

**Alternatives for Going Public: Evidence from Reverse Takeovers,  
Self-Underwritten IPOs, and Traditional IPOs<sup>\*</sup>**

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**Abstract**

*We examine the characteristics of firms that go public using a reverse takeover (RT) or self-underwritten (SU) IPO instead of a conventionally underwritten IPO. Relative to control IPOs, firms that use alternative mechanisms to go public tend to be less profitable but exhibit similar levels of distress. After going public, RT and SU firms exhibit lower trading liquidity and higher volatility than matched IPO firms. While IPO firms experience significant increases in institutional support those using RTs and SUs experience declines. Firms that use alternative mechanisms outperform their matched IPO counterparts in the short term, and exhibit comparable performance in the three years following going public.*

Keywords: merger, going public, IPO, underwriting

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## **Alternatives for Going Public: Evidence from Reverse Takeovers, Self-Underwritten IPOs, and Traditional IPOs**

### **1. Introduction**

On March 7, 2006, the New York Stock Exchange (a private company) went public when it acquired the publicly traded Archipelago Holdings Inc. with the surviving firm being the New York Stock Exchange (Lucchetti, Craig, and Berman, 2005). Due to the historical importance of the New York Stock Exchange going public, this relatively novel variation on the traditional IPO has generated a great deal of publicity. Contrary to popular belief, it is not necessary to hire an investment bank and have the issue underwritten in order to become publicly traded. A private firm can acquire a public firm in order to go public through a technique known as a “reverse takeover” (sometimes called a reverse merger), or manage the underwriting of their own IPO, called a “self-underwritten IPO”.

Since IPOs have been and still are the dominant method used to go public, it is not surprising that there is a large scholarly and practitioner literature on the issues surrounding IPOs, their performance, as well as the governance of IPO firms. However, there has been little research on reverse takeovers (RTs) and self-underwritten offerings (SUs). Given the increasing use of alternative going public transactions, both in the U.S and outside, and by firms of all sizes, more analysis of these types of transactions is merited.

Our analysis is motivated by the costs and benefits for a firm in going public via a traditional underwritten IPO relative to alternative going public methods. In a traditional IPO, the firm gets the benefit of underwriter marketing to institutional investors, aftermarket stabilization, and certification (see Gompers and Lerner, 1999). Additionally, entrepreneurs and original investors may also value bullish analyst coverage by the underwriter(s) after the IPO (see Aggarwal, Krigman, and Womack, 2002). Finally, the opportunity costs of having management market the issue rather than an investment bank are nontrivial. On the other hand, the IPO process has been extensively criticized for the extent to which money is left on the table and the fixed costs of going public via a traditional offering are relatively high. Additionally, by using a reverse takeover or self-underwritten offer to go public, a firm avoids much of the uncertainty inherent in obtaining a firm commitment from an investment bank as in a traditional underwritten issue. Finally, firms that use reverse takeovers are, in some ways, able to evade the disclosure requirements and uncertainty of completion inherent in the IPO process as very little information must be provided about the private firm prior to the acquisition.

Given these costs and benefits of various going public methods, we examine if there are differences in the characteristics of firms that go public using non-traditional methods versus those that go public via an underwritten offering. Specifically, we analyze if firms that use an RT or SU are typically smaller or less profitable than otherwise similar firms that use an underwritten IPO. Additionally, we examine if RT and SU firms attract lower levels of support from institutional investors relative to traditional IPO firms that may have been assisted by their underwriters in marketing the offering to institutional investors. We also test whether or not the lack of after-market support and stabilization efforts by an underwriter/investment bank makes RT and SU stocks relatively more volatile and less liquid than the stocks of IPOs. Finally, we compare the performance of RT and SU stocks in the short- and medium-term with contemporaneously issued IPO stocks that likely benefited from bullish analyst coverage by their underwriters.

Our paper is organized as follows. In Section 2, we discuss the going public process and in Section 3, we discuss data requirements. Section 4 covers the methodology used, and in Section 5 we discuss results, while the conclusion appears in Section 6.

