

PUBLIC AND PRIVATE TAKEOVER MARKETS: AN EMPIRICAL ANALYSIS

by

MICHAEL A. STEGEMOLLER

(Under the direction of Annette B. Poulsen)

ABSTRACT

An unparalleled \$2.7 trillion worth of merger and acquisition activity occurred in the 1990s. These mergers resulted in the combination of firms that were able to combine rapidly changing technologies in new ways. Despite the large amount of merger activity in this period, there is relatively little research studying these mergers and the financial markets that facilitated them. My research addresses the following basic questions about takeovers. The first is whether mergers and acquisitions facilitate economic growth, and the second examines why private firms sell-out to public companies instead of undertaking an initial public offering.

I find that acquisitions create tremendous value for those firms utilizing them as a means of corporate change. Frequent acquirers outperform non-frequent acquirers using both economic and accounting measures of performance. Additionally, the level of over-performance is positively influenced by the relative size of the acquisition program of the acquirer.

I also examine the transition from private to public ownership by private owners selling their business to a public corporation. I compare these transactions to initial public offerings to better compare the characteristics that influence the decision to be acquired versus "go public." My results suggest that private firms seeking to transition to public ownership choose an acquisition as the means of transition based on firm-specific characteristics such as growth rates, insider ownership, leverage, and profitability.

INDEX WORDS: Takeovers, Mergers, Acquisitions, Long-run performance, Private, IPO, Corporate governance, Ownership

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DEDICATION

To my firstborn, Adeline Jane: your birth is a reminder of what is important and joyous.

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CHAPTER 1

INTRODUCTION

I examine the merger and acquisition boom in the 1990s. While many observers believe that merger activity declined in the 1990s relative to the 1980s, in actuality a record breaking \$2.7 trillion worth of merger and acquisition activity occurred in the past decade. Mergers and acquisitions in the 1990s were also fundamentally different from any earlier period. These mergers resulted in the combination of firms that were able to combine rapidly changing technologies in new ways. Despite the large amount of merger activity in this period, there is relatively little research studying these mergers and the financial markets that facilitated these mergers. I believe that my research on this topic will be both socially and economically significant. My research addresses the following two basic questions about takeovers.

I first study whether mergers and acquisitions facilitate economic growth. I compare the performance of companies that acquire five or more private and public companies with a matched set of companies that are not acquiring other firms. I compare both stock price performance of the companies and actual changes in earnings and other measures of operating performance over one- and three-year periods. The relative performance of multiple acquisition firms helps to determine whether acquiring firms is an efficient means for companies to expand. In short, this paper is designed to answer the economic question, "Are acquisitions an efficient method of corporate growth?"

In my second study, I analyze the acquisition of companies that are not traded in the public stock market by firms that are public. I contrast these transactions to initial public share offerings (IPOs). These transactions are similar in that they both give the company founders the opportunity to sell their assets in the company and provide the opportunity to raise large amounts

of capital. However, they are different in that in the first case the company is purchased by another company, with no separately trading stock, but in the latter there is a public market for the shares of stock. While there is abundant academic literature on the IPO process, there is essentially no research on private-firm acquisitions. These private-firm acquisitions account for more than twice the dollar value of IPOs.

CHAPTER 2

LITERATURE REVIEW

The overall literature relevant to the following studies of private and public takeover markets is diverse and beyond the scope of this analysis. However, there is a basic literature that is helpful in understanding the intersection of the following two studies.

A few works best summarize the literature on takeovers. Jensen and Ruback (1983), Jarrell, Brickley and Netter (1988) and Mulherin and Boone (2000) present evidence on public takeovers for the 60s and 70s, the 80s, and the 90s, respectively. These studies suggest target shareholders gain significantly around the announcement of a takeover. The acquirers in these transactions experience small gains in the 60s and 70s, dwindling down to small losses in the 80s and 90s according to Bradley, Desai and Kim (1988) and Mulherin and Boone (2000). These papers also find the combined return of target and acquiring shareholders to be positive. The positive returns of public takeovers are attributed most frequently to synergies created by the combining of complementary firms. This combining allows for efficiencies of scale, reduction in middle management, the sharing of technologies, and the elimination of duplicative processes. Thus, the literature suggests that public takeovers are, on average, beneficial, especially to target shareholders.

Private takeovers have received considerably less attention. Fuller, Netter and Stegemoller (2001) and Chang (1998) find positive abnormal returns to acquirers of private targets, suggesting takeovers of private firms may be different than public takeovers. While synergies are sure to be a reason for the acquisition of a private target, these studies focus on possible explanations for the positive bidder returns that are non-existent in the public takeover market. These returns are most frequently described as the result of a liquidity discount, the

creation of a blockholder, or the beneficial tax consequences for private owners that are liquidating their holdings.

In chapter 3, I examine firms that are frequent acquirers by testing their long-run stock and operating performance. The analysis builds on the prior literature by examining the implications of takeovers on the long-term value of the firm. Chapter 4 attempts to further explore the decision of private owners to sell their company to a public firm.

CHAPTER 3

THE PERFORMANCE OF FREQUENT ACQUIRERS

3.1. Introduction

Takeovers represent transfers of control over a preexisting collection of assets. Such control transfers are often justified by management as being motivated by a desire to improve asset efficiency, exercise discipline on wayward management, contract or expand industry capacity, and create corporate synergies. Takeovers are an important method by which these objectives can be reached; however these objectives can also be achieved via mechanisms such as joint ventures, proxy contests, stock-based compensation plans, recapitalizations, or securities issuance. Financial economic theory implies that a firm will choose the method that maximizes shareholder value. Therefore, for a given firm operating at below its optimal capacity or operating in an expanding or contracting industry we will observe the choices that management believes will move the firm towards optimal operating efficiency and thus maximum value. For example, a below-capacity firm may build additional facilities or acquire a similar company currently operating with excess capacity. Either choice moves the firm to a more appropriate operational capacity, but with differing consequences. This analysis concerns the ability of a frequent acquirer to change itself in response to market expansion or contraction by comparing its long-run stock price and operating performance to that of a firm choosing to evolve in a different manner.

Frequent acquirers in this paper are firms that complete five or more public, private and subsidiary acquisitions during the 1990s. For this set of firms, it is especially important to understand the impact of acquisitions. Issues that frequently arise during a takeover are

appropriate target valuation, possible competing bidders, target response, integration issues, the outcome of target employees, and investor response. Frequent acquirers must deal with these issues numerous times. I examine the long-term response of 542 firms to the acquisitions of almost 4,500 targets. The economic importance of such a shift in corporate control is magnificent: sample acquirers valued at \$1 trillion dollars spent over \$1.5 trillion dollars (i.e., 150% of the bidders original market value) on takeovers from 1990 to 1999. Frequent acquirers provide a sample of companies making massive corporate governance changes, often quintupling the size of the firm through takeovers. These acquirers account for 56 percent of domestic takeover activity from 1990 to 1999. While being the major component of the '90s merger wave, these firms are also the most experienced at integrating separate businesses and most subject to the agency costs of free cash flow. Previous long-run performance studies predominantly analyze the success of a *single* takeover for a *public* corporation.¹ This study is different as it involves firms that are actively involved in a takeover strategy, albeit a strategy only known ex-post. Additionally, these acquirers are making public, private and subsidiary takeovers. These firms can easily be characterized as firms actively involved in the takeover market, while firms in traditional studies of merger performance may visit the takeover market on rare occasions.

I hypothesize that firms undertaking frequent acquisitions are either poor managers of free cash flow (Roll (1986)) or are efficient at evaluating prospective synergies. These hypotheses are termed in this paper as *the empire-building hypothesis* and *the efficient firm hypothesis*, respectively. The *efficient firm hypothesis* is based on the notion that frequent acquirers are able to acquire a new competency in a matter of months, instead of waiting years to adapt to changing technology internally. Additionally, frequent acquirers will be better at creating merger-related synergies as they move upward on the learning curve of integrating businesses. If this is the case, we should expect to see that the performance of frequent acquirers is on par with or above the performance of the average firm and, specifically, the average firm within the acquirer's own

¹ A notable exception is Rau and Vermaelen's (1998) analysis that use both public and private acquisitions.

industry. The synergies they attain will be noticeable by changes in the firms' operating performance, resulting in a corresponding change in stock-price performance. A positive change in operating performance will occur as costs decrease from the increase in economies of scale and as the firm increases revenues and profits resulting from a gain in market power.

The empire-building hypothesis states that the management of frequent acquirers undertake multiple takeovers to increase the pecuniary benefits derived from ruling over an ever-increasing empire, such as described in Jensen and Meckling (1976). The acquisition of more capital is a quick means of growing an empire, so managers undertake multiple acquisitions at the expense of firm value. The resulting observations should be that frequent acquirers should underperform the average firm and, particularly, the average firm in its industry. The operating and stock-price performance should exhibit downward trends over the acquisition period. Operating performance will exhibit margins that are no different or lower than similar firms within the industry, and the market will evaluate the combined entity as being no better, if not worse than, than the sum of the separate firms' value. Firms that simply match pace with their peers through multiple acquisitions will exhibit no difference in performance measures. However, those firms with hubristic management (Roll (1986)) will decrease in value as the market observes shrinking margins and reduced cash flows at the expense of increasing size. Frequent acquirers should be the crown jewels of firms exhibiting poor use of discretionary cash flows.

Market efficiency implies that we would not reject the null hypothesis of takeovers being zero net present value projects and thus accept the efficient firm hypothesis. A takeover may represent (1) a simple alternative to expanding capacity already impounded in the firm's stock price, (2) a vessel used by management to build an empire, and (3) an introduction of valued synergies not previously recognized by the market. The market will view these three possibilities in a neutral, negative, and positive light, respectively. One bias introduced by this sample is in truncating the left tail of the distribution of possibilities a takeover may represent. Empire-

building firms may be somewhat removed from this sample due to the five takeover restriction. If a firm were empire building, they would be less likely to muster the resources necessary for five takeovers over a ten-year period or would be more likely to be acquired. Thus, this sample may be biased upward by including a disproportionate number of firms in categories (1) and (3). However, I find evidence suggesting that frequent acquirers are no more apt to be acquired than firms making four or fewer acquisitions. Alongside the evidence provided by Mitchell and Lehn (1990), the average frequency of takeovers of frequent acquirers suggests this sample is not overly biased. Nevertheless, the possibility of small bias skewing the following results does not negate the contribution a study of frequent acquirers provides.

This analysis differs from the majority of performance studies of mergers, since it combines both long-run stock price performance measures as well as operating performance measures. The stock price performance is measured using three differing methodologies in order to alleviate some of the controversy surrounding such studies. Using both stock price and accounting performance allows me to evaluate the profitability of these firms, as well as the long-term implications of the firm's strategy. In addition, this dual approach may alleviate some skepticism resulting from methodological problems associated with long-run stock returns by providing some operational evidence as well. Finally, as pointed out in Healy, Palepu and Ruback (1992), stock price performance studies cannot determine whether gains (or losses) around a takeover announcement are due to economic improvements or capital market inefficiencies. However, a study combining the two methodologies may be able to relate any change in operating performance to a related change in stock price performance. While this approach is unable to eliminate the uncertainty of capital market inefficiencies, it at least reduces its possible impact. Since there is information released by the firm's current profitability about future profitability, financial economic theory suggests that firms reporting relatively higher (lower) profits will be valued more (less) highly by the market. While this study cannot define

the sources of gains or losses, accounting returns can confirm or refute the existence of them and stock returns can serve to validate their long-term implications for firm valuation.

The operating profitability and the stock price performance found in this study of frequent acquirers suggest that these firms are quite good at allocating capital to resources that increase profits at efficient rates. Alternatively, this increase in profitability can be related to the acquirer's ability to garner synergies from their acquisitions. The causality relationship between takeover activity and profitability is, of course, debatable. I suggest that frequent acquirers become more profitable as a result of their takeover activity; or more clearly, takeovers increase profitability in those firms that find takeovers to be an optimal choice for accomplishing corporate functions. My confidence in this assertion is founded in the sheer size of takeover activity undertaken by the sample firms and the resulting long-run performance of stock returns. If the relationship among takeovers and profitability is

Increased profitability → Increased takeover activity,

then one would expect a preponderance of empire building and thus a decreasing stock price, especially as the firm increases the number of takeovers completed. This relationship could easily be linked to empire building. However, if the relationship is

Increased takeover activity → Increased profitability,

then one should expect to see an increasing market valuation due to the acquirer's ability to utilize takeovers as a more efficient corporate function than other alternatives.

The remainder of the paper is organized as follows. Section 2 reviews the recent literature on both operating and stock-price post-merger performance. The data and experimental design are discussed in section 3. Section 4 presents results from the acquirers' stock price and operating performance. Section 5 concludes.

3.2. Prior research

Traditional studies of takeover performance examine a short window around the initial takeover announcement. Jensen and Ruback (1983), Jarrell, Brickley and Netter (1988) and Mulherin and Boone (2000) present evidence for the 60s and 70s, the 80s, and the 90s, respectively. These studies suggest target shareholders gain significantly around the announcement of a takeover. The acquirers in these transactions experience small gains in the 60s and 70s, dwindling down to small losses in the 80s and 90s according to Bradley, Desai and Kim (1988) and Mulherin and Boone (2000). These papers also find the combined return of target and acquiring shareholders to be positive. Using the same universe of frequent acquirers as this study, Fuller, Netter and Stegemoller (2001) find positive abnormal returns to acquirers of private targets, suggesting firms making private takeovers may be different. These studies are useful for understanding the market's initial perception of takeover activity. However, they do not provide much insight on the long-term ability of the acquirer to utilize takeovers as instruments for corporate change, nor do they provide much insight into the types of firms that regard takeovers as an optimal method of performing corporate functions.

The evidence on the long-run post-merger performance of acquirers is somewhat mixed. Healy, Palepu and Ruback (1992) investigate the post-merger cash flow performance of the 50 largest mergers and acquisitions in the early 1980s. They report that merged firms significantly improve in operating performance in the five years after the merger occurs. However, adjusting for industry performance, their measure hovers around economic and statistical insignificance. Similarly, Heron and Lie (2000) examine the operating performance of over 600 acquisitions between 1985 and 1997. These takeovers are more profitable in both industry- and performance-adjusted comparisons. Both of these studies support the hypothesis that acquiring firms are at least as profitable as similar firms choosing to make operational decisions that do not include takeovers.

The long-run stock price performance of mergers is mixed, given varying holding periods and methodologies used by researchers. Agrawal and Jaffe (2000) summarize several of the following studies that examine the post-merger stock price performance of acquirers. Franks, Harris and Titman (1991) find no evidence of significant underperformance over the three years after an acquisition. Agrawal, Jaffe and Mandelker (1992) use a different method for calculating excess returns than Franks, Harris and Titman (1991) and find that there is significant underperformance of -10% in the five years following an acquisition. They also find negative abnormal returns of -1.5%, -5%, -7.3% and -8.7% for years one through four, respectively. Using an equal-weighted calendar time portfolio approach, Mitchell and Stafford (2000) also find underperformance of bidders. Loderer and Martin (1992) find only period-specific evidence of post-acquisition performance different from that of the firm's required rate of return. They find that underperformance is concentrated in the 1960s and disappears in the two decades thereafter.

Two studies that find similar results using comparable methods are Loughran and Vijh (1997) and Mitchell and Stafford (2000). Both studies find insignificant and negative abnormal returns using a buy-and-hold investment strategy to measure the long-run performance of acquiring firms. Acquirers in the Mitchell and Stafford (2000) sample underperform a matched sample of firms over three years by a statistically insignificant negative 1%. Loughran and Vijh (1997) measure the abnormal return over a five-year period and find an insignificant negative 6.5% abnormal return. Loughran and Vijh then show that method of payment and type of transaction has a significant impact on long-run returns. Acquirers using stock as the method of payment underperform matched firms by -24%, and those using cash outperform the matched set of firms by 18%. They also find that the average merger and tender offer in their sample have abnormal returns of -16% and 43%, respectively. Using cumulative abnormal return methodology, Rau and Vermaelen (1998) bolster these results by finding underperformance in mergers and small but significant positive performance to acquirers in tender offers. They find that the underperformance of acquirers in mergers is caused by a -17% long-run return to low

book-to-market (glamour) acquirers. They reason that managers in glamour firms have an overly confident view of their abilities to manage potential takeover candidates.

Hou, Olsson and Robinson (2000) find that takeovers increase shareholder value using a comprehensive sample and a modified long-run performance measure. While their results are mainly focused on evaluating the general economic impact of takeovers, they present strong evidence that takeovers add value at the firm level as well.

There is a wide dispersion of results on post-merger long-run abnormal performance; the evidence ranges from -17% for glamour acquirers to 43% for firms using tender offers. These and other long-run event studies have produced a great deal of skepticism on the validity of long-run performance measures, given their implications on market efficiency. This has led to these studies being termed “treacherous” and their findings as “chance events.” Fama (1998) suggests that the market is efficient, but that overreaction and underreaction to information occurs in the market with equal frequency. While I use the same long-run measures as those in the aforementioned literature, analysis of the operating performance of frequent acquirers is included as an important companion to the stock-price evidence. Additionally, this study is concerned with assessing the profitability of frequent acquirers and the viability of takeovers as an alternative source of corporate change, not as an investment portfolio strategy.

This experiment is different from previous long-run performance studies in that the event being examined continues to occur throughout the event period. Since the sample set of firms is only known *ex post*, this study examines the market’s evaluation of a firm’s method of change as it occurs. The previous studies examine the period after a takeover, and therefore could reasonably be turned into an investment strategy of going long or short in the merged firm and taking the opposite position in the comparison index. To accomplish this with a set of frequent acquirers, the portfolio must be initiated after a credible announcement of an acquisition program is made. While such a strategy may seem reasonable given research by Schipper and Thompson

(1983), identifying such announcements is difficult at best.² This analysis *does not* attempt to infer the feasibility of a trading strategy consisting of buying frequent acquirers and shorting an index of comparable firms based on size and industry.

3.3. Data and methodologies

3.3.1. Sample

I examine the long-run performance of frequent acquirers gathered from Securities Data Corporation's (SDC) U.S. Mergers and Acquisitions database, with initial bids announced between January 1, 1990 and December 31, 1996. The sample is drawn using the following criteria:

1. The target firm has a disclosed dollar value and the acquirer is acquiring over 50% of the target firm.
2. The value of the target is \$1 million or more.³
3. Acquirers are publicly traded on the AMEX, NASDAQ, or NYSE.
4. Financial institutions and utilities are excluded.
5. From 1990 through 1999 the firm acquires five or more foreign or domestic targets which include subsidiary, private and public firms.

There are 5,980 takeovers by 730 acquirers that survive the aforementioned screen. The median number of takeovers per acquirer is seven. I exclude firms with an initial stock price less than \$1 due to microstructure considerations. Acquiring firms, with missing COMPUSTAT or CRSP data from one year prior to three years after the initial announcement month are also excluded. After these exclusions, the sample contains 542 unique acquirers involved in 4,490 takeovers from 1990-1999. This is the overall sample of frequent acquirers.

² Using *LEXIS-NEXIS* I found only four announcements of the initiation of an acquisition program from 1985-1998; of these none are in my sample of frequent acquirers.

³ Deal value is defined as the total value of consideration paid by the acquirer, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred

To control for method of payment effects, I group payment types similar to Martin (1996). Cash financing is comprised of combinations of cash, debt, and liabilities. Financing with common stock includes the use of common stock or a combination of common stock and options, warrants, or rights. Combination financing contains combinations of common stock, cash, debt, preferred stock, convertible securities, and methods classified as other by SDC.

Table 3.1 describes the market value of the acquirer and the total deal value of all targets acquired by frequent acquirers during the 90s. The initial acquisitions are well dispersed from 1990 to 1996, ranging from 58 initial acquisitions in 1996 to 93 initial acquisitions in 1990. The early 90s contain a greater number of acquirers that are larger in market value; the median value of acquisition programs started in the early 90s is also larger. Clearly, the largest acquisition programs were begun in 1990 where the median market value of the acquirer was \$406 million and the median amount of dollars spent on the total acquisition program was \$1,157 million. The sum of the deal values of all targets acquired by frequent acquirers in my sample is 1.5 times the acquirers' initial market value. Thus, frequent acquirers made massive changes to their corporate structure, more than doubling their beginning market value and the bulk of these programs were started before 1994.

3.3.2. Operating performance methodology

The operating performance methodology employed in this study is similar to that advocated by Barber and Lyon (1996) and implemented by Heron and Lie (2000). The performance metric used is operating income (COMPUSTAT item #13) scaled by either sales (COMPUSTAT item #12) or total assets (COMPUSTAT item #6) to produce return on sales (ROS) and return on assets (ROA), respectively. Operating income is employed since earnings are heavily influenced by the financing associated with acquisitions; operating income is less influenced by a change in capital structure. While I include operating income scaled by both

stock, debt, options, and assets, warrants and stake purchases made within six months of the announcement date of the transaction.

Table 3.1**Descriptive statistics of acquirers for sample of firms where the acquirer made five or more takeovers from 1990 through 1999**

This table reports mean and median size. Size for frequent acquirers is defined as the product of total shares outstanding and the stock price as of one month prior to the initial announcement. For targets, the size is defined as the deal value paid for the target during the takeover. For each of the following panels a particular acquirer is represented in the year of its initial takeover. The total row for the number of acquirer firms represents the number of unique acquirers throughout the sample period. In the last row, the descriptive statistics for the matched sample used to calculate BHARs and CARs are reported. All acquirers are publicly traded firms listed on the NYSE, NASDAQ, or AMEX. Targets include foreign and domestic and private, public and subsidiary firms. Numbers are reported in millions.

	Acquirer size		Acquisition program size		# of acquirers
	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>	
1990	3,124	406	4,430	1,157	93
1991	2,357	278	3,193	922	82
1992	1,419	148	1,422	423	82
1993	2,576	151	4,643	597	81
1994	1,161	168	2,601	460	79
1995	1,092	222	1,454	431	67
1996	793	243	1,042	298	58

sales and assets, ROA should be viewed with some skepticism. As Barber and Lyon (1997) point out, frequent acquirers “are likely to have recently acquired large amounts of operating assets and thus have higher book value of total assets than control firms because of the recency of the acquisitions.” The balance sheet is a snapshot of a particular point in time, while the income statement is the accumulation of the operations of the firm over an entire year. Thus matching operating income with the sales that produced it – both located on the income statement – makes more sense than scaling operating income by assets that are on the books at their acquisition price rather than historical price. ROA will then *understate* the firm’s true performance.⁴

I proxy for the expected accounting return (ROS and ROA) of the frequent acquirer by using two measures. Mitchell and Mulherin (1996) show that takeovers have a significant industry component. Thus, when calculating operating returns, it is important to consider industry performance. The first measure is the median accounting return of the industry in which the frequent acquirer is located. Industry is determined by the two-digit SIC code. Subtracting the median accounting return of the industry from the frequent acquirer accounting return controls for any expansion or contraction-related shocks to an industry that may skew accounting returns. Recent literature has also emphasized several important revisions for more accurately assessing expected returns. Barber and Lyon (1996) point out that performance matching on years prior to an event accounts for observed mean reversion in accounting data. Matching sample data based on size has been used in recent studies such as Heron and Lie (2000) and those mentioned in Barber and Lyon (1996) to more accurately proxy for expected accounting returns; Fama and French (1995) also find that the earnings of smaller-sized and high book-to-market firms have a downward bias compared to earnings of larger firms. Size is included in the second matching procedure, and book-to-market is incorporated in a univariate and multivariate framework. More specifically, the second measure accounts for pre-announcement performance, industry and size.

