The IPO Market as a Screening Device and the Going Public Decision:
Evidence from Acquisitions of Privately and Publicly Held Firms

Tomas Mantecon
and
Paul D. Thistle *

Abstract

Some owners of private firms who cash out their investments sell their firms all at once. Others sell part of the firm in an initial public offering (IPO), then sell the remainder shortly after the IPO. Using a unique data set from IPO filings we find that the expected payoff to going public before selling the firm is 200 percent higher than selling privately. One explanation for these different valuations is that public markets are more competitive than private markets for corporate assets. An alternative explanation is that the going public process is a screening mechanism; public firms have higher valuations because they are better firms. We test between these two explanations. The results suggest that listing shares in public equity markets enhances the value to owners who want to cash out their investments because the IPO process acts as a screening device of a firm's quality.

JEL Classification: G32, G34

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Mantecon (Corresponding Author): Department of Finance, University of North Texas, Department of Finance, Insurance, Real Estate and Law, 1167 Union Circle, Denton, Texas, 76201. Phone 940-891-6905, Email: tomas.mantecon@unt.edu

Thistle: Department of Finance, University of Nevada Las Vegas, 4505 Maryland Pkwy, Box 6008, Las Vegas, NV 89154, Phone 702-895-3856, Fax; 702-895-4650, Email: paul.thistle@unlv.edu

1. Introduction

Some owners of private firms who cash out their investments sell their firms all at once. Others sell part of the firm in an initial public offering (IPO), then sell the remainder shortly after the IPO. This suggests that some owners may use the IPO process as an intermediate stage in the sale of the firm. Consistent with this motivation for taking the company public, Pagano, Panetta and Zingales (1994) and Field and Mulherin (1999) find that the rate of acquisition is larger for newly listed firms. The exit strategy of selling the company after an IPO (effectively a two-stage sale) has been described as “teeing-up” a company for sale (Rock, 1994) or as “picking-off” a company in the IPO process (Fitch and Benjamin, 1998, Gomez, 1999, Huf, 2000).

A two-stage sale has great appeal to owners because there is a broad consensus among practitioners and academicians that public firms have higher valuations than private firms (Ciccatello, Field and Bennett, 2001; Brau, Francis and Kohers, 2003; Poulsen and Stegemoller, 2005). However, little is known about the sources of these different valuations. In this paper we analyze two alternative explanations of the choice between a direct sale and a two-stage asset sale as well as the payoffs to these two exit strategies.

Zingales (1995a) and Ellingsen and Rydqvist (1997) offer two explanations for the larger valuation to public targets. Zingales analyzes the problem of an owner who wants to sell a company either through a direct sale or by using an IPO as a first step in the complete transfer of control (two-stage sale). The owner uses the IPO to determine the optimal ownership structure to maximize the proceeds from the sale. The total proceeds from the sale of rights to cash flows are maximized if they are sold to dispersed shareholders in competitive public markets, but control rights increase the bargaining position of the owner and should be sold in a direct negotiation. This model suggests that private markets for control rights are less than perfectly

competitive and owners are able to extract the buyer's full reservation price by selling cash-flow rights in competitive markets. Mantecon (2008) also argues that private markets for control are less than perfectly competitive. He (2008) finds empirical evidence that suggest that the cost to obtain information on private targets acts as a barrier to entry and reduces the pool of potential buyers. Highly competitive markets for public firms and less than perfectly competitive markets for private targets can also explain why buyers of public firms experience small and insignificant returns in the acquisition of public targets, but gain in the acquisition of private firms (e.g., Chang, 1998; Faccio, McConnell and Stolin, 2006).

Ellingsen and Rydqvist (1997) develop a model of the IPO market where it is the IPO itself that is the signal of quality. All good firms go public along with some bad firms, while the other low-quality firms carry out direct sales in the semi-separating equilibrium of their model.¹ The implication is that the firms that are sold through an IPO are more valuable than firms that are sold privately because they are better firms.

These analyses suggest two alternative sources of value that listing shares in public markets provides to owners who want to sell their private firms. Zingales (1995a) focus on the different degree of competition in public and private markets. Some owners will chose to sell their firms in two-stages because they will benefit from a competitive public market. Ellingsen and Rydqvist (1997) view the process of listing shares in public equity markets as a device to screen good quality companies. Some owners will benefit from taken the company public because by doing so signal the quality of their firms. We investigate these two sources of value provide by public equity markets. The role of equity markets for newly listed firms is of interest

¹ The semi-separating equilibrium is not the only equilibrium in Ellingsen and Rydqvist's model. If the proportion of good firms is sufficiently large, then there is a pooling equilibrium in which all firms go public. There are also two equilibria in which there are no IPOs if the cost of going public is too high relative to the value of good firms. However, since we have both direct sales and two stage sales in our sample, the semi-separating equilibrium seems to be the most empirically relevant.

to owners who are considering cashing out their investments, to financial intermediaries and practitioners in the business of valuating firms, and to researchers in the quest for a better understanding of the difference between public and private markets for corporate assets.

To investigate the source of gains to owners of private firms that want to sell their firms, we compile a sample of firms that filed for an IPO during 1996-2005. Some of the firms were sold privately (before completing the IPO) while others were sold after completing the IPO through a two-stage asset sale. Since all of the firms in our sample filed for an IPO, we have information on both public and private firms from their SEC filings. With the caveat of its small size, the availability of information that is not commonly produced by private firms lets us analyze the choice of exit strategy and the expected payoffs to these strategies.

Using information from prospectuses we examined the returns to public and private targets. We divided the sample of private targets into firms that cannot go public (at least at the proposed price in the filing), and firms that are likely to have the choice to go public, but decide to sell privately instead. We find that private firms that do not have the option to go public receive 52 cents for each dollar they expected to raise in IPO, whereas firms that have the option to go public and sell privately sell at \$1.63 for every dollar that they expected to receive at the IPO. This result underlies the need to distinguish between the groups of private firms with and without the option to access public capital markets. Owners of these two groups are likely to have different bargaining power when they sell their firm and that is likely to affect the price of the transaction. Public targets that are acquired shortly after the IPO receive \$2.76 for each expected dollar at the IPO. Thus, the payoffs to two-stage sales are approximately 160 to 200 percent larger than the payoffs to direct sales.

We investigate whether these different valuations can be explained by the different attributes of private and public markets or by the screening value of the IPO process. However, an important underlying assumption of Zingales and Ellingsen and Rydqvist's models is that the exit strategy, either a direct sale or a two-stage sale, is endogenous. In Zingales, the endogeneity is the result of the fact that the firm chooses the method of sale. In Ellingsen and Rydqvist, the endogeneity is the result of the screening function of the IPO market. We investigate the importance of endogeneity. We first analyze the factors that affect the choice between selling in one versus two stages. The results show that firms with venture capital (VC) backing, less leverage, less R&D, higher growth, a higher filing price and higher proceeds are both more likely to be sold in two stages and obtain a higher payoff on the sale. Internet firms and firms sold when the number of contemporaneous IPOs is higher are more likely to use two-stage sales. These results indicate that the payoff from the sale of the firm is not independent of the decision to sell privately or in two-stages and consequently the presence of endogeneity may be important in our analysis.

