ELSEVIER

Journal of Financial Economics 51 (1999) 273–308

JOURNAL OF Financial ECONOMICS

Long-term returns from equity carveouts[1]

Anand M. Vijh*

College of Business Administration, University of Iowa, Iowa City, IA 52242, USA

Received 29 May 1997; received in revised form 27 April 1998

Abstract

Using a sample of 628 carveouts during 1981–1995, this paper finds that the newly issued subsidiary stocks do not underperform appropriate benchmarks over a three-year period following the carveout. This result is in striking contrast with the documented poor performance of initial public offerings and seasoned equity offerings. I conjecture that the superior performance of subsidiary stocks arises because the subsidiary and parent firms can focus on fewer business segments after carveout, and because the parent firms continue to own a monitoring position in the subsidiary firms. I test whether the subsidiary stock performance is related to the number of business segments the parent firm has before carveout. The relationship is not always significant, which suggests another possible explanation, that the market may react efficiently to the likely future performance of carveouts.

JEL classification: G12; G14; G24; G34

Keywords: Carveouts; Divestitures; Initial public offerings; Long-term returns; Seasoned equity offerings

* Corresponding author. Tel.: 319 335 0921; fax: 319 335 3690; e-mail: anand-vijh@uiowa.edu.

[1] I have benefited from comments of seminar participants at the Case Western Reserve University, the University of Iowa, the University of Oklahoma, the Eighth Annual Conference on Financial Economics and Accounting at the State University of New York, Buffalo, and the Financial Management Association. I wish to thank Jeffrey Allen, Tom George, Inmoo Lee, Tim Loughran, Harry Paarsch, William Schwert (the editor), Ajai Singh, and Mike Stutzer for useful comments. I also wish to thank Yao-Min Chiang and Sterling Yan for valuable assistance with the data collection, and Eugene Fama for sharing the data used in developing the Fama–French three factor model. I am especially obliged to Brad Barber (the referee) for many comments that improved this paper substantially.

0304-405X/99/$ – see front matter
PII: S0304-405X(98)00053-1

1. Introduction

In an equity carveout, a parent firm raises money by selling part or all of the equity in a wholly owned subsidiary to the public. In recent years, there has been a sharp increase in carveout activity that has coincided with a general increase in focus and other divestiture activity of US corporations. The list of recent carveouts includes such notables as the \$0.48 billion issue of Dean Witter Discover Company by Sears, the \$1.16 billion issue of First Data Corp. by American Express, the \$1.38 billion issue of Pactel Corp. by Pacific Telesis Group, and the \$2.12 billion issue of Allstate Corp. by Sears. The pace continued in 1996 and 1997, topped by the \$2.65 billion carveout of Lucent Technologies by AT&T Corp. This paper investigates the after-market performance of a sample of 628 carveouts during 1981–1995 with an offering value of \$55 billion. This sample compares with the Ritter (1991) sample of 1526 initial public offerings (IPOs) during 1975–1984 with an offering value of \$21 billion, the Spiess and Affleck-Graves (1995) sample of 1247 seasoned equity offerings (SEOs) during 1975–1989 with an offering value of \$46 billion, and the Loughran and Ritter (1995) sample of 8455 IPOs and SEOs during 1970–1990 with an offering value of \$294 billion in 1991 dollars. Despite the increasing importance of carveouts in raising equity capital, the current literature provides little evidence on their underlying motives, or the after-market performance of carveouts as compared with IPOs and SEOs.

Recent finance literature suggests that, on average, the market may be overoptimistic about the prospects of IPOs and SEOs at the time of offering. Over a three-year holding period, starting with the listing day, Ritter (1991) documents that a dollar invested in an equally weighted portfolio of IPOs results in a terminal wealth that equals only 83% of a similar investment in matching firms. Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) document similar underperformance for SEOs. Subsequent papers examine the robustness of IPO underperformance, and the possible explanations for that underperformance by comparing returns across subsets formed by one or more variables of interest. Brav and Gompers (1997) find that IPOs backed by venture capitalists outperform IPOs that are not backed by venture capitalists. They also find that the IPO underperformance is the greatest for small firms with low book-to-market values. Carter et al. (1997) find that the underperformance is less severe for IPOs handled by more prestigious underwriters. Field (1997) finds that the underperformance decreases with increasing institutional ownership.

This paper has two objectives. First, I examine the long-term excess returns of a large sample of carveouts, with reference to the market portfolio and the size, book-to-market, industry, and earnings-to-price matching firms. I examine both the subsidiary and parent returns. The subsidiary returns provide an out-of-sample test of the Ritter (1991) and Loughran and Ritter (1995) claim that

equity-issuing firms take advantage of a window of opportunity when, on average, they are overvalued. Second, I compare many cross-sections of the data to understand the carveout returns.

The 628 carveout subsidiary stocks during 1981–1995 earn an average initial listing-day return of 6.2%, smaller than the 15.4% initial return earned by 8989 IPOs over a similar period, as shown in Ibbotson, Sindelar, and Ritter (1997). However, unlike IPOs and SEOs, carveout subsidiaries do not underperform a variety of benchmarks during the following three years. On average, the subsidiaries earn an annual raw return of 14.3%, which contrasts with 3.4% for IPOs and 4.7% for SEOs in Loughran and Ritter (1995). The subsidiary three-year buy-and-hold excess returns (BHERs) are insignificantly different from zero with reference to five different benchmarks. There is some evidence of significantly positive excess returns earned by 243 subsidiaries carved out during the first half of the sample period, driven in part by the poor performance of comparable small growth firms. This evidence evaporates during the second half of the sample period, resulting in insignificantly negative excess returns earned by 385 subsidiaries. The parent BHERs are insignificant during the entire period. Alternate tests based on cumulative excess returns in event time (CERs), annual excess returns in calendar time, and the three factor model developed by Fama and French (1993) (hereafter referred to as the Fama–French three factor model) also cannot reject the null hypothesis that the market reacts efficiently to the likely future stock price performance of carveouts. The only exception is three-day excess returns around the first quarter's earnings announcements of subsidiary stocks, which are significantly positive.

The insignificant long-term excess returns of all carveout subsidiary stocks are surprising in view of the documented negative excess returns of all IPOs and SEOs. The marketing of carveouts is similar to IPOs and SEOs. I conjecture that the superior performance of subsidiary stocks arises because the subsidiary and parent firms can focus on fewer business segments after carveout, and because the parent firms continue to own a monitoring position in the subsidiary firms. Carveouts are undertaken by parent firms that are, on average, significantly less focused than the firms on the Compustat business segment file. To explore the link between focus and performance, I arrange my sample into three subsets, based on whether the parent firm, before carveout, had one major business segment, two or three segments, or four or more segments. There is some evidence that subsidiary BHERs are higher when the parent firms are less focused. However, in my regression framework, the coefficients of focus and parent ownership variables become insignificant in the presence of other variables. Thus, the improved focus, and the continued ownership by parent firms, may explain why subsidiary stocks do not underperform, whereas the IPOs and SEOs do underperform. However, in smaller subsets of data I cannot reject the null hypothesis that the market simply reacts efficiently to the likely future performance of carveouts.

In the remaining paper, Section 2 discusses the previous literature on carveouts and why their long-term returns may differ from IPOs and SEOs. Section 3 describes the data and methods. Section 4 presents the main results related to the long-term returns of carveouts. Section 5 explores the variation in returns over time and some cross-sectional patterns related to the corporate focus and ownership structure. Section 6 concludes.

2. Previous literature on carveouts and the implications for long-term returns

2.1. Previous literature

The difference between carveouts and other equity issues first became known with Schipper and Smith (1986). They examine a sample of 76 carveouts during 1963–1984 and find that, on average, the parent stocks earn an excess announcement-period return of 1.8%. This contrasts with SEOs that are accompanied by a negative excess return of -3.5% in their study, and in Masulis and Korwar (1986). Schipper and Smith offer several possible explanations of the different announcement-period returns of carveouts, which are similar to explanations of the positive announcement-period returns of other forms of divestiture. These explanations include obtaining external financing for the subsidiary's growth, designing more efficient compensation contracts for the subsidiary's managers, and the market's preference for pure-play stocks.

Nanda (1991) explains the different announcement-period returns of carveouts by using the same asymmetric information arguments that are used to explain the negative returns of SEOs. He extends the Myers and Majluf (1984) model to show that firms will issue subsidiary stock when the parent assets are undervalued and the subsidiary assets are overvalued. He argues that the market reacts positively to the good news concerning parent assets, which dominates the bad news concerning subsidiary assets. Slovin et al. (1995) find evidence consistent with Nanda's model by documenting negative announcement-period returns earned by firms in the subsidiary's industry that presumably reflect some of the same overvaluation.

Other researchers have explored the excess returns to subsidiary and parent stocks over extended periods after carveouts. Klein et al. (1991) find that carveouts are usually the first stage of a two-stage process to either dispose of parent interest in the subsidiary by selloff, or eventually reacquire the subsidiary's publicly traded shares. Using a sample of 28 carveouts during 1966–1983, they document that the subsidiary returns measured over the interim period, which continues up to the second announcement and averages 4.5 years, are significantly lower than the S&P 500 returns if the effect of second announcement is excluded, but insignificantly different if the effect of second announcement is included. Allen (1998) examines the unique case of Thermo Electron,

which carved out eleven subsidiaries during 1983–1995. These carveouts created superior gains for the subsidiary and parent shareholders during the years following the carveouts. In a contemporaneous study, Hand and Skantz (1997) find that the subsidiary firms earn insignificant excess returns during six months after carveouts, whereas the parent firms earn negative excess returns. However, their evidence is based on market-adjusted returns for subsidiaries, and market model-adjusted returns for parents. The use of market returns for the typical small size and low book-to-market subsidiaries does not adjust for two well-known factors in stock returns. The use of the market model for parent firms may understate the excess returns if carveouts are preceded by a large increase in the parent stock price. Overall, these three studies do not provide evidence on long-term returns of a comprehensive sample of carveout subsidiary and parent stocks, which is based on a fixed holding period and adjusts for different risk factors.