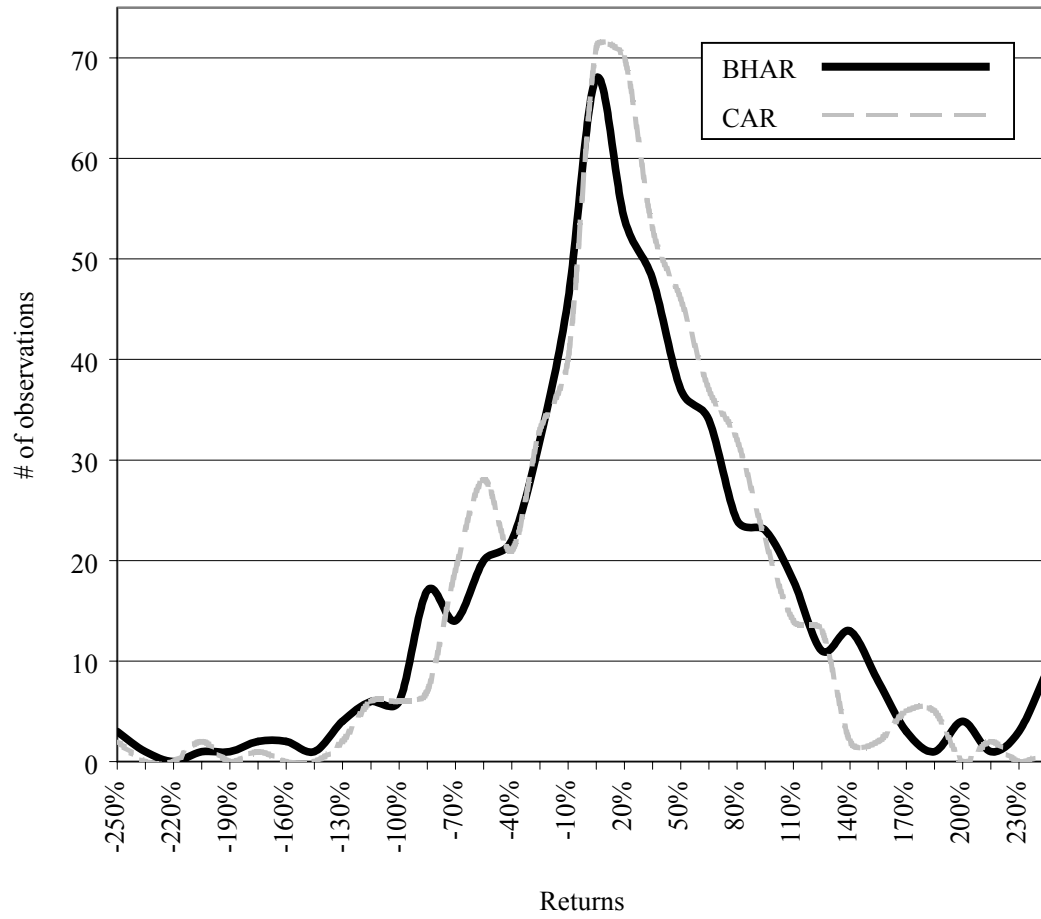
⁴ While it is reasonable to scale operating income by the average of beginning and end-of-year assets, Barber and Lyon (1996) report no difference between that method and scaling by end-of-year assets.

This measure matches the frequent acquirer with another firm located within the same industry. The corresponding firm is further matched by pre-announcement accounting performance and market value, respectively.

3.3.3. Long-run stock performance methodologies

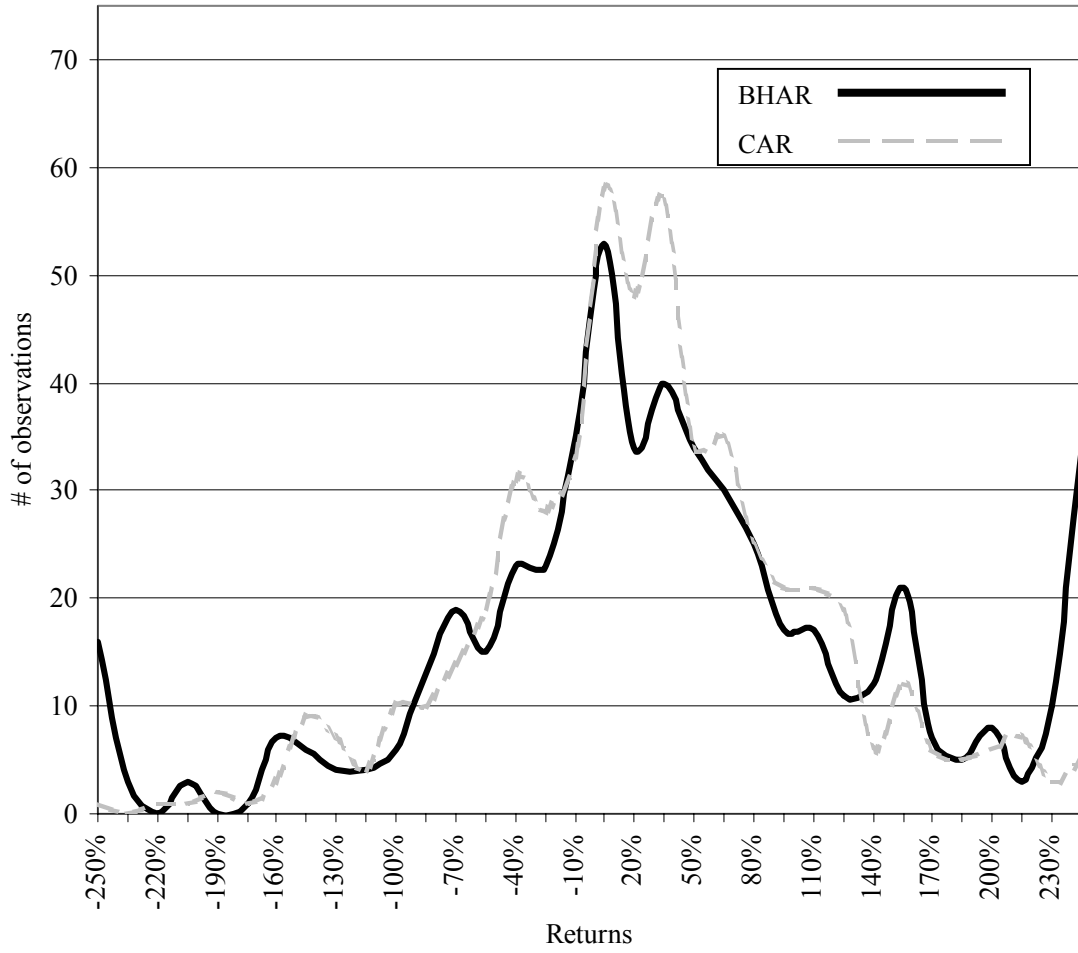
The method for computing abnormal long-run returns has been debated in numerous articles (see Barber and Lyon (1997), Kothari and Warner (1997) and Lyon, Barber and Tsai (1999)). This section lays out the three differing methodologies used for determining the long-run post-merger stock-price performance of frequent acquirers. The study uses calendar time portfolio returns (CTPRs), buy-and-hold abnormal returns (BHARs) and cumulative abnormal returns (CARs) to calculate the performance of frequent acquirers for the three years after their first acquisition announcement. Each has strong points for this study. CTPRs are the most reliable and statistically sound. BHARs best express the *experience* of the firm, as they measure the performance, of the individual acquirer from the beginning of the acquisition program to the end of the three-year holding period with no rebalancing. However, BHARs tend to magnify over and under performance as they compound monthly returns. While CARs are rebalanced monthly, their properties are more ‘normal’ than BHARs and thus have more reliable distributional properties and test statistics. Figures 3.1 through 3.4 present an example of the distributions of abnormal returns for using CAR and BHAR methodologies. None of these methods are perfect, and in fact, all should be supplemented with accounting data to validate the results. In this study, all three methodologies produce differing results in terms of magnitude, but similar results in terms of sign and significance. For a comparison of these testing procedures see Mitchell and Stafford (2000).

Figure 3.1



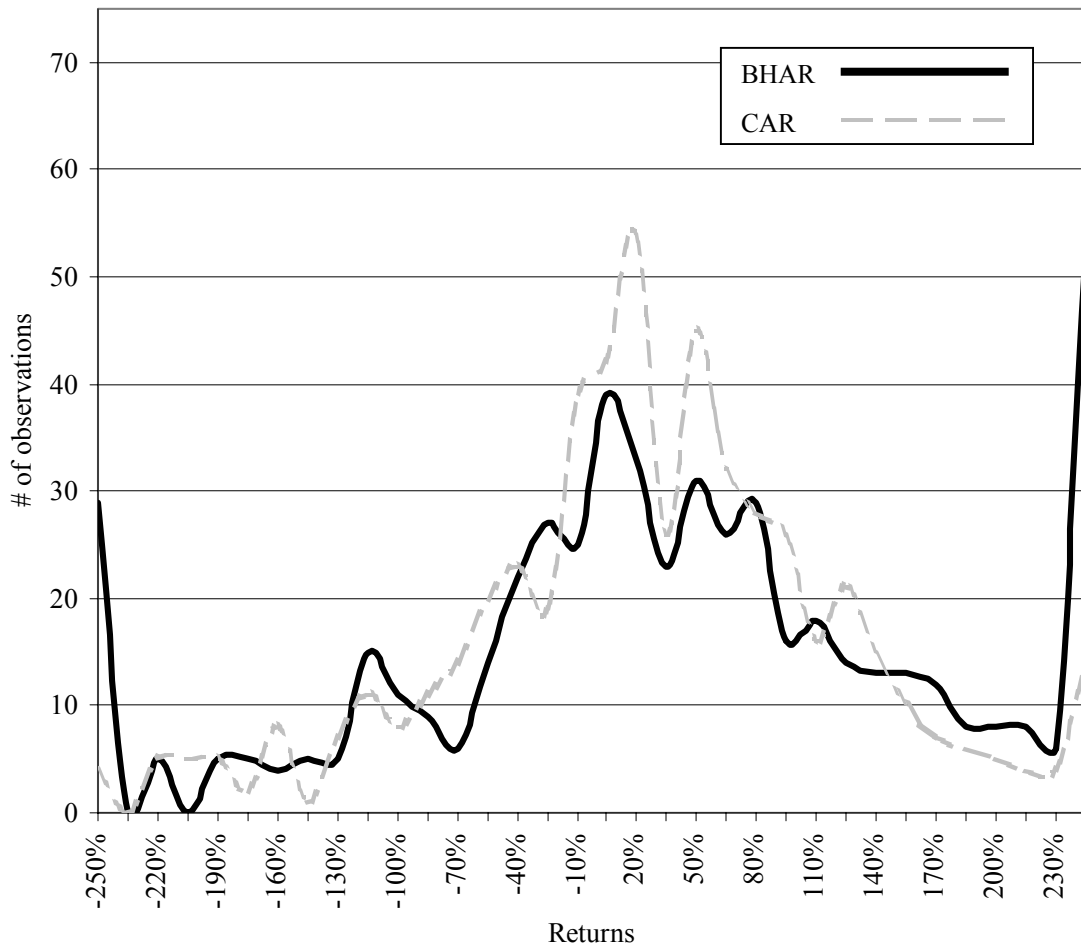
1-year distribution of returns from using BHAR and CAR methodologies for calculating long-run returns.

Figure 3.2



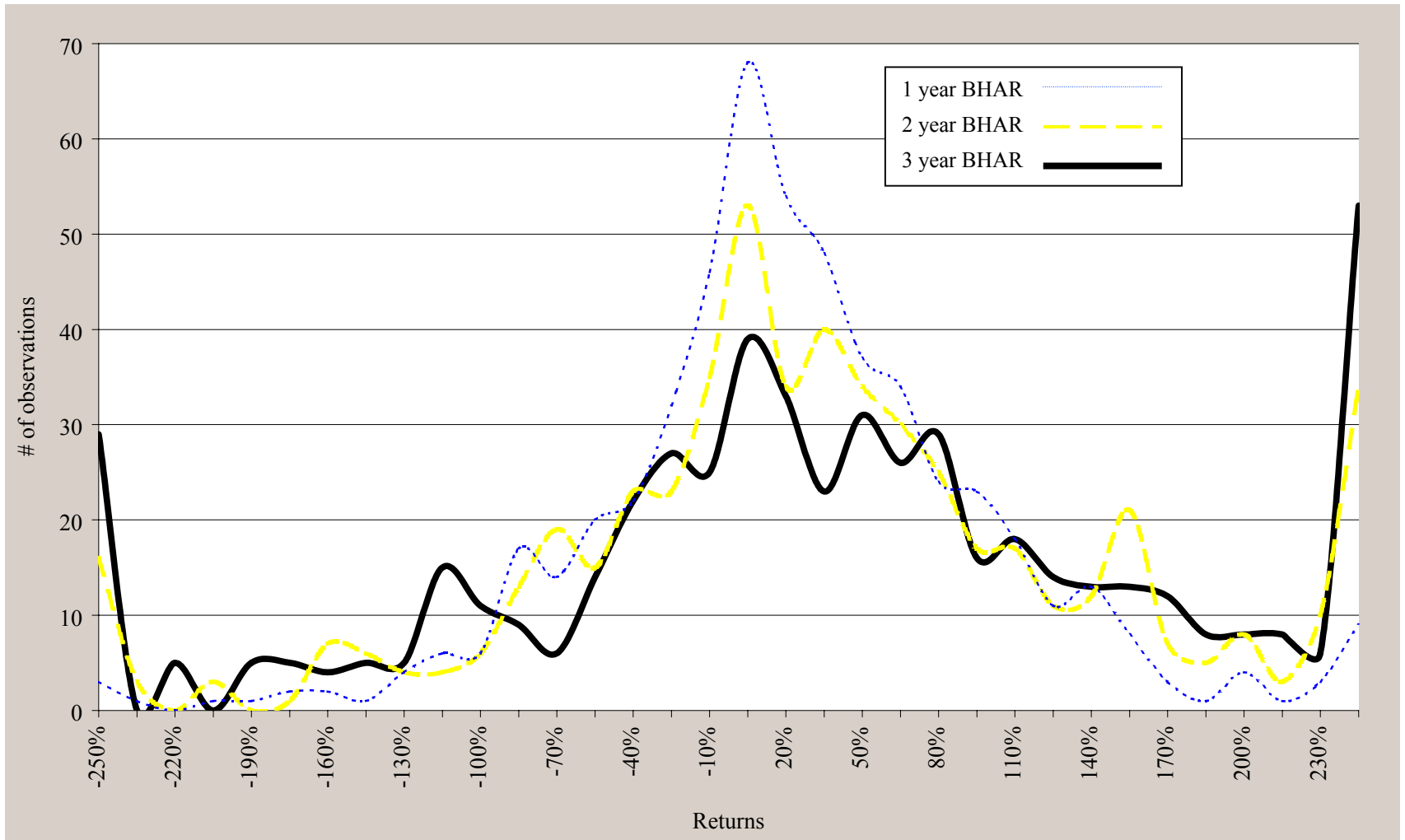
2-year distribution of returns from using BHAR and CAR methodologies for calculating long-run returns.

Figure 3.3



3-year distribution of returns from using BHAR and CAR methodologies for calculating long-run returns.

Figure 3.4



One, two and three year distributions for buy and hold abnormal return methodology

Matched control firms are gathered to serve as proxies for the expected return of the sample firms in the abnormal return calculations. For the buy-and-hold abnormal return (BHAR) and cumulative abnormal return (CAR) methodologies, I use two matching methods. For the first, given the findings of Fama and French (1992), I use size and book-to-market to find appropriate matches. A control firm is chosen from firms on COMPUSTAT based on 1) having a market value of equity between 70 and 130 percent of the sample firm's market equity and 2) having the closest book-to-market value to the sample firm after considering step one. I use the COMPUSTAT annual file to gather data regarding market value and book-to-market ratio. The product of the calendar year closing price (data item #24) and the number of common shares outstanding (data item #25) is used to calculate the market value as of the year prior to the announcement date. The book-to-market ratio is calculated as common equity (data item #60) divided by the firm's market value of equity. The second method uses an industry, size-matched control firm obtained by a similar method. As described in the operating performance measures, the industry component of takeover activity is important. Therefore, I include this measure as an alternative means by which to proxy for expected return. Additionally, this aids in the comparison of stock-price and operating performance. The first step matches on two-digit SIC, and the second step finds the firm with closest market value of equity from those in the acquirer's matching industry.

3.3.3.1. Buy-and-hold abnormal return methodology

The BHAR approach is intuitively appealing, as it calculates the return an investor would experience if she went long in a portfolio of frequent acquirers rather than a portfolio of firms with similar size and comparable growth opportunities. However, for my sample of frequent acquirers a positive (negative) BHAR indicates that, on average, a firm choosing to use acquisitions to perform corporate functions is more (less) efficient at achieving its strategy than a firm with similar growth opportunities and size characteristics that does not primarily use acquisitions as a source of significant change. BHARs, in this setting, cannot be used to infer

market inefficiency based on the resulting abnormal return. Doing so would imply knowing the portfolio of frequent acquirer *ex ante*. The portfolio is only known *after* the fifth acquisition has occurred; therefore, it would be quite impossible to form an investment strategy using the sample firms.

Buy-and-hold abnormal returns are calculated as:

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau})$$

where $AR_{i\tau}$ represents the buy-and-hold return for firm i in period τ . $R_{i\tau}$ and $E(R_{i\tau})$ are the returns on the sample and either the size-book-to-market or size-industry matched control firm, respectively. I calculate this return for one, two and three-year holding periods. The BHAR measurement is initiated at the end of the month of the frequent acquirer's first announcement of an acquisition and concludes at the end of the specified holding period. The null hypothesis that there is no difference in the buy-and-hold returns of the frequent acquirer and the control firm is tested using conventional t -statistics.

3.3.3.2. Cumulative abnormal return methodology

Cumulative abnormal returns are recommended by Gompers and Lerner (2000) in their study of the performance of IPOs. They argue that CARs are superior to BHARs since they do not magnify underperformance and have distributional properties and test statistics that are better understood. Figures one through three show graphically the sample CARs and BHARs. The assertion made by Gompers and Lerner is confirmed in the abnormal return distribution of sample frequent acquirers. It is apparent, especially in figures two and three, that BHARs tend to be more multi-peaked and leptokurtic.

CARs are calculated in the same fashion as BHARs, except that the monthly returns are not compounded. In terms of holding a portfolio, CARs require the portfolio to be rebalanced monthly. The effects of this change in return calculation is substantial. For example, the top three performing firms using the BHAR method have three-year performances of 1,969%, 1,537% and 1,063%. Using the CAR method the three best performances are 521%, 426% and

357%. So while BHARs may better measure investor experience, they produce extremely leptokurtic abnormal return distributions.

I also analyze BHARs and CARs in a univariate framework, controlling for method of payment, public status of the target, own industry acquisitions, total number of acquisitions, and the relative size of the targets. This allows for consideration of the impact that these conditions have on the market's evaluation of the strategy of acquiring firms. I further examine CARs in a multivariate framework, controlling for the same factors as the univariate tests. Regressions were run using BHARs for the left-hand-side variable, but I only report regressions using CARs, given the preferred statistical properties.

3.3.3.3. Calendar-time portfolio return methodology

Calendar time portfolios are recommended by Fama (1998) and implemented by Mitchell and Stafford (2000) for testing long-run performance, while accounting for cross-sectional correlation in BHAR calculations. On the month of the initial announcement, the frequent acquirer becomes part of an equal-weighted portfolio until the one, two and three-year holding periods elapse. Using monthly rebalancing, firms initiating their first acquisition are added, and those completing the given holding period are dropped. The returns from the portfolio of frequent acquirers ($R_{p,t}$), net of the risk free rate ($R_{f,t}$), are then regressed on the three Fama and French (1993) factors: the difference between the return on the market portfolio ($R_{m,t}$) and the risk-free rate ($R_{f,t}$), the difference in returns of portfolios of small and large stocks (SMB), and the difference in returns of portfolios of high and low book-to-market stocks (HML). This regression is viewed as:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_{1p}(R_{m,t} - R_{f,t}) + \beta_{2p}SMB_t + \beta_{3p}HML_t + e_t$$

Thus, the intercept α represents the *monthly* mispricing and model misspecification. The mispricing is also the monthly abnormal return of the portfolio of frequent acquirers. Since these frequent acquirers are only known *ex-post* a significant intercept does not necessarily mean market inefficiency. However, I am also not confident that this particular model sufficiently

characterizes asset prices. The return measured by the intercept is annualized in the discussion of the results.

3.4. Results

3.4.1. Summary statistics

Tables two and three report summary statistics for the sample of frequent acquirers. Table 3.2 presents statistics on the characteristics of takeover activities. All calculations are computed on a deal-weighted basis. Thus, if a firm acquires four \$1 million targets with cash and a single \$6 million firm with stock, the stock acquisition will represent 60% of the acquirer's acquisitions. Column 2 of panel A shows that approximately 41% of all acquirer dollars were used for private takeovers, followed by 34% and 25% for public and subsidiary takeovers, respectively. The last column of panel A shows that the average acquirer purchased 4.7 private, 1.4 public, and 2.1 subsidiary targets. Overall there were 2,548 private deals versus 774 public and 1,146 subsidiary deals. Thus, on average and in the aggregate, private deals dominated both the number and value of acquisitions made by acquirers. This is of significance since private and subsidiary takeovers have been shown to increase acquirer value more significantly than public acquisitions during the days immediately surrounding a takeover announcement. Panel B shows the method of payment most often used is cash. Cash accounts for an average of 42.3% of aggregate financing. Cash deals represent more than double (2,439) the number of common stock (970) or combination deals (1,059) in terms of aggregate numbers. Panels C and D illustrate that the majority of deals, in dollar and frequency terms, are domestic targets within the acquirer's own industry as defined by Fama and French (1997). Frequent acquirers pay out approximately 88% and 64% of their takeover dollars, respectively, on domestic firms and firms from the same industry. The last panel shows that the average (median) frequent acquirer purchased 8.3 (7) firms throughout the 1990s. Frequent acquirers purchased targets that summed to an average of

Table 3.2
Descriptive statistics of acquiring firms acquiring 5 or more targets from 1990-1999

This table presents summary statistics for frequent acquirers. Panels A - D describe the average deal-weighted percentage acquisitions per acquirer. For example, row 1 and column 1 of Panel A state that 33.7% of the value of an acquisition program is composed of public targets for the average frequent acquirer. The second column of data expresses the median results. The final column states that there were a total of 774 public takeovers in the sample, representing an average of 1.4 public targets per frequent acquirer. Panel B represents the payment method used by frequent acquirers. Stock offers include common stock only or a combination of common stock and options, warrants, or rights. Cash offers include cash only and mixtures of cash and debt. Combination deals are comprised of everything not considered stock or cash. Panel C and D describe the home country and industry of the target, respectively. Industry is defined by the firm's two-digit SIC code. Finally, panel E gives additional information on the average number of takeovers, market-to-book, and relative acquisition program size per acquirer. Relative acquisition program size is measured as the sum of all target deal values divided by the beginning market value of the acquirer.

Acquisition characteristics	Avg of total acquisitions	Median of total acquisitions	N - total [N - avg]
Panel A: public status			
Public	34.3%	23.3%	774 [1.4]
Private	40.6%	33.2%	2,548 [4.7]
Subsidiary	25.1%	13.5%	1,146 [2.1]
Panel B: method of payment			
Cash only	42.3%	32.7%	2,439 [4.5]
Common stock only	26.9%	6.4%	970 [1.8]
Combination	30.8%	18.7%	1,059 [2.0]
Panel C: target country			
Domestic	87.6%	99.5%	3,767 [7.0]
Foreign	12.4%	0.5%	701 [1.3]
Panel D: industry			
Intra-industry	63.5%	75.6%	2,881 [5.3]
Inter-industry	36.5%	24.4%	1,587 [2.9]
Panel E: other			
Total # of takeovers per acquirer	8.3	7	
Beginning market-to-book	10.3	2.8	-
Relative size of acquisition program	12.1	2.0	

12 times the acquirer's market value as of the date of the first takeover announcement. The median relative size of the acquisition program is considerably smaller at 2 times the acquirer's original size. Finally, sample firms appear to be valued highly by the market, as the average (median) market to book value was 10.3 (2.8).

As evidenced by Mitchell and Mulherin (1996) and Andrade and Stafford (2000), there is significant industry clustering in takeover activity. This clustering is most often due to economic shocks that require the industry to move towards a new efficient operating capacity level. The results in Table 3.3 are consistent with their findings, since they provide similar evidence of industry clustering in frequent acquirers. I use the Fama and French (1997) industry classification scheme to analyze the industry make-up of frequent acquirers. Table 3.3 presents the number of frequent acquirers within each industry and the percentage of overall frequent acquirers this number comprises. Forty-five percent of all frequent acquirers are found in five industries. The most noted clustering of sample firms appears in the business service (16.6%), telecommunications (8.3%), petroleum and natural gas (7.9%), and healthcare (6.5%) industries. Thus, frequent acquirers do not appear to be distributed randomly. They seem to have some strategic incentive for expansion. This sample of frequent acquirers is competing for scarce resources amongst other firms within their own industries.

