$	1.69	98 91)	189
3	0.47**	2.24	105 85	190	43	-0.17	1.52	74 115	189
-2	0.15	2.39	99 91)	190	44	0.16	1.68	94 95	189
1	0.25$	2.64	104 86	190	45	0.02	1.70	89 100	189
0	0.04	2.68	95 95	190					

Note: $ ( ) significant level at 10%; *, < > significant level at 5%; **, << >> significant level at 1%; ***, <<< >>> significant level at 0.1%

The market model parameters are estimated over 255 trading days, starting from -300 to -46 days before the equity carve-out announcement (day = 0)

Table 7.B

Daily Prediction Errors (PE) and Cumulative Daily Prediction Errors (CPE) for Parent Firms listed on the NYSE, with Announcements of Subsidiary Equity Carve-Outs for the period of 1965 to 1993. Split Estimation Period Utilized

Day	PE (%)	CPE (%)	Sign Rank Test	Number of Firms	Day	PE (%)	CPE (%)	Sign Rank Test	Number of Firms
-45	-0.11	-0.11	84 105	189	1	0.15	2.81	97 93	190
-44	-0.04	-0.15	89 100	189	2	0.00	2.81	88 102	190
-43	0.01	-0.14	93 97	190	3	0.09	2.90	98 92)	190
-42	0.08	-0.06	89 101	190	4	-0.10	2.80	84 106	190
-41	-0.06	-0.12	86 104	190	5	-0.10	2.70	90 100	190
-40	-0.10	-0.22	85 105	190	6	0.07	2.77	93 97	190
-39	-0.03	-0.25	90 100	190	7	0.09	2.86	94 96	190
-38	-0.14	-0.39	87 103	190	8	0.14	3.00	104 86	190
-37	0.16	-0.23	97 93	190	9	0.50*	3.50	88 102	190
-36	0.33$	0.10	99 91)	190	10	0.09	3.59	85 105	190
-35	-0.01	0.09	90 100	190	11	-0.49*	3.10	67 123	190
-34	-0.09	0.00	89 101	190	12	-0.10	3.00	89 101	190
-33	0.02	0.02	89 101	190	13	0.05	3.05	86 104	190
-32	0.05	0.07	90 100	190	14	0.10	3.15	89 101	190
-31	-0.05	0.02	81 109	190	15	0.02	3.17	91 99	190
-30	-0.06	-0.04	83 107	190	16	-0.47*	2.70	85 105	190
-29	-0.22	-0.26	82 108	190	17	0.39$	3.09	102 88	190
-28	0.08	-0.18	83 107	190	18	-0.01	3.08	95 95	190
-27	-0.14	-0.32	92 98	190	19	0.19	3.27	96 94	190
-26	0.21	-0.11	91 99	190	20	-0.27	3.00	87 103	190
-25	-0.03	-0.14	88 102	190	21	0.01	3.01	84 106	190
-24	-0.04	-0.18	84 106	190	22	-0.04	2.97	95 94	189
-23	-0.02	-0.20	90 100	190	23	-0.34$	2.63	82 107	189
-22	0.06	-0.14	86 104	190	24	0.06	2.69	83 106	189
-21	-0.02	-0.16	84 106	190	25	-0.30	2.39	76 113	189
-20	-0.01	-0.17	87 103	190	26	0.12	2.51	100 89	189
-19	-0.15	-0.32	80 110	190	27	-0.11	2.40	76 113	189
-18	0.11	-0.21	92 98	190	28	-0.17	2.23	78 111 (	189
-17	0.36$	0.15	97 93	190	29	-0.03	2.20	84 105	189
-16	0.19	0.34	88 102	190	30	-0.19	2.01	89 100	189
-15	0.11	0.45	94 96	190	31	-0.28	1.73	79 110 (	189
-14	0.00	0.45	77 113 (	190	32	-0.33$	1.40	84 105	189
-13	-0.01	0.44	93 97	190	33	0.09	1.49	83 106	189
-12	0.32	0.76	93 97	190	34	0.00	1.49	74 115	189
-11	0.03	0.79	92 98	190	35	-0.22	1.27	89 100	189
-10	0.08	0.87	92 98	190	36	0.13	1.40	85 104	189
-9	0.34$	1.21	90 100	190	37	0.17	1.57	93 96	189
-8	0.07	1.28	82 108	190	38	0.21	1.78	81 108	189
-7	0.56*	1.84	104 86	190	39	-0.11	1.67	87 102	189
-6	0.00	1.84	91 99	190	40	0.20	1.87	93 96	189
-5	-0.04	1.80	84 106	190	41	-0.47$	1.40	76 113	189
-4	-0.09	1.71	91 99	190	42	0.27	1.67	95 94	189
-3	0.49*	2.20	108 82	190	43	-0.14	1.53	75 114	189
-2	0.15	2.35	96 94	190	44	0.17	1.70	95 94	189
-1	0.24	2.59	101 89	190	45	0.03	1.73	89 100	189
0	0.07	2.66	96 94	190					

Note: $ ( ) significant level at 10%; * significant level at 5%; ** significant level at 1%; *** significant level at 0.1%

A split estimation is used to control for post event changes in Beta.
The market model parameters are estimated over 255 trading days, starting from [-173, -46] days before the announcement period and [46, 174] days after the announcement period.

Table 8

Daily Prediction Errors (PE) and Cumulative Daily Prediction Errors (CPE) for Parent Firms listed on NASDAQ, with announcements of Subsidiary Equity Carve-Outs for the period of 1981 to 1993.

Day	PE (%)	CPE (%)	Sign Rank Test	Number of Firms	Day	PE (%)	CPE (%)	Sign Rank Test	Number of Firms
-45	-0.34	-0.34	23 24	47	1	1.86***	4.54	28 19 >	47
-44	-0.91*	-1.25	19 28	47	2	0.12	4.66	25.22	47
-43	0.08	-1.17	22 25	47	3	0.91*	5.57	24 23	47
-42	0.59	-0.58	23 24	47	4	-0.03	5.54	16 31 (	47
-41	0.63	0.05	26 21)	47	5	-0.88*	4.66	19.28	47
-40	-0.35	-0.30	18 29	47	6	0.43	5.09	19.28	47
-39	-0.15	-0.45	18 29	47	7	0.13	5.22	20.27	47
-38	-0.05	-0.50	22 25	47	8	-0.34	4.88	22 25	47
-37	0.35	-0.15	24 23	47	9	-0.02	4.86	22 25	47
-36	-0.44	-0.59	22 25	47	10	-0.45	4.41	22 25	47
-35	0.05	-0.54	25 22	47	11	-0.04	4.37	18.29	47
-34	-1.27**	-1.81	17 30 (	47	12	0.15	4.52	20 27	47
-33	-0.18	-1.99	23 24	47	13	0.91*	5.43	24 23	47
-32	-0.22	-2.21	23 24	47	14	0.39	5.82	24 23	47
-31	-0.91*	-3.12	18 29	47	15	0.21	6.03	21 25	46
-30	1.24**	-1.88	26 21)	47	16	0.25	6.28	23 23	46
-29	-0.19	-2.07	21 26	47	17	-0.55	5.73	21 25	46
-28	0.55	-1.52	23 24	47	18	0.21	5.94	24 22	46
-27	-0.10	-1.62	23 24	47	19	0.43	6.37	19 27	46
-26	0.93*	-0.69	22 25	47	20	1.62**	7.99	25 21	46
-25	-0.09	-0.78	27 20)	47	21	0.57	8.56	21 25	46
-24	0.89*	0.11	28 19	47	22	-0.02	8.54	20 26	46
-23	-0.54	-0.43	18 29	47	23	0.11	8.65	16 30 (	46
-22	0.68$	0.25	25 22	47	24	0.32	8.97	24 22	46
-21	-0.41	-0.16	20 27	47	25	-0.27	8.70	17 29	46
-20	-0.46	-0.62	22 25	47	26	0.02	8.72	20 26	46
-19	0.88*	0.26	27 20)	47	27	-0.51	8.21	19 27	46
-18	0.35	0.61	24 23	47	28	-0.57	7.64	19 27	46
-17	-0.89*	-0.28	15 32 <	47	29	0.24	7.88	24 22	46
-16	0.31	0.03	19 28	47	30	-0.36	7.52	19 27	46
-15	-0.56	-0.53	22 25	47	31	0.23	7.75	21 25	46
-14	-0.81$	-1.34	20 27	47	32	0.06	7.81	21 24	45
-13	0.06	-1.28	19 28	47	33	-0.56	7.25	23 22	45
-12	-0.19	-1.47	24 23	47	34	-0.66	6.59	17 28	45
-11	-0.50	-1.97	21 26	47	35	0.05	6.64	19 26	45
-10	-0.26	-2.23	20 27	47	36	-0.63	6.01	19 25	44
-9	-0.10	-2.33	20 27	47	37	0.23	6.24	21 24	45
-8	0.45	-1.88	24 23	47	38	-0.53	5.71	23 22	45
-7	-0.53	-2.41	22 25	47	39	0.71$	6.42	20 25	45
-6	0.38	-2.03	26 21)	47	40	-0.68$	5.74	15 30 <	45
-5	0.34	-1.69	26 21)	47	41	-0.81$	4.93	17 28	45
-4	0.63	-1.06	24 23	47	42	0.57	5.50	26 19)	45
-3	1.45**	0.39	25 22	47	43	-0.16	5.34	19 26	45
-2	0.42	0.81	24 23	47	44	-1.35**	3.99	12 33 <	45
-1	1.04*	1.85	26 21)	47	45	-0.09	3.90	20 25	45
0	0.83$	2.68	24 23	47					