2.2. *Implications for long-term returns*

Carveouts are joint events which combine features of equity offerings and divestitures. New stock is issued, but the subsidiary also gains partial freedom from the parent. Both the subsidiary and the parent improve their corporate focus. Cusatis et al. (1993) find that, on average, the subsidiaries and parents of spinoffs earn positive excess returns over the following three years. Desai and Jain (1998) find that the long-term excess returns are significantly positive for the cross-industry spinoffs, which increase focus, but not for the own-industry spinoffs, which do not increase focus. Studies outside the context of divestitures also document the long-term benefits of focus. Lang and Stulz (1994) find that Tobin's q and firm diversification, or lack of focus, are negatively correlated. Berger and Ofek (1995) estimate that diversified firms sell for a 13% to 15% discount from the sum of imputed stand-alone values of their individual business segments. Comment and Jarrell (1995) find a positive relation between stock returns and focus increase.

The first argument of why long-term returns of carveouts may differ from IPOs and SEOs centers on the observation that carveouts combine two events that are separately associated with negative and positive excess returns in the previous literature. However, in the sample of all carveouts, this hypothesis cannot be distinguished from the traditional hypothesis that the market reacts efficiently to both events, if the excess returns are insignificantly different from zero. To distinguish between them, I examine subsets formed by the size of the potential benefits of increased focus.

The second argument centers on the continued ownership by parents. The subsidiaries gain partial freedom, but the parents continue to hold a large interest in the subsidiaries. Parents own at least 20% of the equity of the new firms in 93% cases, and at least 50% equity in 66% of the cases. Schipper and

Smith (1986) report that, in 56 out of 57 cases, the subsidiary board includes at least one member of the parent board or an individual from top management of the parent firm. Holderness and Sheehan (1985, 1988), Shleifer and Vishny (1986), Shome and Singh (1995), and Denis and Serrano (1996) highlight the monitoring benefits of blockholders, which should accrue to both the subsidiary and parent shareholders.

The continued ownership and control by parents makes carveout subsidiaries similar to IPOs backed by venture capitalists in some ways. Venture capitalists also take concentrated equity positions before IPOs, and continue to hold large equity positions and board memberships after IPOs. Barry et al. (1990) and Megginson and Weiss (1991) argue that they play important certification and monitoring roles. Their presence attracts more reputable analysts and investment bankers and reduces information asymmetry, which results in lower initial returns of IPOs backed by venture capitalists, compared to IPOs not backed by venture capitalists. Brav and Gompers (1997) find that IPOs backed by venture capitalists do not underperform over the following three years.

The third argument of why long-term returns of carveouts may differ from IPOs and SEOs centers on the likely benefits from overpricing of new shares. The parent firms making carveouts are much bigger than the typical firms making IPOs, and put their presumably more substantial reputation behind the offering. The median carveout offering value equals 8.2% of the parent value. Suppose the new subsidiary stock were only worth 83% of the first listing price, as documented for IPOs by Ritter (1991). Then, even before considering the initial returns, issuance costs, and corporate taxes, the old parent shareholders would benefit by no more than 8.2×0.17, or 1.4% of their stock holding. It is not clear if that is a sufficient motive, considering the possible reputation effects.

3. Data and methods

3.1. Sample of carveouts

The sample of carveout parents and subsidiaries is collected from two different sources. First, a list of carveouts completed during 1981–1995 is purchased from the Securities Data Company (SDC). The SDC data provide the names of parent and subsidiary firms, the offering date, the offering price, the number of shares offered, and the parent's ownership of the subsidiary after the carveout.[2]

[2] The SDC data include one carveout during 1980, for General Defense Corp., which was carved out by Clabir Corp. on 11 July 1980. The next reported carveout occurs on 14 April 1981. I include the General Defense carveout in my sample, but for reporting purpose, I treat it as part of the 1981 carveouts. Otherwise, in calendar-time tests, there would be a portfolio of just one stock from July 1980 to April 1981.

Second, in recent years the *Mergers and Acquisitions* magazine has been reporting the annual carveout activity in its May/June issue of the following year. The names of parent and subsidiary firms, the offering date, and the offering price of carveouts completed during 1991–1995 are also collected from this magazine. Neither data source appears to be comprehensive; there are cases that appear in one source and not the other. For carveouts included only in the *Mergers and Acquisitions* report, the number of shares offered is collected from the S1 report filed with the Securities and Exchanges Commission (SEC), if available.

The initial data include 721 carveouts. In 636 cases, the subsidiary returns data can be found on the Center for Research in Security Prices (CRSP) 1996 tapes, usually starting with the first trading day after the offering date. I exclude eight cases of utility offerings, which have three-digit standard industry classification (SIC) code between 491 and 494. Utilities are regulated companies, and are often excluded from studies of long-term returns (see, e.g., Loughran and Ritter, 1995). My results are not sensitive to this exclusion. The net result is a sample of 628 subsidiary firms. However, the parent firms can be located on the CRSP tapes in only 300 cases. In the remaining 328 cases, the parent firm is a private firm, a foreign firm, or a mutual insurance firm.

3.2. Sample distribution and summary statistics

Table 1 shows the sample distribution over time. There are, on average, 12 carveouts per year during 1981–1982, 42 during 1983–1987, 16 during 1988–1990, and 69 during 1991–1995. In nominal terms, the average offering value is \$87 million and the median offering value is \$33 million. Adjusted for inflation, the average offering value is \$100 million in 1995 dollars. This figure compares with the average IPO during 1975–1984 at \$14 million in Ritter (1991), the average SEO during 1975–1989 at \$37 million in Spiess and Affleck-Graves (1995), and the average IPO/SEO during 1970–1990 at \$35 million in 1991 dollars in Loughran and Ritter (1995). The carveouts tend to be larger than IPOs and SEOs, although in part this difference may be attributed to the increased market values over time.

The last two columns of Table 1 show that there is not much clustering of carveout issues in any particular industry during any one-year period. The 628 subsidiary firms belong to 195 different three-digit SIC codes. The two largest clusters in any one-year period each consist of 7 firms. This contrasts with IPOs that tend to be more clustered in a few industry sectors during certain 'hot issue' markets. For example, Ritter (1984) documents a large clustering of natural-resource IPOs between January 1980 and March 1981. He argues that issuers take advantage of a window of opportunity. There are somewhat more carveout subsidiaries with an SIC code starting with 4 or 5 as compared with the general population, and somewhat less starting with 6, which are mainly financial

Table 1
Sample distribution of carveout subsidiary and parent stocks, 1981–1995.

The sample of 628 carveout subsidiaries and 300 parents during 1981–1995 is obtained from the Securities Data Corporation and from the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. The number of parents is significantly smaller than the number of subsidiaries, as many carveout issues are offered by private firms, mutual insurance firms, and foreign firms. The offering value is based on the offering price, multiplied by the number of shares offered in the domestic market. The figures in 1995 dollars are obtained by adjusting for inflation.

Year	Number of issues	Average offering value (in millions of nominal dollars)	Total offering volume (in millions of nominal dollars)	Total offering volume (in millions of 1995 dollars)	Number of different 3-digit SIC codes	Max number of issues with the same 3-digit SIC code
1981	15	13	188	366	14	2
1982	9	7	64	100	8	2
1983	51	31	1591	2441	36	6
1984	20	29	587	868	17	3
1985	32	60	1922	2727	27	3
1986	62	68	4243	5805	46	7
1987	47	64	3024	4092	38	2
1988	18	81	1458	1888	15	3
1989	17	121	2060	2556	12	3
1990	14	64	898	1064	11	4
1991	42	84	3534	3952	31	4
1992	74	103	7608	8246	52	4
1993	113	120	13 578	14 306	75	7
1994	79	82	6484	6642	56	4
1995	35	213	7465	7465	25	2
1981–1995	628	87	54 704	62 518	195	24
Median		33				

companies and holding companies. Otherwise, the issues seem proportionally distributed across the spectrum of SIC codes.

Table 2 presents the summary statistics. First, the median carveout offers new equity worth 32.2% of the subsidiary's total equity and 8.2% of the parent's total equity. Second, the parent firms own an average of 58.6% (median 62.5%) of the subsidiary firms after carveout. Third, the parent firms realize a market-adjusted price increase of 14.7% in the year preceding the carveout and 5.7% in the year ending one year before carveout, with t-statistics of 3.42 and 1.59. This price increase is smaller than for SEOs, which occur after an average price runup of 72% in Loughran and Ritter (1995).

Table 2 also summarizes the average decile ranks of subsidiary and parent stocks on size, book-to-market value, and earnings-to-price ratio as compared with the population of all NYSE stocks in the year of carveout. Although many firms in my sample are listed on the Amex or Nasdaq, it is a standard practice in studies of long-term returns to form deciles by using only the NYSE firms (see, e.g., Fama and French, 1993). By comparing these figures with the NYSE average rank of 5.50 (by construction), I make two inferences. First, the subsidiary size and book-to-market value are much smaller than the NYSE average. The subsidiaries are best described as small growth firms. Second, the parent earnings-to-price ratio in the year before carveout is significantly less than the NYSE average. This is consistent with Allen and McConnell (1997), who document that the parent firms have poor operating performance before carveouts.