3.4.2. Operating returns

This section presents the results from estimations of the operating returns of frequent acquirers. One should expect any change in market valuation to be the direct result of changes in cash flows or capital costs. I indirectly investigate changes in cash flows for frequent acquirers here. It is indirect in the sense that operating returns – defined as operating income scaled by either assets or sales – are not cash flows, but should be strongly correlated to them. And while I do not explicitly discuss changes in capital costs here, the relationship between costs of capital and cash flows can be thought of as being circular in nature. For instance, a firm increasing in profitability can expect to command lower borrowing costs due to larger and more predictable

Table 3.3**Takeover activity by industry for firms that make multiple takeovers**

This table reports the fraction of sample firms making acquisitions in the 1990 – 1999 period per industry. Industry data are organized using Fama and French (1997) industry classifications. The targets are comprised of public, private and subsidiary firms.

Industry	%	N
Agriculture	0.6%	3
Aircraft	0.9%	5
Apparel	0.6%	3
Automobiles	2.6%	14
Business Services	16.6%	90
Business Supplies	1.1%	6
Candy and Soda	0.6%	3
Chemicals	1.7%	9
Computers	5.5%	30
Construction	1.1%	6
Construction Materials	2.0%	11
Consumer Goods	1.8%	10
Defense	0.2%	1
Electrical Equipment	1.1%	6
Electronic Equipment	5.2%	28
Entertainment	2.0%	11
Fabricated Products	0.6%	3
Food Products	1.5%	8
Healthcare	6.5%	35
Machinery	4.2%	23
Measuring and Control Equipment	1.8%	10
Medical Equipment	3.0%	16
Nonmetallic Mining	0.4%	2
Personal Service	0.9%	5
Petroleum and Natural Gas	7.9%	43
Pharmaceutical	2.6%	14
Printing and Publishing	0.9%	5
Recreational Products	0.2%	1
Restaurants, Motels, Hotels	1.5%	8
Retail	3.1%	17
Rubber and Plastics	0.4%	2
Shipbuilding, Railroad	0.4%	2
Shipping Containers	0.4%	2
Steel Works	1.5%	8
Telecommunications	8.3%	45
Textiles	0.4%	2
Transportation	1.5%	8
Utilities	3.5%	19
Wholesale	5.2%	28
<i>Total</i>		<i>542</i>

cash flows. In the same way, lower capital costs will increase net profitability or cash flows by virtue of cheaper and more accessible capital used for growth. In short, this section attempts to garner some evidence for any deviation in accounting performance away from what may be considered normal, thus causing some basis for stock prices to change.

In Table 3.4, I report calculations of the median operating performance of frequent acquirers from the year prior to the initial announcement through the following third year. ROS and ROA are presented in Panels A and B, respectively. It is readily observable that ROA is smaller than ROS. This, in part, may be due to the fact that operating income, being measured over the year, is scaled by assets measured at year-end reflecting either purchase or pooling accounting treatment of the takeovers. The remainder of the discussion of operating returns is focused on the ROS results. Very little changes if we rely on return on assets.

The frequent acquirer's median ROS from year 0 (the year of the initial takeover) to year 3 are positive and significant for industry and performance adjusted abnormal returns. Industry and size adjusted median abnormal returns range from 4.1% in year 0 to 4.8% in year 3. Performance adjusted abnormal median returns, which also are adjusted by industry and size, range from 0.7% in year 0 to 2.3% in year 3. These results show a distinct improvement in operating performance from the year prior to the initial takeover and an improvement over similar firms that did not choose to utilize takeovers to adapt to changing operating environments. The last three columns of Table 3.4 report the median change in operating performance from year -1 to years 1, 2, and 3. If takeovers increase the profitability of the firm, a positive change in this performance measure should be observed. Median performance and industry-adjusted measures of the change in operating performance are all positive and significant; they are 1.8%, 1.7% and 2.2% for changes from year -1 to years 1, 2 and 3, respectively. While the magnitude is not as large as that of performance-adjusted returns, industry-adjusted returns are positive and significant as well. All median ROS calculations are positive and significant for frequent acquirers. Additionally, all performance adjusted median ROAs, with one exception, are positive

Table 3.4**Median operating performance of acquirers acquiring five or more firms from 1990 – 1999**

The following table reports the median income of frequent acquirers scaled by sales and total assets in Panels A and B, respectively. Year 0 represents the year in which the acquirer made its first acquisition. Reported are both the median annual operating return and the change in median operating return relative to the year prior to the first acquisition. Raw returns are simply the median acquirer return. Industry adjusted returns are calculated by subtracting the median operating return of the industry (two-digit SIC) from the median return of the acquirer. Performance-adjusted returns are calculated by matching a frequent acquirer to a firm in the same industry with the closest year –1 operating performance.

	Year relative to initial acquisition					Changes in operating performance		
	-1	0	1	2	3	-1 to +1	-1 to +2	-1 to +3
Panel A: Operating income to sales								
Raw return	14.4%	14.7%	14.9%	14.7%	14.8%	0.8%	1.0%	1.1%
Industry adjusted	3.8%	4.1% ^a	4.5% ^a	4.3% ^a	4.8% ^a	0.6% ^c	1.0% ^c	1.0% ^c
Performance adjusted	0.0%	0.7% ^b	1.8% ^b	1.7% ^c	2.3% ^c	1.8% ^b	1.7% ^c	2.2% ^c
N	542	542	542	542	542	542	542	542
Panel B: Operating income to total assets								
Raw return	14.8%	13.4%	13.9%	13.5%	13.6%	-0.3%	-0.7%	-0.5%
Industry adjusted	3.5% ^a	2.4% ^a	2.7% ^a	2.6% ^a	3.1% ^a	-0.4%	-0.3%	0.1%
Performance adjusted	-0.1%	-0.2%	0.6% ^b	0.4% ^a	0.8% ^a	1.1% ^a	1.2% ^a	1.0% ^a
N	542	542	542	542	540	542	542	540

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

and significant as well. These results are consistent with frequent bidders being careful managers of the firm's free cash flows and inconsistent with managers being hubristic. In addition, the results suggest that frequent acquirers are able to adapt to a changing environment more efficiently than other firms within their industry.

Table 3.5 presents results of frequent bidder industry, performance, and size-adjusted median ROS by method of payment, public status of targets, market-to-book and relative size of the acquisition program. The data for method of payment and target public status are placed into dollar-weighted quartiles grouped into three categories: 0% to 25%, 26% to 75%, and 75% to 100%. For example, if a frequent acquirer purchased 47% of their takeovers with cash, the firm would be placed in the 26% to 74% category (the middle quartiles are lumped together).

The results in Table 3.5, Panel A, describe median abnormal ROS by method of payment. Frequent acquirers using stock as the method of payment 25% of the time or less have significant returns of 1.7% and 1.8% for years 1 and 2, respectively. The remainder of the stock usage categories is positive but insignificant. Conversely, the median abnormal ROS in years 1 and 2 of firms using cash 75% of the time or greater is 1.6% and 1.9%, respectively. The main result from the panel is that firms using large amounts of cash and small amounts of stock for acquisitions have significantly higher profitability than their performance- and industry-matched counterparts, and this holds only for years 1 and 2. These results are consistent with the long-run stock performance findings of Loughran and Vijh (1997), which show that firms using cash as the method of payment outperform those using stock. Heron and Lie (2000) study method of payment in takeovers and find that the operating performance of firms using stock exceeds the operating performance of firms using cash as currency. Both cash and stock in their study, however, significantly outperform performance and industry matches. The difference in findings between this paper and Heron and Lie (2000) may be found in the difference in frequency with which sample firms visit the market for corporate control. Firms that consistently use stock as currency for takeovers may be strapped for cash. More profitable firms, however, have an

Table 3.5

**Size, industry and performance-adjusted operating returns of acquirers
acquiring five or more targets from 1990-1999.**

Details of frequent acquirer takeovers are represented in this table. Individual targets are value-weighted by the overall value of their acquirer's total acquisitions. All returns are calculated by matching the acquirer to a firm in the same industry with the closest year -1 operating performance, where operating performance is operating income divided by sales. Industry is defined as the firm's two digit SIC. Panels A and B describe the abnormal operating returns to acquirers based on method of payment and public status, respectively. Stock offers include common stock or a combination of common stock and derivative securities. Cash offers include cash and mixtures of cash and debt. The column headings in Panels A and B represent the deal-weighted percentage of the acquisition program. For example column 1, row 1 of Panel A reads frequent acquirers using cash to fund 25% or less of the dollar value of acquisitions performed a statistically insignificant 1.9% better than a performance matched firm in the same industry. Panel C describes the relationship between operating returns and market-to-book and relative size of the acquisition program. Relative size is the sum of all target deal values divided by the acquirer's beginning market value. Acquirer market value is calculated as of the month before the announcement and is the product of the monthly price and common shares outstanding on CRSP. Deal value is defined as the total value of consideration paid by the acquirer, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Acquirers are divided approximately into quartiles for both sections. The first and fourth columns represent the lowest quartile in terms of market-to-book and acquisition program size. Similarly columns three and six represent the highest quartile, while columns two and five represent the middle two quartiles.

Panel A: Method of Payment						
Year	Cash			Stock		
	0%-25%	26%-74%	75%-100%	0%-25%	26%-74%	75%-100%
1	1.94%	2.01%	1.56% ^b	1.69% ^c	1.94%	1.65%
2	1.64%	1.26%	1.86% ^a	1.80% ^a	1.08%	1.60%
3	1.82% ^c	2.35% ^b	2.74%	2.17%	3.11%	3.04%
<i>N</i>	235	166	141	344	115	83

Panel B: Public Status						
Year	Private			Public		
	0%-25%	26%-74%	75%-100%	0%-25%	26%-74%	75%-100%
1	0.75%	1.97%	2.62% ^c	2.81% ^c	1.64%	0.48%
2	1.63% ^b	1.81% ^c	1.46%	1.89%	0.85%	2.06% ^b
3	2.15%	1.69%	3.38% ^b	3.16%	0.97%	2.47% ^b
<i>N</i>	238	179	125	275	149	118

Panel C: Market-to-Book and Size of Acquisition Program						
Year	Market-to-book			Relative size of targets		
	< 1.7	1.7 to 5.5	> 5.5	< 1	1 to 5.5	> 5.5
1	1.97% ^c	1.26% ^b	2.91%	1.86%	1.69% ^c	1.69% ^c
2	3.13%	0.81% ^b	1.98%	0.88%	1.72% ^a	2.06% ^b
3	3.18% ^c	2.41% ^a	1.29%	2.68%	1.92% ^b	3.04% ^b
<i>N</i>	139	270	133	154	249	139

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

increased access to cash as the firm throws off more and more profits. Thus, differences in results may be consistent with the more profitable firms using cash with greater frequency while less profitable firms must use stock as currency for frequent takeovers. Overall, these results suggest that frequent acquirers are at least as profitable as firms choosing methods other than frequent acquisitions as a means of adapting to change. This supports the efficient firm hypothesis.

Panel B describes operating returns contingent on the percent public status of targets. Frequent acquirers purchasing 75% or more of either public or private firms have the most frequent significant returns. In year three, for frequent bidders acquiring 75% and more of either public or private firms, the median abnormal returns are 2.5% and 3.4%, respectively. Firms acquiring greater than 74% public takeovers have a significant 2.1% median ROS in year 2. Firms acquiring greater than 74% private takeovers have a significant 2.6% median ROS in year 1. The remainder of median returns is either positive and insignificant, or is significantly positive but dispersed randomly over year and category. These results are consistent with frequent acquirers developing a niche in acquiring firms, thereby benefiting from a learning curve resulting from frequent takeovers of similar firms. For example, after acquiring a private firm, the acquirer may be better suited at acquiring another private corporation. The differences in regulatory requirements and depth of knowledge of the market for corporate control of public or private companies may give the acquirer an advantage in the entire takeover process. The best frequent acquirers may prefer only those types of firms that they have experience acquiring and integrating with their current operations.

The median operating returns in Panel C are related to the acquirer's beginning market-to-book value and the relative size of the acquisition program. Acquirers are divided into approximate quartiles based on these two characteristics. The middle two quartiles form one group of acquirers. Considering the initial market-to-book ratio of the acquirer, those acquirers with medium to low ratios are the only ones with significantly positive operating returns. Five

out of the six years for these lowest two quartiles are significant. Year 2 of the lowest market-to-book quartile is insignificantly positive. The significant returns median abnormal ROS range from 0.8% to 3.2%. These results, while economically insignificant at times, suggest that firms with low market-to-book ratios may be meticulous in their takeover program since the market may view their abilities to manage cash flows as suspect. In addition, the presence of no negative operating returns is inconsistent with the empire-building hypothesis, as low market-to-book firms should be those most likely to use free cash flows unwisely.

Jarrell and Poulsen (1989) find that the relative size of the target during an acquisition is positively related to the stock price performance of the acquirer in a small window around the announcement of an acquisition. For a long-run window this abnormal return should be even more pronounced given the long-term implications of the acquiring firm purchasing a large target. Relative size of the acquisition program is the total value of all takeovers for the acquirer divided by the beginning market value of the acquirer. The operating performance results for all three years after the initial acquisition are significant and positive for firms acquiring targets amounting to more than the acquirer's beginning market value. The largest median returns are found in years two and three for the 139 firms acquiring greater than 5.5 times their initial market value in targets; they yield median abnormal ROS of 2.1% and 3% for years two and three, respectively. For firms acquiring between 1 and 5.5 times their beginning market value, median abnormal ROS is significant and ranges from 1.7% to 1.9% for years one through three. Those frequent bidders acquiring many small firms, targets summing to less than the acquirer's beginning market value, have economically and statistically insignificant positive returns. These findings are consistent with smaller acquisitions having so little influence on acquirer performance that any profitable results are hidden by the size of the acquirer. The significantly positive returns for the medium and large quartiles suggest that frequent acquirers may be able to make significant positive changes to profitability via acquisitions. This is consistent with the efficient firm hypothesis. Finally, the latter result suggests that those firms with the ability to make large operational

changes through frequent acquisitions may be the firms that are able to position themselves to reap the benefits of takeover. Overall, Table 3.5 suggests that we cannot reject the efficient firm hypothesis and can seemingly reject the empire building hypothesis. No return in Table 3.5 is negative.

Table 3.6 reports results from regressing performance-adjusted changes in median ROS on the acquirer's beginning book-to-market, the percent private and public takeovers, the percent of acquisitions financed with stock and cash, the log of relative size of targets, and the number of takeovers per acquirer. The operating returns are winsorized at 5% and 95% levels to account for large outliers. When I include the outliers, the results do not change. In addition, I use the reciprocal of the market-to-book variable as it produces a better-behaved variable, eliminating gross outliers. Only the one- and three- year regressions are significant. Without regard to the test statistic for the regression, I am inclined to believe the third year regression more than the previous regressions, since its independent variables more closely describe the dependent variable. In year 1 it is unlikely that all of the acquirer's acquisitions have occurred, thus the independent variable *number of takeovers* is much less meaningful in the year1 regression than in the year 3 regression.

The regression results provide evidence that the acquirer's beginning book-to-market value is directly related to subsequent operating performance. The coefficients for years one and three are 1.9% and 2.9%, respectively. Both are significant at the 5% level. These results are consistent with the findings from the univariate tests. It appears that those firms in which the market has the most confidence have the most difficulty profitably integrating takeovers. Managers of these firms appear to be over-confident in their ability to manage. High book-to-market firms perform better than firms with low book-to-market in my sample of frequent acquirers. These high book-to-market firms are traditionally thought of as having the greatest amount of agency costs of free cash flows, since they produce a large amount of cash flows but

Table 3.6
Ordinary least squares regression analyses explaining performance-adjusted operating returns for acquirers with five or more acquisitions from 1990 through 1999

This sample consists of 489 acquirers. The performance-adjusted operating return is the left-hand-side variable. These are calculated by matching a frequent acquirer to a firm in the same industry with the closest year -1 operating performance, where operating performance is defined as operating income divided by sales. Industry is defined by the firm's two-digit SIC code. The operating returns have been winsorized at 5% and 95% levels. Stock offers include common stock only or a combination of common stock and options, warrants, or rights. Cash offers include cash only and mixtures of cash and debt. Everything else is considered as a combination offer. The relative size of the target is the acquisition program value divided by acquirer market value. Acquirer market value is calculated as of the month before the announcement date and is the product of the monthly price and common shares outstanding on CRSP. P-values are reported in brackets next to the parameter estimates.

	1 year	2 years	3 years
Intercept	-1.7% [0.60]	0.6% [0.88]	-8.0% ^c [0.08]
# of takeovers	1.6% [0.17]	1.0% [0.49]	3.5% ^b [0.03]
% of acquisitions financed w/only stock	2.3% [0.13]	1.3% [0.51]	3.0% [0.17]
% of acquisitions financed w/only cash	-0.5% [0.75]	-0.4% [0.81]	3.5% [0.11]
% private acquisitions	1.2% [0.47]	1.6% [0.47]	5.4% ^b [0.03]
% public acquisitions	-1.9% [0.27]	0.0% [0.99]	3.0% [0.23]
% domestic acquisitions	0.6% [0.74]	-1.4% [0.56]	-3.2% [0.27]
Acquirers beginning book-to-market	1.9% ^b [0.02]	2.0% ^c [0.07]	2.9% ^b [0.02]
Log of relative size of acquisitions	-0.2% [0.45]	0.4% [0.27]	-0.0% [0.95]
N	489	489	489
F-statistic	1.72 ^c [0.09]	1.09 [0.37]	2.56 ^a [0.01]
Adjusted R^2	1.2%	0.1%	2.5%

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

have few positive NPV projects in which to invest them.⁵ The reported evidence is consistent with acquisitions being an improvement from internally investing cash flows for high book-to-market firms. Thus, while the market may be skeptical of the prospects of high book-to-market firms, my evidence is consistent with these lowly valued firms being able to recognize positive net present value projects in the form of takeovers.

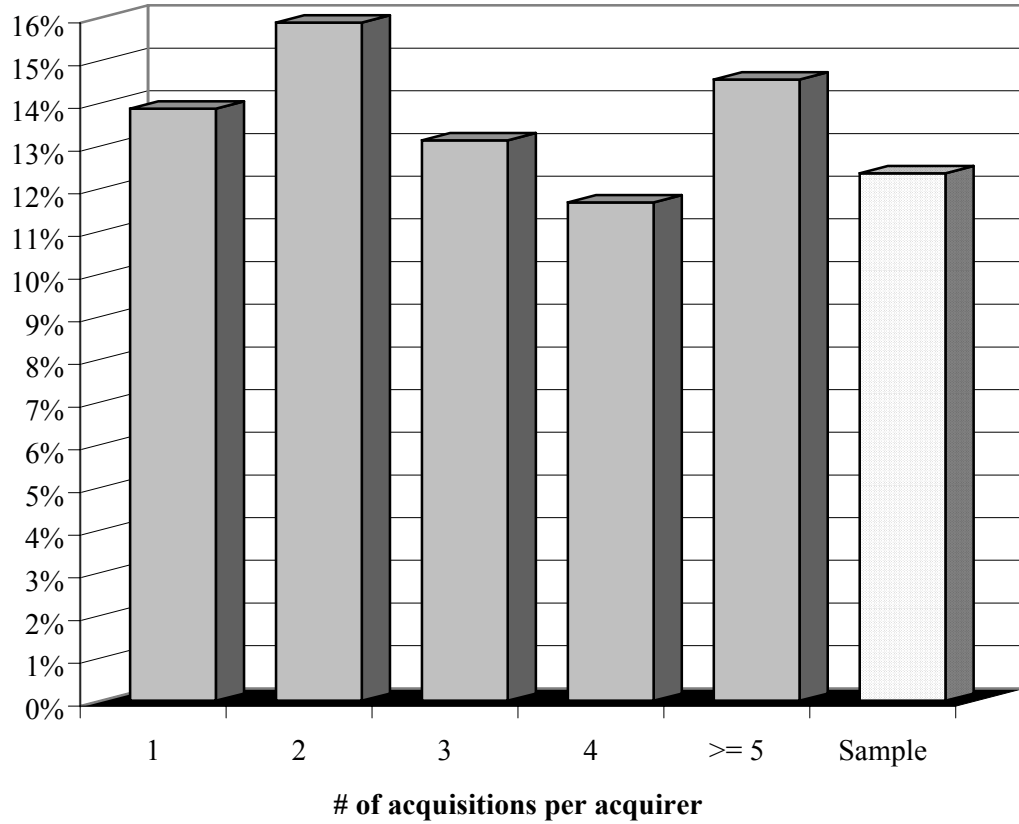
The year 3 regression intercept is a significant -8% . The intercept captures subsidiary takeovers where the acquirer uses some combination of securities and cash to finance the transaction. Other variables that are significant are # of takeovers (3.5%), % private acquisitions (5.4%), and book-to-market (discussed above). These results are consistent with larger acquisition programs being most profitable, and with private targets providing the largest amount of synergy gains. Thus, this evidence coupled with the overall operating performance evidence, is consistent with takeovers being *more* efficient than alternative investment opportunities for frequent acquirers.

3.4.3. Stock returns

There have been numerous studies of the post-merger performance of acquirers. While frequent acquirers are often included in such studies, to my knowledge they have not been analyzed separately, nor has there been much attention given to linking operating returns to stock-price returns. The CRSP/COMPUSTAT survivorship bias found in many studies most certainly exists in this study of frequent acquirers. By only including firms with three years of continuous data on CRSP and COMPUSTAT, I avoid including frequent acquirers that are subsequently acquired. And while the sample of frequent acquirers may have survivorship bias, I have imposed the same bias on matching firms. As an indirect method of testing the bias of frequent acquirers in relation to non-frequent acquirers, I consider the rate of acquisition at which acquirers are subsequently the target of a takeover themselves. Figure 3.5 shows that there is little difference in the acquisition rate among frequent acquirers and those acquirers acquiring

⁵ See Jensen (1986).

Figure 3.5



The takeover percentage of all U.S. acquirers from 1990 to 1999

This figure relates the percentage of U.S. acquirers that were subsequently acquired in the 1990s. The y axis denotes the overall rate by which acquiring firms were subsequently taken over. The x axis shows the number of acquisitions the target made prior to being acquired.

fewer than five firms. This data is consistent with frequent acquirers being neither a sample of empire builders – thus having a greater than normal rate of acquisition – nor a sample of overperforming firms with inflated values – which would be indicated by a lower than normal rate of acquisition.

Table 3.7 describes the long-run stock returns for one through three-year holding periods. The returns are calculated using BHAR, CAR and CTPR methodologies: for BHAR and CAR calculations I use industry and size, and book-to-market and size matching procedures. I also use net-of-market returns for BHARs and CARs, using the CRSP value-weighted index to proxy for the market. The remainder of discussion will be based on industry and size-adjusted returns. All three methodologies return positive and significant returns for all time horizons, without exception. The lowest stock-price returns from my sample of frequent acquirers for years one through three are 12.9%, 20.5% and 14.7%, respectively. The returns from years one and two are from the CAR methodology; the year three return is from CTPR methodology. The largest returns for years one through three are 20.7%, 43.3% and 40.7% respectively. All of these returns were measured using BHAR methodology. All net-of-market calculations are lower than the returns where a matched firm was used. This table presents results that are consistent with frequent acquirers being able to efficiently utilize takeovers as an optimal corporate function. In addition, these results are consistent with takeovers being positive net present value projects over the long term for frequently acquiring firms. The results are also consistent with Hou, Olsson and Robinson's (2000) finding that takeovers add value.

Since the relative size of takeovers has an impact on accounting returns for frequent acquirers and Jarrell and Poulsen (1989) find it has significant impact on event study returns, I consider long-run stock returns based on relative size. Table 3.8, Panel A, relates the long-run returns to the relative value of the firm's total takeover activity. As with operating returns, the stock returns for the largest acquisition programs are highly positive and significant. Acquirers making the largest relative changes via takeover – those in which the value of takeovers are over

Table 3.7

Long-run abnormal buy-and-hold returns, long-run cumulative abnormal returns, and calendar-time Fama and French three-factor model portfolio regressions of acquiring firms where the acquirers acquired five or more firms from 1990-1999.