We use Heckman's (1978) endogenous treatment model to investigate the relationship between different proxies for the private benefits of control and the choice of exit strategy and value from going public suggested in Zingales (1995a). Zingales argues that if the value of control rights is large relative to the value of cash flow rights, then the firm should be sold privately. However, findings from the analysis fail to show any significant relationship between our proxies for private benefits and the decision to go public. The results indicate that firms that are sold in two stages were more valuable than firms that were sold in a private market because they were typically better firms. The results suggest that the value of going public for owners of

private firms who sold shortly after the IPO can be explained because the IPO process acts as a screening device.

Taken together the results indicate that private firms that failed to gain access to public equity markets are sold for a fraction of the value that the owners expected to receive in the IPO. This suggests that, compared to public listed firms, this group of private firms may have weaker bargaining position in the negotiation with potential buyers because their limited access to external financing impairs their probability to operate as stand-alone entity. This result appears as a potential explanation to different valuation effects for buyers in the acquisition of private and public firms. However, for the restricted sample of private targets with the option to access public markets, the results indicate that two-stage sales created value for owners who used the IPO market to signal the quality of their firms.

The next section discusses prior research and hypotheses. Section 3 describes the sample construction and characteristics. Section 4 examines the payoffs to the sale of the firm. Section 5 provides brief concluding remarks.

2. Prior research and hypotheses

Prior empirical research indicates that public firms sell at a higher price than IPO and private firms. Ciccotello, Field and Bennett (2001) provide evidence that some thrifts chose an IPO as a route to an eventual sale while others were acquired privately. Thrifts that are acquired privately appear to be smaller and less risky than those that go public. They report that the average market-to-book ratio was 85 percent for thrifts that were acquired privately. For thrifts that went public, the average post-IPO market-to-book ratio was 77 percent (net of underwriting discount) but these thrifts were acquired at an average market-to-book ratio of 1.8.

As they put it (p. 37), "Regardless of the source of the gains, thrifts that took the risk to go public to sell themselves at a later date were generally rewarded for doing so."

Brau, Francis and Kohers (2003) compare IPOs and acquisitions of private targets by public firms during 1984-1998, analyzing the choice between an IPO and a takeover. Relying on industry-level data, they find that industry, market-timing and deal-specific factors along with the demand for funds are determinants of the choice between an IPO and a takeover. They report (p. 586) that "target insiders receive a payoff that equals approximately 78% of an IPO payoff" and that the discount appears to be due to the greater liquidity of takeovers.

Reuer and Shen (2004) analyze 3,783 mergers and acquisitions between 1996 and 1999; of these 180 were of firms acquired shortly after going public. They conclude that two stage sales are more likely in industries where search costs (proxied by geographic dispersion) are higher and when information asymmetries (proxied by R&D intensity, the use of strategic alliances and high tech industry) are greater. They conclude (p. 263) that IPOs may reduce "... adverse selection either directly or by sending signals concerning the quality of the firm" consistent with Ellingsen and Rydqvist's model.

Poulsen and Stegemoller (2005) compare 366 private firms acquired during 1995-1999 to a size-, industry- and year-matched sample of IPOs. Since the acquisitions in their sample are "material", information on the private firms is available from Securities and Exchange Commission (SEC) filings. Their empirical results indicate that ownership, profitability, growth, liquidity constraints and difficulties in valuation affect the decision to sell privately or publicly. They find (their Table 6) that, on average, price-sales multiples are 75% higher and median price-assets multiples are 110% higher for IPOs.

We analyzed two explanations of why firms decide to sell their firms privately or to conduct a two-stage sale. A first explanation can be found in Zingales (1995a) who analyzes the problem of an owner who wants to sell her company.² Zingales argues that, since there are different markets for the rights to cash flows and the right to control the firm, the owner may obtain a higher payoff if cash flow rights and control rights are sold separately. The rights to cash flows are sold to dispersed owners through the IPO, and the control rights are sold in a direct negotiation. This allows the seller to extract the buyer's surplus from higher cash flows and some of the buyer's surplus from greater private benefits of control. However, if the potential buyer places a high value on control rights, but is expected to reduce the value of cash flows, then a private sale is preferred. Zingales' analysis implies that there will be both one- and two-stage sales, but that firms sold in two stages will be more valuable. The different levels of competition in private and public markets and the value of control and cash flow rights determine the decision and the pay-off from going public.

This analysis suggests that private markets for control rights are less than perfectly competitive and sellers can benefit from` selling cash flow rights in competitive public markets. A similar argument is used by Mantecon (2008) to explain the difference in excess returns between buyers of private and public target. Acquirers experience small and statistically insignificant returns when the target is a public corporation, but gain in the acquisition of private targets, a result that was termed as the "listing effect" by Faccio, McConnell and Stolin (2006).

² A number of other papers examine the choice between going public and remaining private. Brennan and Franks (1997, p. 393) "... presuppose that the directors of the IPO firm wish to maintain control of the firm after the IPO ... ". Mello and Parsons (1998, p. 82) argue that "the IPO is always a good choice ... ", so that private sales do not occur in their model. Chemmanur and Fulghieri (1999) and Pagano and Roell (1998) examine the choice between private and public equity as a source of financing for investment projects under the assumption the original owner retains control of the firm. Since these papers all assume that the original owners maintain control of the firm, they are not directly relevant to our analysis. We point out that Chemmanur and Fulghieri's and Pagano and Roell's analyses imply that the choice of the method for the partial sale and its payoff are jointly determined.

Mantcon (2008) argues that higher cost to acquire information in private markets explains why private markets for corporate assets are less competitive than public markets.

This theoretical and empirical work suggest that owners of private firms willing to sell their firms may benefit from two-stage sales because they will be able to extract buyer's full reservation value in competitive public markets.

Hypothesis 1: Firms that are sold in public equity markets shortly after the IPO are sold for more than firms that are sold in private markets because of the differential degree in competition in public and private markets.

A second explanation why public firms are more valuable is suggested by Ellingsen and Rydqvist's (1997) adverse selection model of the IPO market. Unlike earlier models (e.g., Allen and Faulhaber, 1989) where underpricing signals quality, in Ellingsen and Rydqvist's analysis it is the IPO itself that is the signal of quality. When the firm's shares are publicly traded the market price aggregates the information of investors, which is more beneficial to "good" firms. Thus, the owner of a good firm may be able to sell the rest of the firm at a better price following the IPO. Owners of "bad" firms may prefer a less costly direct sale. In the semi-separating equilibrium, all good firms go public along with some bad firms. All of the firms that are sold privately are bad firms. The implication is that the firms that are sold through an IPO are more valuable than firms that are sold privately because they are better firms.³ This analysis suggests that owners can use the IPO market to credibly signal the quality of their firms.