Note: $, (,) significant level at 10%
*, <, > significant level at 5%
**, <<, >> significant level at 1%
***, <<<, >>> significant level at 0.1%

The market model parameters are estimated over 255 trading days, starting from -300 to -46 days before the equity carve-out announcement (day 0)

FIGURE 1.A
Prediction & Cumulative Prediction Errors For Equity Carve-Outs
Parent Firms Based on NYSE

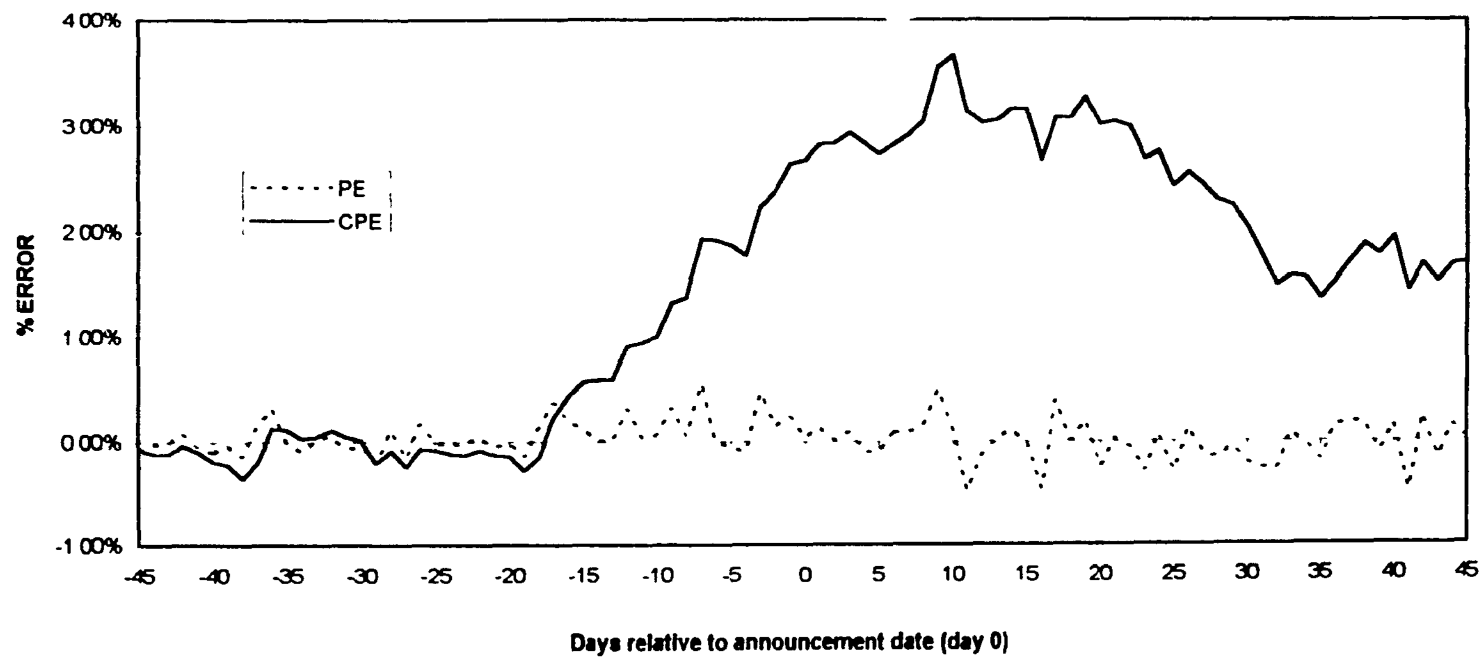

Fig 1 A. The Prediction errors (PE) of parent firms (listed on NYSE/ASE) reaction to subsidiary equity carve-out announcements. for a sample of 190 events, during the period of 1965 to 1993, are represented by the dashed line. Cumulative prediction errors (CPE) of parent firms (listed on NYSE/ASE) reaction to subsidiary equity carve-out announcements for the same period and sample, are represented by the solid line The market model parameters are estimated over 255 trading days, starting from -315 to -46 days before the announcement (day 0)

FIGURE 1.B

Prediction & Cumulative Prediction Errors For Equity Carve-Outs
Parent Firms Based on NYSE- Adjusting for Post-Event Changes in Beta

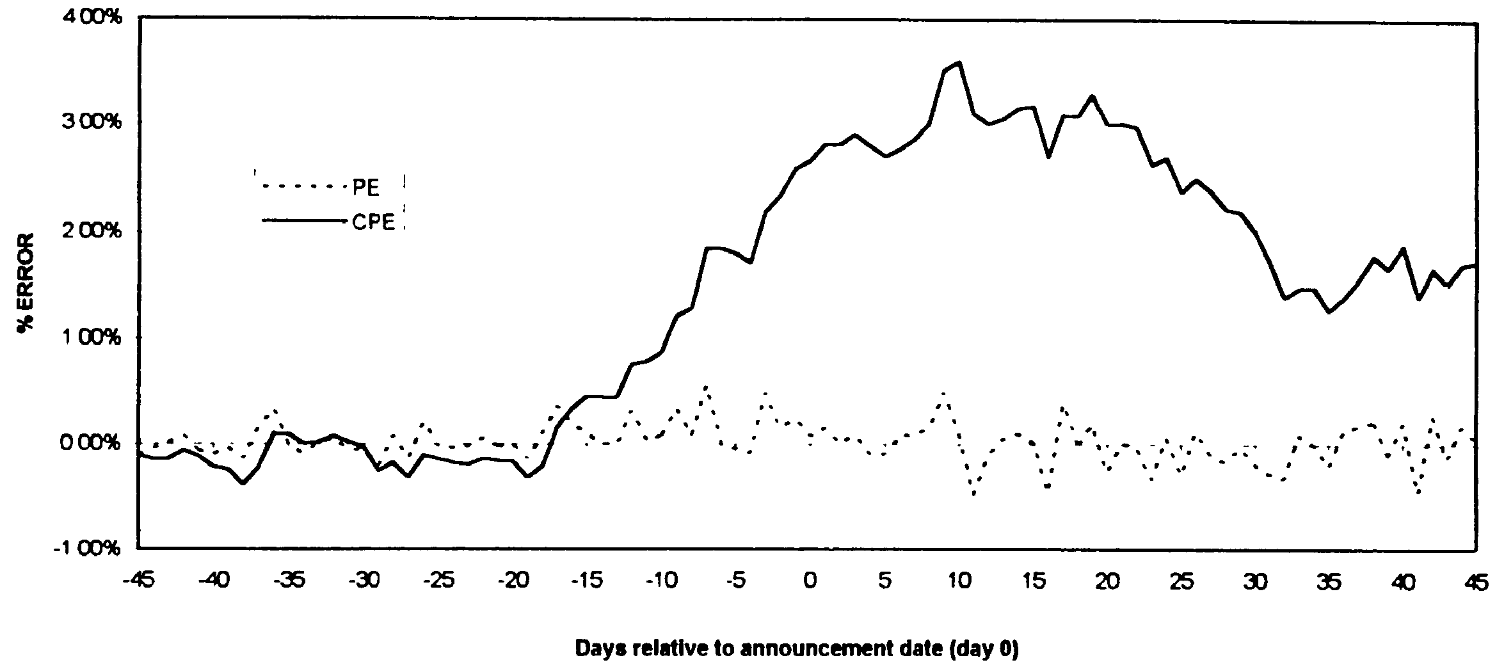

Fig. 1.B. The Prediction errors (PE) of parent firms (listed on NYSE/ASE) reaction to subsidiary equity carve-out announcements, for a sample of 190 events, during the period of 1965 to 1993, are represented by the dashed line. Cumulative prediction errors (CPE) of parent firms (listed on NYSE/ASE) reaction to subsidiary equity carve-out announcements for the same period and sample, are represented by the solid line The market model parameters are estimated over 255 trading days, starting from -173 to -46 days before the announcement (day 0) and 46 to 174 days after the announcement