Panel A displays the buy-and-hold abnormal returns (BHAR) for frequent acquirers calculated:

$$AR_{it} = R_{it} - E(R_{it}),$$

where $E(R_{it})$ is the return from a firm matched on size and book-to-market for the first number in the column and is the return from a firm matched on size and industry (two-digit SIC code) for the second number in the column. In the second row of the panel, $E(R_{it})$ is the value-weighted CRSP index. The first number is the buy-and-hold abnormal return. The number in brackets is the median. Panel B displays the cumulative abnormal returns (CAR) for frequent acquirers, calculated:

$$AR_{it} = R_{it} - E(R_{it}),$$

where $E(R_{it})$ is the return from a firm matched on size and book-to-market for the first number in the column and is the return from a firm matched on size and industry (two-digit SIC code) for the second number in the column. This method requires monthly rebalancing, unlike BHAR methodology. In the second row, $E(R_{it})$ is the value-weighted CRSP index. The first number is the cumulative abnormal return. The number in brackets is the median. Panel C displays the calendar-time abnormal returns for frequent acquirers. The first number is the annualized return on an equal-weighted portfolio of frequent acquirers. (The numbers italicized and in brackets are adjusted R-squares.) There are 542 total acquirers.

Calculation Method	1 year	2 years	3 years
Panel A: BHARs			
BHAR	19.0% ^a / 20.7% ^a	48.5% ^a / 43.3% ^a	51.6% ^a / 40.7% ^a
Matched sample	[11.2%] / [12.2%]	[28.3%] / [22.7%]	[41.8%] / [27.5%]
BHAR	26.2% ^a	49.1% ^a	50.5% ^a
Value-weighted CRSP	[10.7%]	[9.4%]	[4.9%]
Panel B: CARs			
CAR	13.5% ^a / 12.9% ^a	27.0% ^a / 20.5% ^a	33.3% ^a / 22.9% ^a
Matched sample	[9.1%] / [11.9%]	[21.4%] / [16.1%]	[27.4%] / [17.9%]
CAR	19.0% ^a	26.3% ^a	26.1% ^a
Value-weighted CRSP	[13.7%]	[20.6%]	[22.2%]
Panel C: Calendar-time portfolios			
Calendar-time portfolios	18.3% ^a	22.7% ^a	14.7% ^b
Equal-weighted	<i>[84.3%]*</i>	<i>[91.8%]*</i>	<i>[88.6%]*</i>

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

*Denotes adjusted r-squared

5.5 times the size of the acquirer's beginning market value - report long-run returns of 27%, 55%, and 61% for one, two and three-year holding periods, respectively. These returns are the lowest of each of the three methodologies for each year. Once again, these results come from both the CAR and CTPR methodologies; the BHAR continue to be the largest returns, often being double in magnitude. In those firms where the relative size of the acquisition program is between 1 and 5.5 we see smaller positive and significant returns of 11% for one and two-year holding periods, and an insignificantly positive return for year three. When takeovers represent less than the market value of the acquirer, long-run returns are insignificantly different from zero for all methodologies and holding periods. These results are consistent with the findings from operating returns and from Jarrell and Poulsen's (1989) findings that relative size is an important factor when determining gains to an acquirer from takeover. This dispersion of stock returns within the sample of frequent acquirers coupled with their apparent correlation with operating returns provides evidence that supports acquisitions being value enhancing corporate functions. In sum, it appears that firms using takeover to dramatically change the size of their operations tend to extract long-term synergies above those which occur in similar firms that do not choose frequent takeovers as a dominant form of capital procurement. This gain may be due, in part, to their ability to increase the immediate profitability from operations.

In Table 3.8, Panel B, univariate results based on the beginning market-to-book ratio of the acquirer are reported. Results are divided into quartiles according to the acquirers' beginning market-to-book ratio. The middle two quartiles are grouped together. The main result from this panel is the outperformance of the lowest quartile of market-to-book firms compared to the middle two and highest quartiles. More specifically, the lowest quartile reports highly positive and significant returns of 11%, 30% and 32% for holding periods one through three, respectively. Additionally, all returns in this quartile, regardless of holding period or methodology, are significant and positive. For the middle quartiles, returns are positive and significant for years 1 and 2, 13% and 18%, respectively, and insignificant for year 3. The highest quartile reports

Table 3.8
Long-run stock-price performance according to the relative size of the
acquisitions and market-to-book of acquirers acquiring five or more firms
from 1990-1999

This table presents the industry and size matched buy-and-hold and cumulative abnormal returns (BHARs and CARs) and calendar-time portfolio returns of frequent acquirers. Panel A controls for the relative size of the sum of the acquisitions made. The relative size of the acquisitions is measured as the sum of the target values (includes public, subsidiary, and private acquisitions) divided by the market value of the acquirer as of the month of the first acquisition. Acquirer market value is calculated as of the month before the announcement date and is the product of the monthly price and common shares outstanding on CRSP. Deal value is defined as the total value of consideration paid by the acquirer, excluding fees and expenses. The dollar value includes the amount paid for all common stock, common stock equivalents, preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the announcement date of the transaction. Panel B controls for the market-to-book value of the acquirer as of the month prior to the first takeover. Book value is COMPUSTAT item #60, common equity. Both Panels A and B are approximately divided into quartiles. The first set of acquirers in each panel represents the smallest market-to-book value or relative size of targets quartile. Similarly, the last set is the largest, and the middle set represents the middle two quartiles together.

Panel A: Relative size of targets			
	<i>1 year</i>	<i>2 years</i>	<i>3 years</i>
< 100% (N=154)			
BHAR	2.2%	-5.4%	-16.3%
CAR	3.3%	2.4%	-3.1%
Calendar-time	5.8%	0.2%	-8.1%
From 1 to 5.5x (N=249)			
BHAR	15.3% ^a	19.7% ^b	27.5% ^b
CAR	10.8% ^a	12.7% ^b	16.8% ^a
Calendar-time	14.5% ^a	11.4% ^b	4.3%
> 550% (N=139)			
BHAR	50.9% ^a	140.0% ^a	127.7% ^a
CAR	27.2% ^a	54.5% ^a	61.2% ^a
Calendar-time	40.3% ^a	73.8% ^a	62.6% ^a
Panel B: Market-to-book			
	<i>1 year</i>	<i>2 years</i>	<i>3 years</i>
< 1.7 (N=139)			
BHAR	19.1% ^c	89.2% ^b	56.0% ^b
CAR	11.3% ^c	29.5% ^a	32.2% ^a
Calendar-time	22.1% ^a	36.3% ^a	49.7% ^a
From 1.7 to 5.5 (N=270)			
BHAR	20.8% ^a	27.6% ^a	50.0% ^a
CAR	12.9% ^a	18.2% ^a	22.0% ^a
Calendar-time	17.6% ^a	21.1% ^a	-0.7%
> 5.5 (N=133)			
BHAR	22.1% ^b	27.4% ^c	14.2%
CAR	14.5% ^b	15.7% ^c	13.4%
Calendar-time	14.7% ^a	16.4% ^b	14.2%

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

significant returns of 15% and 16% for one and two-year holding periods, but all three methodologies are insignificant for the three-year holding period. The evidence for the lowest market-to-book quartile is consistent with mean reverting stock prices; however the evidence for the highest quartile of market-to-book firms is not consistent with mean-reverting stock prices. There are no negative returns for the highest quartile of market-to-book firms. The results in Table 3.8, Panel B are consistent with both univariate and multivariate results of the operating returns and with the results in Rau and Vermaelen's (1998) study. This suggests that frequent acquirers with a high valuation by the market place may place too much confidence in their abilities to identify and integrate viable takeovers. However, takeovers by these firms still do not appear to destroy value. Firms subject to the most recent market discipline appear to evaluate their prospects more cautiously, thereby exceeding market expectations. Additionally, the combined operating and stock performance evidence from the low market-to-book firms is consistent with takeovers being a better alternative to investing cash flows internally. All evidence in Table 3.8 is consistent with the efficient firm hypothesis. I cannot reject the efficient firm hypothesis, but can safely reject the empire building hypothesis.

Method of payment and target public status are analyzed in Table 3.9. The columns represent the deal-weighted value of targets that are public/private or acquired via cash/stock. In Loughran and Vijh's (1997) analysis of post-merger performance, they find that stock-financed takeovers underperform cash financed takeovers from -11% to -76%. For frequent acquirers, these results do not hold. In fact, there is some evidence that acquirers that use the highest proportion of stock perform better than those using cash. There is weak evidence contradicting the operating performance findings for method of payment. Using stock returns I find that firms using over 75% stock and less than 25% cash are more efficient in utilizing takeovers. With the exception of the CTPR results in the third year, all returns for greater than 75% stock usage and less than 25% cash usage are significantly positive at the one percent level. Though *all* results in this panel are positive, significance and magnitude of performance are highly dependent on the

Table 3.9

Long-run stock-price performance according to method of payment and public status of target firms where the acquirers acquired five or more firms from 1990-1999

This table presents the industry and size matched buy-and-hold and cumulative abnormal returns (BHARs and CARs) and calendar-time portfolio returns of frequent acquirers. Individual targets are value-weighted with respect to the overall value of their acquirer's total acquisitions. Panel A details the BHAR based on the method of payment the acquirer chooses. The last row and first column states that on average, when the acquirer uses common stock for 75% or more of the total number of acquisitions the 1-year calendar-time portfolio return is 7.2%. Stock offers include common stock only or a combination of common stock and options, warrants, or rights. Panel B details returns based on the public status of the target. The first row and last column states that on average, when public targets are 25% or less of the total number of targets acquired the 3-year BHAR is 41.6%.

Panel A: Method of payment						
	Cash			Stock		
	1 year	2 years	3 years	1 year	2 years	3 years
0-25% [N= 235, 344]						
BHAR	27.0% ^a	41.6% ^a	54.0% ^a	12.2% ^b	35.5% ^b	16.6%
CAR	18.0% ^a	20.5% ^a	22.6% ^a	7.1% ^b	14.5% ^a	16.2% ^a
Calendar-time	24.9% ^a	29.4% ^a	13.8%	14.4% ^a	21.5% ^a	18.8% ^a
26%-74% [N= 166, 115]						
BHAR	22.9% ^a	60.1% ^a	43.4% ^a	21.6% ^a	45.7% ^a	51.6% ^a
CAR	11.3% ^b	26.7% ^a	27.0% ^a	14.6% ^b	27.3% ^a	25.8% ^a
Calendar-time	19.0% ^a	23.1% ^a	12.0%	16.1% ^a	0.4%	8.6%
75%-100% [N= 141,83]						
BHAR	7.7%	26.4%	15.5%	54.9% ^a	72.4% ^a	125.6% ^a
CAR	6.0%	13.1% ^c	17.0% ^b	34.5% ^a	35.6% ^a	44.0% ^a
Calendar-time	7.2% ^a	16.3% ^a	27.4% ^a	38.3% ^a	48.0% ^a	15.5%
Panel B: Public status						
	Private			Public		
	1 year	2 years	3 years	1 year	2 years	3 years
0-25% [N= 238, 275]						
BHAR	24.7% ^a	51.6% ^a	58.7% ^a	17.6% ^a	51.3% ^a	41.6% ^a
CAR	15.5% ^a	19.7% ^a	26.2% ^a	9.2% ^b	19.2% ^a	21.2% ^a
Calendar-time	19.7% ^a	12.7% ^c	24.9% ^a	13.9% ^a	25.3% ^a	18.6% ^b
26%-74% [N= 179, 149]						
BHAR	17.1% ^b	19.7%	9.9%	18.0% ^a	25.6% ^b	15.1%
CAR	8.9% ^c	17.8% ^a	12.6% ^c	14.3% ^a	22.4% ^a	19.8% ^a
Calendar-time	18.3% ^a	28.3% ^a	8.2%	20.8% ^a	23.6% ^a	5.1%
75%-100% [N= 125,118]						
BHAR	18.3% ^b	61.4% ^b	50.7% ^b	31.3% ^a	47.0% ^a	71.1% ^a
CAR	13.5% ^b	25.8% ^a	29.7% ^b	19.5% ^a	21.1% ^a	29.0% ^a
Calendar-time	16.3% ^a	30.7% ^a	25.7% ^b	29.5% ^a	-0.0%	11.4%

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

methodology used. Results for method of payment are robust only in the sense that there are no negative returns. Unlike Loughran and Vijh's findings for *normal* acquirers, I find no evidence that frequent acquirers are signaling their value via method of payment. In fact, firms using stock for more than 75% of the dollar value outlay have highly positive and significant returns using both the CAR and BHAR methodology. The returns in year 3 using the CTPR methodology are insignificant.

The result for heavy stock users in year 3 is somewhat telling of the nature of long-run returns and the particular methodology used for measurement. Using BHAR methodology, I find that acquirers using over 74% stock for currency during their acquisition program have a return of 126%, significant at the one percent level. When CTPR methodology is employed the measured return is an insignificant 15.5%. Using only the BHAR methodology, one could suggest evidence consistent with acquirers using a rising stock price to fund acquisitions, or the addition of phenomenal value through acquisitions. However, using CTPRs, I find no evidence consistent with either of these conclusions. By using all three methods, it is somewhat more difficult to reject any hypothesis relating to the long-run return results.

The public status of deal-weighted takeover programs is analyzed in Panel B of Table 3.9. For takeovers of public companies including no synergies, Roll (1986) argues that "offers are observed only when the valuation is too high; outcomes in the left tail of the distribution of valuations are never observed." One's expectation is that on average there are synergies in takeovers, but it is not rare to observe non-synergistic takeovers. This may be especially true for frequent acquirers.⁶ However, since the market value of a private target is unobservable, one might expect undervaluation to occur with some degree of frequency. This reinstates the left tail of Roll's hypothesized distribution. Considering this and the results discussed in Fuller, Netter and Stegemoller (2001), acquirers purchasing a large percentage of private firms should outperform acquirers that purchase a relatively large percentage of public targets and therefore

should be the most likely value-adding firms. There appears to be some results suggesting private acquisitions are better deals than public acquisitions for frequent acquirers. The two- and three-year holding period returns for those companies acquiring over 74% private targets are 25.8% and 25.7%, respectively. Both are significant. The two- and three-year results for those companies acquiring greater than 74% public targets are -0.0% and 11.4%, respectively. Neither of the returns is significant. Therefore, this evidence suggests that private targets may add more value than public targets to those frequent acquirers that purchase private targets often. Nevertheless, there are only four groups of firms that have insignificant results in this panel. The three-year returns for firms that acquire between 25% and 75% public or private targets are insignificant. Additionally, the two- and three-year results for firms acquiring greater than 74% public targets are also insignificant. The implication may be that frequent acquirers are good at valuing possible synergies in takeovers, regardless of public status.

Table 3.10 analyzes CARs in a regression framework. I use White's adjustment for heteroscedasticity for each regression. The independent variable for percentage of acquisitions financed with stock is 37%, 42% and 56% for years one through three, respectively. Each is significant at the one percent level. Additionally, the percentage of acquisitions financed with cash is significantly positive for years two and three. As in the univariate analysis, the magnitude of results for the percentage of stock-financed acquisitions is greater than that of cash-financed acquisitions. This may simply be attributable to a firm's using stock as currency in a period of rising stock prices.⁷

In the two-year regression, I find the book-to-market variable is a significantly positive 20%. This result supports the evidence found on market-to-book in the univariate setting, as well

⁶ As the number of takeovers increase the probability of making a non-synergistic takeover increases.

⁷ I tested this assumption by using the pre-announcement returns for the sample firms throughout the period in which they made acquisitions. I find in both a univariate and multivariate setting that frequent bidders are more likely to utilize stock as method of payment during a period of rising stock prices.

Table 3.10

Ordinary least squares regression analyses explaining industry and size adjusted cumulative abnormal returns for acquirers with five or more acquisitions acquiring private and public targets from 1990 through 1999

Regressions of the industry and size adjusted CARs against several independent variables. Stock offers include common stock only or a combination of common stock and options, warrants, or rights. Cash offers include cash only and mixtures of cash and debt. Everything else is considered as a combination offer. The relative size of the target is the acquisition program value divided by acquirer market value. Acquirer market value is calculated as of the month before the announcement date and is the product of the monthly price and common shares outstanding on CRSP. White-adjusted *t*-stats are reported in brackets next to the parameter estimates.

	1 year	2 years	3 years
Intercept	5.8% [0.38]	0.9% [0.04]	0.7% [0.03]
# of takeovers	-0.7% [-1.56]	-0.9% [-1.00]	-1.3% [-0.99]
% of acquisitions financed w/only stock	37.3% ^a [3.59]	42.4% ^a [3.15]	55.5% ^a [3.19]
% of acquisitions financed w/only cash	11.4% [1.15]	27.0% ^b [2.00]	42.5% ^b [2.52]
% private acquisitions	4.2% [0.37]	17.9% [1.15]	13.6% [0.75]
% public acquisitions	-1.8% [-0.15]	-3.3% [-0.22]	-5.4% [-0.32]
% domestic acquisitions	-11.6% [-0.97]	-25.3% [-1.43]	-29.0% [-1.56]
Acquirers beginning book-to-market	5.3% [0.85]	20.0% ^b [2.42]	12.8% [1.43]
Log of relative size of acquisitions	6.8% ^a [3.19]	15.0% ^a [5.25]	20.2% ^a [5.97]
N	542	542	542
<i>F</i> -statistic	3.38 ^a [.0001]	6.64 ^a [.0001]	6.32 ^a [.0001]
Adjusted <i>R</i> ²	3.4%	7.7%	7.3%

^a Denotes significance at 1% level.

^b Denotes significance at 5% level.

^c Denotes significance at 10% level.

as tests of operating performance that suggest undervalued firms create value through takeover rather than squandering free cash flows on internally anemic investments.

The coefficient for the independent variable of log of the relative size of acquisitions is 6.8%, 15% and 20.2% for years one through three, respectively. Each of these coefficients is significant at the one percent level. This further bolsters the results from the operating returns and the univariate stock return results. Of all variables, the relative size of the acquisition program is the most consistently significant and positive. Regardless of any interacting characteristics, the magnitude of the change wrought by takeovers is positively related to the success, both in the market and on the books, of the acquiring firm.

3.5. Conclusion

This study examines the operating and stock-price performance of frequent acquirers for the three years after their initial announcement. The operating performance of a firm has the flaw of representing accounting numbers and not the actual economic performance of the firm. Event studies, concentrating on a short window of time around a takeover announcement, cannot capture the long-term effect of combining two businesses and are fraught with errors as evidenced by Eckbo and Thorburn (2000). Finally, long-run measures of abnormal returns are “treacherous” according to Lyon, Barber and Tsai (1999). Fama (1998) suggests these studies produce “chance” results. Additionally, stock price analysis may not be able to distinguish synergy gains from market or model inefficiencies. This study views each methodology as being complementary in nature, and thus combines each to test the performance of frequent acquirers and their use of takeovers as means of change.

The results found here are consistent with frequent acquirers being firms that are able to extract significant gains from takeovers. These gains appear to elude other firms; previous long-run return studies find little evidence of positive post-acquisition performance. In this study, similar size and industry firms underperform frequent acquirers. The gains to frequent acquirers

may be viewed as market inefficiencies or model misspecifications. However, my evidence is consistent with the underlying source of these gains being linked to *unexpected* profitability improvements stemming from the firms publicly unobservable ability to make takeovers work. In addition, stock-return improvements appear to be linked with profitability improvements for frequent acquirers.

This analysis suggests that frequent acquirers are better able to change themselves, in response to a changing environment, than other firms within their own industry, firms with similar market-to-book and size characteristics, firms with similar pre-event performance and firms that comprise the market index. I find *no* evidence that frequent acquirers can be classified as empire builders. In fact, most of the evidence presented suggests that the largest acquisition programs in terms of both the number and value of firms acquired is directly related to the efficiencies produced from the acquirer. Overall, my results are consistent with frequent acquirers being good at change.

Chapter 4

TRANSITIONS: FROM PUBLIC TO PRIVATE OWNERSHIP

4.1. Introduction

Takeovers of private firms by publicly traded firms (sell-outs) and initial public offerings (IPOs) are two methods through which privately owned assets transition to public ownership. These transactions are comparable since they represent significant shifts in ownership structure, a channel for raising capital, and a means of liquidation for owners. However, there are fundamental differences between the transactions. While IPOs are often discussed as an extreme event in ownership dilution (see, e.g., Mikkelson, Partch and Shah, 1997), private takeovers represent an even more dramatic change with prior owners generally relinquishing their entire ownership stake. Additionally, these two transactions have vastly different post-event implications with regard to the employment of pre-event management, the monitoring ability of shareholders in regards to project and capital-procurement decisions, the dispersion of shareholders, and the information content of the firm's stock price. In our research, we study the transition from private to public ownership whether through an IPO or a sell-out and then consider the factors that lead to the choice of one means versus the other. We expect that our analysis will provide evidence that the choice of transaction is based on firm and management characteristics that cause one transaction to be more desirable than the other. In the process of comparing these two transactions, we also add to the relatively sparse knowledge of private firm acquisitions and compare the costs of going public versus the costs of being acquired.

Private owners may have various reasons for desiring transition from private to public markets and those reasons may affect the means through which the transition occurs. In addition,

firm characteristics also play an important, if not dominant, role in the choice. At the time of transition, an owner may value control rights more than increased returns, liquidity more than capital procurement, or hubris more than the interests of the firm. In addition, the characteristics of the firm's assets and production processes may be better suited for a sell-out or an IPO. Firms with specific assets may be more attractive to a corporate buyer that can both integrate those assets into their current production processes and value them most appropriately. Similarly, high-growth assets might be better valued in the public equity market.

Sell-outs are transactions where a public company buys all of the outstanding shares of a privately held firm. The private firm usually retains the service of an investment banker in facilitating the transaction. These transactions often result in target management losing a significant portion of, if not all, block ownership influence in the resulting combined firm. In IPOs, however, the private firm generally sells off only a portion of the outstanding equity, with the previous owners retaining significant ownership and control of the public corporation.

Sell-outs differ from IPOs in several other ways. From a takeover perspective, sell-outs represent the possibility for synergy between the firm and the acquirer that is priced positively by shareholders (for evidence see Bradley, Desai and Kim (1988) and Mulherin and Boone (2000)). Sell-outs do not involve the lengthy public disclosure, require the additional costs of regulation faced by IPOs, nor are they bound by regulations on trading after the transaction such as the quiet period for issuing owners in IPOs. As Chemmanur and Fulghieri (1999) show, information gathering is done by a large number of investors in IPOs in contrast to a limited number of investors in a sell-out. In addition, any underpricing effects are gained by the acquirer's shareholders. Clearly, many private firms involved in sell-outs could instead choose to issue equity to the public. This is seen in the rationale behind Viewstar Corporation's decision to forego an IPO in lieu of a sell-out, as stated by Kamran Kheirrolomoom, the President and CEO of Viewstar:

Although Viewstar had planned an IPO of Viewstar Common Stock and considered it an attractive opportunity for the Viewstar shareholders, the Viewstar Board of Directors has concluded that the anticipated benefits of the proposed merger with Digital will provide a better opportunity for the shareholders to realize the full value of their investment.

Thus, in our work we hope to identify the reasons managers choose the sell-out over the IPO, or vice versa.

Beneficial characteristics of a sell-out that are shared with an IPO include access to public debt and equity markets (through the parent in the case of the sell-out), liquidity of ownership previously tied up in an illiquid firm, and the possibility of linking management and employee compensation to traded securities. Sell-outs may be less beneficial than IPOs in other ways, though. Management loses its ability to set firm policy due to dilution of ownership. In addition, in a sell-out managers are choosing to sell the firm in a private transaction where information asymmetry may be especially high. Zingales (1995) argues that IPOs can give managers of private firms a means to establish a market value of the company before liquidating their position. Mulherin and Field (2000) show that IPOs are followed by a higher rate of takeover in the few years following the transaction than other publicly traded firms. The private target, however, has little negotiating power resulting from a practically non-existent market in which to value the firm's ownership and cash flow rights. This market value uncertainty results in a private company valuation discount. This is best seen in an example from one of the S-4 statements collected for this study. Allen & Company's public-company comparables valuation of Impac Hotel Group includes a final 20% private market (liquidity) discount for the target. If the company had chosen to do an IPO first, they may have been able to avoid the discount entirely and recognize an additional premium in the public takeover market.

Although both of these transactions provide similar benefits to the firm and its managers, the popular press and academic literature focuses primarily on IPOs. Additionally, it is generally stated by entrepreneurs that an IPO is the most desired form of "harvest" (see, e.g., Kensinger,

Martin and Petty (2000)). However, there must be reasons why an IPO is viewed as the preferred method of transition for entrepreneurs. Similarly, there must be firm characteristics that would prohibit management from choosing an IPO as the best transition option as we have readily observed numerous sell-outs contemporaneous with a hot IPO market in the late 1990s.