³ Wu (2004) analyzes the choice between private placements and secondary offerings for post-IPO firms and provides evidence that firms with high informational asymmetry are more likely to use private placements.

Hypothesis 2: Firms that are sold in public equity markets shortly after the IPO are sold for more than firms that are sold in private markets because firms that are sold in public markets are firms of higher quality.

3. Sample construction and characteristics

3.1. Sample construction

To test these hypotheses we collect data on all firms that filed for an IPO during 1996-2002 and were completely acquired within 18 months of the initial filing.⁴ Firms that completed the IPO before the acquisition were identified by searching the first and last listing dates in the CRSP files. Firms that did not complete the IPO and were acquired were identified by searching Lexis-Nexis and the SDC Global New Issues data-base. We choose a relatively short window for the acquisition for two related reasons. First, since these firms are sold shortly after filing for the IPO, it is a reasonable inference that the owners intended to sell the firm and that the IPO filing was a step in that process. Second, we want to reduce the probability that other corporate events could affect the analysis. Finally, we need a sufficiently large number of observations for the statistical analysis to have some power. We verify that a registration withdrawal request is filed with the SEC. Information regarding the firms was collected from SEC forms S-1, SB-2, prospectuses and 10-Ks, so we also delete all firms for which the information in these forms was incomplete. Information about the price and method of payment was collected from the SDC data-base and compared to news releases and SEC filings. We identify and exclude target firms in financial distress and firms in bankruptcy. This screening process yields a sample of 207 firms, but we have the transaction value only for 176 firms.

⁴ We excluded spin-offs, equity carve-outs, REITs, closed-end funds, unit offers, partnerships, ADRs, best-efforts offerings, financial firms, banks and S&Ls, and firms with offer prices below \$5.00.

Figure 1 illustrates the sample construction. At node 1 firms either withdrew or continued the IPO process. Thirty-nine firms withdraw the IPO and were later acquired. These firms were sold for a fraction of the expected price of the IPO (48% discount). We will refer to these firms as “withdrawn” firms. One hundred thirty seven firms continue with the IPO process. At node 2, 44 firms decided not to proceed with the IPO and sell directly. These firms sold at 63% premium over the expected value in the IPO. It seems likely that these firms have the option of going public, but do not do so because they receive a suitable offer; we refer to this group of firms as “preempted” firms. Finally, ninety three firms were sold in two stages. These firms were sold at 176% premium over the expected value in the prospectus.

3.2. Sample Characteristics

Table 1 reports the main characteristics of the sample. We measure the payoff to the sale two ways. The first measure, the total payoff, is measured as the percentage difference between the transaction value and the pre-issue value of the firm, where the pre-issue value of the firm is the pre-issue value of equity (filing price times the number of shares outstanding) plus the book value of debt. The second measure, the insiders’ payoff, was computed as the sum of the payoff to insiders for the shares sold at the IPO, the payoff to shares sold in subsequent seasoned offerings, the payoff to shares sold between the offering and the final purchase and the payoff for the shares sold at the takeover.⁵ By construction, the total payoff and insiders’ payoff are equal

⁵ The insiders’ return is computed as follows. (1) We computed the number of secondary shares sold at the IPO times the offering price. (2) We multiplied the number of secondary shares sold in seasoned equity offerings (SEOs) times the SEO offer price. (Thirteen firms carried out SEOs) (3) We computed the value of shares sold between the IPO and acquisition as the difference between the number of insiders’ shares at the IPO and the number at the takeover announcement times the average of the first day closing price and the market price one week before the announcement; we excluded shares sold at SEOs. (4) We multiplied the number of insiders share at the acquisition times the acquisition price per share. These four values were summed and divided by the value of insiders shares, valued at the filing price.

for firms that are sold privately. There are some outliers, so the median may be a more reliable measure of central tendency.

We begin by comparing the withdrawn firms (column 1) to the preempted firms (column 2). The difference in the payoff to the sale of these two types of firms is striking. Firms that withdrew their IPO and were later acquired lost an average of nearly one-half and a median of nearly two-thirds of the value anticipated at the IPO filing. In contrast, preempted firms gained an average of nearly two-thirds over the value anticipated at the IPO filing. The differences in the mean and median payoffs are statistically significant. Other than the payoffs, there are relatively few differences in the characteristics of the withdrawn and preempted firms.

We next compare preempted firms that sold in one stage (column 2) to firms that sold in two stages (column 3). Firms that sold in two stages had a mean (median) total payoff of 175 percent (62 percent) and mean (median) insiders' payoff of 160 percent (62 percent). This compares to a mean (median) total payoff of 63 percent (12 percent) for firms that sold in one stage. The differences are statistically significant at the five percent level. In addition to the payoffs, firms that sell in two stages are less likely to use the proceeds to repay debt and have higher filing prices. Market conditions appear to be better for firms that complete the IPO before selling.

In this analysis we examine the choice between the exit strategies of a direct sale and a two-stage sale. The low sale price of the withdrawn firms suggests that their IPOs were likely to fail, their owners did not have the choice of going public and these firms should be excluded from the analysis. However, the decision to complete or not complete the IPO at node 2 of Figure 1 is only observed if the firm decides to continue the IPO at node 1. Then the data used to analyze the decision to sell in one or two stages at node 2 is conditioned on a sampling rule (that

the firm decided to continue the IPO at node 1), rather than being a random sample. As a result, we might attribute differences in payoffs to the method of sale that are really differences in payoff due to the characteristics of the firms. If this economic and statistical linkage is important, then we need to take account of the decision at node 1 of the tree in analyzing the decision to complete the IPO and payoffs to the sale. Since the decisions are discrete, the appropriate statistical model is a joint probit model.⁶ We included control variables for the ownership structure, private benefits of control, firm characteristics, offering characteristics and IPO market conditions (variables in Table 1). In results not reported, but available from the authors upon request, we find that the two probit equations are independent; the linkage between the decisions at nodes 1 and 2 is weak. Thus, we feel confident that the decision to withdraw or continue at node 1 does not affect the decision or the payoffs at node 2. Consequently, we proceed with the analysis excluding the withdrawn firms.

4. Valuation of one-stage and two-stage sales

In this section we use univariate and regression analysis to compare the proceeds of one-stage and two-stage sales.