FIGURE 2
Comparison of Cumulative Prediction Errors for Samples of Parent Firms Listed on NYSE using Two Different Estimation Periods

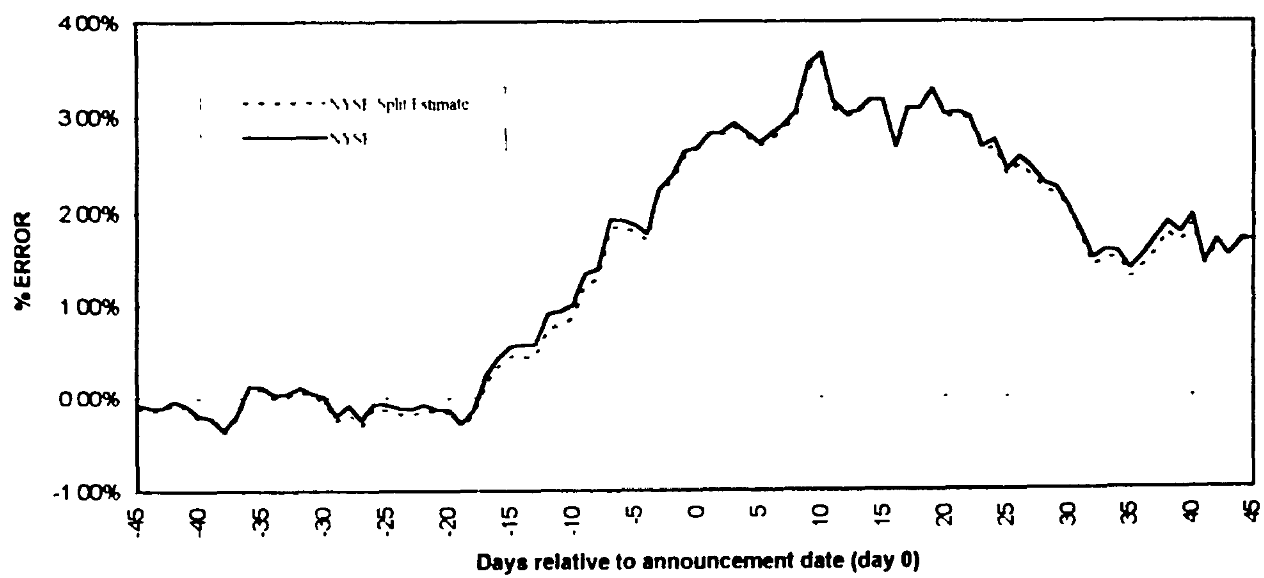

Fig. 2 The Cumulative Prediction errors (CPE) of parent firms (listed on NYSE/ASE) reaction to subsidiary equity carve-out announcements, for a sample of 190 events, during the period of 1965 to 1993. The solid line represents the CPE of firms on the NYSE where the market model parameters are estimated over a period of 255 trading days, starting from -300 to -46 days before the announcement (day 0). The dashed line represents the CPE of firms on the NYSE where market model parameters are estimated over a period of 255 trading days, starting at -173 to -46 days before, and 46 to 174 days after the announcement. This attempts to account for any post event changes in risk.

FIGURE 3
Prediction & Cumulative Prediction Errors for Equity Carve-Outs
Parent Firms Based on NASDAQ

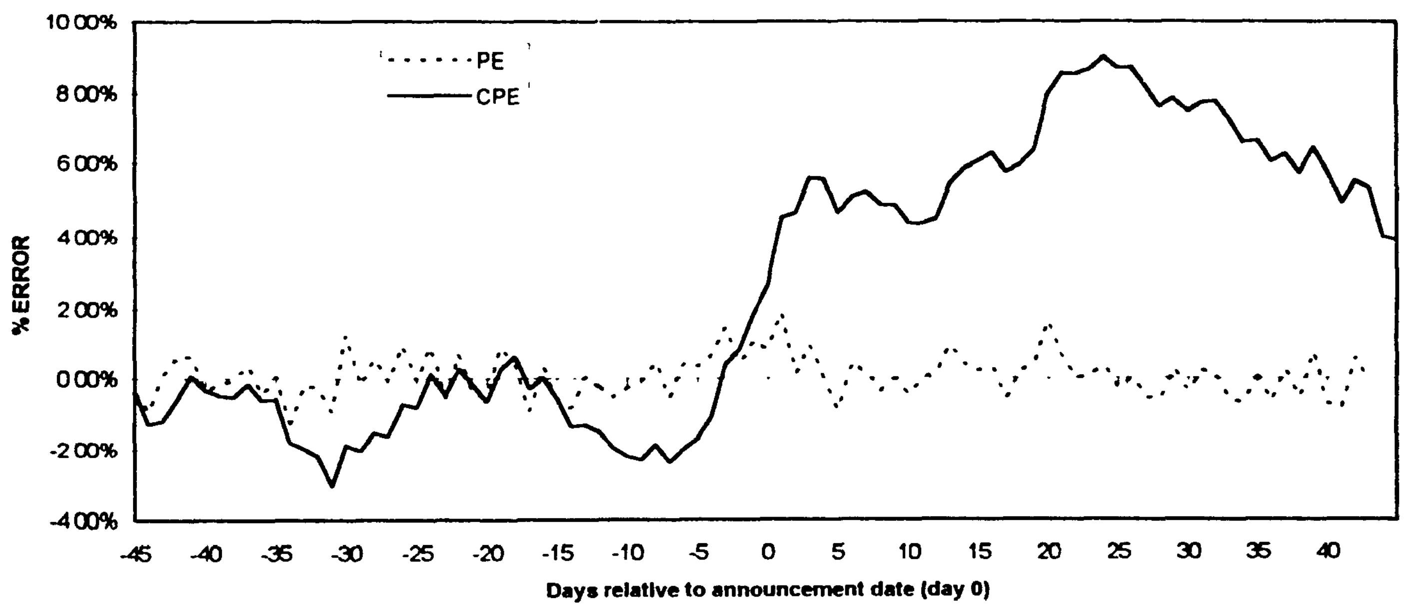

Fig 3. The Prediction errors (PE) of parent firms (listed on NASDAQ) reaction to subsidiary equity carve-out announcements, for a sample of 47 events, during the period of 1981 to 1993, are represented by the dashed line. Cumulative prediction errors (CPE) of parent firms (listed on NASDAQ) reaction to subsidiary equity carve-out announcements for the same period and sample, are represented by the solid line. The market model parameters are estimated over 255 trading days, starting from -315 to -46 days before the announcement(day 0)