This paper examines the differences between 366 sell-outs and an industry- and size-matched sample of IPOs. We test several firm characteristics that might influence the transition to public status. Some characteristics include the firm's past operating performance, presence of institutional funding, growth opportunities, age of the enterprise, and the presence of insider ownership. Additionally, valuation multiples and underpricing are analyzed to determine if IPOs receive more favorable valuations and pricing or if they simply have more desirable characteristics than their sell-out counterparts. The comparison of sell-outs to IPOs is not limited to the matched sample, but is also compared to previous research findings on IPOs. There is merit in comparing the sample of sell-outs with IPOs in a contemporaneous market, as there is belief that private firm values have a stronger relationship with demand shifts in the economy than do public firm values (see Gompers and Lerner (2000)).

In sum, this paper's contribution to the existing literature is best stated in the context of Pagano, Panetta and Zingales (1998). They state that the decision to go public is one of the most important, yet least studied questions in corporate finance. This statement is most certainly true, but is often taken as applying only to IPOs. By extending the literature with our analysis of sell-outs, we are increasing our understanding of one of the most significant sources of newly public assets.

The remainder of the paper begins with a discussion of the relevant literature on IPOs, sell-outs and venture capital in section 2. Section 3 discusses sample selection and descriptive statistics of transitioning firms. We then develop testable hypotheses in section 4 and the empirical tests in section 5. Finally, section 6 contains concluding remarks.

4.2. Prior research

Three basic literatures are relevant for the comparison of IPOs and sell-outs. These are the IPO, private takeover, and venture capital literatures. While there is a wealth of research to review on IPOs and venture capital, the literature on sell-outs is less comprehensive. The documentation and analysis of these transactions is a significant portion of the contribution this paper will make to the current literature on private-to-public transactions. In addition, we focus the majority of this analysis on IPOs and sell-outs, and less on the role and impact of the venture capital industry.

In general, it is assumed that an IPO creates the most value for an entrepreneur. In Kensinger, Martin and Petty's (2000) examination of the different methods by which entrepreneurs extract value from a firm, they find that entrepreneurs view an IPO as the most desired form of taking assets public. However, they note that venture capitalists often view sell-outs as a viable, and sometimes preferable, alternative to an IPO. This is consistent with the evidence presented by Sahlman (1990). Sahlman documents more venture-backed firms resulting in sell-outs (56%) than IPOs (44%) in the 1980s (709 sell-outs versus 555 IPOs). So, while it traditionally appears that owners perceive that an IPO will increase their benefits more than a sell-out, an IPO may not be optimal. Sahlman's evidence shows that venture capitalists are in no way averse to a sell-out. In fact, of all of the constituents of private firms, venture capitalists have the largest incentive to encourage the option that maximizes payout. In general, they are more concerned about the rate of return received at the end of their investment holding period than raising additional capital or the ownership structure after the transaction.⁸

Previous research points to sell-out firms as being highly profitable prior to takeover. Matsusaka (1993) studies sell-outs in the late 60s to mid 70s and finds that private firms undergoing a takeover are more profitable than comparison public firms. The operating returns of

⁸ See Cumming and MacIntosh (2001) for an analysis on the agency issues between venture capitalists and entrepreneurs.

private firms outperformed comparable industry-match, size-match, and public-match firms by 9.1%, 9.4% and 5%, respectively. He suggests that these deals are the result of synergy considerations, not corporate control issues. An additional study on sell-outs is by Camerlynck and Ooghe (2000). Their sample is of private Belgium firm takeovers from 1992-1994. They find that private firms involved in sell-outs are, on average, more profitable than their industry and industry-size-matched counterparts. In the three years leading up to takeover, the industry adjusted and industry-and-size-adjusted operating returns for these firms are 0.43% and 1.15% for year -3, 1.27% and 1.67% for year -2, and 1.96% and 2.62% for the year prior to takeover. Additionally, they show that these firms are highly liquid, lowly levered, and less likely to experience financial distress than median firms within their industry.

Similar analysis to that on sell-outs has been performed for IPOs. Mikkelson, Partch and Shah (1997) and Jain and Kini (1994) report the operating performance of private companies before and after the IPO. Mikkelson, Partch and Shah sample firms going public between 1980 and 1983. They report the operating performance for one year prior to IPO through 10 years after. These firms have an industry-adjusted pre-IPO performance of 9% and an industry and size-adjusted performance of 7%. Jain and Kini report on a group of firms going public between 1976 and 1988. These firms outperform their industry counterparts by approximately 7%. In our analysis, we will contrast the operating performance of private firms that participate in a sell-off versus ones that go public through an IPO, but it appears, from the previous literature, that IPOs and sell-outs are quite comparable in terms of operating performance.

Multiples are often used as the basis by which firm value is assessed in the IPO and sell-out process. Koeplin, Sarin and Shapiro (2000) analyze a set of sell-outs and public takeovers from 1984 to 1998. They find that sell-outs are valued at a 20-30% discount to similar public takeover deals. However, the magnitude of the discount only holds for multiples of earnings and disappears when multiples of revenues are used for evaluation. Ritter and Kim (1999) analyze IPO multiples for 1992 and 1993. A comparison of the multiples from Koeplin et al and Ritter

and Kim is as follows: the mean (median) market-to-book multiple for an IPO is 3.5 (3.0) and 2.4 (1.9) for a sell-out, an IPO price-to-sales multiple is 2.7 (2.1) and a sell-out is 1.4 (1.1). Lerner (1993) finds that the return to investments in private firms that go public via IPO is over four times that of sell-outs for venture-backed private firms, seemingly justifying any higher valuation placed on IPOs and paid by investors. Thus, although the difference in pre-transaction performance is small there is evidence that the market assigns a premium to IPOs over sell-outs according to the current literature. We will also examine multiples of sample firms to directly contrast the valuation of sell-outs and IPOs.

The market assessment of the value transferred from the old owners to new owners is similar in these transactions. For an IPO, the initial offering return is referred to as the underpricing and represents a transfer to the new public owners of the firm. For a sell-out, the publicly traded acquirer's stock price should reflect any value gained from the transaction. Fuller, Netter and Stegemoller (2001) detail these value gains as the bidder realizing an undervaluation of the target due to a liquidity discount, blockholder formation or beneficial tax implications for target shareholders. In his discussion on IPO underpricing, Ritter (1987) documents the costs of going public for 1,028 firms taken public from 1977 to 1982. The return on the day of an IPO is 14.8% for firm commitment offers and 47.8% for best efforts offers. He finds that the costs of going public are 21.2% and 31.9% for firm commitment and best efforts offers, respectively. Fuller, Netter and Stegemoller report the returns to bidding firms from acquisitions of private targets in the 1990s. They find that private acquisitions have a 2% return to bidders for the five days surrounding the event. When the sell-out dollar returns to the bidder are viewed as a percentage of the target's value, we find that the announcement day returns for the bidder translate into 49.7% of the value of the sellout firm. The median percent return to the bidder, which is related to the bidder's gain from buying an undervalued asset, is very similar to that of Ritter's finding on best effort IPOs. Therefore, returns to bidders of sell-outs may in fact be more fully characterized as consisting of both synergy gains and underpricing effects.

The costs of an IPO includes not only underpricing, underwriting and registration, but also the cost of agency problems created by separating ownership from management. Mikkelson, Partch and Shah (1997) document insider ownership prior to IPO as 67.9%. Insider ownership decreases to a median ownership level of 17.9% ten years after the IPO. Sell-outs represent a similarly large change in ownership, but the dramatic shift in ownership occurs over a much shorter time period. While sell-outs do not have to bear the costs of registration and underwriting, they do share similar costs of underpricing and agency costs. Thus, when assessing the relevant costs of sell-outs we should find that they are primarily the cost of agency problems created by the massive separation of ownership from management, underpricing and the employment of an investment banker for due diligence purposes. The shift in ownership from management to dispersed shareholders observed in the literature on IPOs, and most certainly present in sell-outs, misaligns the interests of managers and shareholders and is viewed as the ideal setting in which to study agency costs.

To better understand the value of control to entrepreneurs Moskowitz and Vissing-Jorgensen (2000) show that most entrepreneurs earn less in their business than the return on large stocks. Entrepreneurs place tremendous value on owning and controlling their own firm. These private nonpecuniary benefits of control account for the equivalent of as much as 20 percent in average returns per year. This research suggests that there may be benefits in taking a private firm public, as the firm's full potential may be realized under the scrutiny of public shareholders, but this is only gained via a significant loss of the entrepreneur's control.

Recent theoretical work on the decision to go public sheds some additional light on why a firm might rather undergo an IPO than a sell-out. As Field and Mulherin (1999) note, the current body of theoretical work casts the role of IPOs as a means in which managers transfer the control of assets, not necessarily just as a means to raise capital for new investments. Zingales (1995) asserts that an IPO is the result of a value-maximizing decision made by an entrepreneur who eventually wants to sell her firm. He argues that through an IPO the entrepreneur can sell off

the rights to cash flows to subscribers of the IPO, without selling the private benefits of being a large blockholder. The owner can then negotiate a sale later for control of the firm and extract additional profits. Mello and Parsons (1998) relate that by selling shares to a diverse group of shareholders in an IPO, information about the true value of the firm is released. Knowing the firm's value, the entrepreneur increases her bargaining position with potential acquirers thereby increasing the total value for the entrepreneur. Ellingsen and Rydqvist (1997) have a similar explanation of IPOs to that of Zingales (1995) and Mello and Parsons (1998), however they couch the selling of ownership and cash flow rights, separately, to the public in terms of reducing adverse selection problems within a private corporation. Additionally, they show that owners with negative information are reluctant to go public and will instead choose a cheaper direct sale. Finally, Chemmanur and Fulghieri (1999) model the going-public decision as a tradeoff between information costs borne during the IPO process and the risk-premium demanded by a private equity placement.

The theoretical literature on the decision to go public implies two testable hypotheses. One is that the rate of acquisition of newly public firms should exceed that of more established public companies. Field and Mulherin test this hypothesis and find that the acquisition rate of newly public firms is higher than that of more established companies. This evidence is consistent with IPOs being a means in which managers transfer the control of assets. The second testable hypothesis suggests that valuations placed on sell-outs should not exceed the valuation of a similar IPO firm. This study will test the later hypothesis.

Finally, investment bankers and venture capitalists play a substantial role in the transition of a company from private to public status. Gompers (1996) relates the certifying role venture capitalists [VC] play in the life of private companies. His analysis produces results showing that younger VC firms have a greater tendency to take firms public "earlier" than older VC firms. This finding lends credence to the belief that IPOs are a preferred method of harvest to sell-outs, even if it solely due to the reputational capital of a firm's financial backers. Gompers also states that

the venture capital industry is "particularly well suited for examining reputation and capital raising," thus validating its role as a positive signal to the market in going public transactions. Megginson and Weiss (1991) find similar evidence consistent with venture-backed IPOs maximizing the fraction of proceeds that go to the issuing firm. They attribute this to the VCs role as third party certification, thereby reducing information asymmetries between the issuing firm and investors. More generally, this study deciphers the value-added role institutional investors play in private-to-public transactions, as it uses institutional ownership data from both IPOs and sell-outs.

Kim and Ritter (1999) document the role of investment bankers in the going public process. Their results indicate that the midpoint of the offer price range is better at predicting the value of the firm than market multiples. This is consistent with investment bankers adding value in pricing new issues. It can be observed that some firms that sell-out do not employ the use of an investment bank, while all IPO firms do. If investment bankers do add value, we should expect to see the premiums on transactions where the target has no investment banker to be higher and the multiples to be lower than those that do employ their services.

4.3. Data and methodology

We select both the sell-out and IPO sample from the Securities Data Corporation's (SDC) databases on U.S. Mergers & Acquisitions and U.S. Global New Issues, respectively. Dates are restricted to 1995 - 1999 for the announcement date of sell-outs and the issue date of IPOs.⁹ Finding financial statements for private corporations that do not "go public" via an IPO is difficult. We document this process here, as it is a meticulous one and may create ideas of large bias given the large number of private takeovers occurring within this period and the relatively small sample we are left with. Additionally, we execute event study analysis on two sets of

⁹ There are two particular reasons why these dates are chosen. The first is that this period of the 1990s was an especially active IPO and takeover market. Transactions were abundant spanning multiple industries.

private acquisitions to test the similarity between our final sample and a sample of all private takeovers where the acquirer is covered by CRSP, to test for any biases that the market may reveal in announcement returns. We find there to be no difference in the abnormal announcement period returns between the sample firms and sell-outs as a whole.

The following outline provides detail on the sample selection process for the sell-outs.

Private takeovers must satisfy the following constraints:

1. Starting with the U.S. Mergers & Acquisitions database, we identify all targets with a disclosed dollar value. This step leaves 7,471 transactions.
2. The deal value must be at least \$50 million. SDC defines deal value as the total value of consideration paid by the acquirer, excluding fees and expenses. This step leaves 6,018 firms.
3. The target must be a private firm based in the United States. This step leaves 1,661 firms.
4. The acquirer must be a publicly traded U.S. firm traded on the AMEX, NASDAQ or NYSE. This step leaves 1,144.
5. Financials and utilities are removed leaving 813 firms.
6. The deal value must be at least 10% of the acquirer's net assets. Ten percent is the level of materiality as defined by the S.E.C. Significantly more data are available from acquirer filings when the target crosses this threshold and those firms less than 10% are more difficult to find in a timely manner. This step leaves 608 firms.
7. The firm is neither a spin-off, roll-up, nor a subsidiary. This leaves 577 firms.
8. For takeovers, there must be financial data for the private target in the form of an S4, 8K, S3, Proxy, or S1. This leaves 549 private takeover transactions.

Secondly, the Securities Exchange Commission's EDGAR database begins keeping electronic filings in 1995 for sell-outs and in 1996 for IPO prospectuses, making data collection somewhat easier.

Of the 549 possible transactions, we are able to find 366 transactions with at least one year of historical financial statements. All of the data used in the analysis are collected using Disclosure Global Access and the Securities and Exchange Commission's EDGAR database.

We gather similar data for IPOs from their prospectuses filed on the issue date. For sell-outs, the relevant information is collected from filings made by the acquiring firm. Securities regulation S-X states that "if securities are being registered to be offered to the security holders of the business to be acquired, the financial statements...shall be furnished for the business to be acquired..." The exceptions to this regulation are for those targets that are not significant acquisitions. Significant acquisitions are those that have a deal value in excess of 10% of the acquirer's total assets. Furthermore, there are many targets that do not have a full 3 years of historical financials. This is due, in part, to the large number of development stage corporations that are acquired. In addition, there are also requirements found in regulation S-X that relate the number of years of historical statement reporting required to the relative size of the target to the acquirer.¹⁰

Firms that issue equity in conjunction with a business combination file S4s while "significant" transactions, as discussed above, are found in 8K, S1, S3 and proxy filings. The S4 filings, along with the prospectuses for IPOs, provide historical financial statements, records of fees paid by the target to, and the name of, the investment banker employed, a timeline of events leading to the purchase, reasons for the transaction, and the ownership structure of the firm prior to and after the acquisition or IPO. Matsusaka (1993) only observes sell-outs that were fully or partly financed with an equity issuance, while approximately 30% of sell-outs in this sample are cash deals that have no partial equity financing.

From the sample of private takeovers, a matched set of IPO firms is created. IPO firms are matched to sell-out firms by industry and size. After considering IPOs that are within the

¹⁰ Additional reading on these requirements can be found in Regulation S-X, Rule 3-05 – Financial Statements of Businesses Acquired or to Be Acquired

same Fama-French (1997) industry classification, we select a matching IPO based on size.¹¹ For IPOs, size is defined as the market value following initial trading; for sell-outs it is defined as the deal value as reported by SDC. Finally, we select the IPO occurring closest to the announcement date of the matching sell-out. The IPO sample is collected from SDC given the following constraints:

1. The IPO firm must be based in the United States and traded on the AMEX, NASDAQ or NYSE.
2. Financials and utilities are excluded.
3. The market value of the company performing the IPO is more than \$50 million.

This procedure leaves 1354 IPOs. From these firms we choose a matched sample of IPOs for the sell-out sample. For about 30 sell-outs same Fama French industry IPOs could not be found. We then find matches based on two and then one-digit SICs.

Table 4.1 presents descriptive statistics of the frequency and size of all reported IPO and sell-outs on SDC. The number and value of sell-outs is greatly understated since acquiring firms are not required to report, nor publicly announce, insignificant acquisitions. This is most keenly seen in a February 4, 2002 Wall Street Journal article:

Tyco International Ltd. said it spent about \$8 billion in its past three fiscal years on more than 700 acquisitions that were never announced to the public. ...[Tyco's chief financial officer] said the company doesn't disclose details on its numerous smaller deals because they aren't "material" given Tyco's huge size.

Table 4.1 relates that the majority (79.1%) of the 3,827 sell-outs reported by SDC from 1995 to 1999 are firms that are valued at less than \$50 million. The inverse is true for IPOs; over 78% of the 1,824 IPOs reported by SDC from 1995 to 1999 are valued by the market at over \$50 million. So, in general, sell-outs are relatively smaller transactions than IPOs, but occur with much greater

¹¹ If Fama and French industry matches cannot be found firms are matched 3-digit and 2-digit SIC codes.

Table 4.1

Value Distribution of All IPOs and Sell-outs from 1995 – 1999.

This table presents aggregate numbers for IPOs and sell-outs from 1995 to 1999 as reported by the Securities Data Corporation. The first column is based on groupings of firm value. Sell-outs are valued by deal value defined as the total value of consideration paid by the acquirer, excluding fees and expenses. IPO value is market value defined as the midpoint of the price on the opening day multiplied by the number of shares outstanding. The middle columns present the number of transactions occurring within in each value category. The final column represents the total number of private-to-public transactions per value category. The final row represents the total number of private-to-public transactions.

Value (\$mil)	IPOs	Sell-outs	Total
< \$5	2	922	924
\$5 - \$9.99	17	568	585
\$10 - \$49.99	374	1,539	1,913
\$50 - \$99.99	385	364	749
\$100 - \$499	810	389	1,199
\$500 - \$1,000	133	33	166
> \$1,000	103	12	115
<i>Total</i>	<i>1,824</i>	<i>3,827</i>	<i>5,651</i>

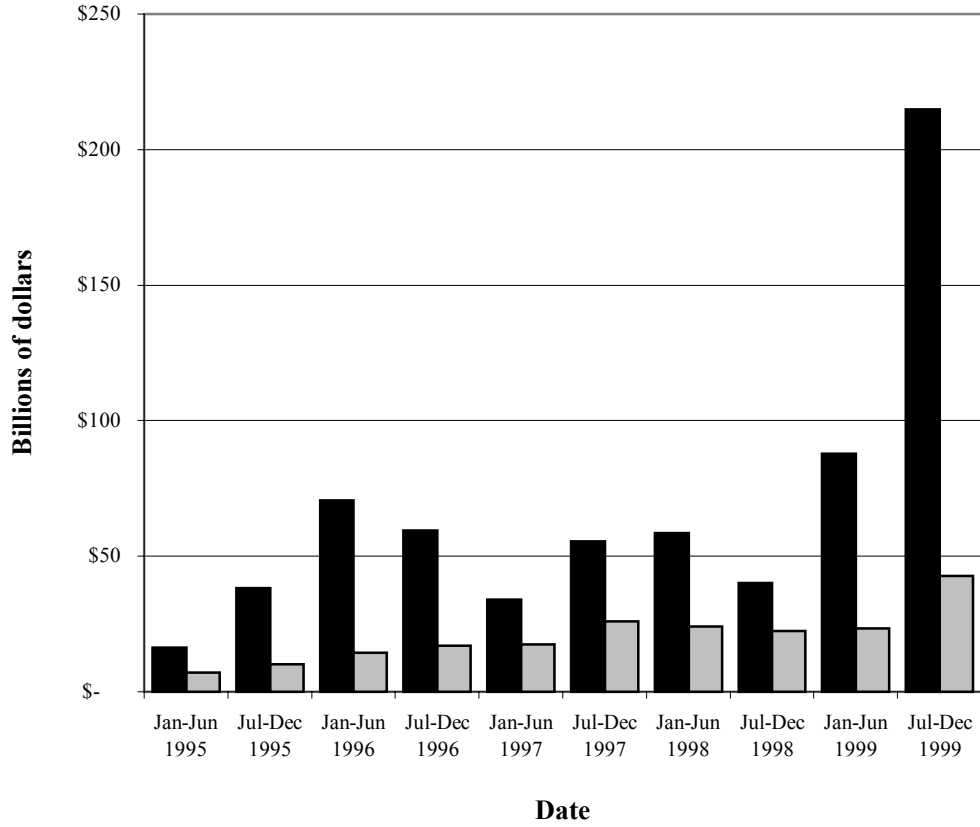
frequency. More than 67% of the 5,651 private to public transactions reported by SDC from 1995 to 1999 are sell-outs.

More specific information on the size of the transactions and the year in which they occur is shown in panel A of Table 4.2. The average (median) size of a sell-out is \$49.8 (\$14.7) million compared to \$333 (\$121) million for IPOs. The total value of firms involved in IPOs dominates the total value of firms undergoing a sell-out; from 1995 to 1999 \$607 billion transitioned from private to public ownership via IPO versus \$190 billion via sell-out. This domination is represented graphically in Figure 4.1. In every six-month period, IPOs are shown to far exceed sell-outs in terms of dollar value. Figure 4.1 also shows the somewhat sporadic nature of IPOs in comparison to sell-outs.

Another interesting trend shown in panel A of Table 4.2 is the time trend in deal size within sell-outs and IPOs. There is a distinct trend for both transactions in which the mean and median deal size increases over the period analyzed. Sell-outs more than double in the amount paid per deal from an average (median) deal value of \$31 (\$10) million in 1995 to \$77 (\$20.6) million in 1999. This trend is even more distinct for IPOs; the average (median) deal value in 1995 is \$137 (\$71) million and is \$719 (\$304) million in 1999. IPO deal values more than quintuple during the last 5 years of the 1990s.

The timing of these transactions is another issue presented in panel A of Table 4.2. In my sample, the frequency of IPOs, relative to sell-outs is quite time sensitive. This is primarily the result of the cyclical nature of “hot” IPO markets, whereas sell-outs tend to be more evenly distributed across time. Additionally, there appears to be some substitution between IPOs and sell-outs. For IPOs, 1997 and 1998 were the two lowest years in terms of number of deals. The same years were the highest two years for sell-outs. Figure 4.3 relates this relationship graphically in six-month increments. The worst six months for IPOs, July to December of 1998,

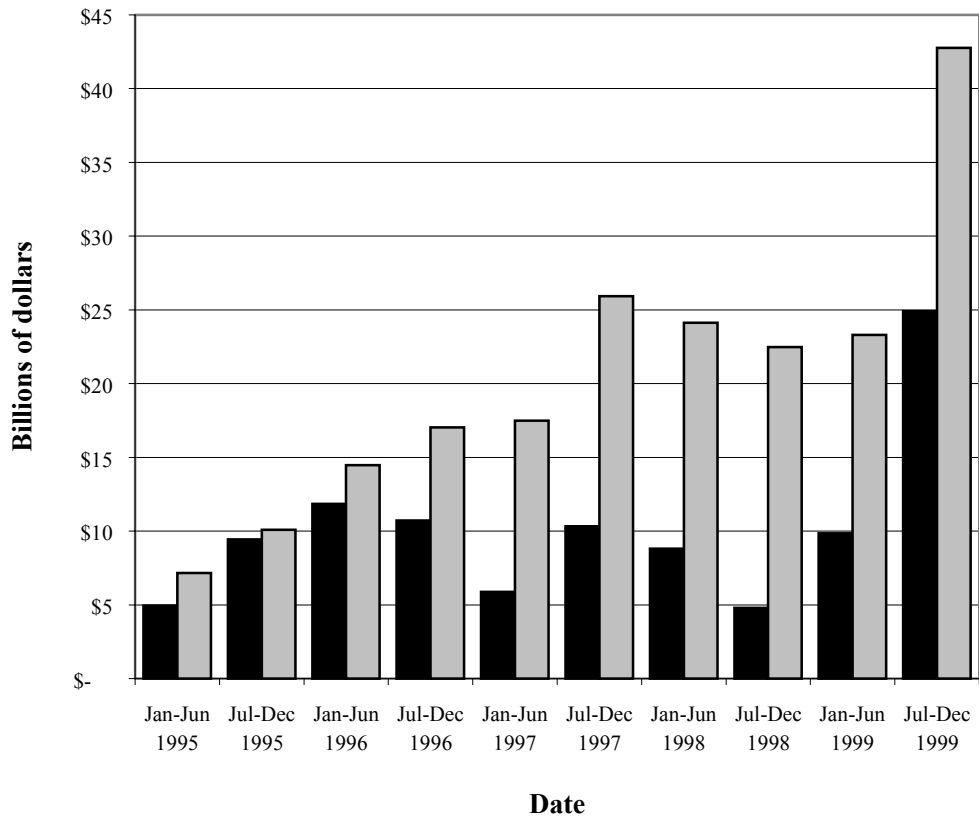
Figure 4.1



Billions of Dollars per Six Months Transitioning form Private to Public Ownership from 1995 through 1999

This table compares the value of IPOs and sell-outs from 1995 to 1999. The black bars represent all IPOs and the gray represents all sell-outs. These are aggregate numbers and represent more than the firms in this study.