3.3. *Selection of benchmarks and the computation of excess returns*

The examination of long-term returns is very controversial. Barber and Lyon (1996), Kothari and Warner (1997), Lyon et al. (1997), and Fama (1998) discuss the pros and cons of BHERs, CERs, annual excess returns in calendar time, and the Fama–French three factor model. BHERs capture the investor experience more accurately, while the remaining methods give more reliable test statistics. To overcome potential criticism of any methodology, I examine all measures of excess returns over a three-year holding period, and use many different benchmarks. The inferences are similar with all methods.

The first measure computes buy-and-hold returns of subsidiary and parent stocks over a three-year holding period after carveout. These returns are adjusted for the value-weighted market returns, and four sets of matching-firm returns, to calculate alternate measures of BHER. The matching firms are drawn from the universe of all ordinary common shares listed on the NYSE, Amex, and Nasdaq as of the end of the last calendar year before carveout. American Depository Receipts, certificates, shares of beneficial interest, depository units, etc., are excluded. The first matching-firm procedure controls for size and book-to-market effects. I pair each sample firm with another firm that had the

Table 2
Summary statistics of carveout subsidiary and parent stocks, 1981–1995.

The sample of 628 carveout subsidiaries during 1981–1995 is obtained from the Securities Data Corporation and from the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on the CRSP tapes. Utility issues are excluded. The offering value is based on the offering price, multiplied by the number of shares offered in the domestic market. The firm size is measured by the market value of equity on the first trading day after the carveout. The book-to-market value and the earnings-to-price ratio for parent firms are as of the last fiscal year ending before the carveout, and for subsidiary firms as of the first fiscal year ending after the carveout.

Item description	Subsidiary firms			Parent firms		
	Mean	Std. error	Median	Mean	Std. error	Median
Offering value as a percentage of subsidiary value	38.2	1.0	32.2			
Offering value as a percentage of parent value				15.9	1.6	8.2
Percentage ownership of subsidiary by parent after carveout				58.6	1.0	62.5
Market-adjusted percent return during last year				14.7	4.3	5.1
Market-adjusted percent return during year before last				5.7	3.5	− 3.2
Firm size in millions of nominal dollars	350	38	100	2766	388	510
Book-to-market value	0.466	0.013	0.426	0.595	0.028	0.553
Earnings-to-price ratio	0.026	0.010	0.055	− 0.023	0.022	0.049
Size decile ranking with respect to NYSE firms	2.99	0.22	2.00	5.52	0.33	6.00
Book-to-market decile ranking with respect to NYSE firms	3.94	0.27	3.00	5.12	0.29	5.00
Earnings-to-price decile ranking with respect to NYSE firms	5.30	0.30	5.00	4.65	0.30	4.00

closest book-to-market value within the subset of firms whose market value lies between 70% and 130% of the sample firm value. The second procedure controls for the size and industry effects. Each sample firm is paired with whichever firm had the same two-digit industry code and the closest market value. The third procedure controls for the size and earnings-to-price effects. Each sample firm is paired with another firm that had the closest earnings-to-price ratio within the subset of firms whose market value lies between 70% and 130% of the sample firm value. The book-to-market value is available for 574 subsidiaries and 269 parents, the industry classification is available for 621 subsidiaries and 300 parents, and the earnings-to-price ratio is available for 563 subsidiaries and 271 parents. In all cases, where data on book-to-market value, industry classification, or earnings-to-price ratio are not available, I match firms by the closest market value. The fourth procedure pairs a subsidiary firm with its parent firm, and vice versa.

The selection of multiple benchmarks is necessary because, at present, there is no consensus about the relevant factors in stock returns. The size and book-to-market matching firms are an especially important benchmark for subsidiaries, as Table 2 shows that they differ most significantly from the general population of NYSE stocks on these dimensions. For similar reasons, the size and earnings-to-price matching firms are an especially important benchmark for parents.

The BHERs are computed starting with the closing price on the listing day, and ending three years later. A year is defined as 252 trading days. Sometimes the subsidiary, or the parent, gets delisted because of an acquisition, or some other reason, before the end of three years. In addition, for subsidiary firms that went public during 1994–1995, it is not possible to compile three years of data by using the CRSP 1996 tapes. In both cases, the returns are computed for the sample and matching firms ending with the last day of data, which gives an average holding period of 2.67 years. Another complication arises when a matching firm gets delisted before the end of a holding period. To account for this contingency, I keep a reserve of the next four matching firms. When the first matching firm gets delisted, its proceeds are rolled over into the second matching firm, and so on. The t-statistics are calculated by using the cross-section of excess returns, computed by the difference between sample and matching firm returns.

4. The long-term returns of carveouts

4.1. The initial returns of subsidiary stocks

Table 3 shows the distribution of initial listing-day returns, calculated by subtracting one from the ratio of the closing price on the first day to the offering

Table 3
Initial listing-day returns of carveout subsidiary stocks, 1981–1995.

The sample of 628 carveout subsidiaries during 1981–1995 is obtained from the Securities Data Corporation and from the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on the CRSP tapes. Both data sources provide the offering price. Utility issues are excluded. The first listing price is obtained from the CRSP daily stock files. The initial listing-day return is calculated by subtracting one from the ratio of the closing price on the listing date to the offering price. A re-computed average return is calculated by assuming lognormally distributed returns, and by censoring zero and negative return cases. This re-computed average return is significant at the one-percent level.

Initial listing-day return (in percent)	Percentage frequency	Cumulative percentage frequency
return $\leqslant -15$	1	1
$-15 <$ return $\leqslant -10$	1	2
$-10 <$ return $\leqslant -5$	3	5
$-5 <$ return < 0	11	16
return $= 0$	17	33
$0 <$ return $\leqslant 5$	31	64
$5 <$ return $\leqslant 10$	13	77
$10 <$ return $\leqslant 15$	9	86
$15 <$ returnm $\leqslant 20$	5	91
$20 <$ return $\leqslant 25$	3	94
$25 <$ return	7	100
Average return	6.2%	
T-statistic	11.5	
Median return	2.5%	
Re-computed average return	4.1%	

price. The average initial return equals 6.2%, with a median of 2.5%. The initial return is positive in two-thirds of all cases. In comparison, Ibbotson, Sindelar, and Ritter (1997) document that during 1980–1996, IPOs earn an average initial return of 15.4%.

A closer examination of Table 3 raises some doubt that the initial returns may be overstated. In 17% of all cases, the initial return equals zero. In another 11% of the cases, it lies between -5% and 0%. A large number of zero-return and close to zero-return cases points to underwriter price support. Hanley et al. (1993) and Schultz and Zaman (1994) document that the lead underwriters often support prices of IPOs for many days. Therefore, I also estimate the average initial return by assuming that the initial returns are lognormally distributed, and by censoring all zero and negative return cases. A censored maximum likelihood estimation procedure with these restrictions gives an average initial return of 4.1%, a figure significant at the one-percent level.

The small initial returns indicate that there is less information asymmetry about carveout subsidiaries than IPOs. I am not aware of any theoretical model to link the initial returns with subsequent long-term returns. However, previous literature shows that lower initial returns are followed by higher long-term returns in other contexts. This pattern can be found in comparison of IPOs backed by venture capitalists against those not backed by venture capitalists, as demonstrated by Megginson and Weiss (1991) on initial returns, and by Brav and Gompers (1997) on long-term returns. Lower initial returns followed by higher long-term returns were also revealed in studies comparing IPOs backed by more reputable investment bankers to those backed by less reputable investment bankers, performed by Carter and Manaster (1990) studying initial returns, and Carter et al. (1997) studying long-term returns. Finally, Field (1997) uncovered the same pattern in her study comparing IPOs backed by higher institutional holdings to IPOs backed by lower institutional holdings.

4.2. Subsidiary and parent BHERs and CERs

Table 4 shows the BHERs of subsidiary and parent stocks during a three-year holding period after carveout. The BHERs and the other measures of subsidiary excess returns in this paper exclude the initial returns. This exclusion is justified for two reasons. First, a significantly positive or negative long-term excess return is a rejection of the joint hypothesis of market efficiency and the specification of the asset pricing model used to calculate the excess return. But a positive initial return is not a rejection of market efficiency. Rock (1986) argues that the initial return is a necessary compensation to less informed investors who are allotted a disproportionately large number of poor quality issues. Second, the allotment of new shares at the offering price is not guaranteed. Thus, including the initial return will overstate the returns that many investors can earn.

The first portion of Panel A of Table 4 shows that the 628 subsidiary stocks earn BHERs of -2.9%, 8.0%, 4.4%, 5.7%, and 7.6% with reference to value-weighted market returns, size and book-to-market matching firms, size and industry matching firms, size and earnings-to-price matching firms, and parent firms. The t-statistics are insignificant in every case. Looking at each year of the holding period, the first-year returns range between 1.3% and 8.5%, but are significant only with reference to the parent firms. The second-year returns range between -5.1% and 1.9%, and are generally insignificant. The third-year returns range between -0.5% and 5.5%, and are also generally insignificant.

In the aggregate sample of all carveouts, the subsidiary stocks do not underperform any of the five chosen benchmarks. This result is in striking contrast with IPOs and SEOs. The 628 subsidiaries earn an average raw return of 43.0%

Table 4
Three-year buy-and-hold excess returns (BHERs) of carveout subsidiary and parent stocks, 1981–1995.

The sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. BHERs of carveout subsidiaries and parents are computed with reference to CRSP value-weighted market returns, and four matching firm returns. The first matching procedure pairs each sample firm with another firm that has the closest book-to-market value among all CRSP firms within 70% to 130% of firm size. The second procedure pairs each sample firm with another firm that has the closest size within the same 2-digit industry code. The third procedure pairs each sample firm with another firm that has the closest earnings-to-price ratio among all CRSP firms within 70% to 130% of firm size. The fourth procedure pairs each subsidiary firm with its parent firm (if available), and vice versa. BHERs are computed by the difference between buy-and-hold returns of sample and matching firms over a three-year holding period, starting with the listing date of subsidiary stock, and over three one-year subperiods. The initial listing-day returns are excluded from all computations of subsidiary long-term returns. The holding period is truncated if a subsidiary or parent firm gets delisted, or if data for the entire holding period does not exist by the end of 1996 (i.e., cases where the carveout took place during 1994–1995). However, the holding period is never truncated if a matching firm gets delisted. Instead, the proceeds of the first matching firm are rolled over into the second closest matching firm, and so on. The *t*-statistics are computed by using the cross-sectional distribution of BHERs, and are reported in parentheses. The *t*-statistics greater than 1.64, 1.96, and 2.57 are significant at the 10, 5, and 1 percent level, respectively.

Holding period	Sample size	Raw return	BHERs with reference to									
			Value-weighted market		Size and book-to-market		Size and industry		Size and earnings-to-price		Parent or subsidiary firm	
Panel A: *Subsidiary stocks*												
1. All 628 subsidiary stocks												
First year	628	12.8	1.3	(0.46)	5.2	(1.42)	2.9	(0.84)	4.0	(1.19)	8.5	(1.93)
Second year	619	11.5	− 4.5	(− 2.05)	− 1.3	(− 0.45)	− 5.1	(− 1.66)	− 2.1	(− 0.69)	1.9	(0.59)
Third year	532	16.4	− 0.5	(− 0.20)	5.5	(1.74)	2.2	(0.71)	3.4	(1.14)	4.0	(1.08)
Up to three years	628	43.0	− 2.9	(− 0.56)	8.0	(1.19)	4.4	(0.70)	5.7	(0.87)	7.6	(1.09)

2. 300 subsidiary stocks for which the parent was a U.S. exchange-traded company

First year	300	15.9	2.8	(0.55)	7.5	(1.25)	3.3	(0.58)	6.4	(1.22)	8.5	(1.93)
Second year	291	13.3	− 0.9	(− 0.33)	0.1	(0.02)	− 5.6	(− 1.33)	0.8	(0.19)	1.9	(0.59)
Third year	236	17.8	2.8	(0.80)	3.7	(0.79)	5.1	(1.06)	6.7	(1.58)	4.0	(1.08)
Up to three years	300	45.7	3.3	(0.47)	5.7	(0.60)	5.7	(0.64)	12.5	(1.38)	7.6	(1.09)
Panel B: Parent stocks												
First year	300	7.4	− 5.8	(− 2.24)	− 0.6	(− 0.19)	− 10.0	(− 2.74)	− 2.6	(− 0.80)	− 8.5	(− 1.93)
Second year	291	11.3	− 2.9	(− 1.32)	− 1.9	(− 0.64)	− 8.2	(− 2.19)	− 5.7	(− 1.51)	− 1.9	(− 0.59)
Third year	236	13.6	− 1.5	(− 0.58)	− 3.2	(− 0.87)	1.2	(0.39)	0.0	(0.00)	− 4.0	(− 1.08)
Up to three years	300	38.1	− 4.3	(− 0.78)	− 0.7	(− 0.10)	− 12.7	(− 1.48)	− 3.3	(− 0.42)	− 7.6	(− 1.09)

over an average holding period of 2.67 years, which gives a compound annual return of $1.430^{1/2.67} - 1 = 0.143$, or, 14.3%. In comparison, Loughran and Ritter (1995) document that IPOs and SEOs earn compound annual returns of 3.4% and 4.7% during the first three years, as computed by the geometric mean of yearly returns in their Table 3. The difference is economically very significant. The subsidiary returns also contrast with small growth stock returns. Fama and French (1993), Brav and Gompers (1997), and Loughran (1997) document that small growth stocks earn much lower returns than the market average during the 1980s. Only 14% of the subsidiaries have size greater than the NYSE median, and 28% have book-to-market value greater than the NYSE median. Yet these subsidiaries do not underperform relative to the value-weighted market returns following carveout.

The 628 subsidiaries include only 300 cases where the parent is a public firm traded on a US exchange. The investment opportunities and financing alternatives of these subsidiaries may differ from the 328 cases where the parent is a private firm, a foreign firm, or a mutual insurance firm. The two groups may also differ in their need to focus, and the likely benefits from reputation. However, the second portion of Panel A in Table 4 shows that the BHERs of the 300 subsidiaries of US exchange-traded parents are as insignificant as the BHERs of all 628 subsidiaries. Alternately, the BHERs of the 328 subsidiaries of other than US exchange-traded parents are also insignificant (results not shown).

Panel B of Table 4 shows the BHERs of 300 parents with reference to the same benchmarks. Eighteen out of the twenty measures of excess return shown in this panel are negative, although generally insignificantly different from zero.

I examine CERs to test the robustness of my results, and to ascertain whether there are any time-series patterns in excess returns. Fig. 1A shows the CERs of subsidiary stocks computed with reference to the size and book-to-market, the size and industry, and the size and earnings-to-price matching firm benchmarks. There is no discernible pattern in subsidiary excess returns in event time. The CERs at the end of 36 months equal 5.0%, -5.7%, and 1.2% for the three paired groups, and are insignificant. The CERs are smaller than the BHERs with reference to each benchmark, which is predictable because of skewness. Fig. 1B shows that the CERs for parent stocks equal -3.0%, -12.6%, and -9.0%. The corresponding t-statistics equal -0.49, -2.11, and -1.37, and are generally insignificant. The size and industry benchmark is less credible for parent firms, which are often diversified across industries. There is one significant pattern in parent CERs that is not captured by the BHERs. The parent stocks earn an excess return of -3.2% during the first month after carveout, which is significant, robust to the choice of benchmarks, and inconsistent with market efficiency. This observation confirms a finding first documented by Hand and Skantz (1997).

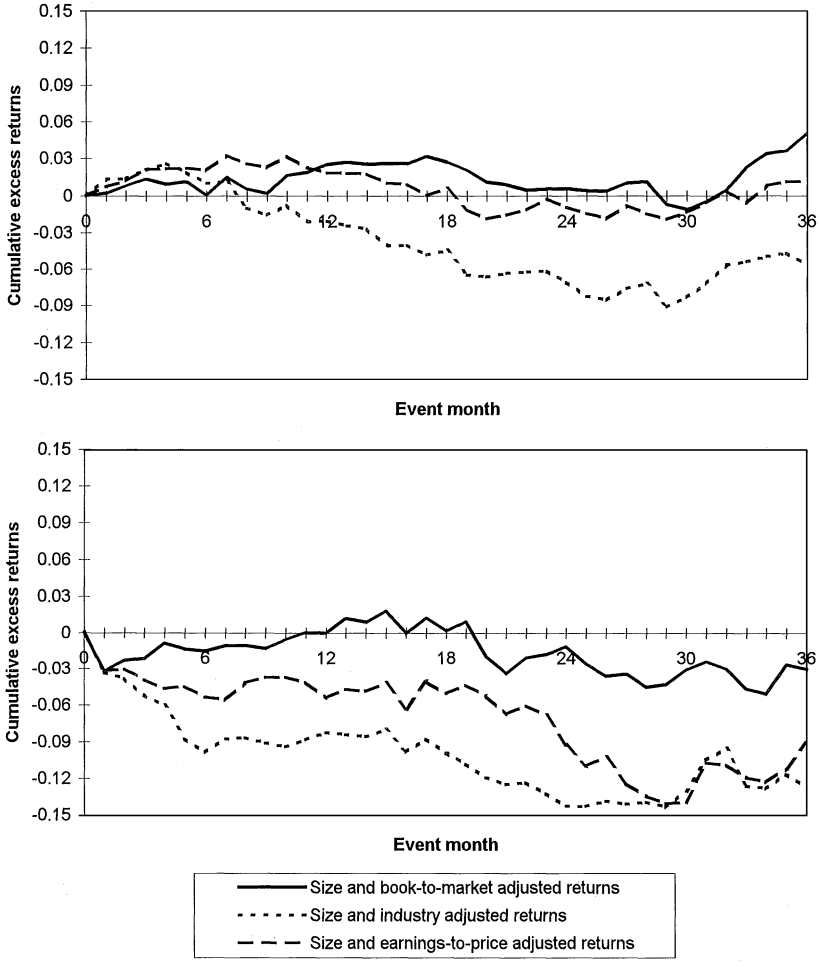

Fig. 1. Cumulative excess returns (CERs) of carveout subsidiary and parent stocks, 1981–1995.

The sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. CERs of carveout subsidiaries and parents are computed with reference to three matching firm returns. These control for the size and book-to-market, size and industry, and size and earnings-to-price effects. Monthly excess returns are calculated for 21-day periods for each sample firm by subtracting the matching firm returns. The initial listing-day returns are excluded from all computations of subsidiary long-term returns. The average excess return for an event month t, $t = 1$ to 36, is calculated by averaging the excess returns for all firms. The CER_t for month t is the sum of average excess returns for months 1 to t.

4.3. Excess returns on calendar-time portfolios of subsidiary and parent stocks

My sample period extends over 15 yr, whereas the BHERs and CERs are computed over three years. Brav (1997), Fama (1998), and Mitchell and Stafford (1997) argue that the overlapping return calculations may induce cross correlations between stock returns, and affect the statistical inference. In addition, the BHERs and CERs represent portfolio strategies in event time, which are conceptually harder to understand than portfolio strategies in calendar time. Fama (1998) argues that calendar-time tests of long-term returns provide the most reliable tests of market efficiency, conditional on the use of an appropriate model to calculate the excess returns.

To address these issues, I calculate excess returns on a portfolio strategy that invests in carveouts completed during the last three years. Following Brav and Gompers (1997), I first calculate the annual returns on portfolios of subsidiary and parent stocks by compounding monthly returns starting in January and ending in December of each year. I then subtract the annual returns on similar portfolios of matching stocks. I calculate the average annual excess returns and t-statistics by using the series of annual excess returns over 1981–1996.