4.1. Valuation Multiples

Table 2 reports generally accepted valuation multiples (e.g., Kim and Ritter, 1999, Koeplin, Sarin and Shapiro, 2000). Due to the presence of outliers, the median may be a better measure of central tendency. While we cannot reject that the mean price-sales multiple is the same in both samples, the median price-sales multiple is significantly higher for public firms (21.98) than for preempted firms (10.85). The mean and median price-assets multiples are 35.87

⁶ The problem here has the same structure as the credit scoring problem (Boyes, Hoffman and Low, 1989) where a loan must first be approved in order for payment or default on the loan to be observed. See Greene (1998) for a clear discussion of the economic and statistical issues

and 10.54 for public firms and 14.89 and 8.09 for preempted firms, and again the differences are significant. Poulsen and Stegemoller find that mean price-sales and price-asset multiples are significantly higher for IPOs than for private sales. Neither mean nor median market-to-book ratios are significantly different. The mean and median IPO payoffs for firms that sold publicly are 176 percent and 81 percent, respectively. These are significantly greater than the mean and median total payoffs for preempted firms, which are 63 percent and 12 percent, respectively.⁷

Overall, these results provide strong support to the implication in Zingales and Ellingsen and Rydqvist that firms that are sold in two stages receive a higher payoff than firms that are sold in one stage. While these results offer an initial comparison, they do not control for factors that affect the payoff to the sale of the firm.

4.2. Regression Analysis

A basic assumption of our analysis is that the owners of firms compare the expected payoffs in deciding which strategy to pursue. Since firms self-select whether to sell in one or two stages, ordinary least squares regression (OLS) may be subject to selectivity bias (Heckman, 1978, 1979). Following Heckman (1978), the appropriate econometric model, known as the "endogenous treatment model," can be written as:

$$R_i = C_i\delta + x_i\beta + \varepsilon_i, i = 1, \dots, n. \quad (1)$$

$$C_i^* = z_i\gamma + u_i, i = 1, \dots, n \quad (2)$$

$$C_i = 1 \text{ if } C_i^* > 0, C_i = 0 \text{ otherwise.} \quad (3)$$

In equation (1), R_i is the payoff on the sale of the firm, C_i is the indicator for firms that complete the IPO and sell in two stages, x_i is the vector of observable control variables and δ and β are

⁷ The values of the valuation multiples are high compared to other studies. This is due to the fact that a number of the firms in our sample, especially internet firms, have few tangible assets and very low revenue.

coefficients to be estimated. The error term, ε_i , has mean zero and variance σ_ε^2 . Equations (2) and (3) model the decision to complete or not complete the IPO before selling the firm, where z_i is the vector of control variables and γ is the vector of coefficients to be estimated. The error term u_i has a standard normal distribution. In general, the variables in z_i include the variables in x_i and may (but need not) include additional variables. For our application, any observable factors that affect the profitability of the sale also affect the choice of the method of sale, so that x_i and z_i contain the same variables. Finally, ρ is the correlation between the errors ε_i and u_{2i} . Observe that if $\rho = 0$, then the payoff equation (1) and the selection equations (2) and (3) can be estimated separately, otherwise the equations should be estimated jointly.

4.2.1. Variable Definitions

We investigate whether the decision to sell in one or two stages is independent of the return to the sale of the firm, and whether the same factors, observable and unobservable, affect both the choice between a one-stage or two-stage sale and the return to the sale.⁸ We want to control for observable characteristics. The decision to sell privately or publicly and the value of the firm depend on the ownership structure of the firm, private benefits of control, the characteristics of the firm, the characteristics of the offering, and IPO market conditions. We use the share of common equity held by directors and officers as the measure of insider ownership. High levels insider ownership in private firms reduce agency costs of equity (i.e. Jensen and Meckling, 1976), and facilitates coordination between owners in a takeover attempt (Grossman and Hart, 1980). We also include an indicator variable for the presence of a venture capitalist

⁸ Examples of observable factors are firm size, venture capital backing and the size of the offering. An example of an unobservable factor is the information learned by the investment bank during the book-building process. We want to control for observable characteristics.

because they provide monitoring and certification of quality for firms (e.g., Megginson and Weiss, 1991, Gompers and Lerner, 1999)

Zingales also argues that private benefits of control should be relatively more important in firms that sell privately than in firms that sell publicly. The value of private benefits of control has been estimated using dual class shares (DeAngelo and DeAngelo, 1985, Nenova, 2003) and control block transactions (Barclay and Holderness, 1989, Dyck and Zingales, 2004). Both approaches require market data and cannot be applied to the private firms in our sample. We use several proxies for private benefits of control. Outside directors play an important role in monitoring management (Weisbach, 1988) and we include the percentage of the board of directors who are outsiders. Field and Karpoff (2002) find that many firms use takeover defenses when they go public and that they are used to protect private benefits of control. We include an indicator for whether the firm has a classified or staggered board of directors in its corporate charter at the IPO filing. We also include an indicator for dual class shares because they are valuable to protect private benefits of control. The ability to extract excess compensation is a private benefit of control. Following Zingales (1995*b*) we use the excess compensation is measured as the residual of the regression of the log of cash compensation to the largest shareholder on annual dummies and the log of revenues.

Larger firms may be able to take advantage of the economies of scale in the offering process (Ritter, 1987) and may be more likely to go public. We measure size by total assets. Brau, Francis and Kohers (2003) and Poulsen and Stegemoller (2005) find empirically that firms with more leverage are less likely to carry out an IPO. We include leverage, measured as total debt to total assets. We use return on assets (ROA), defined as earnings before interest, taxes depreciation and amortization divided by total assets, as the measure of profitability.

Chemmanur and Fulghieri (1999) argue that firms in industries with greater technological uncertainty are more likely to go public. We include R&D intensity, measured as R&D expenditures as a percentage of sales. Given our sample period, we also include an indicator variable for Internet firms.⁹

Busaba, Benveniste and Guo (2001) and Booth and Booth (2003) argue that if the proceeds of the IPO will be used to repay debt the firm is less likely to complete the IPO. We include a variable that indicates that the process of the IPO will be used to repay debt. Informational asymmetries can be ameliorated by signaling (Leland and Pyle, 1977). We include an indicator if part of the offering consists of secondary shares. Spatt and Srivastava (1991) develop a model of the IPO pricing process in which the initial filing price plays a role similar to a reserve price in an auction. In addition, low-priced stocks tend to be issued by highly speculative firms (i.e., Tinic, 1988). Seguin and Smoller (1997) and Fernando, Krishnamurthy and Spindt (2004) show that firms with lower IPO prices have higher mortality.¹⁰ We include the filing price, defined as the mid-point of the initially filed price range, as a control variable. Beatty and Ritter (1986) argue that smaller offerings are more speculative. We include expected proceeds, defined as the filing price times the number of shares offered, to capture this effect.

Both Zingales' and Ellingsen and Rydqvist's analyses imply that two-stage sales are more likely when the general level of the market is higher. Since all of the firms in our sample file for listing on Nasdaq, we use the return on the Nasdaq market index for the month following the initial IPO filing as a measure of the overall market return. We also use the number of IPOs filed in the same month as the measure of activity in the IPO market.