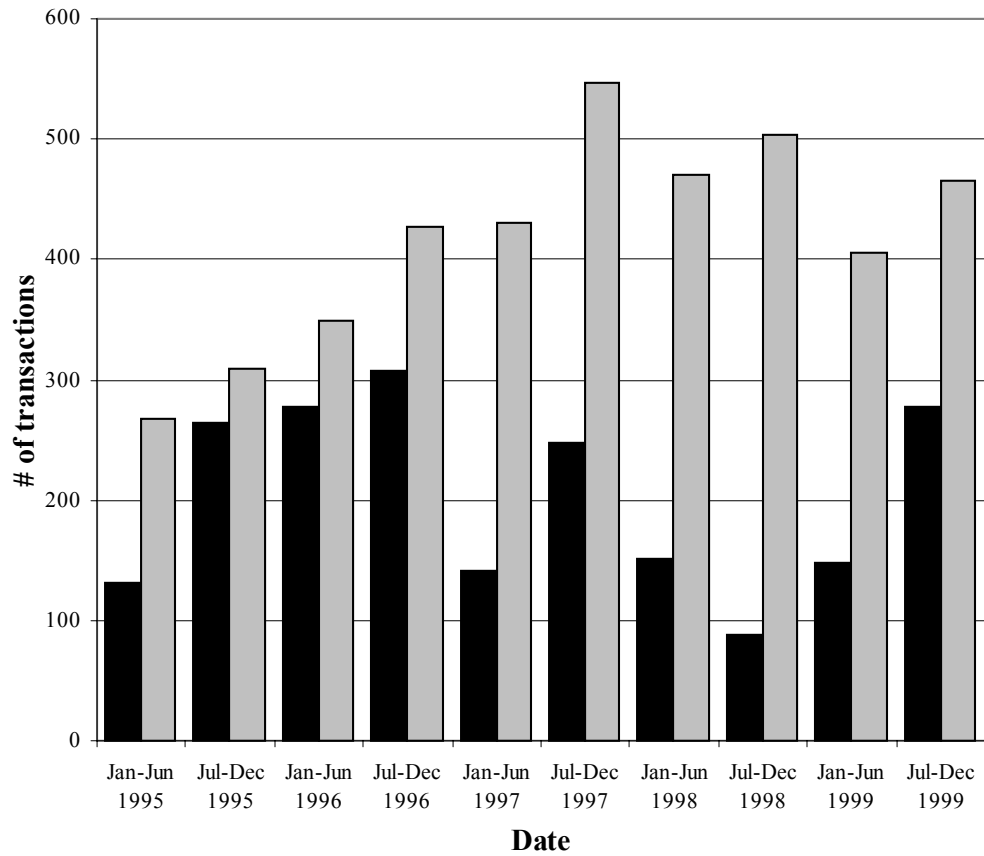
Figure 4.2



Total dollars paid per six months for all IPOs and sell-outs from 1995 - 1999

This table compares the amount of proceeds raised during IPOs and the dollars paid for sell-outs from 1995 to 1999. The black bars represent all IPOs and the gray represents all sell-outs. These are aggregate numbers and represent more than the firms in this study.

Figure 4.3



Number of deals per six months for all IPOs and sell-outs from 1995 - 1999

This table compares the total number of IPOs and sell-outs from 1995 to 1999. The black bars represent all IPOs and the gray represents all sell-outs. These are aggregate numbers and represent more than the firms in this study.

Table 4.2**Values of Sell-outs and IPOs from 1995 through 1999**

The following table describes the size and number of deals in a given year. The total row provides the average deal value and also sums the deal values and number of sell-outs and IPOs. Deal value is defined as the total value of consideration paid by the acquirer, excluding fees and expenses. Market value is defined as the midpoint of the price on the opening day multiplied by the number of shares outstanding. The average, median and total columns are reported in millions of dollars.

	Sell-out Deal Values				IPO Market Values			
	<i>Average</i>	<i>Median</i>	<i>Total</i>	<i>N</i>	<i>Average</i>	<i>Median</i>	<i>Total</i>	<i>N</i>
Panel A: All transactions								
1995	30.9	10.0	16,433	531	137.7	71.1	49,013	356
1996	42.1	13.6	29,951	712	214.3	101.6	113,798	531
1997	44.6	13.1	40,377	905	226.7	95.9	79,344	350
1998	48.2	16.2	42,822	888	442.8	159.6	90,341	204
1999	77.0	20.6	60,892	791	719.1	303.8	275,433	383
<i>Total</i>	<i>49.8</i>	<i>14.7</i>	<i>190,463</i>	<i>3,827</i>	<i>333.3</i>	<i>120.9</i>	<i>607,930</i>	<i>1,824</i>
Panel B: Sample transactions								
1995	163.4	112.0	4,084	25	-	-	-	-
1996	193.1	114.5	16,411	85	192.0	111.1	20,163	105
1997	169.7	94.0	12,898	76	154.5	93.8	17,459	113
1998	183.1	116.9	16,659	91	224.5	134.1	14,370	64
1999	244.3	130.7	21,744	89	302.1	167.3	25,373	84
<i>Total</i>	<i>196.2</i>	<i>113.1</i>	<i>71,798</i>	<i>366</i>	<i>211.4</i>	<i>122.6</i>	<i>77,365</i>	<i>366</i>

was the second best six-month period for sell-outs in terms of number of deals that transpired. Figure 4.3 shows the cyclical nature of the IPO market, even over a short period of time. The figure details the number of transactions per six-month period and shows the relatively small number of IPOs in comparison with sell-outs. In five out of the 10 six-month periods, there were more than 200 IPOs. For sell-outs, 7 of 10 six-month periods have more than 400 transactions and only one six-month period has fewer than 300 sell-outs. The volatility of IPOs in relation to sell-outs, for this sample period, is suggested in the mean and standard deviation of deal numbers. The mean and standard deviation of IPOs per six months is 184.5 and 69.1, respectively. For sell-outs the mean and standard deviation are 429.2 and 93.4, respectively.

In terms of ownership changing hands, Figure 4.2 shows that sell-outs represent a larger proportion of dollars that transitioned from private to public ownership. The reason for the shift is that during the IPO process only a portion, typically less than 30%, of the firm is sold to public shareholders. During a sell-out, the entire firm is purchased.

Panel B, of Table 4.2, provides the same statistics as Panel A, only for the final sample of sell-outs and IPOs. Note that we match the 1995 sell-outs to IPOs from 1996 since we were not able to identify any IPO prospectuses on either EDGAR or Compact Disclosure for 1995. Panel B shows that the two samples are very comparable in average, median and aggregate size. The average, median and total size of sample sell-outs is \$196 million, \$113 million and \$72 billion, respectively. For IPOs, these measures are \$211 million, \$122 million and \$77 billion, respectively. Finally, the apparent upward change in the size of deal values seen in panel A is only slightly observed for our sample of sell-outs and IPOs. Sell-outs increase somewhat in the amount paid per deal from an average (median) deal value of \$163 (\$112) million in 1995 to \$244 (\$131) million in 1999. This trend is also observed in the IPO sample; the average (median) deal value in 1996 is \$192 (\$111) million and is \$302 (\$167) in 1999. In the context of the Table 4.1, this study compares average-sized IPOs to larger-sized sell-outs.

Table 4.3 reports additional statistics on the success of the matching procedure. The median (average) difference in size of the two samples is \$7.9 (\$59) million. Industry comparisons show that 344 of the 366 sample firms were perfectly matched by Fama-French industry. Of the 22 firms which are not matched by Fama-French industry, 14 do not have an adequate 2-digit SIC match. The average difference in year matching is 0.5 years, and the median difference in years is zero.

4.4. Theory on influencing firm characteristics

We hypothesize that firm level characteristics, such as growth rate, informational asymmetries, pre-transaction profitability, ownership structure and capital structure, influence private owners' decision between undergoing an IPO versus sell-out. In this section, we provide additional theoretical discussion on the influence of firm characteristics on the choice of transaction made by the entrepreneur and other owners of the firm.

4.4.1. Growth

The growth characteristics of the private firm may influence the choice of transition method for private-firm owners. These characteristics may also be valued quite differently between diverse shareholders and an individual firm.

Private firms have different growth characteristics at the time of transition. These characteristics range from a capital-starved firm with many opportunities, to a mature firm producing a great deal of cash flow but having few positive net present value projects in which to invest. In an IPO, the private firm is able to raise public capital and allocate it to projects that management deems most important. The ability to raise public capital is also relevant for sell-outs but in a constrained framework. After the sell-out is completed, the investment opportunities of the sell-out firm must compete with other subsidiary operations for scarce resources within the merged firm. This competition for resources within a conglomerate is otherwise known as the internal capital market. Stein (1997) suggests that the internal capital market, which the sell-out

Table 4.3

The Goodness-of-fit for the Matching Procedure of IPOs and Sell-outs

Descriptive statistics for the matched sample of IPOs and sell-outs is reported in this table. The first column represents the difference in size, as measured by the deal value of sell-outs and the initial market value of IPOs, between the two samples. Column two shows the number of firms that we are able to match using Fama and French (1997) industries. It also reports firms that are matched by two digit SIC and the remainder of firms that are either matched by one digit SIC or matched without using industry as a criteria. The last column displays the difference in the transaction year between IPOs and sell-outs.

Difference in size	Industry differences	Difference in years
Mean = \$59.8	Exact matches = 344	Mean = 0.5
Median = \$7.9	Mismatched = 22	Median = 0
Standard deviation = \$174.9	Mismatched in different 2-digit SIC = 14	Standard deviation = 0.87

firms face after transition, may enhance the value of the overall firm as managers are able to allocate funding to winners, known as winner picking. However, Stein also shows that these same firms may be likely to participate in “loser sticking” – allocating funds to poor performing projects on the basis of it being a pet project. Whether conglomerates “loser stick” or “winner pick” is testable in our framework, since we observe whether the firms with the greatest growth opportunities choose IPO or sell-out.

In contrast to the probability of not receiving adequate funding resulting from an internal capital market allocating funds, it can be argued that the sell-out firm may enjoy a reduced cost of capital thereby causing marginal projects which would have previously been rejected to be considered value enhancing. The costs of capital for the newly acquired firm as a part of the parent should be less than a similar IPO firm, as the cost of raising capital is spread across the different functional areas of a diversified corporation. This reduction in the cost of capital may also result from the sell-out being a part of a larger firm with increased debt capacity relative to a firm that undertakes an IPO. Thus, there may be an initial aversion of high growth firms from undergoing a sell-out due to the constraints imposed by an internal capital market. By undertaking an IPO, the firm may have greater flexibility in accessing resources, but this comes along with a higher cost of capital.

We hypothesize that firms with greater growth potential will choose IPO over sell-out. Although sell-outs may procure capital more cheaply, via the internal capital market, it is that very market which also may constrain the newly formed subsidiary from gaining full access to the capital it desires.

4.4.2. Profitability

In this section we develop a hypothesis linking firm profitability to the chosen form of transition. The ability of a firm to produce sustainable profits may have a significant impact on the marketability of a firm to the general public. In other words, the earnings of a firm may serve as the single best proxy for the probability of future positive performance. Conversely, poor

profitability may simply result from a firm being in the development stage, or it may be the result of less than stellar management or inefficiencies due to small scale. We control for development stage firms by including the years of operating history of the firm in a logistic regression framework and any agency issues are addressed further in additional analysis.

We hypothesize that, controlling for longevity of the firm, more profitable private firms will choose an IPO over sell-out. More profitable firms will choose IPO as the preferred method of transition since individual investors and money managers will place more emphasis on historical returns as an indicator of future profitability than an individual firm interested in the assets of the corporation. Less profitable firms should be bought out more frequently as they will be better able to attain an optimal scale, or replace average or poor management with managers that have been recruited by public corporations.

4.4.3. Asymmetric information

The buyer's ability to gather and properly assess information of the firm seeking transition plays an important role in determining the method by which a firm transitions out of private ownership. Private-firm management may possess information on firm-specific assets that is not be easily valued by diverse public shareholders or that is not favorable. According to the theory of Ellingson and Rydquist (1997), these firms will choose a direct sale rather than undergo the lengthy regulation and information disclosure of an IPO.

Subscribers to an IPO are, in general, institutional managers that do not have particular expertise in the operational intricacies of the private firm. These managers then offer the shares to a dispersed group of even more uninformed investors. While investment bankers and money managers are more informed than the general investor, they cannot value a set of assets that have unique qualities as well as another firm with the same types of assets. Another company operating in a similar industry environment to the private firm may be best able to accurately value these firm-specific assets. Additionally, firm-specific information may retain its value only when the information is not accessible by competitors as suggested by Chemmanur and Fulghieri

(1999). By keeping information undisclosed the private firm is able to hold a competitive advantage over other firms in the same industry, both public and private. Undertaking an IPO exposes firm-specific information much more than if the firm were acquired by another public company. The merged entity will be better able to hide any proprietary information due to the added complexity of a consolidated firm. The benefit of non-disclosure, however, is a trade-off for a transaction that may not value growth options as highly. Contrary to keeping information from the public, Mello and Parsons (1998) suggest that information dissemination is the very reason a firm will choose an IPO. Information release will cause the firm to be more accurately, and more highly, valued.

All of the hypotheses suggested by the literature in the preceding paragraphs on asymmetric information are testable in this paper given our set of sample firms. Our hypothesis is that firms with large amounts of asymmetric information will choose a takeover by a public firm over those firms with assets that are more easily valued by dispersed public shareholders that are involved in an initial public offering. Stated differently, we believe that a sell-out best resolves asymmetric information in the context of shifting from private to public ownership.

4.4.4. Agency costs

The stockholder – manager conflict is a non-trivial factor in assessing both the valuation of the private firm and the type of transaction, IPO or sell-out, a private company undertakes. While agency costs are traditionally thought of in relation to public companies, recent studies on the relationship between entrepreneurs and institutional owners, primarily venture capitalists, have brought agency costs to bear within the framework of a private company. It is important to consider the valuation effects of such agency costs. If private owners choose the transaction that maximizes the value of the firm, then, all else equal, we should find those firms with the smallest agency costs being more highly valued. Additionally, it is important to analyze the type of transaction that would best mitigate these agency costs *ex post*. Consequently, it is important to evaluate the agency costs of IPO and sell-out firms prior to the going public transaction.

A traditional proxy for agency costs is the level of insider ownership. In general, firms with a greater amount of insider ownership have fewer agency costs. Demsetz and Lehn (1985) explain that ownership levels are in fact structured in such a way as to maximize the value of the firm. So, as Lehn, Netter and Poulsen (1990) argue, the level of agency costs at which a firm can competitively operate varies by the firm's ability to internalize agency costs. They argue that smaller, more closely held firms may have fewer agency costs relative to larger, more diffusely held firms. However, the larger firm can realize cost savings due to efficiencies resulting from scale and is therefore able to operate competitively by balancing its agency costs with scale efficiencies. These costs and benefits are balanced in such a way as to maximize the value of the firm. We predict that sell-out firms are firms with higher agency costs than IPO firms, since they are merged with a larger public entity and are therefore able to realize immediate operational efficiencies to offset their increased agency costs. This prediction goes hand-in-hand with our prediction of IPOs having a greater amount of insider ownership in the next section. In addition, sell-out transactions will be better able to replace wayward management, which is another contributor to agency costs with management from a rich talent market found in public company arenas.

Jensen's (1986) free cash flow theory suggests that agency costs are directly related to the firm's amount of free cash flows. As managers have increased access to the cash flows not reinvested into positive NPV projects and not paid out to shareholders as dividends and debt holders as principal and interest payments, potential for agency costs rise accordingly. Even in privately held firms there is room for shirking, and managers are not always shareholders. We provide additional theoretical evidence as to why we should expect sell-outs to have large agency costs based on the free-cash flow theory and the hypothesis we have drawn from our discussion on the influence of growth characteristics and transition choice. If IPO firms are higher growth firms, as we have suggested, then we should expect to see those firms have fewer undistributed

free cash flows, and thereby have lower agency costs. Further discussion on how constrained cash flows influence choice of transition method is discussed in section 4.7.

4.4.5. Ownership

Perhaps, the most significant consequence of a “going public” transaction is dilution of ownership. Pre-transaction owners must consider the amount of control they will lose and the resulting trade-offs. In sell-outs there is a massive dilution effects coupled with immediate liquidity, and an IPO is less-dilutive but more illiquid initial public offering. Casual observation of sell-outs and IPOs suggest that the dilution of ownership during a sell-out is much greater than that occurring after an IPO. In an IPO owners sell off a portion, typically less than half, of their stake in the private firm. However, a sell-out entails selling the whole entity to a public company that is most often comprised of diverse shareholders. Unless the acquiring firm pays with stock, the owners of the private company retain no ownership of the newly merged company. In the event that stock is used as a method of payment, the private company is typically so small that, at most, original owners may acquire a minority block of the merged firm’s stock. In contrast, the dilution effects of an IPO are relatively minimal since the average IPO, in this sample, leaves the original owners with approximately 73% of their pre-transaction ownership of the firm. In the context of McConnell and Servaes’ (1990) findings on the relationship between value and insider ownership, our hypothesis is that firms with lower insider ownership and with greatest change in insider ownership will be acquired versus undergo an IPO.

Further insight on how ownership influences the choice of transaction is found in understanding the life-cycle of a private firm. Ownership, or the level of control rights, are negotiated throughout the life of a private firm. As these firms have need for an infusion of capital insiders must decide among choices of investment that demand differing amounts of control rights. In the years or months leading up to the transition from private to public ownership, owners have had numerous opportunities to relinquish ownership and perhaps even fully exit their initial investment altogether. “Angel” investors, venture capitalists, banks, large

corporations and other institutional investors offer entrepreneurs capital in exchange for a significant ownership stake in the firm. Many institutional investors, such as venture capitalists, invest in private firms simply to recognize a capital gain when the firm is sold to the public or to another firm. Individual investors, however, are often founders, friends of the founder or original investors in the private firm. While some of these investors prefer the entrepreneur to stay invested in the firm, there may be adequate opportunity for the original owners to completely cash out before an exit via sell-out or IPO. All else being equal, firms with a small amount of insider ownership may find it easiest to transition via a sell-out, due to reduced regulatory requirements. In addition, those firms where insiders have a smaller stake in the firm may value their control rights significantly less than those firms where insiders have struggled to retain control over the decisions of the firm. Thus, the pre-transaction ownership of insiders should have a significant impact on the choice of transition method. We hypothesize that firms with low insider ownership will be more likely to sell out to a public corporation via a takeover, whereas firms with a high percentage of insider ownership will be more likely to undertake an IPO.

An additional explanation for this hypothesis is that insiders owning only a small portion of a private firm may be more interested in liquidity and diversification of their financial and human capital, than insiders that have kept a large proportion of their control rights until the time of the transaction. Therefore, these owners will be observed to choose a sell-out as ownership is quickly transferred into capital that is liquid and diversifiable.

4.4.6. Management efficiency

The quality of private firm management and the firm's resulting efficiency, or performance, is as highly variable as the observed outcomes of private companies. Some are incredibly successful while others are failures. While not all of the traditional theories on the market for corporate control apply to the private takeover market, due to the private firms' ability to completely block a takeover bid, it is important to understand that they may have some bearing on choosing sell-out as a method of changing ownership. The primary theory we examine here is

that of purchasing a poor-performing firm in order to replace old management with management better able to eek out additional efficiencies from the firm's assets. In particular, we want to test whether our sample of sell-outs are those firms that may be pressured by a large institutional blockholder to sell the firm in order to gain some return on investment. In other words, are sell-outs simply firms that could go public via an IPO if they had better management? We hypothesize that the management of sell-out firms will be less efficient than the management of IPO firms since they are the firms most likely to benefit greatest from a change in management.

4.4.7. Capital structure

Myers (1984) develops theory suggesting a strong link between a firm's growth options and their aversion to finance investment projects with debt. Smith and Watts (1992) show that a firm's investment opportunity set, or growth options, is strongly related to the firm's financial policy. In particular, they find that public firms with larger amounts of growth options are more likely to use equity financing than those firms with fewer growth opportunities. Growth options are highly valued at the time of transition from private to public ownership, as the owners of control rights will ultimately determine whether projects are funded or not. In the case of sell-outs and IPOs, capital structure may be the very constraint that spurs a firm to seek public financing. A firm constrained by a large amount of debt may repay it by an issue of public equity that is subsequently used to pay-off outstanding debt. Similarly, a firm with few investment opportunities may seek to be purchased from a firm with a larger capacity for debt, thereby reducing free cash flows and agency costs. Related to our previous discussion on growth, we hypothesize that those firms with a greater probability of financial distress or that are constrained by a leveraged capital structure will more frequently undertake an IPO in order shift free cash flows from debt repayments to investment in positive NPV projects.

4.5. Results

This section describes the empirical results and their relation to the hypotheses developed in section four.

4.5.1. Reasons for transition through the eyes of owners

Before we analyze the empirical data on firm characteristics that determine the method of transition, we observe the reasons for transition from private to public ownership, stated in SEC filings. Table 4.4 presents the reasons listed in the SEC statements. We were able to collect reasons for transition from 78 sell-out documents, concentrated in S4 statements, and all 366 IPO prospectuses. The discrepancy in number of filings is due to the uniform filing requirements for IPOs and the more scarce and non-mandatory nature of the corresponding information for sell-outs. The reasons stated in the SEC documents vary greatly between sell-outs and IPOs. The top reasons given from sell-out and IPO firms for transition are liquidity and repayment of debt, respectively. Liquidity was mentioned in 71% of sell-out documents and repayment of debt was listed in 62% of IPO documents. These two reasons alone show that both the stage of firm development and the mindset of management are important factors in the decision of transition choice. In addition, the repayment of debt by IPOs is consistent with the theoretical evidence of Myers (1984) and the empirical findings of Smith and Watts (1992).

Additional reasons given for an IPO focus mainly on the capacity of the firm to grow. Repayment of debt not only reduces the riskiness of cash flows, but also increases the amount of free cash flows available to the firm for reinvestment. Alongside the growth argument for IPOs, we see firms cite the ability to raise working capital 58%, future acquisitions 35%, capital expenditures 29%, research and development 18% and expansion 15%. This is further evidence of IPO firms being more growth-oriented than sell-outs as we suggest in section 4.1.

In sell-outs, it seems management may view the transition as an opportunity to harvest their initial investment and turn control over to the buyout firm in exchange for immediate

Table 4.4**Reasons Given for the Transition from Private to Public Ownership**

The following table represents reasons found in S.E.C. filings for private firms either being acquired by a public company or undertaking an initial public offering. Sell-outs are represented in the first three columns and IPOs are represented in the last three. There are more observations for IPOs since the information gathered from prospectuses for IPOs is uniform, while the corresponding information for sell-outs is scarcer and not always mandatory. In addition to the reason reported by the private firm, the frequency with which the reason is reported is recorded in both absolute and percentage terms.