FIGURE 4

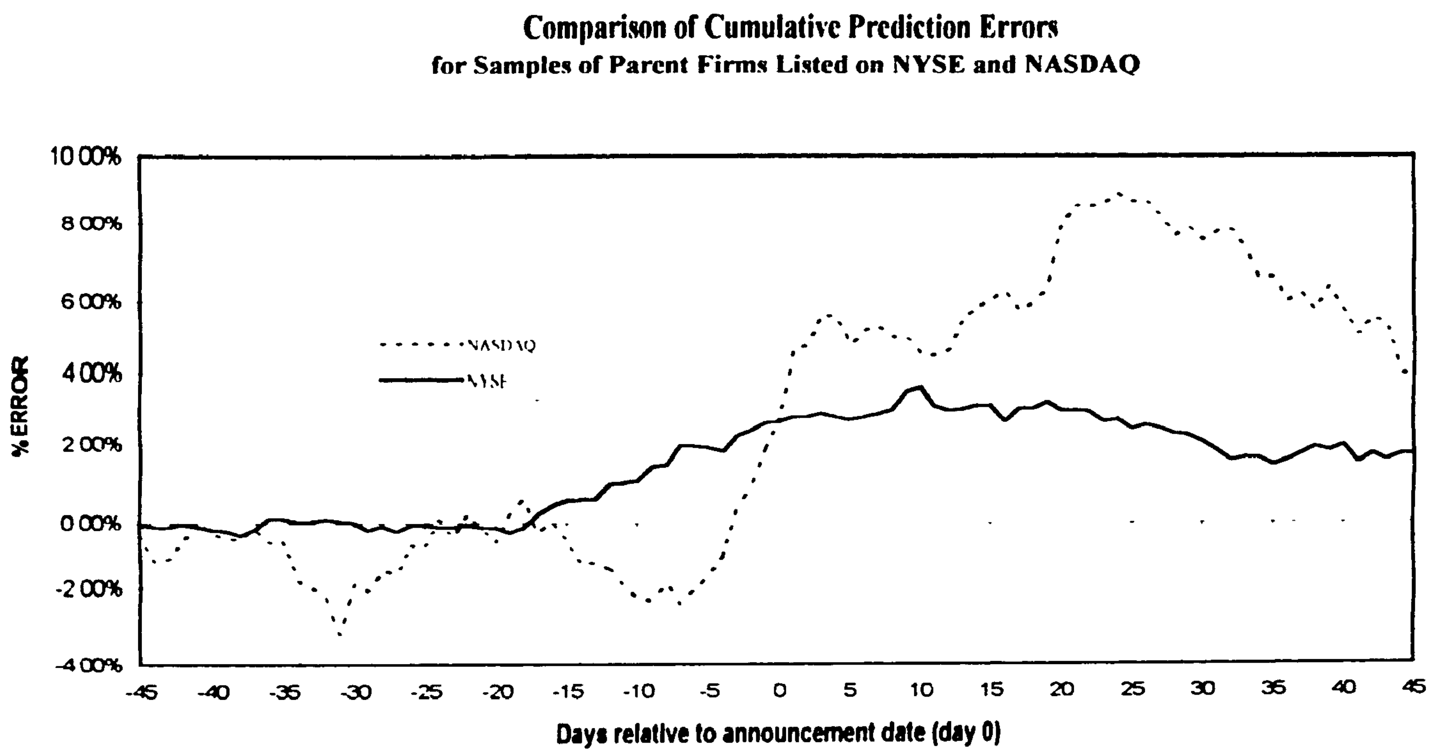

Fig 4 The Cumulative Prediction errors (CPE) of parent firms (listed on NYSE/ASE) reaction to subsidiary equity carve-out announcements, for a sample of 190 events, during the period of 1965 to 1993, are represented by the solid line Cumulative prediction errors (CPE) of parent firms (listed on NASDAQ) reaction to subsidiary equity carve-out announcements for the same period and sample of 47 events, are represented by the dashed line The Market model parameters are estimated over a period of 255 trading days, starting from -300 to -46 days before the announcement (day 0)

Table 9 reports the CPE for both the NYSE and NASDAQ samples, over several event windows. In both samples, window [-4,0] reported significant CPE values at under 1%, with the NYSE being 0.82% compared to 4.39% for the NASDAQ. The sign rank tests for this window were also significantly positive. The NASDAQ group also showed significance at under 1% (Z-score) for the [-1, 0] and [-1,1] windows, whereas the NYSE was significant at 10% and 5% respectively. Our results are consistent with other studies in terms of being significantly positive. However, the returns for the NYSE are smaller in comparison to the other related studies. Schipper and Smith [1986] and Klein, Rosenfeld and Beranek [1991] found CPE values of 1.83% and 2.75% respectively for window [-4,0]. These were both significant at under 1%. Slovin, Sushka and Ferraro [1995] also reported significant positive returns of 1.23% for the two day window (1-,0) at the 5% level. The difference between our results and other studies may be the size of the samples being used.

A comparison test between the abnormal returns associated for parent firms listed on the NYSE and NASDAQ was performed and found to be significantly different for windows [-4,0] and [-1,1] at 10% and 5% respectively (see table 10). One possible explanation for this result may be attributed to the asymmetry of information that exists between the NYSE and NASDAQ markets. Schipper and Smith [1986] and Klein, Rosenfeld and Beranek [1991] also noted that in their samples of equity carve-outs there were no events during the period from 1973 to 1978. Likewise, we found no events during the same period (see table 2).

Table 9

Summary of Cumulative Daily Prediction Errors (CPE)

Results of 190 Parent Firms Listed on the NYSE with an estimation period of -300 to -46 trading days before the ECO announcement

Window	CPE (%)	t-Stat CPE	Z score CSPE	Sign Rank Test
-45 to 45	1.74	0.92	0.46	97.93
-45 to -5	1.87	1.49$	0.61	93.97
-4 to 0	0.83	1.87*	2.56**	112.78 · ·
-1 to 0	0.30	1.07	1.61$	94.96
-1 to 1	0.44	1.30$	1.92*	99.91
1 to 45	-0.97	-0.73	-0.78	93.97

Results of 190 Parent Firms Listed on the NYSE with an estimation period of -173 to -46 and 46 to 174 trading days before and after the ECO announcement

Window	CPE (%)	t-Stat CPE	Z score CSPE	Sign Rank Test
-45 to 45	1.72	0.7	0.83	98.92)
-45 to -5	1.79	1.08	0.78	94.96
-4 to 0	0.87	1.51$	2.35**	114.76 · ·
-1 to 0	0.31	0.87	1.58$	97.93
-1 to 1	0.46	1.04	1.92*	101.89
1 to 45	-0.94	-0.73	-0.34	97.93

Results of 47 Parent Firms Listed on the NASDAQ with an estimation period of -300 to -46 trading days before the ECO announcement

Window	CPE (%)	t-Stat CPE	Z score CSPE	Sign Rank Test
-45 to 45	4.04	0.77	1.98*	25.22
-45 to -5	-1.72	-0.51	1.76*	30.17 · ·
-4 to 0	4.39	3.70***	4.13***	27.20)
-1 to 0	1.88	2.50**	3.80***	25.22
-1 to 1	3.74	4.07***	5.79***	26.21)
1 to 45	1.23	0.35	-0.26	25.22

Note: $, ( ) significant level at 10%; *, · · significant level at 5%; **, · · · significant level at 1%; ***, · · significant level at 0.1%

TABLE 10

COMPARISON OF RETURNS FOR PARENT FIRMS LISTED ON THE NYSE AND NASDAQ EXCHANGES

Window	*Market*	*Mean*	*Std Dev*	*T stat for Difference in means between NASDAQ and NYSE*
[-1,0]	Nasdaq	0.0188	0.0637	1.6262
	NYSE	0 003	0.0395	
[-45,45]	Nasdaq	0.0404	0.3679	0.4057
	NYSE	0.0174	0.2459	
[-4,0]	Nasdaq	0 0439	0 1321	**1.8057S**
	NYSE	0.0083	0.0589	
[-1,1]	Nasdaq	0.0374	0.0941	**2.3079***
	NYSE	0.0044	0.055	

Note: All tests where adjusted for unequal variance

Thus, we tested for differences that may exist between the CPE values prior to 1973 and after 1978, but found no statistically significant difference.

5.3 Results from the Cross Sectional Regressions

With a sample size of 190 ECOs from the NYSE, EPS were available for 140 firms, bond rating for 118 firms and percentage carved-out for 126 firms. Also, the Industry for 101 firms was available, along with the issue size (LOGSIZE) for 123 firms and finally the exchange listing for 129 subsidiary firms. Cross sectional regressions on CPE were performed solely on the sample of NYSE events due to the lack of available information for the NASDAQ sample. Tables 11A-D present the results of the regressions for the following event windows: [-45,45], [-4,0], [-1,0] and [-1,1].

The univariate regression of EPS on CPE shows that EPS has a positive effect on the abnormal returns, with a coefficient of 0.27% which is significant at 5%, for the [-1,0] window (see table 11A). This implies that the better the profitability and hence performance of the parent firm, the higher the abnormal returns associated with the ECO event. Likewise, a positive effect is found in window [-1,1], while window [-45,45] shows a negative coefficient which is statistically significant. The performance of this model for window [1,0] was found to be significant at 5%, with an F statistic of 5.653 and an explanatory power (R^2) of 3.91%.

Results from the RATING variable present a significantly positive relationship to CPE. Window [-1,0] shows the bond rating coefficient at 0.28% with a significance at under

0 1%, as well as the intercept being significantly negative related. Thus, the greater the differential risk between the parent and subsidiary firm, the more likely the parent firm is to issue equity through the subsidiary. A possible explanation is that the market perceives the subsidiary investment as substantially safer, and therefore less underpricing occurs. This results in higher abnormal returns (CPE) for the parent firm. The variable RATING has a positive and significant coefficient across all other event windows. The F-statistic of all the models ranged from a high of 15 55' to a low of 5.478, while the R^2 varied from 0.117 to 0.045 (see model 2, table 11A-D). The bond rating variable, used as a proxy for riskiness of the parent firm provided the most explanatory power for all univariate regressions performed. Our results contrast from those of Powers [1994], who analyzed corporate sell-offs. He shows that the bond rating of the selling firm provided no significant influence on the cumulative abnormal returns achieved by shareholders.

In the analysis of the cumulative prediction errors, tests between the means of the NASDAQ and NYSE parent cumulative abnormal returns were performed and found to be significantly different for window [-4, 0] and [-1,1]. This confirmed the existence that information asymmetry may exist between the two markets (table 10). Therefore, we test to see if this condition (ie. information asymmetry) persists in regards to the exchange listing (either NYSE or NASDAQ) and the returns generated by parent firms. The regression results show that the coefficients are negative for EXCHANGE (ie. higher returns associated with the NASDAQ market); however the t-statistics all provide insignificant results. Therefore, the listing of the subsidiary does not appear to influence the abnormal returns of the parent firm. This is consistent with results found by Stewart [1994].