⁹ We use Meeker (2001) to identify internet firms.

¹⁰ Approximately ten and one-half percent of the firms that went public during 1996-2002 were delisted for violating the share price or distribution requirements by the end of 2002.

4.2.2. Results

The regression results are reported in Table 3. The dependent variable is the total payoff to owners adjusted for the return on the Nasdaq market index. Control variables include the observable characteristics that are expected to affect the value of the firm's cash flows and the value of control rights¹¹

Model 1 is estimated by OLS. The indicator Complete is positive (0.8001), but not significant. For both payoff measures, only leverage and ROA have negative (-0.0438) and marginally significant effects ($p < 0.10$). None of the other explanatory variables are significant in either equation. However, the OLS estimates may be biased: the estimated values of ρ is 0.9463 statistically significant ($p < 0.001$). Thus, consistent with the basic implication of Zingales and Ellingsen and Rydqvist, the payoff to the sale and the decision to sell in one or two stages are not independent and selectivity bias corrections are necessary.

The results of the endogenous treatment effect model are reported as Model 2 in Tables 3. First we analyze the factors that affect the exit strategy (one- versus two-stage sales). The indicator for VC backing is positive (0.7355) and significant ($p < 0.05$), thus firms with VC backing are more likely to go public. Leverage has a significant and negative (-1.1254; $p < 0.01$) effect on the probability of completing the IPO, consistent with Brau, Francis and Koher (2003) and Poulsen and Stegemoller (2005). R&D has a negative (-0.5491) and significant effect ($p < 0.05$). The indicator for Internet firms is positive (0.7162) and marginally significant ($p < 0.10$), consistent with Chemmanur and Fulghieri (1999). The coefficient of the variable Growth is 0.0028 ($p < 0.10$), suggesting that firms with higher growth are significantly more likely to sell in two stages. Finally, examining the offering characteristics, we find that the coefficient of

¹¹ Given the small percentage of firms that have dual class shares, we do not include this variable in the subsequent analysis.

filing price is positive (2.0189; $p < 0.01$) and significant whereas the coefficient of the expected proceeds is negative and significant.

Zingales argues that if the value of control rights is large relative to the value of cash flow rights, then the firm should be sold privately. However, the proxies for the private benefits of control are never significant. There are three possible reasons for this result. First, the value of the private benefits of control is inherently difficult to measure – if they were easily quantifiable their appropriation could be prevented. Second, our sample size is relatively small, and it may be the case that with more powerful tests these variables would be significant. Third, it may be the case that the private benefits of control are not an important determinant of the choice between one-stage and two-stage sales. Zingales' and Ellingsen and Rydqvists' analyses imply that two-stage sales are more likely when the general level of the market is high. The results in Tables 3 and 4 show that the coefficient for the market return is not significant. Thus, we find little support for this implication.

Table 3 also reports the results of the payoff equation. The results for the selection equation and the payoff equation are broadly consistent: the factors that affect the choice of exit strategy also affect the payoff. Interestingly, the coefficient for completion of the IPO is negative (-4.5851) and significant at the one percent level.

Table 4 replicates this analysis using the insiders' adjusted payoffs. To be concise, the results are qualitative similar to those reported in Table 3 and yield identical conclusions.

This analysis implies that the direct effect of selling the firm in two stages is to *lower* payoffs. However, the presence of selectivity bias implies that this coefficient does not completely capture the effect of carrying out a two-stage sale.

The next question that we address is the economic significance of the selectivity bias. The results of this analysis are reported in Table 5 for the total adjusted payoff (Panel A) and the insiders' adjusted payoff (Panel B). We estimate the expected payoff given that the owner decides to sell in one stage, $E\{R_i | C_2 = 0\}$, and the payoff given that owners chose to sell in two stages $E\{R_i | C_2 = 1\}$. Taking account of the selection bias, the difference in the payoff between a two-stage sale and direct sale is

$$E\{R_i | C_2 = 1\} - E\{R_i | C_2 = 0\} = \delta + \rho\sigma_\varepsilon\lambda_i, \quad (4)$$

where $\lambda_i = \phi(z_i\gamma)/\Phi(z_i\gamma)(1 - \Phi(z_i\gamma))$ and ϕ and Φ denote the standard normal density and distribution. The coefficient for Complete, δ , is the direct effect of going public and the second term is the effect of self selection.

For the total adjusted payoff, the estimated value of $E\{R_i | C_2 = 0\}$ is -0.2762 , which is not significant. That is, on average the value of a firm sold in one stage is approximately equal to the expected value of the firm at the IPO filing. The estimated value of $E\{R_i | C_2 = 1\}$ is 1.7390 , which is significantly different from zero at ($p < 0.001$). Thus, there is a substantial gain in value from a two-stage sale relative to the expected value of the firm at the IPO. The difference in the expected total adjusted payoffs to two-stage and one-stage sales is 2.0151 ($p < 0.001$). For the insiders' adjusted payoff, the estimated value of $E\{R_i | C_2 = 0\}$ equals 0.1186 and is not significant. The estimated value of $E\{R_i | C_2 = 1\}$ is 1.5199 , which is significant ($p < 0.001$). The difference in the payoffs to two-stage and one-stage sales is 1.6385 ($p < 0.001$).

This analysis shows that the expected payoff to a two-stage sale is 160 to 200 percent higher than the expected payoff to a one-stage sale.¹² Moreover, the coefficient for "Complete" in both of the payoff equations is negative, so that the direct effect of completing the IPO is

¹² The difference in returns is too large to be explained by IPO underpricing. The mean (median) first day return for public firms in our sample is 44.7% (19.3%).

negative. The results support Hypothesis 2 and suggest that that all of the gain from completing the IPO to carry out a two-stage sale is due to sample selection. This result is consistent with the view in Ellingsen and Rydqvist that the IPO process is a screening device so that public firms are typically better firms and sell for higher prices.

4.3. Robustness.

In the preceding sections firms are classified as withdrawn or preempted based on the timing of the IPO withdrawal and the acquisition announcement. We hypothesize that firms that withdrew the IPO before being acquired are different from firms that withdrew because they were being acquired. The returns suggest that the withdrawn firms' IPOs would have been unsuccessful. However, there are two types of potential errors in this classification. There may be good firms that withdrew because of bad market conditions and were later acquired; these are good firms facing bad market conditions. The other potential misclassification is that the road-show may have led some firms to conclude that their IPOs would be unsuccessful at the filing price, but they were able to sell privately at a lower price before withdrawing the IPO.