Sell-outs (N=78)			IPOs (N=366)		
<i>Reason</i>	<i>#</i>	<i>%</i>	<i>Reason</i>	<i>#</i>	<i>%</i>
Liquidity	56	71.8%	Repay debt	227	62.0%
Access to capital	37	47.4%	Working capital	213	58.2%
Favorable tax consequences	28	35.9%	General purposes	201	54.9%
Economies of scale	26	33.3%	Acquisitions	131	35.8%
Growth	20	25.6%	Capital expenditures	108	29.5%
Access to workforce	14	17.9%	Research & development	67	18.3%
Research & development	14	17.9%	Expansion	56	15.3%
Access to distribution channels	12	15.4%	Pay distribution	31	8.5%
Improve financial position	12	15.4%	Redeem preferred stock	27	7.4%
Corporate diversification	11	14.1%	Marketing	10	2.7%
Reduce risks associated with small firm	11	14.1%	Repurchase stock	7	1.9%
Synergies	10	12.8%	Advertising	5	1.4%
Access to customers	9	11.5%	Pay dividends	5	1.4%
Industry consolidation	9	11.5%	Fund losses	4	1.1%
Complementary products/technologies	8	10.3%	Increase personnel	3	0.8%
Improve competitive position	8	10.3%	Improvements	2	0.5%
Publicly traded stock	8	10.3%	Joint ventures	2	0.5%
Shareholder diversification	8	10.3%	Investments	1	0.3%
Higher value than IPO	6	7.7%	Payoff dissenting shareholder	1	0.3%
Increase reputation	6	7.7%	Pay settlement	1	0.3%
Compatibility of firms	5	6.4%	Pay signing bonuses	1	0.3%
Increase market presence	5	6.4%	Reorganization	1	0.3%
Access to technologies	3	3.8%	Start-up expenses	1	0.3%
Less risk than IPO	3	3.8%	Strategic alliances	1	0.3%
Enhance stockholder value	2	2.6%			
Higher dividends	2	2.6%			
Strategic reasons	2	2.6%			
Access to proprietary information	1	1.3%			
Acquisition strategy of bidder	1	1.3%			
Board and management influence	1	1.3%			
Keep exec leadership of CEO	1	1.3%			
Meaningful role in new firm	1	1.3%			
Timing	1	1.3%			
Walk away agreement	1	1.3%			

liquidity. Other reasons taken from sell-out documents support this conjecture: 35% cite favorable tax consequences and 10.3% cite shareholder diversification as reasons for choosing a sell-out. We find this to be consistent with an agency motivated explanation of transition method, since managers who may also be owners desire a liquidity event, whereas other shareholders are more concerned about the long-term viability of the firm. Our evidence suggests that sell-out is the better solution to conflicts of interests among owners.

Although these transactions appear to be vastly different arenas for transition, we see numerous reasons overlap. Some of the main reasons listed for undergoing an IPO are also listed for sell-outs. Sell-out documents cite access to capital, growth opportunities and research and development in 47%, 25% and 18% of SEC filings, respectively. Similarly, IPOs cite working capital, research and development, and expansion in 58%, 18% and 15% of SEC filings, respectively. So while these transactions exhibit some stark differences, many reasons for transitioning from private to public ownership coincide. Therefore, it is misleading to think of these transactions as not being in the same information set of owners when transition to public ownership is considered.

4.5.2. Growth

We measure growth using several different variables similar to those used in Lehn, Netter and Poulsen's (1990) comparison of dual-class recapitalizations and leveraged buyouts. Simple growth rates in revenues, total assets, cash flows, and earnings are reported in Table 4.5. We also examine scaled capital expenditures as a proxy for growth in Table 4.6. These two items serve as a sign of the firm's commitment to future development and thus serve as informative ratios for assessing the growth prospects of the firm.

Table 4.5 presents univariate statistics on different growth measures of IPO and sell-out firms. The first measure is growth in revenues. We find that in the two years prior to the "going public" transaction IPO median (average) revenue growth is 34% (360%) for the year prior to transaction and 29% (116%) for the year before that. These growth rates are significantly greater

Table 4.5
Growth Rates for Accounting Numbers in Sell-outs and IPOs from 1995 - 1999

This table presents the growth rates for sales, EBITDA (measured as operating income plus depreciation and amortization), net income, and total assets. Three years of pre-transaction data is available for income and cash flow statement variables. Balance sheet data is available for the two years prior to the transaction. For the middle columns the median growth rate is reported on top, with the mean reported in brackets, below. The last column represents the number of observations for rates for years -2 to -1 and for -3 to -2, respectively. Year 0 represents the year in which the transaction occurred. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	Years -2 to -1	Years -3 to -2	N
<i>Sales</i>			
Sell-outs	22.1%* [127%]	19.9%** [113%]	294, 202
IPOs	34.1% [360%]	28.7% [116%]	186, 164
<i>Total Assets</i>			
Sell-outs	16.4%* [112%]	-	300
IPOs	32.4% [204%]	-	191
<i>EBITDA</i>			
Sell-outs	20.4%** [53.9%]	15.7%*** [44.2%]	299, 205
IPOs	35.2% [15.4%]	24.2% [224%]	193, 171
<i>Net Income</i>			
Sell-outs	17.0%** [-54.2%]	8.4% [-45.9%]	299, 205
IPOs	33.5% [189%]	8.8% [24.3%]	193, 171

* significantly different at 1% level
** significantly different at 5% level
*** significantly different at 10% level

than the median (average) growth in revenues experienced by sell-out firms of 22% (127%) and 20% (113%) for the year prior and the two years prior to transaction, respectively. We also measure the aggregate growth of the firm by growth in total assets. Since there is only data for the two years prior to the transaction, we report only one growth rate for total assets. Median (average) asset growth for IPOs in the year prior to the transaction is 32% (204%), which is significantly higher than the median (average) growth in assets for sell-outs of 16% (112%).

Growth in cash flows and earnings are detailed in the last two sections of Table 4.5. We find that an IPOs cash flows and earnings grow significantly more in the two years prior to the transaction than sell-outs. The median (average) growth in cash flows, measured as operating income plus depreciation and amortization, for IPOs is 35% (15%) for the year prior to going public and 24% (22%) for the year before that. For sell-outs the median (average) growth in cash flows for the year prior to sell-out is 20% (54%) and 16% (44%) for the year before that. All of the median IPO cash flow growth rates are statistically significantly greater than the median sell-out growth rates. For earnings, only the median growth rate in the year prior to transaction is significantly different between IPOs and sell-outs. The median (average) earnings growth rate is 34% (189%) for IPOs in the year prior to the transaction, and is 17% (-54%) for sell-outs. In sum, our results for growth in revenues, assets, cash flows and earnings are consistent with private firm owners choosing IPOs over sell-outs when there is greater growth potential that may be more highly valued by the market than by another firm.

Further evidence of IPO firms being more growth-oriented than sell-out firms is presented in panel A of Table 4.6. We find that for the three years prior to transition IPO firms acquire a significant amount more capital than sell-out firms. The measurement we use in Table 4.6 panel A is capital expenditures, as found in the cash flow statement, scaled by sales. The -1, -2 and -3 year median scaled capital expenditures for IPOs is 7.2%, 6.8% and 4.7%, respectively. For sell-outs median scaled capital expenditures are 4.9%, 5.5% and 3.9% for years -1, -2 and -3, respectively. The IPO capital expenditures are significantly greater than those found for sell-outs

Table 4.6

Accounting Ratios in Sell-outs and IPOs from 1995 to 1999

This table presents ratios that proxy for growth, asymmetric information and agency costs. The ratios are research and development, capital expenditures, and advertising expenses scaled by sales. Three years of pre-transaction data is available for income and cash flow statement variables. Balance sheet data is available for the two years prior to the transaction. Year 0 represents the year in which the transaction occurred. For the middle two columns the median growth rate is reported on top, with the mean reported in brackets. The last column represents the number of observations per year. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	Year -1	Year -2	Year -3	N
Panel A: Growth				
<i>Sell-outs</i>				
Capex / sales	4.9%* [129%]	5.5% [218%]	3.9%** [37%]	362 (-1) 291 (-2) 199 (-3)
<i>IPOs</i>				
Capex / sales	7.2% [527%]	6.8% [463%]	4.7% [81%]	348 (-1) 328 (-2) 277 (-3)
Panel B: Asymmetric Information				
<i>Sell-outs</i>				
R&D / sales	0.0%* [120%]	0.0%* [273%]	0.0%* [92%]	366 (-1) 294 (-2) 202 (-3)
Advertising / sales	0.0% [7.7%]	0.0% [4.1%]	0.0% [22.2%]	366 (-1) 294 (-2) 202 (-3)
Intangibles / total assets	0.0% [7.6%]	0.0% [5.8%]	-	366 (-1) 336 (-2)
<i>IPOs</i>				
R&D / sales	0.0% [65%]	0.0% [248%]	0.0% [131%]	352 (-1) 330 (-2) 278 (-3)
Advertising / sales	0.0% [3.3%]	0.0% [4.1%]	0.0% [2.3%]	348 (-1) 328 (-2) 277 (-3)
Intangibles / total assets	0.0% [7.8%]	0.0% [6.7%]	-	366 (-1) 299 (-2)
Panel C: Agency Costs				
<i>Sell-outs</i>				
EBIT / interest expense	2.45* [6.02]	2.38* [7.66]	3.09* [107.7]	280 (-1) 227 (-2) 153 (-3)
Cash flow / equity	4.15%* [4.46%]	3.05%* [4.00%]	-	363 (-1) 296 (-2)
<i>IPOs</i>				
EBIT / interest expense	1.37 [-19.14]	1.40 [13.28]	1.48 [6.64]	295 (-1) 276 (-2) 230 (-3)
Cash flow / equity	1.11% [1.51%]	0.55% [1.01%]	-	365 (-1) 341 (-2)

* significantly different at 1% level

** significantly different at 5% level

*** significantly different at 10% level

in years -1 and -3, and are insignificantly higher in year -2. Altogether, this evidence is consistent with private firms that seek IPOs being those companies in which there is a higher degree of growth than those companies that choose to sell-out to a public firm.

4.5.3. Profitability

We measure pre-transaction performance with two separate accounting measures. The first is operating income scaled by sales; the second is operating income scaled by total assets. We report the raw operating returns of both in Table 4.7. Both return metrics show that sell-out firms are more profitable than IPO firms before the transaction occurs. Median return on sales for sell-outs range from 5.4% in year -2 to 6.1% in year -3; these numbers for IPO firms range from 2.0% in year -2 to 3.0% in year -1. Similar results are found when operating income is scaled by total assets. Median return on assets for sell-outs are 8.8% in year -1 and 8.0% in year -2. Again, the return metric is lower for IPO firms; they are 3.2% in year -1 and 2.9% in year -2. The initial profitability results are not consistent with our hypothesis that profitability is a proxy for future profitability and thus more profitable firms will undertake an IPO. We now consider industry-adjusted calculations.

After considering the raw operating returns, we control for the observed operating return for the industry and calculate an abnormal operating return by subtracting an industry return from the private firms' return metric. Our proxy for the industry return is the return on an equal weighted portfolio of publicly traded firms in the same two digit SIC. Overall, we find the performance of private firms significantly below that of publicly traded firms in the same industry. The median abnormal returns for both IPOs and sell-outs range from -1.1% to -7.7%, both statistically significant. This is surprising given the opposite results found by Matsusaka (1993). However, this result may be period specific due to the large volume of deals occurring in the latter half of the 1990s that are believed to be driven by irrational investor behavior. However, since this sample includes transactions by both corporations and individuals, we must conclude that either a large portion of the investment community, including institutions, was

Table 4.7**Median Operating Performance Prior to IPO or Sell-out**

The following table reports the median income of sell-outs and IPOs scaled by sales and total assets. Year 0 represents the year in which the transaction occurred. The median annual operating return is reported. Raw returns are simply the median operating return. Industry adjusted returns are calculated by subtracting the median operating return of the industry (two digit SIC), taken from public companies, from the median return of the sample firm. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	Year -1	Year -2	Year -3
<u>Sell-outs</u>			
<u>Operating income / sales</u>			
ROS	5.5%	5.4%	6.1%
Industry-adjusted ROS	-2.8% ^{c,*}	-3.8% [*]	-3.5% ^{c,*}
<i>N</i>	366	294	202
<u>Operating income / total assets</u>			
ROA	8.8%	8.0%	
Industry-adjusted ROA	-1.1% ^{a,*}	-2.3% ^{a,*}	
<i>N</i>	366	296	
<u>IPOs</u>			
<u>Operating income / sales</u>			
ROS	3.0%	2.0%	2.5%
Industry-adjusted ROS	-5.6% ^a	-7.7%	-7.2% ^b
<i>N</i>	352	330	278
<u>Operating income / total assets</u>			
ROA	3.2%	2.9%	
Industry-adjusted ROA	-6.7% ^a	-7.0% ^a	
<i>N</i>	366	335	
* significantly different at 1% level		^a significant at 1% level	
** significantly different at 5% level		^b significant at 5% level	
*** significantly different at 10% level		^c significant at 10% level	

irrational or that there is uncertainty in the latter 90s that is difficult to evaluate. When we compare IPO firms to sell-out firms we again find that sell-out firms perform better than, or, rather, not as poorly as, IPO firms do. Sell-out firm median abnormal return on sales is -2.8% , -3.8% and -3.5% , for years -1 through -3 , respectively. IPO firm median abnormal return on sales are significantly lower at -5.6% , -7.7% and -7.2% , for years -1 , -2 and -3 , respectively. We find this same pattern in median abnormal return on assets. Sell-outs have significantly higher return on assets of -1.1% and -2.3% compared to IPO firm returns of -6.7% and -7.0% for years -1 and -2 , respectively. This evidence also suggests that our hypothesis of IPO firms being more profitable firms is not acceptable.

In Table 4.8 we further examine the profitability of sell-out and IPO firms by performing an ordinary least squares regression with industry-adjusted return on assets as the dependent variable and several firm characteristics and a dummy for type of transition as independent variables. Results from the regression show that there is no difference in profitability in IPO and sell-out firms once size, measured as the log of total assets, and leverage taken into consideration. Characteristics that influence profitability in a positive direction are firm size (0.321) and the level of insider ownership prior to transaction (0.580); both are significant at the 1% level. Characteristics that have a negative influence on private firm profitability are leverage (-0.206), measured as long-term debt scaled by total assets, capital expenditures scaled by total assets (-0.425), and research and development scaled by sales (-0.044). The characteristics that have a negative influence on profitability are those that constrain the firm; firms with large amount of leverage must payout a significant portion of their profits in debt repayments; firms with large amounts of capital expenditures are using profits to grow the firm; and firms spending significant dollars on research and development are undertaking measures that reduce short-term profitability in the hopes of increasing long-term value. In short, while many things influence the profitability of firms undergoing a shift from private to public

Table 4.8**Ordinary Least Squares Regression Analysis of Factors the Profitability of Firms Transitioning from Private to Public Ownership from 1995 to 1999**

The following regression is calculated where the dependent variable is the abnormal return on assets of private companies involved in sell-outs and IPOs from 1995 to 1999. Return on assets is measured as year -1 earnings before interest and taxes (EBIT) divided by total revenues in year -1 net of the same return metric of an equal-weighted portfolio of publicly trade firms in the same two-digit SIC. IPO or sell-out is a dummy taking the value of 1 for IPO and 0 for sell-out. Firm size is measured by the natural log of total assets. Leverage is measured as total debt minus current debt scaled by total assets. Sales growth is the growth in sales from year -2 to year -1. Scaled capital expenditures is measured as capital expenditures scaled by total assets. Scaled research and development is measured as research and development scaled by sales. Age of the private firm is measured as the number of years between transaction date and the founding of the firm. Private firm insider ownership measures the percentage of the private firm owned by officers and board of directors (insiders). P-values are reported in brackets next to the parameter estimates.

Variable	(1)	(2)	(3)
Intercept	-2.951 [0.000]	-2.197 [0.000]	-3.680 [0.000]
IPO or sell-out	-0.085 [0.198]	-0.082 [0.232]	-0.055 [0.646]
Firm size	0.275 [0.000]	0.208 [0.000]	0.321 [0.000]
Leverage	-0.228 [0.001]	-0.141 [0.049]	-0.206 [0.012]
Sales growth	-	-0.015 [0.031]	-0.006 [0.420]
Scaled capital expenditures	-	-0.186 [0.248]	-0.425 [0.028]
Scaled research & development	-	-0.050 [0.000]	-0.044 [0.000]
Age of private firm	-	-	-0.002 [0.370]
Private firm insider ownership	-	-	0.580 [0.001]
Adjusted-R ²	18.1%	18.8%	30.2%
F Value	53.72 [0.000]	24.76 [0.000]	20.55 [0.000]
<i>Number of observations</i>	<i>732</i>	<i>615</i>	<i>362</i>

ownership, there is no evidence that profitability itself has any influence on the choice of IPO versus sell-out.

4.5.4. Asymmetric information

Table 4.9 presents results from comparisons of basic statistics of the IPO and sell-out samples. The second row of Panels A and B detail the historical value of assets of each firm. Given that we match on the dollar value of the transactions, we are able to use asset value as a measure of asymmetric information. In other words, a firm with similar market values but dissimilar asset values may be valued differently due to information disparity regarding the assets held by the private firm. We find that sell-out firms have larger balance sheets than do IPOs. The median total assets for sell-out firms is \$48 million; this amount is significantly different from the median total assets for IPOs of almost \$27 million. This suggests that the assets of these firms are less valuable, or are more difficult to value, on the open market. This finding is consistent with sell-outs being those private companies that have asset specific risks that are only identifiable by another firm with similar assets. These private companies will be more likely to be acquired than go public as diverse shareholders will be unable to value the assets correctly, thereby increasing the probability of undervaluing the firm.

We also use the age of the firm to proxy for possible asymmetric information. In a study by Cumming and MacIntosh (2001) on venture capital exits in Canada and the United States, they suggest that older firms tend to have a more established market, product and management team and a longer operating history. These characteristics will reduce informational asymmetries between the owners and potential investors, all else being equal. In Table 4.5, we provide results on differences in firm age. There is not a significant difference in the age of IPOs versus sell-outs as the 25th and 50th percentile is 4 and 8 years, respectively, for both sets of firms. The 75th percentile of operating history is 17 years for sellouts and 15 years for IPOs. In addition, we are able to decipher only 191 founding dates for sell-outs and 343 for IPOs.

Table 4.9
Descriptive Statistics for Sell-out and IPO Firms for Transactions from 1995 to 1999

The following table gives descriptive statistics for the sell-out and IPO sample. Sell-outs and IPOs are described separately in panels A and B, respectively. The first six rows of each panel are measured in millions of dollars. Undistributed cash flow is measured as earnings before taxes plus depreciation and amortization. Transaction expenses for sell-outs are defined as all direct expenses related to the takeover. This includes accountant, lawyer and financial advisor fees. For IPOs, expenses are the sum of underwriting commissions and total other expenses of issuance and distributions as listed in the prospectus of the offering. Columns represent the 25th, 50th and 75th percentiles and the final column represents the total number of IPO or sell-out observations for a particular statistic. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	25 th percentile	Median	75 th percentile	N
Panel A: Sell-outs				
Revenues prior to transaction*	\$16.4	\$48.1	\$118.6	366
Total assets prior to transaction*	\$12.2	\$35.9	\$80.9	366
Operating income prior to transaction*	-\$1.5	\$4.0	\$9.3	366
Undistributed free cash flow*	-\$1.3	\$4.7	\$10.9	363
Retained earnings*	-\$8.5	\$1.3	\$13.9	337
Dollar value of transaction	\$70.0	\$113.1	\$214.1	366
Years of operating history	4	8	17	191
Number of employees	126	279	1,040	64
Insider ownership prior to transaction*	35.5%	61.5%	78.1%	72
Insider ownership after the transaction*	8.3%	19.5%	37.5%	50
Change in insider ownership*	27.0%	45.9%	65.6%	40
Transaction expenses as % of deal value*	1.3%	2.1%	3.6%	186
Panel B: IPOs				
Revenues prior to transaction	\$7.6	\$26.9	\$76.1	366
Total assets prior to transaction	\$8.2	\$23.0	\$56.9	366
Operating income prior to transaction	-\$4.1	\$0.8	\$5.6	366
Undistributed free cash flow	-\$3.3	\$1.2	\$6.9	365
Retained earnings	-\$13.4	-\$2.7	\$2.1	364
Dollar value of transaction	\$75.0	\$122.6	\$219.7	366
Years of operating history	4	8	15	343
Number of employees	109	219	675	366
Insider ownership prior to transaction	51.0%	71.8%	90.8%	364
Insider ownership after the transaction	34.0%	50.8%	63.7%	364
Change in insider ownership	10.6%	17.3%	26.6%	364
Transaction expenses as % of market value	2.0%	2.7%	3.6%	366

* significantly different at 1% level

** significantly different at 5% level

*** significantly different at 10% level

An unreported logistic regression is performed where transaction method (IPO = 1 and sell-out = 0) is the dependent variable and age of the firm the only independent variable. This additional test using age as a proxy for informational asymmetries finds that age of the firm has no influence on the method of transition. Therefore, we have no evidence of increased informational asymmetries in sell-out firms when we consider the length of operating history.

In Table 4.6, we use three variables to measure the asymmetric information in the private firms at the time of, and leading up to, the transition. The first is research and development expense scaled by firm sales. We use research and development as it is difficult to value by the general market, but perhaps more easily valued by firms with which there are synergies to be gained. We find that the dollar amount invested in research and development is significantly greater for sell-outs than IPOs. While all of the medians for the three years prior to the transaction are zero, the average R&D expenditures scaled by sales is significantly greater for sell-outs in two of the three prior years. For sell-outs the average scaled research and development expenditure is 120%, 273% and 92% for years -1, -2 and -3, respectively; IPO firms' average scaled research and development expenditure is 65%, 248% and 131% for years -1, -2 and -3, respectively. We also measure information asymmetries by advertising scaled by sales and intangible assets scaled by total assets. All of the medians for each year are zero and are not significantly different from zero. Thus, we find some evidence that sell-out firm processes, such as research and development, that are more difficult to value by the general market, may be best valued by another firm with similar processes.

Our findings on research and development and asset size provide some evidence consistent with sell-out firms having more informational asymmetries than IPOs. Thus, these firms may choose a sell-out since they will be more difficult to value by diverse investors. This is consistent with Chammanur and Fulghieri's (1999) theory of firm-specific information being valued highly by the private firm and thus owners choose to undertake a sell-out in order to better conceal proprietary information. We also find evidence consistent with the theory of information

disbursement constructed by Mello and Parsons (1998). For IPOs, the dispersion of information occurring during the road show is quite valuable, as it reveals information about the firm's valuable growth options that would be otherwise unknown. We see here that the release of information can be detrimental to one firm, in the case of proprietary information about the firm's processes or assets, while being beneficial to another, as in relaying information about future growth.

4.5.5. Agency costs

We now analyze agency costs through the transition of private to public ownership. We first observe the number of private firms that have a compensation policy for executives and/or directors that is based, in part, on the performance of the firm. This includes stock option grants and restricted stock awards. We find that of the 732 firms in our sample, 74% (542) firms have some type of pay-for-performance compensation package in place at least one year before transition. This number is unequally weighted towards IPOs 98% (360) of IPO firms have some form of stock-based compensation; only 49.7% (182) of sell-out firms have stock-based compensation. The fact that the majority of sell-out firms do not have a stock-based compensation package compared to the existence of stock-based compensation in almost all IPO firms suggests that sell-out managers have less incentive to find the alternative that maximizes shareholder value. These managers may be concerned more with liquidity than with maximizing value. This result is consistent with agency costs being greater in sell-outs.

In Table 4.5, we find a significant difference in the median amount of cash flows that are undistributed to sell-out and IPO shareholders. Undistributed cash flows to stockholders is measured as earnings before taxes plus depreciation and amortization. We find that sell-outs have a median undistributed cash flow of \$4.7 million, while IPOs have a median undistributed cash flow of \$1.2 million. Although these numbers are not scaled they are measured from transactions of similar size and industry, so we can say with some confidence that sell-outs have more undistributed cash flow than IPOs. This finding is consistent with those firms with the

largest potential for agency problems taking the most drastic measures – replacing old management with presumably better managers whose compensation has the potential to be based on a highly liquid share price. We observe scaled undistributed cash flows, found in Table 4.6, later in this section.

We now examine scaled undistributed cash flow to security holders and interest coverage ratios in panel C of Table 4.6. First, we observe undistributed cash flows scaled by the market value of the firm. Our findings are consistent with the outcome of the raw undistributed cash flow numbers; for the two years prior to the transaction, the median (average) scaled cash flow for sell-out firms is 4.2% (4.5%) and 3.1% (4.0%), respectively. Median (average) scaled cash flows for IPOs are significantly lower; 1.1% (1.5%) for year –1 and 0.6% (1.0%) for year –2. These results support the hypothesis that those firms with the largest potential for agency costs undergo the largest changes to align the interest of owners and managers.

Next, we examine the relationship between interest expense paid by the firm and operating income. This variable proxies for the amount of income that is available beyond interest payments. Here we find that managers of private firms that are sold to public firms having a larger cushion of cash with which to pay debt holders than those firms that undertake an IPO. Sell-out firms' median (average) operating income to interest expense ratio is 2.5 (6.0), 2.4 (7.7) and 3.1 (108) for years –1, -2 and –3, respectively; for IPO firms the ratios are significantly lower at 1.4 (-19.1), 1.4 (13.3) and 1.5 (6.6) for years –1, -2 and –3, respectively. These results are consistent with managers of sell-out firms being more subject to the agency costs of free cash flows. The results also dispel any notion that sell-out firms may be those firms that are in financial distress or those firms that must undergo restructuring in order to continue as a viable corporation. Additionally, these results are consistent with IPO firms going public in order to repay debt, thereby increasing the cash flow available for positive NPV projects.