Table 5 shows that, on average, the subsidiary portfolios earn annual raw returns of 14.1%, with a t-statistic of 2.11. This figure is close to the compound annual returns of 14.3% calculated by using the average buy-and-hold returns, and asserts the large difference between the carveout subsidiary returns and the IPO and SEO returns. The annual excess returns of subsidiary portfolios with reference to the three matching firm portfolios are insignificantly different from zero. The annual excess returns of parent portfolios are significantly negative with reference to the size and industry benchmark, but not with reference to the size and book-to-market benchmark, or the more important size and earnings-to-price benchmark.

The final tests of long-term excess returns in the aggregate sample are based on the Fama–French three factor model. In this model, the difference between the monthly return of sample stocks and the riskfree return is regressed on three factors: the difference between the market return and the riskfree return, the difference between returns on portfolios of small stocks and big stocks, and the difference between returns on portfolios of high book-to-market stocks and low book-to-market stocks. The intercept from the Fama–French three factor model serves as an estimate of excess returns.

Based on monthly returns over 1981–1996, the intercepts for equally weighted portfolios of subsidiary and parent stocks equal -0.17% and -0.42% per month, with t-statistics of -0.82 and -1.52. The intercepts for value-weighted portfolios of subsidiary and parent stocks equal -0.13% and 0.22% per month, with t-statistics of -0.49 and 0.75. Thus, based on the Fama–French three factor model, both the subsidiary and parent stocks earn insignificant excess returns.

4.4. Excess returns around long-term earnings announcements

Fama (1998) argues that inferences based on long-term returns are limited by the bad model problem, that is, that all such tests are joint tests of market efficiency and the model specification. Fama and French (1993) show that even their now famous three factor model does not capture the returns of small growth stocks during the period of their study. In contrast, event-study returns computed over short windows are much less sensitive to the model of expected returns. Short-horizon event studies are also more powerful in detecting small price effects, as there is less noise in excess returns.

If carveouts create long-term wealth gains or losses for subsidiary or parent shareholders, then it may be that a significant proportion of the excess returns are concentrated around earnings announcements. Table 6 reports an event study of earnings announcement dates during a one-year period before and after carveout. The announcement dates are obtained from the Compustat Quarterly files. Earnings announced within the first 63 trading days after carveout are classified as belonging to $+1$ quarter, within 64 to 126 trading days as belonging to $+2$ quarter, etc. The excess returns are computed by subtracting the cumulative value-weighted market returns from the cumulative subsidiary or parent returns over a three-day or five-day period ending on the day after the announcement.

The subsidiary stocks earn significant excess returns of 2.27% and 2.74% over three-day and five-day windows around the first earnings announcements, with t-statistics of 4.08 and 3.97. Of the 190 three-day excess returns, 118 are positive, with a z-statistic of 3.34. Significantly positive excess returns around a predictable event are inconsistent with market efficiency. There is finally some evidence that, if anything, the market undervalues the earnings potential of carveout subsidiaries at the time of offering. However, this undervaluation may be short-lived, as the subsequent announcements are accompanied by insignificant excess returns.

Table 6 also shows that parent stocks earn significantly positive excess returns around the last two earnings announcements before carveout. The excess returns during the four quarters after carveout are insignificant. This evidence is consistent with the positive excess returns of parent stocks before carveout, and the insignificant excess returns after carveout.

5. Additional results: the long-term returns of carveouts in subsets of data

5.1. Subsidiary and parent excess returns by calendar years

To test the robustness of my results, and to understand the reasons for the superior performance of carveout subsidiaries as compared with IPOs and

Table 5
Annual excess returns in calendar time on monthly rebalanced portfolios of subsidiary and parent stocks involved in carveout during last 36 months, 1981–1995.

The sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. Excess returns for carveout subsidiaries and parents are computed with reference to three matching firm returns. These control for the size and book-to-market, size and industry, and size and earnings-to-price effects. Each month, the return on all subsidiary or parent firms that were involved in a carveout at any time during the last 36 months is calculated. The annual raw return in each year is the compound return from January through December of these average monthly returns. The annual excess return is calculated by subtracting the compound return for matching firms. The initial listing-day returns are excluded from all computations of subsidiary long-term returns. The *t*-statistics of average annual excess returns are computed by using the series of annual excess returns over 1981–1996, and are reported in parentheses. The *t*-statistics greater than 1.64, 1.96, and 2.57 are significant at the 10%, 5%, and 1% level, respectively.

Year	Subsidiary stocks					Parent stocks				
	Number in January	Annual raw return	Annual excess returns with reference to			Number in January	Annual raw return	Annual excess returns with reference to		
			Size and book-to-market	Size and industry	Size and earnings-to-price			Size and book-to-Market	Size and industry	Size and earnings-to-price
1981	1	− 40.3	7.8	− 89.6	− 18.5	1	− 26.2	1.2	− 14.9	− 24.4
1982	16	60.9	49.1	49.3	39.4	11	36.4	4.7	0.0	32.7
1983	22	39.1	3.0	− 18.7	3.5	13	18.5	− 29.3	− 28.3	− 11.6
1984	69	− 17.6	2.7	− 14.0	2.4	26	− 8.5	− 5.4	− 1.8	3.8

1985	78	42.3	11.4	14.6	19.2	24	10.6	− 23.7	− 0.5	4.6
1986	100	6.5	2.6	2.5	− 5.7	38	4.2	− 10.4	− 3.2	3.3
1987	105	− 9.6	0.3	− 7.3	− 2.0	55	− 2.4	12.3	− 7.1	− 5.3
1988	131	30.6	19.3	7.3	10.6	73	20.2	8.2	− 6.9	7.0
1989	109	21.8	17.9	2.7	16.1	55	14.9	1.5	− 4.8	0.2
1990	69	− 17.4	− 13.1	− 4.9	3.6	38	− 21.2	− 9.3	− 9.3	− 6.3
1991	46	35.1	− 10.7	15.1	− 11.3	29	37.0	11.6	3.4	7.2
1992	73	25.6	12.8	5.7	− 2.3	47	21.3	7.7	− 4.1	− 20.8
1993	135	13.6	− 5.7	− 7.3	− 7.3	63	12.2	− 10.4	3.0	− 10.0
1994	225	− 5.7	2.5	− 2.9	− 2.1	92	− 6.3	− 3.4	− 11.0	− 4.7
1995	250	26.9	− 7.2	− 4.6	− 4.4	95	38.5	2.2	2.5	− 12.8
1996	202	13.5	− 8.4	− 12.5	− 3.5	88	16.9	0.2	− 3.7	2.3
Average		14.1	5.3	− 4.0	2.4		10.4	− 2.6	− 5.4	− 2.2
		(2.11)	(1.38)	(− 0.58)	(0.68)		(2.13)	(− 0.89)	(− 2.72)	(− 0.65)

Table 6
Excess returns around earnings announcements of carveout subsidiary and parent stocks, 1981–1995.

The original sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. The availability of earnings announcement dates from Compustat restricts the sample sizes as shown below. Earnings announced within the first 63 trading days of carveout are classified as quarter + 1, within 64 to 126 trading days as quarter + 2, etc. Excess returns are computed by subtracting the cumulative market returns from the cumulative stock returns over a three-day or five-day announcement period. Both computation periods end one day after the Compustat earnings announcement date. Market returns are measured by the value-weighted CRSP portfolio. The *t*-statistics are computed by using the cross-sectional distribution of excess returns, and are reported in parentheses. The *t*-statistics greater than 1.64, 1.96, and 2.57 are significant at the 10%, 5%, and 1% level, respectively.

Quarter relative to carveout issue	Earnings announcement reaction of subsidiary stocks			Earnings announcement reaction of parent stocks		
	Number	3-day excess return	5-day excess return	Number	3-day excess return	5-day excess return
− 4				234	− 0.22 (− 0.53)	− 0.47 (− 0.92)
− 3				253	0.40 (0.78)	0.90 (1.60)
− 2				269	0.31 (0.91)	0.76 (2.11)
− 1				265	0.91 (2.62)	1.46 (3.58)
+ 1	190	2.27 (4.08)	2.74 (3.97)	279	− 0.39 (− 1.06)	− 0.23 (− 0.56)
+ 2	429	0.20 (0.61)	0.19 (0.52)	261	− 0.37 (− 1.01)	− 0.36 (− 0.88)
+ 3	468	− 0.03 (− 0.08)	0.07 (0.20)	259	− 0.17 (− 0.47)	− 0.24 (− 0.52)
+ 4	475	− 0.25 (− 0.75)	0.10 (0.26)	246	− 0.09 (− 0.25)	− 0.27 (− 0.64)

SEOs, I now examine several subsets of the data. Table 7 reports the BHERs by the year of carveout. The bottom rows of this table report the BHERs over two equal length subperiods, spanning 1981 to June 1988 and July 1988 to 1995.

The subsidiary raw returns during the two subperiods are quite close, at 41.9% and 43.7%. But the excess returns tell a different story. The BHERs

computed with reference to the size and book-to-market matching firms average 28.9%, with t-statistic 3.03, during the first subperiod, and are positive in every year. The BHERs during the second subperiod average -5.1%, with t-statistic -0.56, and are negative in half the years. Apparently, the matching returns vary considerably over time, from 13.0% during the first period to 48.8% during the second period. This may not be surprising. Brav and Gompers (1997) document that, during 1975–1992, small growth firms in the lowest quintiles of NYSE firms earn almost zero raw returns over five years. Casual empiricism also suggests that size and growth have been positively related to stock returns during the mid-1990s. This observation, combined with a general increase in subsidiary values over time in Table 1, can explain the swings in matching returns. The subperiod BHERs computed with reference to the size and industry and the size and earnings-to-price matching firms corroborate the evidence of the size and book-to-market matching firms to some degree. However, the parent BHERs are insignificantly different from zero during both subperiods. The evidence with CERs and annual excess returns on calendar-time portfolios is similar.