We replicate the prior analysis with a different classification of the firms that sold privately. We identify those firms that could not meet the listing price requirements given the transaction value per share. These are firms with a transaction value per share outstanding of less than \$5. We classify these firms as "low price" firms. There are 27 low price firms and of these 25 are also withdrawn firms. The other group of private targets has transaction value per share of more than \$5. We refer to these firms as "potential IPO" firms. There are 56 potential IPO firms; of these 14 are withdrawn firms and 42 are preempted firms. An obvious drawback of this classification design is that the minimum price requirement can be achieved by artificially

decreasing the number of shares outstanding (for instance, by doing a reverse split), provided minimum share and distribution requirements are met.¹³

The results using the alternative classification scheme are very similar to those reported above. The mean (median) return for low price firms is -74 percent (-81 percent) and the mean (median) return for the potential IPO firms is 52 percent (5 percent); these differences are significant at the one percent level. In results not reported but available from the authors, we found few differences in the analysis and that the main conclusions in the paper remain unchanged.

In particular, the results for the test of the two main hypotheses are the same. For both total and insiders' returns, the endogenous treatment model (eq. (3), (4) and (5)) yields estimates of ρ that are close to one. The hypothesis $\rho = 0$ is rejected at the one percent level, so the decision to sell in one or two stages and the return to the sale are not independent. For both adjusted return measures, the direct effect of completing the IPO is negative. The treatment effects, or difference in the expected return to one-stage and two-stage sales, are 240 percent for the total adjusted return and 205 percent for the insiders' adjusted return. Again, this is due to sample selectivity, that is, firms complete the IPO and sell for more because they are better firms.

The results continue supporting Hypothesis 2. The findings suggest that the value of going public for owners of private firms who sold shortly after the IPO can be explained because the IPO process acts as a screening device. Owners of good firms benefited from two-stage sales because completing the IPO signaled the superior quality of their firm. The results fail to

¹³ The NASDAQ requirements are 1.1 million shares and 400 round-lot holders, (shareholder of 100 shares or more).

support the hypothesis that owners who took the company public benefited because of public market for corporate assets are more competitive than private markets.

5. Conclusion

Some owners of private firms sell their firms all at once while others sell part of the firm in IPO before selling the firm (two-stage sales). Prior empirical evidence indicates that public firms sell at a higher price than private firms. Zingales (1995a) and Ellingsen and Rydqvist (1997) propose two different explanations to these empirical findings. The main objective of this study is to test whether public firms are sold at higher price than private firms because of the characteristics of the markets where they are sold, or because firms that sell in public and private markets are of different qualities.

We compiled a sample of firms that filed for an IPO, some of which were sold privately (before completing the IPO) while others were sold after completing the IPO through a two-stage sale. We find that private firms that do not have the option to go public receive 52 cents for each dollar they expected to raise in IPO, whereas firms that have the option to go public and sell privately sell at \$1.63 for every dollar that they expected to receive at the IPO. This finding suggest that the lower valuation of private targets and the positive excess returns to buyers in the acquisition of these firms (e.g. Chang 1998) may be due to a weak bargaining position of targets with limited access to external financing.

Public targets that are acquired shortly after the IPO receive \$2.76 for each expected dollar at the IPO. Thus, there is a substantial gain from a two-stage sale compared to a one-stage sale. We analyzed the source of this value in a restricted sample of private firms that are more likely to have the option to go public, some chose to sell privately, other in two stages. Because

the decision to sell privately or complete the IPO is endogenous to firm characteristics that can affect the value of the firm, we analyze the factors that affect the decision of direct versus two-stage sales. We find that the same factors that affected the decision to sell the company in a private market or in a public market are also related to the pay-offs to owners, indicating the presence of self-selection. We test for the effect of the endogeneity in our sample and find strong evidence that the choice of exit strategy and its expected payoff are jointly determined. The results indicate that differences in payoffs between private and public targets are explained by selection bias: the direct effect of the IPO on the payoff is negative, but the indirect effect of selection is positive and outweighs the direct effect. These results are not consistent with differences in the value of public and private firms being due to differences in the competitiveness of public and private markets. These results are consistent with the process of going public serving as a signaling mechanism, where the firms that can complete the IPO process signal that they are inherently more valuable firms.

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Figure 1. Decision Tree and Sample Construction

Table 1. Characteristics of Firms By Timing of Sale, 1996-2002

Total Return is the percentage difference between the transaction value and pre-issue value, where pre-issue value is measured as the book value of debt plus the value of equity based on the filing price. Insiders' Return is the total return for the shares sold by insiders at the IPO, in subsequent secondary offering, before the takeover, and at the takeover. Insider Ownership is the percentage of common equity held by directors and officers. Venture Capitalist indicates venture capital backing. Total Assets is for the year prior to the IPO filing, in millions of dollars. Dual Class Shares indicates the firm has dual class shares with differential voting rights. Percent Board Outsiders is the percentage of the board of directors that are not affiliated with the firm. Classified board indicates the firm has a classified (staggered) board of directors. Excess compensation is the excess compensation received by the largest shareholder measured as the residual from a compensation equation specified in the text. Leverage is the ratio of total debt to total assets. ROA is earnings before interest, taxes, depreciation and amortization divided by total assets. R&D is the ratio of R&D expenditure to total sales. Internet is an indicator for internet firms. Growth is the percentage growth in sales from the previous year. Secondary Shares is an indicator that part of the offering consists of secondary shares. Repay Debt indicates that repayment of debt is listed in the prospectus as a use of funds. Filing Price is the midpoint of the price range filed in the prospectus. Exp. Proceeds is the expected proceeds of the offering, in millions, computed as the number of shares offered times the filing price. Market Return is the return on the Nasdaq market index in the month following the initial filing. No. IPOs is the number of IPOs filed in the same month. Hypothesis tests are *t*-tests for the hypothesis that the means are equal or Wilcoxon signed rank tests for the hypothesis the medians are equal.