The dollar amount that investors pay for a private firm serves as the only observable market value that is comparable across IPOs and sell-outs. In Table 4.10, we document the dollar

amount paid for the firm as a multiple of earnings, cash flows, sales and total assets. We measure the market value of sell-outs as the deal value reported by SDC; for IPOs we use the product of opening market price and total shares outstanding. The difficulty using multiple valuation for these firms lies in the number of firms with negative cash flows. So, we use means and medians including and excluding firms with negative cash flows. Ultimately, the most stable valuation multiple measures are those using sales and total assets.

The results from Table 4.10 further support the hypothesis that those private firms with the greatest agency costs are purchased by another company and most likely have management replaced, versus those firms that undergo an IPO and keep pre-transaction management in place. We only discuss median results from Table 4.10. The median price-to-earnings (PE) multiple for sell-outs is 14.5 versus 10.0 for IPOs. Using the same median measurement, replacing earnings with cash flows in the denominator, we find that sell-outs and IPOs are valued at 9.2 and 6.9 times cash flow, respectively. Neither PE nor the EBITDA multiples for sell-outs and IPOs are significantly different from one another and they suffer from a number of negative multiples due to negative operating income. Assets and sales multiples, which have no negative values, indicate that private firms undergoing an IPO are valued significantly higher than those being bought by a public firm. The median multiple paid over sales for private firms undergoing a sell-out is 2.3 compared to a multiple of 4.2 for those firms in an IPO. Similarly, private firms in an IPO are valued at a median of 6.1 times total assets compared to a median of 2.9 times assets for sell-out firms. Both of these differences are significant at the one-percent level.

Difference in valuation multiples may be due to a lack of bargaining power by the sell-out firm. To test this we observe the number of sample firms that employ the services of financial advisors. The services of a financial advisor should have an impact on valuation if bargaining power is a contributor to valuation differences. All IPO firms employ a financial advisor, while only 56% (204) of sell-out firms do. Table 4.11 compares valuation multiples and descriptive statistics of sell-outs dependent upon whether a financial advisor is employed. The

Table 4.10**Valuation Multiples of IPOs and Sell-outs from 1995 to 1999**

This table presents valuation multiples for IPO and sell-out firms. For every multiple, the numerator is market value for an IPO and deal value for a sell-out. The price/earnings multiple is scaled by net income from the most recent financial statement. EBITDA multiples are scaled by the sum of operating income and depreciation and amortization. Sales and total asset multiples are scaled by total revenues and total assets, respectively. A significant problem is accounting for negative multiples. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	Sell-outs		IPOs	
	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
Price / earnings	55.5	14.5	81.6	10.0
EBITDA	-20.6	9.2	48.9	6.9
Sales	505	2.3*	92.8	4.2
Total assets	14.9	2.9*	29.0	6.1

* significantly different at 1% level
 ** significantly different at 5% level
 *** significantly different at 10% level

Table 4.11**Financial Advisor Impact on Sell-outs from 1995 to 1999**

The following table presents descriptive statistics on the impact of financial advisors in a sell-out. The price/earnings multiple is scaled by net income from the most recent financial statement. EBITDA multiples are scaled by the sum of operating income and depreciation and amortization. Sales and total asset multiples are scaled by total revenues and total assets, respectively. Transaction expenses for sell-outs are defined as all direct expenses related to the takeover. Transaction expenses and deal value are measured in millions of dollars. Age is measured as the year of the transaction minus the year the firm was founded. The number of observations for those variables that have less than the full sample of sell-outs is to the right of the median in brackets. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	Sell-outs w/ financial advisor <i>N=204</i>	Sell-outs w/o financial advisor <i>N=162</i>
Price / earnings	12.0**	17.6
EBITDA	8.7	10.2
Sales	2.6***	2.1
Total assets	3.1	2.8
Deal value	\$127.7*	\$97.3
% stock-based compensation	56.4%	41.4%
Transaction expenses	\$3.25* [120]	\$1.85 [66]
% insider ownership	54.8%** [54]	74.3% [18]
Institutional ownership	80% [50]	19% [19]
Age	9** [122]	6 [69]
% of deals with bidder advisor	33.3%	19.1%

* significantly different at 1% level

** significantly different at 5% level

*** significantly different at 10% level

median price-earnings multiple for sell-outs with financial advisors is significantly lower than those firms without a financial advisor, 12.0 versus 17.6, respectively. However, the median sales multiple is 2.6 for firms with a financial advisor compared to 2.1 for firms without a financial advisor. In addition, sell-out firms that employ a financial advisor have larger deal values, higher transaction expenses, lower insider ownership and are older than sell-out firms that do not employ a financial advisor. In sum, there is mixed evidence on the ability of a financial advisor to increase bargaining power and thus valuations, and therefore no reliably consistent evidence that this factor is an important one when understanding the discrepancy in IPO and sell-out valuations.

In summary, all of these results indicate that private firms with a larger potential for agency costs are, on average, bought out by public firms rather than going public via an IPO. These results are consistent with a public firm being able to quickly replace managers of the private firm with already existing management, thereby eliminating poor performing managers or duplicative functions within the firm with a more efficient structure. Additionally, these results are consistent with the choice of exit mechanism being the one which best mitigates the overall costs incurred by the firm as suggested by Lehn, Netter and Poulsen (1990).

4.5.6. Ownership

Table 4.9 provides evidence consistent with pre-transaction insider ownership significantly influencing the method of transition. The median insider ownership of firms that are purchased by public companies is 61.5%, which is significantly different from the 71.8% insider ownership of firms that chose to undertake an IPO. The disparity is further noticed in the difference in the first quartile ownership of 15.5% (51% for IPOs and 35.5% for sell-outs) and the third quartile ownership of 12.7% (90.8% for IPOs and 78.1% for sell-outs). More distinct than the difference in pre-transaction ownership is the difference in post-transaction ownership of insiders. The median ownership of insiders after the transaction for IPOs is 50.8%, for sell-outs it is 19.5%. These are all statistically significantly different. The percentage insider ownership of

sell-outs is in fact biased upwards as many of the unreported ownership changes are from private firms that sold out for cash, thereby losing all ownership in the merged firm.

The change in insider ownership is also measured in Table 4.5. This measure examines the magnitude of the dilution effect resulting from the going public transaction. It is a proxy for the total control loss of insiders as well as the loss of an ownership structure that aligns manager and owner incentives. The difference in loss of ownership is stark, and again the results for sell-outs are biased upwards as 30% of the sell-outs were pure cash transactions where owners lost all equity stakes in the merged firm. The smallest quartile (25%) for change of insider ownership is 27% for sell-outs and 10.6% for IPOs. The largest quartile (75%) for change of insider ownership is 65.6% for sell-outs and 26.6% for IPOs. The median change in insider ownership is 45.9% for sell-outs and only 17.3% for IPOs. These changes are statistically significant and are consistent with sell-outs being more of a liquidity event rather than a means to raise capital. We see the majority of sell-outs being ones in which pre-transaction owners lose control of the firm. This finding coupled with the results from the valuation multiples in Table 4.10, we find evidence in the private sector consistent with McConnell and Servaes' (1990) evidence of the positive relation between public firm valuations and insider ownership.

4.5.7. Management efficiency

We use two measures in panel A of Table 4.12 to test differences in the overall efficiency of management in managing the assets of the firm. The first measure, current assets divided by current liabilities, measures the ability of the firm to pay off maturing debt obligations with their liquid assets. In other words, it is a measure of liquidity. There is no difference between IPO and sell-out firms using this measure. The median liquidity ratio for sell-outs in years -1 and -2 is 1.37 and 1.55, respectively. The median liquidity ratio for IPOs is 1.38 and 1.43, for years -1 and -2 , respectively. Thus there is no evidence that IPOs are better run firms than sell-outs

The second measure of management efficiency, the asset turnover ratio, is measured as revenues divided by total assets. This ratio measures the efficiency with which management is

Table 4.12

Accounting Ratios Measuring Management Efficiency and the Capital Structure of IPOs and Sell-outs from 1995 to 1999

The following table presents median accounting ratios for sell-outs and IPOs. Panel A presents ratios measuring management efficiency. Panel B presents ratios measuring the structure of firm assets and the structure of financing for the firm. Undistributed cash flows are measured as earnings before taxes plus amortization and depreciation. The remainders of the ratios are calculated as they are named, and the variable named is taken from the private firm's financial statements. These ratios are measured for the two years prior to IPO or sell-out. Differences in medians are reported in the sell-out rows, and are represented by asterisks.

	Year -1	Year -2
Panel A: Management Efficiency		
<i>Sell-outs</i>		
Current assets / current liab.	1.37 [366]	1.55 [300]
Sales / total assets	1.41* [366]	1.38 [296]
<i>IPOs</i>		
Current assets / current liab.	1.38 [366]	1.43 [336]
Sales / total assets	1.27 [366]	1.39 [335]
Panel B: Capital Structure		
<i>Sell-outs</i>		
Cash / total assets	0.064** [366]	0.060** [300]
Current assets / total assets	0.602*** [366]	0.623** [300]
Fixed assets / total assets	0.295** [366]	0.282*** [299]
Total debt / total equity	1.25* [364]	1.32* [298]
Undistributed cash flows / total debt	0.148* [363]	0.149* [295]
Total debt / total assets	0.71 [366]	0.70 [300]
<i>IPOs</i>		
Cash / total assets	0.086 [366]	0.090 [336]
Current assets / total assets	0.655 [366]	0.672 [336]
Fixed assets / total assets	0.256 [366]	0.269 [336]
Total debt / total equity	0.76 [365]	0.69 [336]
Undistributed cash flows / total debt	0.054 [364]	0.063 [334]
Total debt / total assets	0.72 [366]	0.70 [366]

* significantly different at 1% level

** significantly different at 5% level

*** significantly different at 10% level

able to convert assets into revenues. The asset turnover ratio for sell-outs is 1.41 and 1.38 for years -1 and -2 , respectively. In other words, sell-out management is able to generate \$1.41 in revenues for every dollar of assets owned. For IPO firms the ratio is 1.27 and 1.39 for years -1 and -2 , respectively. Only in the first year is the asset turnover ratio for sell-outs significantly different from that of IPO firms. However, this evidence is considered a marginal difference in the efficiency of private firm management as a significant influence on the choice of transition method.

4.5.8. Capital structure

We test the hypothesis that firms with a greater amount of leverage constraints will be those most likely to undertake an IPO as they will benefit most from a shift in their capital structure to a more optimal level, which consists of increasing equity and decreasing debt. Panel C of Table 4.6 and panel B of Table 4.12 test this hypothesis in a univariate setting.

Table 4.6, panel C, details the interest coverage ratio that is measured as the firms operating income divided by interest expense. The ratio shows the cushion a firm has in terms of its ability to pay interest coming due on its outstanding debt. As detailed in our discussion on agency costs, we find that sell-outs have a significantly larger median (average) interest coverage ratio 2.5 (6.0), 2.4 (7.7) and 3.1 (108) for years -1 , -2 and -3 , respectively. The results for IPO firms are 1.4 (-19.1), 1.4 (13.3) and 1.5 (6.6) for years -1 , -2 and -3 , respectively. This evidence is consistent with IPO firms being more constrained by interest payments than sell-outs.

Panel B of Table 4.12 details our tests on differences in capital structure across private firms that undergo a transition from private to public ownership. We observe both the right and left-hand side of the balance sheet to determine if there are fundamental differences in firms that choose one method of transition over another. We observe both what the asset structure is, and how capital is financed.

We first look at cash, current, and fixed assets scaled by the total assets of the firm to better understand the structure of assets. All three of these measures are significantly different

across IPO and sell-out firms. Median scaled cash holdings for sell-out firms for years -1 and -2 are 6.4% and 6.0%, respectively. Scaled cash for IPOs is significantly higher than that of sell-outs; IPO relative cash holdings are 8.6% and 9.0% for years -1 and -2 , respectively. A significantly larger percentage of IPO assets are more liquid compared to sell-out assets. The median current asset percentage for IPOs is 65.5% and 67.2% in years -1 and -2 , respectively, and 60.2% and 62.3% in years -1 and -2 for sell-outs. Finally, we observe the percentage of fixed assets carried by IPO and sell-out firms. As expected from the previous results, we find that sell-out firms, in general, have a greater proportion of their capital invested in fixed assets than do IPO firms. The median fixed asset percentage of sell-out firms is 29.5% and 28.2% for years -1 and -2 , respectively. IPO firms have significantly lower fixed asset percentages of 25.6% and 26.9% for the two years prior to transition. These results suggest that IPOs value the ability to access cash (liquidity) more highly; it is consistent with IPOs having riskier cash flows which require the firm to convert assets into cash quicker.

We further test the hypothesis that IPO firms are more financially constrained than their sell-out counterparts by forming a capital constraint ratio of undistributed cash flows, measured as earnings before taxes plus depreciation and amortization, to the total debt of the firm. This should approximate the firm's ability to use cash flows for things other than debt repayment, so as the number increases from zero the firm is better able to defer cash flows to alternative uses. The median capital constraint ratio for sell-outs is significantly higher than for IPOs. The ratio is 14.8% and 14.9% for sell-outs in years -1 and -2 , respectively. The capital constraint ratio for IPOs is significantly lower at 5.4% and 6.3% in years -1 and -2 , respectively. These findings support the hypothesis that those firms whose cash flows are most constrained will choose an IPO in lieu of a sell-out. These findings also support our findings on IPO firms having more growth options.

The securities issued to procure assets for private firms is significantly different based on whether the firm went public via an IPO or was acquired by a public company. We find some

evidence that suggests sell-out firms are more highly levered than IPO firms. Although there is no significant difference between IPO and sell-out firms when we compare debt to asset ratios, we find a significant difference in median debt to equity ratios. The median debt to equity ratio of sell-out firms is 1.25 and 1.32 for years -1 and -2 , respectively. So, for every dollar raised using equity there are \$1.25 raised by debt. This ratio is quite different for IPOs; these firms' median debt to equity ratio for years -1 and -2 are 0.76 and 0.69, respectively. This evidence is consistent with the growth evidence discussed earlier; sell-out firms, in general, fund more stable capital needs with debt, since their cash flows are larger and more predictable, in general. Conversely, we see high growth IPO firms funding more of their capital needs with equity which does not place cash flow constraints on the firm.

4.5.9. Logistic regressions

Finally, we test all of the firm specific characteristics in relation to their influence on the probability of undertaking an IPO versus a sell-out. We report results from logistic regressions in Table 4.13 that examines the relation between characteristics of the private firm and the probability of going public via an initial public offering. We model the private to public ownership transition decision as a function of several firm specific characteristics. The model is as follows:

Left-hand-side Variable

Transaction type

= 1 if IPO, = 0 if sell-out

Right-hand-side Variables

Firm size

= the natural log of total assets

Leverage

= long-term debt / total assets

Cash flow / equity

= (earnings before taxes + amortization and depreciation) / deal value

Book-to-market value of assets

= total assets / deal value

Interest coverage

= earnings before interest and taxes / interest expense

Scaled capital expenditures

= capital expenditures / total assets

Scaled research & development

= research and development expense / sales

Asset efficiency

= sales / total assets

Abnormal return on assets

= (earnings before interest and taxes / total assets) – return on assets of same 2-digit SIC public firms

Earnings growth

= (change in net income from year –1 to –2) / net income in year –2

Sales growth

= (change in sales from year –1 to –2) / sales in year –2

Private firm insider ownership

= percentage insider ownership of firm prior to transaction

Private firm institutional ownership

= percentage insider ownership of institutions prior to transaction

We run three different logistic regressions in Table 4.13, each containing an increasing number of firm specific characteristics. The tradeoff in each of these log regressions is between increasing the number of firm characteristic variables and decreasing the number of observations. The decrease in observations is primarily found for sell-out firms because of the limited amount of reporting required by the S.E.C. The first regression contains 361 sell-out firms; this number falls to 291 and 60 for the second and third regressions. Observations for firms undergoing an IPO, however, never fall below 323. All three regressions are highly significant as measured by the likelihood ratio test statistic.

The first set of regression results show evidence consistent with results found in univariate tests; the only exception to this is the coefficient on leverage. The leverage coefficient is significant and positive indicating that the more highly levered a firm, the more likely the firm will undertake an IPO as the method of transition. The only evidence inconsistent with this is the

Table 4.13

Logistic Regression Analysis of Factors Influencing Transition Choice for Private Firms Being Acquired or Going Public from 1995 to 1999

The dependent variable is a dummy variable taking the value 0 if the private firm was acquired by a publicly traded company and 1 if the company conducted an IPO. Abnormal return on assets is measured as year -1 earnings before interest and taxes (EBIT) divided by total revenues in year -1 net of the same return metric of an equal-weighted portfolio of publicly trade firms in the same two-digit SIC. Firm size is measured by the natural log of total assets. Leverage is measured as total debt minus current debt scaled by total assets. Cash flow / equity is measured as earnings before taxes plus depreciation and amortization divided by book value of equity. Book-to-market value of assets is measured as total assets divided by the deal or market value of the firm for sell-outs and IPOs, respectively. Interest coverage is operating income divided by interest expense. Scaled capital expenditures is measured as capital expenditures scaled by total assets. Scaled research and development is measured as research and development scaled by sales. Asset efficiency is measured as sales divided by total assets. Earnings growth is the growth in net income from year -2 to year -1. Sales growth is the growth in sales from year -2 to year -1. Private firm insider ownership measures the percentage of the private firm owned by officers and board of directors (insiders). Private firm institutional ownership is a dummy set equal to 1 if the private firm was owned by any institutional investors, and set to 0 if not. P-values are reported in brackets next to the parameter estimates.

Variable	(1)	(2)	(3)
Intercept	1.2104 [0.1413]	1.2107 [0.1777]	4.6862 [0.0304]
Firm size	-0.1292 [0.1207]	-0.1268 [0.1590]	-0.3628 [0.0838]
Leverage	0.3736 [0.0673]	0.4311 [0.0589]	1.7105 [0.0203]
Cash flow / equity	-2.3310 [0.0214]	-1.8217 [0.0906]	-4.9056 [0.0500]
Book-to-market value of assets	-0.0373 [0.8854]	0.0348 [0.8953]	-0.0911 [0.8860]
Interest coverage	0.0000 [0.6890]	0.0000 [0.8576]	0.0016 [0.0643]
Scaled capital expenditures	1.2426 [0.0126]	1.0105 [0.0602]	1.7301 [0.1933]
Scaled research & development	-0.0225 [0.2087]	-0.0005 [0.9820]	0.7231 [0.0706]
Asset efficiency	-0.0662 [0.1478]	-0.0296 [0.5462]	-0.1895 [0.0525]
Abnormal return on assets	0.0026 [0.9799]	-0.0934 [0.4473]	0.7448 [0.0234]
Earnings growth	-	0.0214 [0.0364]	0.0514 [0.0271]
Sales growth	-	0.0033 [0.8467]	-0.0361 [0.1987]
Private firm insider ownership	-	-	1.7218 [0.0038]
Private firm institutional ownership	-	-	-0.8960 [0.0357]
Likelihood ratio test statistic	34.6660 [<.0001]	30.3137 [0.0014]	51.3982 [<.0001]
<i>Number of observations</i>	<i>348 / 361</i>	<i>325 / 291</i>	<i>323 / 60</i>

result from univariate tests suggesting the debt-to-equity ratio for sell-out firms is greater than that of IPO firms. This, however, may be due to the large amount of negative retained earnings found in IPO firms. This result is consistent with IPO firms being those firms that want to unsaddle themselves of debt in order to use cash flows for positive NPV projects. In addition to leverage, the cash flow-to-equity and the capital expenditure measures are also significant. The cash flow-to-equity variable is used to proxy for potential agency costs within the private firm. Our results show that those firms with higher potential for agency costs are more likely to be bought out rather than go public via an IPO. Our other proxy for agency, book-to-market value of assets, is insignificant for all three regressions. The proportion of capital expenditures to total assets is used to proxy for the growth characteristics of the private firm. We find in the regressions evidence consistent with the univariate results; firms that are expanding more rapidly, on average, choose an IPO over a sell-out as their preferred method of transition.

In the second set of regressions we add sales and earnings growth variables. The results from this regression are similar to the first. In addition, however, we find results that suggest earnings growth as a determinant for choosing one transaction over the other. Firms with higher earnings growth are more likely to undertake an IPO instead of find a public suitor. This is consistent with high growth being more highly valued by diverse shareholders than by any particular firm.

The final logistic regression includes variables on insider and institutional ownership of the private firm. Adding these additional variables considerably changes the significance of several firm characteristics that appear to influence the choice between IPO and sell-out. First, results from the regression show evidence consistent with the percentage of insider ownership being directly related to the probability of conducting an IPO in lieu of a sell-out. The coefficient for institutional ownership suggests the opposite; firms with institutional have a higher probability of being sold to a public company. Second, the negative coefficient for firm size indicates that asset-intensive firms have a higher probability of sell-out. This is consistent with

asset-intensive firms being more difficult to value due to asymmetric information with regards to asset-specific information. Third, the coefficient for interest coverage is positive and significant in this regression. This is inconsistent with our hypothesis of sell-out firms having greater agency costs when this variable is used as a proxy for agency costs of free cash flow, however it is consistent with firms that undertake an IPO being those firms with a lower probability of bankruptcy. Firms with an increased probability of bankruptcy may be purchased by another firm with cash flow that can more than adequately payoff any principal and interest repayments, and replace inefficient management. Fourth, the coefficient for scaled capital expenditures is insignificant in the last regression. So while this may show a lack of evidence for IPOs as growth firms, the coefficient for research and development and earnings growth is significant suggesting that IPO firms tend to be more growth-oriented than sell-out firms. Next, our proxy for management efficiency, total asset turnover, is negative and significant. The univariate analysis finds similar results, thereby giving some evidence that firms choosing sell-outs may be run by efficient managers. However, we provide evidence, such as an increased proliferation of agency costs, which suggests the contrary. Finally, after controlling for many of the characteristics of the private firm, the coefficient for abnormal return on assets is positive and significant. This evidence suggests that past profitability is a proxy for future profitability which is highly valued by public investors.

4.6. Conclusion

There are two primary means through which privately held stock ownership is transferred to publicly held owners, initial public offerings and acquisitions of private firms by public corporations. These transactions are similar since they are both channels for accessing public capital markets, significant shifts in ownership structure, and a means of liquidation for owners. However they have many differences in terms of the dilution of ownership, information content of stock price, liquidity of owner investment and structure of post-transaction management.

We compare these transactions for insights into the decision-making process of entrepreneurs and institutional owners in regards to the single largest transition during the life cycle of a firm. The evidence we find suggests that firm characteristics contribute significantly to the probability of a firm undertaking either an IPO or sell-out. Firm growth, asymmetric information, agency costs, leverage, profitability and insider ownership are statistically significant factors in determining the method by which a firm transitions from private to public ownership. In short, the probability of IPO is greater in firms that have higher growth rates and insider ownership, fewer informational asymmetries and agency costs, and more constraints on cash flows due to leverage.

CHAPTER 5

CONCLUSION

In my first study I examine whether mergers and acquisitions facilitate economic growth. I find results consistent with frequent acquirers being firms that are able to extract significant gains from takeovers. The success of these firms appears to be linked to *unexpected* profitability improvements stemming from the firms publicly unobservable ability to make takeovers work. In addition, stock-return improvements appear to be linked with profitability improvements for frequent acquirers. The study suggests that frequent acquirers are better able to change themselves, in response to a changing environment, than firms with similar characteristics. I find *no* evidence that frequent acquirers are the result of self-serving managers. In fact, most of the evidence presented suggests that the largest acquisition programs in terms of both the number and value of firms acquired is directly related to the efficiencies produced from the acquirer.

In my second study, I analyze the acquisition of companies that are not traded in the public stock market by firms that are public. I find evidence suggesting that firm characteristics contribute significantly to the probability of a firm being acquired by a public company versus undertaking an initial public offering. Firm growth, asymmetric information, agency costs, leverage, profitability and insider ownership are statistically significant factors in determining the method by which a firm transitions from private to public ownership. Those private firms that are acquired by public companies tend to have lower growth rates and insider ownership, more informational asymmetries and agency costs, and fewer constraints on cash flows due to leverage when compared with firms that undergo an initial public offering.

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