Once again, unlike IPOs and SEOs, the carveout subsidiaries do not underperform the benchmarks during either subperiod. During the first seven and a half years they outperform benchmarks, although the evidence is not consistent across benchmarks, and is driven by the variation in benchmark returns rather than subsidiary returns.

5.2. *Focus, divestitures, and carveout returns*

Carveouts differ from IPOs and SEOs in their ability to increase the corporate focus of both the subsidiary and parent firms. Table 8 compares the business diversity of subsidiary and parent firms with the average firm on the Compustat business segment file. I have these data starting from 1983, although they do not include many smaller firms during the covered period. The data consist of a few broad accounting variables for each business segment of a firm that accounts for at least 10% of its aggregate sales, profits, or assets. During 1983–1996, 74% of all firms included in the business segment file report a single business segment. In comparison, only 25% of the 177 parent firms report a single business segment before carveout. The subsidiaries are the opposite, with 87% of the 405 firms on the segment file reporting a single business segment after carveout. The parents report an average of 5.46 different four-digit SIC codes, compared with 2.60 for all firms and 2.12 for subsidiaries.

The last two rows in Table 8 report the Herfindahl index values, based on sales and assets. The Herfindahl index values are computed by the sum of squares of the proportional sales or assets of all business segments comprising the firm as follows. Suppose there are $i = 1$ to n companies. Denote the sales of the jth segment of the ith company by S_{ij}. The Herfindahl index of sales for

Table 7
Three-year buy-and-hold excess returns (BHERs) of carveout subsidiary and parent stocks by the year of carveout, 1981–1995.

The sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. BHERs of carveout subsidiaries and parents are computed with reference to three matching firm returns. These control for the size and book-to-market, size and industry, and size and earnings-to-price effects. BHERs are computed by the difference between buy-and-hold returns of sample and matching firms over a three-year holding period, starting with the listing date of subsidiary stock. The initial listing-day returns are excluded from all computations of subsidiary long-term returns. The holding period is truncated if a subsidiary or parent firm gets delisted, or if data for the entire holding period does not exist by the end of 1996 (i.e., cases where the carveout took place during 1994–1995). However, the holding period is never truncated if a matching firm gets delisted. Instead, the proceeds of the first matching firm are rolled over into the second closest matching firm, and so on. The *t*-statistics are computed by using the cross-sectional distribution of BHERs and are reported in parentheses. The *t*-statistics greater than 1.64, 1.96, and 2.57 are significant at the 10%, 5%, and 1% level.

Year	Subsidiary stocks						Parent stocks				
	Number	Initial return	Raw return	BHERs with reference to			Number	Raw return	BHERs with reference to		
				Size and book-to-market	Size and industry	Size and earnings-to-price			Size and book-to-market	Size and industry	Size and earnings-to-price
1981	15	− 1.0	82.1	86.9	52.7	60.8	11	69.4	0.3	12.8	57.4
1982	9	10.8	115.5	22.6	22.0	68.1	5	31.6	13.0	0.0	− 13.3
1983	51	8.0	45.7	22.2	6.3	13.7	16	5.7	− 20.5	− 28.7	− 15.2
1984	20	3.2	91.5	38.9	25.0	40.4	6	86.4	− 43.7	22.0	90.1
1985	32	6.6	29.6	2.7	18.8	− 2.8	17	26.8	− 19.2	− 8.5	− 14.9

1986	62	4.1	28.7	33.4	0.5	18.3	37	45.1	31.5	− 12.9	18.3
1987	47	4.6	− 1.9	15.9	2.0	2.1	24	6.7	19.2	− 37.0	13.8
1988	18	1.3	78.1	5.6	25.6	41.1	10	48.5	− 18.9	49.3	24.0
1989	17	4.5	32.6	0.2	− 12.7	25.3	14	8.8	− 24.5	− 15.0	− 24.1
1990	14	6.1	− 30.6	− 77.7	− 16.7	− 84.2	8	− 24.5	− 33.3	− 70.6	− 58.9
1991	42	6.4	97.2	41.4	39.2	47.1	25	43.3	− 7.4	− 26.2	− 42.4
1992	74	6.2	33.3	− 4.1	− 25.2	− 14.7	28	51.4	20.2	17.5	0.3
1993	113	7.5	49.1	− 1.0	16.2	− 8.3	38	51.9	− 8.1	− 22.2	− 13.5
1994	79	7.6	44.3	− 21.8	− 6.4	1.0	38	55.7	− 7.8	− 5.6	− 1.5
1995	35	7.5	23.2	3.5	− 24.9	− 16.8	23	25.8	1.7	− 26.4	− 17.7
1981–June 1988	243	5.1	41.9	28.9 (3.03)	13.2 (1.26)	20.7 (2.05)	120	35.0	8.2 (0.79)	− 12.2 (− 0.91)	15.7 (1.45)
July 1988–1995	385	6.8	43.7	− 5.1 (− 0.56)	− 1.1 (− 0.13)	− 3.7 (− 0.43)	180	40.2	− 6.6 (− 0.71)	− 13.0 (− 1.17)	− 15.9 (− 1.47)
1981–1995	628	6.2	43.0	8.0 (1.19)	4.4 (0.70)	5.7 (0.87)	300	38.1	− 0.7 (− 0.10)	− 12.7 (− 1.48)	− 3.3 (− 0.42)

Table 8
Business focus of carveout subsidiary and parent stocks vs. all Compustat business segment file stocks, 1981–1995.

The initial sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. Business focus is computed by using the Compustat business segment data. This data exists for only 405 subsidiaries and 177 parents in the 1983 to 1996 versions of data. The Herfindahl index is calculated by the sum of squares of the fractional contribution of each segment to aggregate sales or assets. It ranges between 0, for a completely unfocused firm with atomistic holdings of numerous business segments, and 1, for a completely focused firm with one business segment.

Item	Subsidiary firms in the year after carveout	All Compustat segment file firms during 1983–1996	Parent firms in the year before carveout
Available sample	405	85947	177
Percentage of firms with only one business segment greater than 10% of sales and assets	87	74	25
Average number of segments	1.22	1.53	3.09
Average number of different SIC codes	2.12	2.60	5.46
Average Herfindahl index based on sales	0.9539	0.8827	0.6119
Average Herfindahl index based on assets	0.9538	0.8844	0.6090

company i is given by $H_i = \sum_j (S_{ij}/\sum_j S_{ij})^2$. The average Herfindahl index for all n companies is given by $H = \sum_i H_i/n$. The Herfindahl index values range between 0, for a completely unfocused firm with atomistic investments in numerous business segments, and 1, for a completely focused firm with a single business segment.

The parent firms have an average sales-based Herfindahl index value of 0.6119, compared with 0.8827 for all Compustat firms and 0.9539 for the subsidiary firms. The assets-based Herfindahl index values are quite similar. Although not shown in Table 8, each of the four measures of focus for subsidiary and parent firms is significantly different from the average firm, and from each other. Each difference remains highly significant after controlling for the cross-sectional variation in firm size.

The diffused focus of parent firms suggests that there may be opportunities to create value, as suggested by reasons given by Schipper and Smith (1986). I now test the proposition that carveouts create wealth by granting freedom to the subsidiary firms from the complex structure of parent firms. The parent firms

should also benefit from this freedom, because they can focus on their core strengths, and because they continue to hold a large stake in the subsidiary firms. The more business segments the parent firm has before carveout, the greater the subsequent benefits from carveout.

Table 9 arranges carveouts into three subsets, based on whether the parent firm had only one business segment before carveout, two or three segments, or four or more segments. The single-segment firms should realize the least improvement in corporate focus from carveout. The subsidiary and parent firms have the same four-digit primary SIC code in 20% of such cases, and the same two-digit SIC code in another 20% cases. If the single-segment carveouts and SEOs are quite similar, then, as in the case of SEOs, we should expect a strong price runup before carveout, and weak long-term returns after carveout. Table 9 shows a price runup of 34.6%, and subsidiary BHERs ranging between -17.4% and -48.6%. However, the t-statistics are usually insignificant, especially with reference to the size and book-to-market benchmark. The parent firms of single-segment carveouts realize BHERs ranging between -11.9% and -66.4% after carveout, which are significant with reference to the size and book-to-market and the size and industry benchmarks, but not with reference to the size and earnings-to-price benchmark. The evidence is in the right direction, and is economically significant, but remains inconclusive, perhaps due to a sample size of only 44 cases.

Table 9 shows that the subsidiary performance increases monotonically with the number of business segments. On average, subsidiaries in the four-or-more-segments subset earn raw returns of 75.3%, which exceed the raw returns of the single-segment subset by 64.2%, with a t-statistic of 2.70. The difference between the BHERs for these two groups ranges between 55.0% and 93.4%, which is economically very significant. It is also statistically significant with reference to the size and industry and the size and earnings-to-price benchmarks, but not the crucial size and book-to-market benchmark. Comparing the BHERs of the four-or-more-segments subset with the sum of single-segment and two-or-three-segments subsets produces significant differences with reference to all three benchmarks. Differences between the parent BHERs are similar; economically significant in most cases, statistically significant in many cases, but statistically insignificant with reference to the size and earnings-to-price benchmark.