The coefficients of the univariate regressions on the two control variables, %CARVED and LOGSIZE, as well as the INDUSTRY variable (used to compare the relatedness between the parent and subsidiary firm), were found to be not significant for all windows. The only exception was [-1,1] window for the LOGSIZE variable. It shows a significantly positive coefficient of 0.82% (see table 11D). This means the greater size of the issue, the greater the abnormal returns. The F statistic for this model was 5.202, with an explanatory power of 0.0409. The relative size of the issued subsidiary compared to the outstanding equity of the parent firm was also tested as a control variable, and no significance was found.

Three multivariate regressions are reported in tables 11A-D (models 7-9). The first model incorporates 81 firms, and tests the RATING and INDUSTRY variables. The results from these regressions report that the RATING variable has a significantly positive coefficient across all windows, and thus a positive impact on the abnormal returns to the parent firm. The coefficient of the INDUSTRY variable is also significantly positive in two windows, specifically windows [-4,0] and [-1,1], with values of 2.2% and 2.05% respectively. This means that parent and subsidiary firms within the same industry experience a larger CPE than those in different industries. This is contrary to our argument that subsidiaries in a different industry from the parent firm have better expertise, and therefore should be able to raise financing more efficiently. However, it is consistent with findings by Sicherman and Pettway [1987], who find that if both parties involved in a sell-off are in the same industry, greater abnormal returns will be achieved. As mentioned previously, the relationship of parent firms with higher risk experiencing higher abnormal returns continued to persist. This particular model provides the most explanatory power of any of the model combinations tested, with an R^2 ranging from 0.2078 to 0.1037 over four different windows. The F statistic was also found to range from a high of 10.358 to a low of 4.571.

When the EPS variable is added to the above model, the coefficients of the BOND RATING and INDUSTRY variables become not significant over all windows. In contrast, the EPS coefficient reports significant influence on the abnormal returns across windows [-45,45] and [-1,0]. This result shows that EPS may be driving the results of the cross sectional regressions. Interestingly enough, the EPS and RATING variables are not correlated. However, given the fact they both represent proxies, namely for performance and risk of the parent firm, it may be argued that perhaps both are measuring similar factors. We also found that for any other multivariate combinations that included EPS, the results were similar to the above.

Table 11.A

OLS Regressions Results for Company - Specific Explanatory Variables
Window (-1, 0)

$$CPE_j = \alpha_j + \beta_1 EPS_j + \beta_2\ Rating_j + \beta_3 \%Carve_j + \beta_4\ Industry_j + \beta_5\ LogSize_j + \beta_6 Exchange_j + \varepsilon_j$$

Model	1	2	3	4	5	6	7	8	9
Intercept	-0.0034	-0 0214	-0 0019	0 0015	-0 0056	0 0042	-0 0302	-0.0186	-0.0262
	(-0.871)	(2.523)*	(-0.032)	(0.279)	(-0.567)	(0 989)	(-3.23)**	(-1.896)	(-1.054)
EPS	0.0027							0 0024	0 0023
	(2 378)*							(2 332)*	(2 017)*
Rating		0.0028					0 0032	0 0015	0 0017
		(3.944)***					(4.354)***	(1 95)$	(1 605)
% Carve			0 0002						0.0000
			(1 427)						(-0.031)
Industry				0 0033			0.0067	0.0050	0.00783
				(0 433)			(1 083)	(0 842)	(1 137)
LogSize					0 0025				0 0008
					(1 02)				(0.198)
Exchange						-0.0020			0 0059
						(-0 265)			(0 705)
F-Stat	5 653*	15 559***	2 037	0 187	1 04	0 07	9.854***	3 334*	1 824
R^2	0 0391	0 1174	0 016	0019	0 0084	0 0005	0 1997	0.1370	0 1685
N	140	118	126	101	123	129	81	66	60

***, **, *, $ shows significance at a level of 0 1%, 1%, 5% and 10% respectively

CPE represents the dependant variable in the cross sectional regressions It is the cumulative daily prediction error for company j over a specific window
EPS is the earnings per share of the parent firm. taken one year prior to the announcement of the equity carve-out This is a proxy for the performance factor
RATING represents the bond rating of the parent firms largest market valued outstanding debt The rating one year prior to ECO announcement is used
%CARVE is the percent of the subsidiary that is sold to the market INDUSTRY is a dummy variable Firms in the same industry are equal to 1, otherwise 0
LOGSIZE represents the natural log of the gross proceeds from the issue of the subsidiary Gross proceeds are in millions of dollars
EXCHANGE is a dummy variable that assigns a value of 1 to firms listed on the NASDAQ, a 0 to firms listed on the NYSE/ASE
The t statistics are in parentheses All models were tested and accepted the hypothesis for homoscedasticity This was done using White's Test

Table 11.B

OLS Regressions Results for Company - Specific Explanatory Variables
Window (-45,45)

$$CPE_j = \alpha_j + \beta_1 EPS_j + \beta_2\ Rating_j + \beta_3\%Carve_j + \beta_4\ Industry_j + \beta_5\ LogSize_j + \beta_6 Exchange_j + \varepsilon_j$$

Model	1	2	3	4	5	6	7	8	9
Intercept	-0 0704	-0 1015	-0 0048	-0 0005	0 0344	-0.0005	-0 2083	-0.01856	-0 1345
	(-2 779)**	(-1.762)$	(-0 127)	(-0 013)	(0 548)	(-0 02)	(-2 594)*	(-1 896)$	(-0 686)
EPS	-0 0250							-0 0238	-0 0271
	(-3 376)***							(-2 969)**	(-2 969)**
Rating		0 011					0 0168	0 0004	0 0040
		(2 341)*					(2 665)**	(0 064)	(0 479)
% Carve			0 0011						0 0007
			(1 21)						(0 596)
Industry				0 0560			0 0835	0 0179	0 0002
				(1 106)			(1 561)	(0 386)	(0.004)
LogSize					-0 0036				0 0298
					(-0 231)				(0 994)
Exchange						0.0619			0 0422
						(1.334)			(0 643)
F-Stat	11 396***	5.478	1.465	1 223	0.053	1.779	4 571*	3 007*	1 818
R^2	0.0758	0 0366	0.0116	.0121	0 0004	0.0137	0.1037	0.1253	0.1681
N	140	118	126	101	123	129	81	66	60

***, **, *,$ shows significance at a level of 0 1%, 1%,5% and 10% respectively

CPE represents the dependant variable in the cross sectional regressions. It is the cumulative daily prediction error for company j over a specific window
EPS is the earnings per share of the parent firm, taken one year prior to the announcement of the equity carve-out. This is a proxy for the performance factor.
RATING represents the bond rating of the parent firms largest market valued outstanding debt. The rating one year prior to ECO announcement is used
%CARVE is the percent of the subsidiary that is sold to the market INDUSTRY is a dummy variable. Firms in the same industry are equal to 1, otherwise 0
LOGSIZE represents the natural log of the gross proceeds from the issue of the subsidiary Gross proceeds are in millions of dollars.
EXCHANGE is a dummy variable that assigns a value of 1 to firms listed on the NASDAQ, a 0 to firms listed on the NYSE/ASE
The t statistics are in parentheses All models were tested and accepted the hypothesis for homoscedasticity. This was done using White's Test

Table 11.C

OLS Regressions Results for Company - Specific Explanatory Variables
Window (-4,0)

$$CPE_j = \alpha_j + \beta_1 EPS_j + \beta_2 Rating_j + \beta_3 \%Carve_j + \beta_4 Industry_j + \beta_5 LogSize_j + \beta_6 Exchange_j + \varepsilon_j$$

Model	1	2	3	4	5	6	7	8	9
Intercept	0 0097	-0.0271	0 00	-0 0098	-0 0056	0 0066	-0 0347	-0 0160	-0 0490
	(1 501)	(2.111)*	(- 0 009)	(-1 266)	(-0 391)	(1 083)	(-2.418)*	(-0 913)	(-1.124)
EPS	0 0006							0 0006	0 0007
	(0.290)							(0 342)	(0.367)
Rating		0 0035					0 0026	0 0008	0 0011
		(3 286)***					(2 317)*	(0 569)	(0 575)
% Carve			0 0003						0001
			(1 498)						(0 189)
Industry				0 0186			0 0220	0 0155	0.0156
				(1 654)			(2 306)*	(1 467)	(1 294)
LogSize					0 0024				0 0047
					(0 678)				(0 704)
Exchange						-0 0067			0 0287
						(-0 622)			(1 968)$
F-Stat	0 084	10 795***	2 245	2 734	0 46	0 387	5 087**	0 806	1 289
R^2	0 0006	0 0845	0 0176	0266	0 0038	0 0030	0 1141	0 037	0 1253
N	140	118	126	101	123	129	81	66	60