Variable		Withdrawn (1)	Preempted (2)	Public (3)
Total Return	Mean	-48.15%	63.49% ^{###}	175.80% ^{**}
	Median	-64.43%	12.38% ^{##}	62.39% ^{**}
Insiders' Return	Mean	-48.15%	63.49% ^{###}	159.72% ^{**}
	Median	-64.43%	12.38% ^{##}	62.40% ^{**}
Insider Ownership	Mean	68.75%	66.94%	64.72%
	Median	72.10%	69.45%	66.80%
Venture Capitalist	Mean	80.64%	68.18%	80.64%
	Median	-	-	-
Dual Class Shares	Mean	5.12%	2.32	7.53
	Median	-	-	-
Percent Board Outsiders	Mean	60.18	61.59	60.35
	Median	60.00	71.43	66.67
Classified Board	Mean	64.10	51.16	59.14
	Median	-	-	-
Compensation	Mean	159.11	301.92 ^{###}	416.12
	Median	137.65	282.50 ^{###}	305.00
Total Assets	Mean	41.53	99.80	126.86
	Median	23.53	27.08	21.98
Leverage	Mean	73.44%	75.29%	60.62% [*]
	Median	71.21%	66.55%	58.34%
ROA	Mean	-33.21%	-18.88%	33.39%
	Median	-21.27%	-2.23%	-17.01%
R&D	Mean	41.27%	29.24%	23.43%
	Median	6.61%	0 [#]	0
Internet	Mean	35.90%	31.82%	45.16%
	Median	-	-	-
Growth	Mean	183.5%	923.8% ^{###}	808.1%
	Median	68.0%	55.9%	96.4%
Secondary Shares	Mean	0.60%	3.77% ^{###}	6.58%
	Median	-	-	-
Repay Debt	Mean	43.59%	50.00%	27.96% ^{**}
	Median	-	-	-
Filing price	Mean	10.63	11.59 [#]	13.92 ^{***}
	Median	11	11	13 [*]
Exp. Proceeds	Mean	53.90	61.46	75.80
	Median	48.50	51.00	50.60
Market Return	Mean	-2.31%	1.15%	7.71% ^{***}
	Median	-1.41%	0.4%	4.36% ^{***}
No. IPOs	Mean	38.69	41.34	48.91 ^{***}
	Median	41	41.5	43 [*]
Number of Firms		39	44	93

#, ##, ### indicate significant difference between columns (1) and (2) at the 10%, 5% and 1% level.

*, **, *** indicate significant difference between columns (2) and (3) at the 10%, 5% and 1% level.

Table 2. Valuation Multiples for Firms Sold in One or Two Stages, 1996-2002

Price to Sales is the ratio of the transaction value to sales. Price to Assets is the ratio of the transaction value to total assets. Market-to-Book is the ratio of the transaction value to the book value of equity at the acquisition. Total Return is the percentage difference between the transaction value and pre-issue value, where pre-issue value is measured as the book value of debt plus the value of equity based on the filing price. Insiders' Return is the total return for the shares sold by insiders at the IPO, in subsequent secondary offerings, before the takeover, and at the takeover. Test for Difference is the *t*-statistic for the hypothesis that the means are equal or the Wilcoxon signed rank test for the hypothesis the medians are equal

Variable		One-Stage	Two-Stage	Test for Difference
Price to Sales	Mean	141.47	124.97	0.24
	Median	10.85	21.98	1.96**
Price to Assets	Mean	14.891	35.87	2.59**
	Median	8.09	10.54	1.68*
Market to Book	Mean	47.37	94.21	0.97
	Median	15.04	19.92	1.54
Total Return	Mean	0.63	1.76	1.98**
	Median	0.13	0.63	2.31**
Insiders' Return	Mean	0.63	1.76	2.18**
	Median	0.13	0.63	2.23**

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test.

Table 3. Determinants of Total Adjusted Returns to Acquired Firms, 1996-2002

The dependent variable is Total Adjusted Return, measured as the percentage difference between the transaction value and the pre-issue value, where pre-issue value is measured as the book value of debt plus the value of equity based on the filing price; the return is adjusted for the return on the Nasdaq market index. Complete is an indicator of whether the firms completed the IPO before acquisition. Insider Ownership is the percentage of common equity held by directors and officers. Venture Capitalist indicates venture capital backing. Percent Board Outsiders is the percentage of the board of directors that are not affiliated with the firm. Classified board indicates the firm has a classified (staggered) board of directors. Excess compensation is the excess compensation received by the largest shareholder measured as the residual from a compensation equation specified in the text. Total Assets is for the year prior to the IPO filing, in millions of dollars. Leverage is the ratio of total debt to total assets. ROA is earnings before interest, taxes, depreciation and amortization divided by total assets. R&D is the ratio of R&D expenditure to total sales. Internet is an indicator for internet firms. Growth is the percentage growth in sales from the previous year. Secondary Shares is an indicator that part of the offering consists of secondary shares. Repay Debt indicates that repayment of debt is listed in the prospectus as a use of funds. Filing Price is the midpoint of the price range filed in the prospectus. Exp. Proceeds is the expected proceeds of the offering, in millions, computed as the number of shares offered times the filing price. Market Return is the return on the Nasdaq market index in the month following the initial filing. No. IPOs is the number of IPOs filed in the same month. ρ is the correlation between the error terms in the selection and return equations, σ_e^2 is the variance of the error term in the return equation and λ is the selection effect. The absolute value of the t -statistic is for the test of the hypothesis that the coefficient equals zero. χ^2 Model is for the test of the hypothesis that the coefficients of the endogenous treatment model are zero. $\chi^2 \rho = 0$ is for the test of the hypothesis that $\rho = 0$.

Variable	Model 1		Model 2			
	OLS		Selection Equation		Return Equation	
	Coefficient	t -statistic	Coefficient	t -statistic	Coefficient	t -statistic
Intercept	14.8995	1.18	12.6057***	4.55	30.7765**	2.13
Complete	0.8001	1.23	-	-	-4.5851***	3.38
Insider Ownership	-0.0039	0.37	-0.0047	1.13	-0.0017	0.14
Venture Capitalist	0.3302	0.37	0.7355**	2.23	1.8447*	1.87
Percent Board Outsiders	1.0574	0.83	0.1510	0.28	1.3098	0.87
Classified Board	-0.5766	0.84	0.1400	0.62	-0.5846	0.76
Excess Compensation	-0.1157	1.10	-0.0126	0.75	-0.0747	0.63
Total Assets	0.1917	0.57	0.1510	0.91	0.2218	0.59
Leverage	-1.1254*	1.76	-0.7267***	2.65	-2.0893**	2.30
ROA	-0.0438*	1.75	0.3659	1.57	-0.0160	0.57
R&D	0.0103	0.02	-0.5491**	2.22	-1.3348**	2.30
Internet	0.9776	1.17	0.7162*	1.66	1.1451	1.23
Growth	0.0054	1.11	0.0028*	1.75	0.0111**	2.39
Secondary Shares	-0.2316	0.41	0.1661	0.53	-0.3712	0.53
Repay Debt	-0.1444	0.20	-0.3833	1.44	-1.2369	1.48
Filing Price	1.1130	0.76	2.0189***	3.26	3.8803**	2.23
Exp. Proceeds	-1.0223	0.99	-1.0920***	2.81	-2.2281**	1.97
Market Return	-1.333	0.43	1.9396	1.38	4.5186	1.12
No. IPOs	-0.0135	0.89	0.0144***	2.38	0.0209	1.16
ρ			0.9463***	24.08		
σ_e^2			3.6313***	5.58		
λ			3.4362***	4.58		
Sample Size	129		129			
Adjusted R ²	0.1381					
χ^2 Model (p -value)			42.33	(0.00)		
$\chi^2 \rho = 0$ (p -value)			22.85	(0.00)		

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test.