Table 9 attempts to distinguish between two alternate explanations of the insignificant excess returns of subsidiary stocks in the aggregate sample. The first explanation says that the negative returns of the equity issue in a carveout are neutralized by the positive returns of the divestiture. The second explanation says that the market reacts efficiently to both events. It is tempting to conclude that the evidence favors the first explanation. However, the statistical significance of results is weak, even in the univariate tests. The joint hypothesis of market efficiency and the appropriateness of the asset pricing model used to calculate the excess returns cannot be rejected.

Table 9
Business focus and three-year buy-and-hold excess returns (BHERs) of carveout subsidiary and parent stocks, 1981–1995.

The initial sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. The number of distinct business segments accounting for at least 10% of the combined sales or assets of the parent company during the fiscal year before the year of carveout is obtained from the Compustat business segment file. This data exists for 177 parent firms during 1983–1995. BHERs of carveout subsidiaries and parents are computed with reference to three matching firm returns. These control for the size and book-to-market, size and industry, and size and earnings-to-price effects. BHERs are computed by the difference between buy-and-hold returns of sample and matching firms over a three-year holding period, starting with the listing date of subsidiary stock. The initial listing-day returns are excluded from all computations of subsidiary long-term returns. The holding period is truncated if a parent or subsidiary firm gets delisted, or if data for the entire holding period does not exist by the end of 1996 (i.e., cases where the carveout took place during 1994–1995). However, the holding period is never truncated if a matching firm gets delisted. Instead, the proceeds of the first matching firm are rolled over into the second closest matching firm, and so on. In four cases the parent firm was not a U.S. exchange-listed firm on listing date, but later became so. Since Compustat often back-fills the data, only the number of segments data and the subsidiary returns data for these firms, but not the parent returns data, are available. The t-statistics are computed by using the cross-sectional distribution of excess returns, and are reported in parentheses. The t-statistics greater than 1.64, 1.96, and 2.57 are significant at the 10%, 5%, and 1% level, respectively.

Number of business segments	Number	Initial return (for subsidiaries) Price runup (for parents)	Raw return	BHERs with reference to		
				Size and book-to-market	Size and industry	Size and earnings-to-price
Panel A: subsidiary stocks						
1	44	10.3 (3.27)	11.1 (0.79)	− 22.3 (− 0.99)	− 48.6 (− 2.10)	− 17.4 (− 0.74)
2 or 3	65	5.1 (2.61)	29.4 (2.57)	− 7.2 (− 0.47)	− 20.6 (− 1.12)	− 5.0 (− 0.27)
4 or more	68	5.5 (4.91)	75.3 (3.92)	32.7 (1.45)	44.8 (2.33)	49.9 (2.38)
No data	451	6.0 (10.03)	43.2 (6.97)	9.5 (1.16)	7.1 (0.96)	2.9 (0.37)
All	628	6.1 (11.44)	43.0 (8.32)	8.0 (1.19)	4.4 (0.70)	5.7 (0.87)
Difference: 1 vs. 4 or more			64.2 (2.70)	55.0 (1.41)	93.4 (3.10)	67.3 (2.15)
Difference: 3 or less vs. 4 or more			53.3 (2.52)	46.0 (1.81)	76.7 (3.19)	59.9 (2.35)

Panel B: Parent stocks

1	42	34.6 (1.47)	12.0 (1.05)	− 32.9 (− 1.69)	− 66.4 (− 1.84)	− 11.9 (− 0.80)
2 or 3	64	4.2 (0.70)	27.5 (2.41)	− 12.6 (− 0.84)	− 29.9 (− 1.48)	− 19.7 (− 0.89)
4 or more	67	5.0 (1.38)	45.6 (3.83)	9.9 (0.74)	9.6 (0.71)	− 5.5 (− 0.35)
No data	127	18.5 (3.42)	48.2 (5.11)	10.4 (0.95)	2.1 (0.21)	9.0 (0.81)
All	300	14.7 (3.42)	38.1 (6.77)	− 0.7 (− 0.10)	− 12.7 (− 1.48)	− 3.3 (− 0.42)
Difference: 1 vs. 4 or more			33.6 (2.04)	42.8 (1.81)	76.0 (1.97)	6.4 (0.29)
Difference: 3 or less vs. 4 or more			24.2 (1.67)	30.5 (1.42)	54.0 (2.33)	22.1 (1.03)

Table 10
Regression analysis of three-year buy-and-hold excess returns (BHERs) of carveout subsidiary stocks, 1981–1995.

The initial sample of 628 subsidiaries and 300 parents during 1981–1995 is identified from the Securities Data Corporation and the *Mergers and Acquisitions* magazine. It satisfies the additional requirement that subsidiary returns data immediately after issue is available on CRSP tapes. Utility issues are excluded. BHERs of carveout subsidiaries are computed by the difference between buy-and-hold returns of sample firms and the matching firms selected by size and book-to-market values over a three-year holding period, starting with the listing date of subsidiary stock. The initial listing-day returns are excluded from all computations of subsidiary long-term returns. The cross sectional determinants are eight dummy variables listed below. The *t*-statistics are reported in parentheses. The *t*-statistics greater than 1.64, 1.96, and 2.57 are significant at the 10%, 5%, and 1% level, respectively.

SEGMENTS, which takes the value 1 if the parent has 4 or more business segments before carveout, and 0 otherwise.
PAROWN, which takes the value 1 if the parent's ownership after carveout exceeds the median 62.5%, and 0 otherwise.
OFFRSIZE, which takes the value 1 if the ratio of offering value to parent equity exceeds the median 0.0826, and 0 otherwise.
SUBSIZE, which takes the value 1 if the subsidiary market value after carveout exceeds the median $299 million, and 0 otherwise.
SUBPRD, which takes the value 1 if the carveout issue date is on or after 1 July 1988, and 0 otherwise.
INSTOWN, which takes the value 1 if institutional holdings are greater than the median 21.5%, and 0 otherwise.
PARBVMV, which takes the value 1 if the parent's book-to-market value exceeds the median 0.553 before carveout, and 0 otherwise.
PAREP, which takes the value 1 if the parent's earnings-to-price ratio exceeds the median 0.049 before carveout, and 0 otherwise.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Univariate regressions of the subsidiary BHERs on cross-sectional variables								
Intercept	− 13.3 (− 0.89)	5.5 (0.55)	32.5 (2.26)	4.6 (0.49)	28.9 (2.68)	− 32.5 (− 2.39)	20.7 (1.43)	14.1 (0.98)
SEGMENTS	46.0 (1.91)							
PAROWN		5.7 (0.41)						
OFFRSIZE			− 46.2 (− 2.28)					
SUBSIZE				6.8 (0.50)				
SUBPRD					− 34.0 (− 2.47)			
INSTOWN						54.4 (2.82)		

PARBVMV							− 31.1 (− 1.52)	
PAREP								− 17.3 (− 0.85)
Sample size	177	596	264	628	628	322	269	271
Adjusted-R^2	0.015	− 0.001	0.016	− 0.001	0.008	0.021	0.005	− 0.001

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Panel B: Bivariate and multivariate regressions of the subsidiary BHERs on SEGMENTS and other variables								
Intercept	− 0.2 (− 0.01)	10.2 (0.42)	− 16.9 (− 0.89)	− 3.2 (− 0.13)	− 60.7 (− 2.73)	− 16.3 (− 0.86)	− 8.7 (− 0.47)	− 13.7 (− 0.24)
SEGMENTS	39.9 (1.61)	33.7 (1.20)	43.0 (1.65)	44.3 (1.81)	55.4 (1.66)	60.9 (2.30)	71.7 (2.74)	45.3 (1.19)
PAROWN	− 20.2 (− 0.83)							
OFFRSIZE		− 47.1 (− 1.69)						− 27.0 (− 0.75)
SUBSIZE			8.0 (0.31)					
SUBPRD				− 13.6 (− 0.53)				− 49.3 (− 0.89)
INSTOWN					80.0 (2.49)			93.1 (2.64)
PARBVMV						− 5.1 (− 0.20)		
PAREP							− 31.7 (− 1.26)	
Sample size	168	149	177	177	109	161	160	94
Adjusted-R^2	0.007	0.027	0.010	0.011	0.089	0.021	0.037	0.085

5.3. Institutional ownership of carveouts

Field (1997) documents that institutions own an average 11.6% of all IPOs during 1979–1989. She also documents that the subsequent excess returns of IPOs are related to their institutional holdings. I measure institutional holdings of carveout subsidiary firms by the first available record on the Compact D database from Disclosure, Inc., which appears, on average, eight months after carveout. The 322 subsidiaries which can be found on this database, from 1987 onwards, have average institutional holdings of 30.3%, with a median of 21.5%. Detailed examination of institutional ownership for a few subsidiaries shows that there may be occasional overlap between parent ownership and institutional ownership. The problem is not widespread, however. The higher institutional holdings of carveout subsidiaries are consistent with their positive performance as shown below.

5.4. Regression analysis of the subsidiary returns

Table 10 reports several cross-sectional regressions of the subsidiary BHERs computed with reference to the size and book-to-market matching returns. *SEGMENTS* is a dummy variable that takes the value 1 if the parent firm before carveout has four or more segments, and 0 otherwise. Panel A reports the univariate tests of *SEGMENTS*, and seven other variables. Since the relation between carveout returns and focus is an important part of this paper, Panel B also reports bivariate tests of *SEGMENTS* with each of the other variables. Every one of these variables is expressed as a dummy variable that takes the value 1 if it is greater than median, and 0 otherwise.

SEGMENTS is significant at the 10% level in univariate regression. However, its significance decreases with the addition of five out of the other seven variables in bivariate regressions. It becomes insignificant in two out of seven cases. The coefficient of *SEGMENTS* lies between 33.7% and 71.7% in all regressions, which is reasonably consistent and economically very significant.