***, **, * $ shows significance at a level of 0 1%, 1%,5% and 10% respectively

CPE represents the dependant variable in the cross sectional regressions It is the cumulative daily prediction error for company j over a specific window
EPS is the earnings per share of the parent firm, taken one year prior to the announcement of the equity carve-out This is a proxy for the performance factor
RATING represents the bond rating of the parent firms largest market valued outstanding debt The rating one year prior to ECO announcement is used
%CARVE is the percent of the subsidiary that is sold to the market INDUSTRY is a dummy variable Firms in the same industry are equal to 1, otherwise 0
LOGSIZE represents the natural log of the gross proceeds from the issue of the subsidiary Gross proceeds are in millions of dollars
EXCHANGE is a dummy variable that assigns a value of 1 to firms listed on the NASDAQ a 0 to firms listed on the NYSE/ASE
The t statistics are in parentheses All models were tested and accepted the hypothesis for homoscedasticity This was done using White's Test

Table 11.D

OLS Regressions Results for Company - Specific Explanatory Variables
Window (-1,1)

$$CPE_j = \alpha_j + \beta_1 EPS_j + \beta_2\, Rating_j + \beta_3 \%Carve_j + \beta_4\, Industry_j + \beta_5\, LogSize_j + \beta_6 Exchange_j + \varepsilon_j$$

Model	1	2	3	4	5	6	7	8	9
Intercept	-0 0033	-0 0318	-0 0006	-0 0007	-0 0263	0 0074	-0 058	-0 0151	-0 0232
	(-0.743)	(-2 521)*	(-0 062)	(-0 086)	(-1 809)	(1 164)	(-3 389)***	(-1 222)	(-0 789)
EPS	0 0025							0 0014	0 0008
	(1 907)$							(1 097)	(0 609)
Rating		0 0040					0 0057	0 0014	0 0017
		(3 903)***					(4 267)***	(1.421)	(1 358)
%Carve			0 0003						-0 0001
			(1 301)						(-0 678)
Industry				0146			0 0205	0.0100	0 0143
				(1 191)			(1 798)$	(1 345)	1 748$
LogSize					0 0082				0 0026
					(2 281)*				(0 585)
Exchange						-0 0064			-0 0001
						(-0 569)			(-0 014)
F-Stat	3 637$	15.231***	1 692	1 417	5 202*	0 324	10 358***	1 567	1 014
R^2	0 0255	0.1152	0 0134	.0140	0 0409	0.0025	0.2078	0 0694	0.1013
N	140	118	126	101	123	129	81	66	60

***, **, *,$ shows significance at a level of 0 1%, 1%,5% and 10% respectively

CPE represents the dependant variable in the cross sectional regressions It is the cumulative daily prediction error for company j over a specific window.
EPS is the earnings per share of the parent firm, taken one year prior to the announcement of the equity carve-out. This is a proxy for the performance factor
RATING represents the bond rating of the parent firms largest market valued outstanding debt The rating one year prior to ECO announcement is used
%CARVE is the percent of the subsidiary that is sold to the market INDUSTRY is a dummy variable Firms in the same industry are equal to 1, otherwise 0 LOGSIZE represents the natural log of the gross proceeds from the issue of the subsidiary. Gross proceeds are in millions of dollars.
EXCHANGE is a dummy variable that assigns a value of 1 to firms listed on the NASDAQ, a 0 to firms listed on the NYSE/ASE
The t statistics are in parentheses All models were tested and accepted the hypothesis for homoscedasticity This was done using White's Test

6. CONCLUSION

Using a database of 237 equity carve-outs (190 NYSE listed parent firms, and 47 NASDAQ events) this thesis attempts to confirm the results of previous studies on equity carve-outs. We also explore the effects that ECO announcements have on NASDAQ based parent firms, and their relationship to the NYSE. Finally, we determine if there are any significant influencing variables that affect the abnormal returns for NYSE based parent firms

Two different estimation periods, a pre-event estimation and a split estimation, are used in the determination of the PE and CPE values for NYSE based parent firms of ECOs Statistically significant and positive cumulative prediction errors are found for windows [-4,0], [-1,0] and [-1,1]. These results are consistent with previous research, however our CPE values are slightly lower. This may be attributed to the difference in sample size between the studies. The results achieved from the NASDAQ sample of 47 ECOs, which entailed using a standard estimation period of -300 to -46, were also found to be much more positive than any NYSE study, and highly significant for same windows identified above. Comparison tests between the CPE values of the NYSE and NASDAQ are found to be statistically different at window[-4,0] and [-1,1]. The NYSE sample is shown to lead the NASDAQ sample by approximately 12 days in reacting positively to the announcement of an equity carve-out. The NYSE starts around 18 days before the announcement, compared to 6 days before, for the NASDAQ market. This last result reflects on the efficiency of the NYSE versus the NASDAQ market to incorporate information quickly and effectively. Therefore, this result help to confirm that information asymmetry does exist between the two markets.

The results from the cross sectional regressions report that both bond rating and earnings per share affect the size of the market's reaction to the announcement of an ECO. The bond rating variable, which acts as a proxy for risk, provides a positive influence for all windows, while EPS(proxy for performance) only exerts influence on window [-1,0] and [-1,1]. The positive influence of bond rating means higher abnormal returns are experienced by the riskier firms because of the greater differential risk level that exists between the parent and subsidiary. This is because investors view the subsidiary issue as a safer investment than one issued by the parent firm. Also, the positive abnormal returns associated with EPS implies that the better the performance of the subsidiary in terms of profitability, the greater the abnormal returns associated with an equity carve-out.

The cross sectional regression model that provided the most explanatory power was the combination of the RATING and INDUSTRY variables in window [-1,1]. Results imply that parent firms that have a high level of risk, and are carving out their subsidiary in the same industry, may benefit the most. Interestingly, once EPS is added to this model, the EPS coefficient becomes significantly positive, while bond rating and industry coefficients become insignificant. This shows that EPS may be driving the cross sectional regression results. Of particular interest is the fact that EPS and the RATING variable are not correlated.

The results of this particular model (ie. EPS driving the model results) are also consistent with any other multivariate regressions in which the EPS variable is involved (including the full model).

Several opportunities for future research exist in the area of equity carve-outs. Some suggestions include the analysis of other variables in cross-sectional regressions, such as different estimates of profitability, other proxies for risk (e.g. debt to equity ratio, leverage, or the beta of the firms), and incorporating the length of time the subsidiary has been in existence prior to the equity carve-out. Also, given the large increase in the number of ECOs over the past decade, there exists more available data on which to perform post event studies. One can also analyse the effect of ECO announcements on parent and subsidiary firms listed on the OTC market, as well as the effects of international ECOs. Finally, there exists the potential to expand on previous studies, such as those which have looked at secondary events of equity carve-outs, and effects of ECOs on rival firms (ie. incorporate larger samples).

Despite economic changes over the last three decades and the availability of new financial innovations, ECOs continue to grow in popularity, while still providing abnormal returns to the parent firms. This exploratory study attempts to tie current theory to factors that may be affecting the abnormal returns of parent firms, while showing why firms use ECOs as well as which types of firms use them. Clearly, other research in this area may provide further useful insights into the possible benefits of using equity carve-outs as a financing alternative

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APPENDIX 1

List of Parent Firms Used in NYSE Sample with Subsidiaries and Event Dates

PARENT FIRM	SUBSIDIARY FIRM	Event Date
Ling Temco Vought Inc	LTV Aerospace	March 4, 1965
Defiance Industries Inc	Telepro	September 1, 1965
McCrory Corp	Lerner Stores Corp	January 19, 1966
Transcontinental Investing Corp	North American Acceptance	June 15, 1966
Ling Temco Vought Inc	Wilson Sporting Goods	July 11, 1967
Ling Temco Vought Inc	Wilson Pharmaceutical	July 18, 1967
G F Industries Inc	GFI Computer	November 1, 1967
Brunswick Corp	Sherwood Medical Industries Inc	November 24, 1967
Armour & Co	Armour Dial	June 10, 1968
Standard International Corp	Edward Weck	October 7, 1968
Syntex Corp	Zoecon	October 30, 1968
Scientific Resources Corp	Computer Sharing	December 17, 1968
Admiral Corp	Admiral International Entrp Corp	June 2, 1969
Computer Applications Inc	Data Processing Services Center	June 12, 1969
General Dynamics Corp	Stromberg Carlson	June 17, 1969
Pittston Company	Brink's	December 15, 1969
L V O Corp	LVO Cable	January 28, 1970
Studebaker Worthington Inc	Turbodyne Corp	April 27, 1970
Kidde Walter & Co Inc	Globe Security Systems Inc	June 19, 1970
Kidde Walter & Co Inc	Lefebure Sargeant	June 19, 1970
Bemis Inc	Morgan Adhesives	September 17, 1970
Kidde Walter & Co Inc	LCA Corp	November 25, 1970
Grace W R & Co	Chemed Corp	November 25, 1970
Studebaker Worthington Inc	Clark-Gravely Corp	December 16, 1970
Studebaker Worthington Inc	Wagner Electric Corp	February 16, 1971
Avco Corp	Cartridge TV	March 8, 1971
National Industries Inc	Cott/National Recreation Products	May 20, 1971
Southdown Inc	Pelto Oil	June 22, 1971
Eckmar Corp	Health Chem	July 2, 1971
C C I Corp	Safetran Systems Corp	August 2, 1971
Beverly Enterprises	Shastina	September 14, 1971
National General Corp	Bantam Books	September 28, 1971
Eckmar Corp	Medical Leisure	October 27, 1971
Servotronics Inc	Munro Games	December 22, 1971
Trans Union Corp	Ecodyne	June 5, 1972
C P C International Inc	Funk Seed Intl Inc	June 22, 1972
Raymond Industries Inc	Teleco Oil	January 17, 1979
Bally Manufacturing Corp	Bally's Park Place Inc	April 13, 1979
Equitable Life Mtg & Rlty Invs	Informatics General Corp	August 9, 1979
Houston Oil & Minerals Corp	Houston Royal Trust	February 2, 1980
Clabir Corp	General Defense Corp	June 3, 1980
Insilco Corp	Times Fiber	December 19, 1980
Esmark Inc	Swift Independent Corp	February 24, 1981
National Patent Dev Corp	Interferon Sciences	March 5, 1981
Wometco Enterprises Inc	Wometco Cable TV	March 9, 1981