Table 4. Determinants of Insiders' Adjusted Returns to Acquired Firms, 1996-2002

The dependent variable is Insiders' Adjusted Return, measured as the total return for the shares sold by insiders at the IPO, in subsequent secondary offering, before the takeover, and at the takeover, adjusted for the return on the Nasdaq index. Complete is an indicator of whether the firms completed the IPO before acquisition. Insider Ownership is the percentage of common equity held by directors and officers. Venture Capitalist indicates venture capital backing. Percent Board Outsiders is the percentage of the board of directors that are not affiliated with the firm. Classified board indicates the firm has a classified (staggered) board of directors. Excess compensation is the excess compensation received by the largest shareholder measured as the residual from a compensation equation specified in the text. Total Assets is for the year prior to the IPO filing, in millions of dollars. Leverage is the ratio of total debt to total assets. ROA is earnings before interest, taxes, depreciation and amortization divided by total assets. R&D is the ratio of R&D expenditure to total sales. Internet is an indicator for internet firms. Growth is the percentage growth in sales from the previous year. Secondary Shares is an indicator that part of the offering consists of secondary shares. Repay Debt indicates that repayment of debt is listed in the prospectus as a use of funds. Filing Price is the midpoint of the price range filed in the prospectus. Exp. Proceeds is the expected proceeds of the offering, in millions, computed as the number of shares offered times the filing price. Market Return is the return on the Nasdaq market index in the month following the initial filing. No. IPOs is the number of IPOs filed in the same month. ρ is the correlation between the error terms in the selection and return equations, σ_ε^2 is the variance of the error term in the return equation and λ is the selection effect. The absolute value of the t -statistic is for the test of the hypothesis that the coefficient equals zero. χ^2 Model is for the test of the hypothesis that the coefficients of the endogenous treatment model are zero. $\chi^2 \rho = 0$ is for the test of the hypothesis that $\rho = 0$.

Variable	Model 1		Model 2			
	OLS		Selection Equation		Return Equation	
	Coefficient	t -statistic	Coefficient	t -statistic	Coefficient	t -statistic
Intercept	13.5376	1.13	12.5153***	2.85	27.7343**	2.06
Complete	0.6668	1.09			-4.1484***	4.07
Insider Ownership	-0.0035	0.37	-0.0046	1.08	-0.0016	0.14
Venture Capitalist	0.2098	0.25	0.72801**	2.09	1.5641*	1.80
Percent Board Outsiders	0.9154	0.78	0.2151	0.41	1.1411	0.83
Classified Board	-0.4932	0.81	0.1667	0.73	-0.5003	0.74
Excess Compensation	-0.1211	1.27	-0.0115	0.28	-0.0845	0.79
Total Assets	0.1604	0.52	0.1275	0.96	0.1873	0.55
Leverage	-1.0470*	1.76	-0.7429***	2.61	-1.9094**	2.29
ROA	-0.0406*	1.77	0.3470	1.49	-0.0157	0.63
R&D	-0.0443	0.09	-0.6086**	2.36	-1.2471**	2.33
Internet	0.8247	1.09	0.6470*	1.87	0.9744	1.16
Growth	0.0055	1.17	0.0031*	1.81	0.0106***	2.54
Secondary Shares	-0.2961	0.57	0.0970	0.37	-0.4209	0.66
Repay Debt	-0.1314	0.20	-0.3814	0.16	-1.1083	1.54
Filing Price	0.8614	0.64	2.0148***	3.19	3.3359**	2.15
Exp. Proceeds	-0.8876	0.93	-1.0761***	3.03	-1.9658*	1.91
Market Return	-0.9956	0.34	2.0148	1.41	4.2369	1.16
No. IPOs	-0.0126	0.94	0.0146**	2.38	0.0182***	4.07
ρ			0.9242***	25.03		
σ_ε^2			3.2675***	5.84		
λ			3.0197***	4.84		
Sample Size	129		129			
Adjusted R ²	0.1385					
χ^2 Model (p -value)			46.26	(0.00)		
$\chi^2 \rho = 0$ (p -value)			40.85	(0.00)		

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test.

Table 5. Test for the Difference in Expected Return to One-Stage and Two-stage Sales

The variable is the expected Total Adjusted Return (Panel A) or expected Insiders' Adjusted Return (Panel B), conditional on whether the IPO is completed or not completed before the acquisition of the firm. The difference in the expected return between firms which completed and did not complete the IPO is $E\{R_i | C = 1\} - E\{R_i | C = 0\}$. Expected returns are based on the parameter estimates for the endogenous treatment model (Model 2) reported in Table 4 and Table 5. The absolute value of the t -statistic is for the test of the hypothesis that the mean equals zero.

A. Total Adjusted Return			
	Mean	Standard Error	t-statistic
One-Stage Sale	1.7390***	0.0992	17.53
Two-Stage Sale	-0.2762	0.5045	0.55
Difference	2.0151***	0.4824	4.18
B. Insiders Adjusted Return			
	Mean	Standard Error	t-statistic
One-Stage Sale	1.5199***	0.0915	16.61
Two-Stage Sale	-0.1186	0.4220	0.28
Difference	1.6385***	0.4012	4.08

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test.

Table 6. Bidder Cumulative Abnormal Returns

Mean and median (in parentheses) two-day cumulative average abnormal returns in percentage terms (CARs). Number of firms is in square brackets. Venture Capitalist indicates venture capital backing. Repay Debt indicates that repayment of debt is listed in the prospectus as a use of funds. Test for difference is the t-statistic (Wilcoxon z-statistic) for the test of the hypothesis the means (medians) are equal. .

Panel A. By Type of Targets.				
	All Firms	Public	Private	Test for Difference
All firms	0.83% (0.51%) [150]	-1.82%* (-1.15%)** [84]	4.12%** (2.79%*** [67]	3.46*** (3.79)***
Panel B. By Venture Capital Backing and Type of Target				
Venture Capitalist	All firms	Public	Private	Test for Difference
Yes	-0.79% (-0.24%) [113]	-2.34%** (-1.95%)** [67]	1.49% (1.90%) [21]	2.01** (2.30)**
No	5.77%*** (2.79%*** [37]	0.34% (-0.84%) [16]	9.90%*** (5.41%*** [46]	2.64** (2.93)***
Test for Difference	3.34*** (2.69)***	1.02 (0.46)	2.93*** (2.95)***	
Panel C. By Repayment of Debt and Type of Target				
Repay Debt	All firms	Public	Private	Test for Difference
No	-1.25% (-0.10%) [98]	-2.34%** (-1.95%)** [60]	0.61% (1.45%) [38]	1.5 1.80*
Yes	4.76%*** (2.43%*** [52]	-0.25% (-1.13%) [23]	8.73%*** (7.60%*** [39]	2.94*** (3.32)***
Test for Difference	3.30*** (2.96)***	1.08 (0.92)	2.84*** (2.56)**	

*, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, using a two-tailed test.