PAROWN measures the effect of parent's ownership of subsidiary firm, and is insignificant in both regressions. This may be surprising in view of the likely importance of parent's ownership in monitoring the subsidiary firm. However, recall that the parents own at least 20% of the subsidiary equity in 93% cases. Schipper and Smith (1986) document that the voting rights held by parents often exceed their percentage ownership of equity, which is sometimes necessary for the tax consolidation of parent and subsidiary incomes. Morck et al. (1988) argue that insiders can exercise control with as little as five percent ownership. Weston (1979) reports that no firm in which insiders own more than 30% equity has ever been acquired in a hostile takeover. Thus, my sample may not have enough cases in which the parent firm cannot exercise control when required.

OFFRSIZE measures the offering value relative to the parent firm size. This variable is a proxy for the potential benefits to parent shareholders from selling overpriced subsidiary stock. It is significantly negative in both regressions, and demonstrates that offerings which are large, relative to the size of the parent firm, underperform by greater amounts. *SUBSIZE* measures the effect of subsidiary firm size alone, and is insignificant.

SUBPRD measures the effect of subperiod. This variable is significant in the univariate regression, but insignificant in the bivariate regression. This suggests that the lower excess returns during the second subperiod may be partially attributed to the lower business diversity of parent firms during that period, when the number of business segments dropped from an average 2.80 during 1981–June 1988 to 2.40 during July 1988–1995.

INSTOWN measures the effect of institutional ownership. Subsidiaries above the median 21.5% institutional ownership earn significantly greater excess returns than those below the median in both regressions.

PARBVMV and *PAREP* measure the effect of the prior book-to-market value and earnings-to-price ratio of parent firms. These variables are insignificant.

The last column of Panel B reports a multivariate regression, which includes the four variables that are significant in the univariate regressions, which are *SEGMENTS*, *OFFRSIZE*, *SUBPRD*, and *INSTOWN*. Only *INSTOWN* remains significant in a sample of 94 observations. These regression results weaken the statistical significance of the focus and divestiture results.

6. Conclusions

Using a sample of 628 carveouts during 1981–1995, this paper finds that the subsidiary stocks do not underperform appropriate benchmarks over a three-year period following the carveouts. This finding is based on several different measures of long-term excess returns, and is in striking contrast with the documented poor performance of IPOs and SEOs. On average, the subsidiary stocks earn an annual raw return of 14.3% during the first three years, which compares with 3.4% for IPOs and 4.7% for SEOs in Loughran and Ritter (1995). In certain tests, and in certain subsets of data, the subsidiary stocks even outperform benchmarks. The three-day excess returns surrounding the first quarter's earnings announcements of subsidiary firms are significantly positive. The long-term excess returns of subsidiary stocks during the first half of the sample period are also significantly positive. The parent stocks earn insignificant long-term excess returns during the entire period of this study.

I examine several possible explanations of the superior performance of subsidiary stocks, as compared with IPOs and SEOs. First, the parent firms making carveouts are significantly less focused than the universe of the firms on

Compustat business segment file. Carveouts offer the subsidiary and parent firms the opportunity to focus on fewer business segments. Cross-sectional tests offer some evidence that the subsidiary performance is related to the number of business segments in the pre-carveout firm, but this relationship is sensitive to the inclusion of other variables. Second, the subsidiaries gain partial freedom to pursue their own business activities, but the parents continue to own a large part of their equity. Cross-sectional tests of whether the subsidiary performance is related to the parent ownership are insignificant, perhaps because in the vast majority of cases the parent ownership is large enough to exercise control when required. Third, the carveout offering value is usually a small fraction of the parent market value, so reputation effects may prevent the overpricing of the newly offered stock. Cross-sectional tests show some evidence that the subsidiary performance is negatively related to the ratio of offering value to parent value. However, in multivariate tests, most variables become insignificant. In part, this result may be attributed to the reduced sample size with the addition of multiple variables. But, in part, this result also suggests an old and established explanation of why the subsidiary stocks do not underperform the benchmarks. The market may simply react efficiently to the likely future performance of all carveouts.

References

Allen, J., 1998. Capital markets and corporate structure: the equity carveouts of thermo electron. Journal of Financial Economics 48, 99–124.

Allen, J., McConnell, J., 1997. Equity carveouts and managerial discretion. Journal of Finance 53, 163–186.

Barber, B., Lyon, J., 1996. Detecting long-run abnormal stock returns: the empirical power and specification of test-statistics. Journal of Financial Economics 41, 359–399.

Barry, C., Muscarella, C., Peavy, J., Vetsuypens, M., 1990. The role of venture capital in the creation of public companies: evidence from the going-public process. Journal of Financial Economics 27, 447–472.

Berger, P., Ofek, E., 1995. Diversification's effect on firm value. Journal of Financial Economics 37, 39–65.

Brav, A., 1997. Inference in long-horizon event studies: a parametric bootstrap approach. Unpublished working paper. University of Chicago.

Brav, A., Gompers, P., 1997. Myth or reality? The long-run underperformance of initial public offerings: evidence from venture and nonventure capital backed companies. Journal of Finance 52, 1791–1822.

Carter, R., Dark, F., Singh, A., 1997. Underwriter reputation, initial returns, and the long-term performance of IPO stocks. Journal of Finance 53, 285–312.

Carter, R., Manaster, S., 1990. Initial public offerings and underwriter reputation. Journal of Finance 45, 1045–1068.

Comment, R., Jarrell, G., 1995. Corporate focus and stock returns. Journal of Financial Economics 37, 67–87.

Cusatis, P., Miles, J., Woolridge, R., 1993. Restructuring through spinoffs: the stock market evidence. Journal of Financial Economics 33, 293–311.

Denis, D., Serrano, J., 1996. Active investors and management turnover following unsuccessful control contests. Journal of Financial Economics 40, 239–266.
Desai, H., Jain, P., 1998. Firm performance and focus: long-run stock market performance following spinoffs. Journal of Financial Economics, forthcoming.
Fama, E., 1998. Market efficiency, long-term returns, and behavioral finance. Journal of Financial Economics 49, 283–306.
Fama, E., French, K., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33, 3–56.
Field, L., 1997. Is institutional investment in initial public offerings related to the long-run performance of these firms? Unpublished working paper. Pennsylvania State University, State College.
Hand, J., Skantz, T., 1997. The bad news in equity carveouts. Unpublished working paper. University of North Carolina, Chapel Hill.
Hanley, K., Kumar, A., Seguin, P., 1993. Price stabilization in the market for new issues. Journal of Financial Economics 34, 177–197.
Holderness, C., Sheehan, D., 1985. Raiders or saviors? The evidence on six controversial investors. Journal of Financial Economics 14, 555–580.
Holderness, C., Sheehan, D., 1988. The role of majority shareholders in publicly held corporations. Journal of Financial Economics 17, 317–346.
Ibbotson, R., Sindelar, J., Ritter, J., 1997. The market's problems with the pricing of initial public offerings. Unpublished update to 1994 article in Journal of Applied Corporate Finance 7, 66–74. University of Florida, Gainesville.
Klein, A., Rosenfeld, J., Beranek, W., 1991. The two stages of an equity carveout and the price response of parent and subsidiary stock. Managerial and Decision Economics 12, 449–460.
Kothari, S., Warner, J., 1997. Measuring long-horizon security price performance. Journal of Financial Economics 43, 301–340.
Lang, L., Stulz, R., 1994. Tobin's q, corporate diversification, and firm performance. Journal of Political Economy 102, 1248–1280.
Loughran, T., 1997. Book-to-market across firm size, exchange, and seasonality: is there an effect? Journal of Financial and Quantitative Analysis 32, 249–268.
Loughran, T., Ritter, J., 1995. The new issues puzzle. The Journal of Finance 50, 23–51.
Lyon, J., Barber, B., Tsai, C., 1997. Improved methods for tests of long-run abnormal returns. Unpublished working paper. University of California, Davis.
Masulis, R., Korwar, A., 1986. Seasoned equity offerings: an empirical investigation. Journal of Financial Economics 15, 91–118.
Megginson, W., Weiss, K., 1991. Venture capitalist certification in initial public offerings. Journal of Finance 46, 879–904.
Mitchell, M., Stafford, E., 1997. Managerial decisions and long-term stock price performance. Unpublished working paper. University of Chicago.
Morck, R., Shleifer, A., Vishny, R., 1988. Managerial ownership and market valuation: an empirical analysis. Journal of Financial Economics 20, 293–315.
Myers, S., Majluf, N., 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics 13, 187–221.
Nanda, V., 1991. On the good news in equity carveouts. Journal of Finance 38, 371–387.
Ritter, J., 1984. The "hot issue" market of 1980. Journal of Business 57, 215–240.
Ritter, J., 1991. The long-run performance of initial public offerings. Journal of Finance 46, 3–27.
Rock, K., 1986. Why new issues are underpriced. Journal of Financial Economics 15, 187–212.
Schipper, K., Smith, A., 1986. A comparison of equity carveouts and seasoned equity offerings: share price effects and corporate restructuring. Journal of Financial Economics 15, 153–186.
Schultz, P., Zaman, M., 1994. After-market support and underpricing of initial public offerings. Journal of Financial Economics 35, 199–219.

Shleifer, A., Vishny, R., 1986. Large blockholders and corporate control. Journal of Political Economy 94, 461–488.
Shome, D., Singh, S., 1995. Firm value and external blockholdings. Financial Management 24, 3–14.
Slovin, M., Sushka, M., Ferraro, S., 1995. A comparison of the information conveyed by equity carveouts, spinoffs, and asset sell-offs. Journal of Financial Economics 37, 89–104.
Spiess, K., Affleck-Graves, J., 1995. Underperformance in long-run stock returns following seasoned equity offerings. Journal of Financial Economics 38, 243–267.
Weston, J., 1979. The tender takeover. Mergers and Acquisitions, 74–82.