Glasrock Medical Services Corp	Mountain Medical Equipment	March 18, 1981
Buildex Inc	Grant Industries	June 9, 1981
Lionel Corp	Dale Electronics	July 8, 1981
Grace W R & Co	Omnicare Inc	July 17, 1981
Condec Corp	Unimation	October 23, 1981
T I E Communications Inc	Technicom International Inc	April 8, 1982
Raymond International Inc De	Raymond Engineering Inc	October 28, 1982
Cooper Labs Inc	Cooper Vision	October 29, 1982
Glasrock Medical Services Corp	Porex Technologies	December 21, 1982
Kansas City Southn Inds Inc	DST Systems	February 7, 1983
Kidde Inc	Victor Technologies	February 18, 1983
Becton Dickinson & Co	Huntington Research Center PLC	April 18, 1983
Damon Corp	Damon Biotech	April 19, 1983
Thrifty Corp	Crown Books Corp	May 26, 1983
Cooper Labs Inc	Cooper biomedical	May 31, 1983
National Patent Dev Corp	NPS Waste Technology	June 2, 1983
Signal Companies Inc	Mack Truck	June 14, 1983
San Diego Gas & Elec Co	Energy Factors	June 17, 1983
Bell & Howell Co	Devry	July 18, 1983
Searle G D & Co	Pearle Health Service	July 26 1983
American Maize Prods Co	American Fructose	August 15 1983
Olin Corp	Olin America	August 23, 1983
National Patent Dev Corp	International Hydron	September 12 1983
Grace W R & Co	Hermans El Toronto	September 16, 1983
Cooper Labs Inc	Lasersonics Coopercare	September 28 1983
I C N Pharmaceuticals Inc	SPI Pharmaceuticals	September 30, 1983
Rite Aid Corp	Super Rite Foods	October 21, 1983
Helm Resources Inc	Teletrak Advanced Technology	December 9, 1983
Pacificorp	NERCO	June 22 1984
Crown Industries Inc Fl	Crown Rotational	December 24 1984
International Paper Co	IP Timberlands	January 28, 1985
Grace W R & Co	Herman's Sporting Goods	February 26 1985
Chemed Corp	Roto-Rooter	June 7, 1985
Freeport Mcmoran Inc	Freeport McMoRan Gold	May 14, 1985
Unocal Corp	Union Exploration Partners	May 31, 1985
Alco Standard Corp	Alco Health Services	June 28 1985
General Host Corp	All American Gourmet Co	August 9, 1985
American Express Co	Fireman's Fund	September 11, 1985
Perkin Elmer Corp	Concurrent Computer	December 13, 1985
National Patent Dev Corp	Duratex	December 19, 1985
Fluor Corp	St Joe Gold	December 19 1985
Revco D S Inc	General Computer	February 25, 1986
Bergen Brunswig Corp	Commtron	May 8, 1986
Newmont Mining Corp	Newmont Gold	May 9 1986
Chemed Corp	National Sanitary Supply	May 12, 1986
Thermo Electron Corp	Thermo Process Systems	June 25, 1986
Thermo Electron Corp	Thermo Instrument Systems	July 1, 1986
Mckesson Corp	Armor All Products	July 25, 1986
United Merchants & Mfrs Inc	Victoria Creations	August 20, 1986
I C N Pharmaceuticals Inc	ICN Biomedicals	August 26, 1986
Dexter Corp	Life Technologies	September 3, 1986
Standard Havens Inc	BHA Group	September 11, 1986
Jewelcor Inc	Gruen Marketing	October 1, 1986
Mckesson Corp	PCS	October 22, 1986
Helm Resources Inc	Bamberger Polymers	November 14, 1986
Coca Cola Co	Coca Cola Enterprises	November 17, 1986
Hinderliter Industries Inc	Corken International	December 16, 1986
Texas Eastern Corp	Petrolane Partners	February 5, 1987
I U International Corp	Envirosafe Services	March 27 1987
American Express Co	Shearson Lehman Brothers Hldg	March 30, 1987

Thermo Electron Corp	Tecogen	May 5, 1987
F M C Corp	FMC Gold	May 19, 1987
Southmark Corp	Integon	May 22, 1987
Ashland Oil Inc	Melamine Chemicals	June 19, 1987
Amax Inc	Amax Gold, Inc	June 23, 1987
Centel Corp	Centel Cable Television	August 14, 1987
Occidental Petroleum Corp	IBP	August 19, 1987
Atlantic Richfield Co	ARCO Chemical	August 21, 1987
Instrument Systems Corp	Oneita Industries	September 2, 1987
C 3 Inc	Tempest Technologies	September 3, 1987
Safeguard Scientifics Inc	CenterCore	January 15, 1988
Freeport Mcmoran Inc	Freeport-McMoran Copper Co Inc	March 28, 1988
Contel Corp	Contel Cellular	April 7, 1988
Texas Industries Inc	Chaparral Steel	June 1, 1988
Burlington Northern Inc	Burlington Resources	June 2, 1988
Smithkline Beckman Corp	Beckman Instruments Inc	September 27, 1988
Thermedics Inc	Thermo cardiosystems	October 27, 1988
E R C International Inc	ERC Environmental and Energy	October 28, 1988
Atlantic Richfield Co	Lyondell Petrochemical	November 8, 1988
Ogden Corp	Ogden Projects	June 1, 1989
Grace W R & Co	Grace Energy	June 30, 1989
Kaneb Services Inc	Kaneb Pipe Line Partners	August 3, 1989
Quantum Chemical Corporation	RMI Titanium Co	August 23, 1989
Enron Corp	Enron Oil & gas	August 24, 1989
Arkla Inc	Arkla Exploration	October 18, 1989
Cabot Corp	Cabot Oil & Gas	December 18, 1989
Santa Fe Pac Corp	Santa Fe Energy Resources	January 11, 1990
Enserch Corp	Pool Energy Services	March 2, 1990
Primerica Corp New	Fingerhut	March 19, 1990
O H M Corp	NSC	May 3, 1990
Baker Hughes Inc	BJ Services International	June 1, 1990
Dow Chemical Co	Destec Energy Inc	July 26, 1990
Triton Energy Corp	Input Output	August 7, 1990
Maxxam Inc	Kaiser Aluminum Corp	November 12, 1990
M N C Financial Inc	MBNA Corp	December 10, 1990
Comprehensive Care Corp	RehabCare	May 9, 1991
General Host Corp	Calloway's Nursery	May 10, 1991
National Patent Dev Corp	General Physics Corp	May 29, 1991
Thermo Electron Corp	Thermo Electron Technologies	May 31, 1991
Town & Country Corp	Little Switzerland	June 4, 1991
National Intergroup Inc	FoxMeyer Crop	July 12, 1991
Pier 1 Imports Inc De	Sunbelt Nursery Group Inc	August 16, 1991
Bally Manufacturing Corp	Bally Gaming International Inc	August 23, 1991
Chock Full O Nuts Corp	Jimbo's Jumbos	September 9, 1991
Orion Capital Corp	Guaranty National Corp	September 13, 1991
Century Communications Corp	Century Cellular Corp	September 27, 1991
Manor Care Inc	Vitalink Pharmacy Services	October 9, 1991
Primerica Corp New	Magaretten Financial	November 27, 1991
Burlington Resources Inc	El Paso Natural Gas	January 29, 1992
American Express Co	First Data	February 14, 1992
Reynolds Metals Co	Eskimo Pie	February 20, 1992
Manville Corp	Riverwood International	April 17, 1992
Conseco Inc	CCP Insurance	April 24, 1992
New Line Cinema Corp	RHI Entertainment	May 22, 1992
Enron Corp	Enron Liquids Pipeline	June 4, 1992
Penn Central Corp	General Cable (PC Wire & Cable)	June 10, 1992
Weyerhaeuser Co	Paragon Trade Brands	July 7, 1992
Reliance Group Holdings Inc	CMAC Investment	August 24, 1992
Pfizer Inc	Mineral Technologies	August 25, 1992
Ethyl Corp	First Colony	October 9, 1992

Tandem Computers Inc	NetWorth	October 16, 1992
Pennzoil Company	Purolator Products	October 27, 1992
Kimmins Environmental Svc Corp	TransCor Waste Services Inc	November 16, 1992
Sears Roebuck & Co	Dean Witter, Discover & Co	December 21, 1992
National Intergroup Inc	National Steel Corp	February 8, 1993
Transamerica Corp	TIG Holdings	February 10, 1993
Conseco Inc	Bankers Life Holding Corp	February 11, 1993
Goodrich B F Co	Geon co	February 17, 1993
Sears Roebuck & Co	Allstate corp	March 17, 1993
Sonat Inc	Sonat Offshore Drilling Corp	April 13, 1993
General Signal Corp	Electroglas	April 21, 1993
Owens Ill Inc	Libbey Inc	April 21, 1993
National Education Corp	Steck-Vaughn Publishing Corp	May 7, 1993
American Telephone & Teleg Co	AT&T Capital Corp	May 14, 1993
Dial Corp	Motor Coach Industries Intl	May 24, 1993
Cooper Industries Inc	Belden	August 3, 1993
Helionetics Inc	Tri-Lite Corp	August 5, 1993
N S Group Inc	Kentucky Electric Steel	August 6, 1993
Textron Inc	Paul Revere Corp	August 16, 1993
Dun & Bradstreet Corp	Gartner Group Inc	August 18, 1993
Pacific Telesis Group	PacTel	August 27, 1993
Torchmark Corp	Vesta Insurance Group	August 31, 1993
Morrison Knudsen Corp	MK Gold	October 14, 1993
Utilicorp United Inc	Aquila Gas Pipeline Corp	October 19, 1993
Thermo Process Systems Inc	Thermo Remediation	October 19, 1993

APPENDIX 2

List of Parent Firms Used in NASDAQ Sample with Subsidiaries and Event Dates

PARENT FIRM	SUBSIDIARY FIRM	Event Date
Graphic Scanning Corp	Switchco	August 24, 1981
Seibels Bruce Group Inc	Policy Management Systems	November 10, 1981
National Technical Sys	United Education & Software	November 04, 1982
Great American Corp	Stony Point Recreation	November 15, 1982
Dart Drug Corp	Trak Auto	March 15, 1983
Maxco Inc	Medar	May 04, 1983
First Oklahoma Bancorp Inc	First Data Management	August 01, 1983
Porex Technologies Corp	Medco Containment Services	March 02, 1984
Hale Systems Inc	Datron Systems	September 26, 1984
Key Image Sys Inc	I-SYS Technology	October 26, 1984
Cade Industries Inc	Edac Technologies	August 06, 1985
Integrated Barter Intl Inc	Close Outs Plus	December 27, 1985
General Devices Inc	Worldwie Computer Services	March 12, 1986
Minstar Inc	Genmar Industries	May 23, 1986
Comnet Corp	Group 1 Software	November 24, 1986
I M S International Inc	Applied Bioscience Intl	February 12, 1987
Farm House Foods Corp	Entree	May 27, 1987
Valmont Industries Inc	ValCom	July 16, 1987
Autospa Corp	AutoSpa Automalls	January 21, 1988
Dekalb Energy Co	Lindsay Manufacturing	September 23, 1988
Base Ten Sys Inc	BT Telecom	November 08, 1988
Unifast Industries Inc	American Body Armor & Equipment	January 18, 1989
Private Brands Inc	Bali Jewelry	April 25, 1989
Lexicon Corp	Sports-Tech International	April 26, 1989
Medco Containment Svcs Inc	Synetic	May 18, 1989
Tribune Swab Fox Cos Inc	T SF Communications	May 22, 1989
Healthdyne Inc	Home Nutritional Services	October 26, 1989
Medco Containment Svcs Inc	Medical Marketing Group	February 13, 1991
Electromagnetic Sciences Inc	LXE	March 06, 1991
Great American Mgmt & Invt Inc	Vigoro Corp	May 20, 1991
Summit Health Ltd	Summit Care	May 23, 1991
Nationwide Cellular Service Inc	Cellular Technical Services Co	June 19, 1991
North Star Universal Inc	Fortis Corp	June 28, 1991
Beebas Creations Inc	Body Drama	August 26, 1991
American Recreation Ctrs Inc	Right Start	August 29, 1991
Collagen Corp	Target Therapeutics	December 20, 1991
Equitable Of Iowa Companies B	Younkers	February 25, 1992
Boca Raton Capital Corp	RailAmerica	July 22, 1992
Orbit International Corp	USA Classic, Inc	October 13, 1992
Advanced N M R Systems Inc	Advanced Mammography Systems	November 06, 1992
Phoenix Re Corp	Transnational Re Corp	January 02, 1993
Healthdyne Inc	Healthdyne Technologies	April 06, 1993
Tuscarora Inc	Elliott Brothers	April 22, 1993
Genzyme Corp	Genzyme Transgenics Corp	May 14, 1993
Noel Group Inc	Simmons Outdoor	June 18, 1993
Intel Corp	Antec Corp	September 16, 1993
Allied Capital Corp	Allied Capital Lending	November 16, 1993

APPENDIX 3

Bond Rating Codes and Descriptions for S&P and Moody's Ratings

Bond Rating Code	Rating Description for S&P	Rating Description for Moody's	Definition
2	AAA	Aaa	Highest rated bonds. Smallest level of Investment Risk.
4	AA+	Aa1	High quality debt, difference from '2' attributed to slightly lower margins of protection
5	AA	Aa2	
6	AA-	Aa3	
7	A+	A1	Upper medium grade. Strong capacity to repay principal and interest. Affected by averse changes in market.
8	A	A2	
9	A-	A3	
10	BBB+	Baa1	Medium grade investment. Adequate ability to pay principal and interest. have some speculative qualities.
11	BBB	Baa2	
12	BBB-	Baa3	
13	BB+	Ba1	Bonds rated 13 through 24 are rated as speculative, and in many cases may be in default. 13 to 15 represent the least speculative of this group
14	BB	Ba2	
15	BB-	Ba3	
16	B+	B1	
17	B	B2	
18	B-	B3	
23	CCC+		
19	CCC	Caa	
24	CCC-		
20	CC	Ca	
21	C	C	

Sources: Standard and Poor's Compustat Manual, and Moody's Industrial Survey

Appendix 4

SIC Code Distribution for ECOs of NYSE Parent Firms and its Subsidiaries

2digit SIC Code	Industry Name	Number of Parent Firms	Number of Subsidiaries
01	Unknown	-	1
08	Unknown	-	1
10	Metal Mining	2	6
12	Coal Mining	-	1
13	Oil and Petroleum	7	10
16	Heavy Construction	1	1
20	Food Production	3	4
22	Fabrics Production	1	-
23	Clothing	1	1
25	Furniture	1	1
26	Pulp and Paper Production	2	2
27	Publishing	1	-
28	Chemicals Pharmaceuticals Pastics	14	8
32	Cement Abrasives	2	1
33	Metal Production	4	4
35	Machinery Equipment Computers	9	5
36	Communications	3	3
37	Aircraft Ships	2	2
38	Photography Lab instruments	5	3
39	Jewelry Sporting Goods Misc Manufacturing	1	2
40	Railroads	2	-
46	Pipe lines	1	1
48	Television Phone Radio	3	2
49	Natural gas sanitary Electric Services	6	6
50	Machinery & Equipment Wholesale	-	2
51	Paper, Groceries Petroleum consumption	5	5
52	Educational Services	2	2
53	Retail -General Merchadise Chain Stores	2	-
59	Retail Stores Jewelry Stores	3	3
61	Credit Institutions	2	1
62	Investment Advice	-	2
63	Title Fire Casulty Insurance	8	10
65	Operators of non residential buildings	1	-
73	Business Services Computer programming	2	3
76	Auto Rental	-	1
78	Motion Pictures	1	1
80	Health Services Doctors Offices	2	1
87	Management Consulting Bio Research	2	5
Total Sample Known		**101**	**101**
Number of Firms in Same Industry		49	
Number of Firms in Different Industry		52	