## **2. Going public**

### *2.1. Traditional underwritten IPOs*

A great deal is known about the traditional underwritten IPO from both a practitioner and academic perspective (see, e.g., Ritter and Welch, 2002, for a review of the related literature). Generally speaking, the process takes between six months and a year and a half, from the time that the firm obtains an underwriter(s) and legal counsel. The firm then submits the registration statement with the SEC (S-1), receives feedback from the SEC following a typical 30 day review, files amendments to its S-1 (S-1/A), carries on its roadshow, prepares a “litigation proof” prospectus, files the prospectus and additional documents with the SEC, and decides on the exchange on which to apply for a listing. Firms choose an investment bank, arguably the one with the best reputation that they can afford (or which is willing),<sup>1</sup> to handle the pricing and marketing of the issue, in the hopes that they will obtain the best possible price for their shares, get research coverage with a favorable rating,<sup>2</sup> observe a consistent increase in trading volume and liquidity, and, hopefully, perform well post-IPO. The process is time-consuming, sensitive to changes in industry and stock market conditions, and is financially costly. If market conditions are not appropriate, the IPO may be postponed or withdrawn. Prior to July 2003, a quiet period of 25 days was required before an analyst working for an investment bank that managed or co-managed the IPO could issue a report on the company. The quiet period was extended to 40 days for leads and co-leads and a 25 day quiet period was established for other bankers involved in the deal (see SEC Release No. 34-48252; File No. SR-NASD-2002-154; SR-NYSE-2002-49, July 29, 2003).

### *2.2. Reverse Takeovers*

A reverse takeover is a technique that allows a privately held company to obtain a listing on a public exchange without doing an IPO. The private firm (called the target) is acquired by a publicly traded firm, referred to as the vehicle, the “acquirer”, or the shell.<sup>3</sup> Following the acquisition, the management of the privately held firm usually replaces the management of the vehicle, and the surviving entity is the newly public, previously private “target”. As a public firm, the target can raise capital through the public markets, but the transaction itself does not raise capital for the firm, in contrast to most IPOs, (whether self-underwritten or not).

The best known American reverse takeover (RT) was done by Bernie Ebbers, who, along with three other investors, formed Long Distance Discount Service (LDDS), a private company, in September of 1983. In May of 1989, LDDS was acquired by Advantage Companies (NASDAQ: ADCO) through a

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<sup>1</sup> Firms doing an IPO should choose bankers who can match the kinds of investors the firm wants to place its shares with rather than just going with a marquis banker. In some cases, choosing a strong regional banker as a lead or co-lead may result in a more successful IPO, whereas using a marquis banker may result in less experienced bankers taking the firm public.

<sup>2</sup> Under the Global Brokerage Settlement reached in April 2003, it is now illegal for investment banks to promise research coverage as a quid pro quo for getting the deal. However, some people believe that this practice is still continuing with a wink and a nod (see “Wall Street On the Run: Stock Analysts Are Facing a Far Graver Threat Than New York Attorney General,” *Fortune*, June 14, 2004).

<sup>3</sup> The term “shell” typically refers to a publicly traded firm that has ceased operations, but that has been “cleaned” of any potential legal liabilities.

reverse takeover resulting in a listing on NASDAQ. After a protracted acquisition binge, Ebbers renamed the firm WorldCom. Many reverse takeovers have a reputation for low quality, or as being “crash and burn” stocks.<sup>4</sup> Others, such as Hayes Microcomputer Products, which did an RT in 1997 with NASDAQ-listed Access Beyond to go public, were fallen angels that once led their respective industries.<sup>5</sup>

The reverse takeover process is a corporate combination (i.e., an acquisition) rather than an IPO. The private firm’s management seeks an appropriate public vehicle, arranges for the public vehicle to make a bid where payment is in stock or cash and stock, completes the transaction, and files the appropriate forms for a corporate combination with the SEC, as in any other acquisition. The process typically takes anywhere from a month to six months. The short completion time relative to the traditional IPO is often mentioned as a motive for using the reverse takeover. Managers of reverse takeover firms also have the advantage of knowing exactly what the valuation will be prior to the going-public transaction.

Many boutique “shell brokers”, who are generally small investment advisors, can be found to arrange reverse takeovers. They argue that the merits of RTs are that they allow the firm attempting to go public to avoid the costs of having an investment bank underwrite the issue, and that firms that use RTs to go public avoid depending on the vagaries of market sentiment. Evidence also suggests that perhaps the RT process involves less SEC scrutiny than the IPO process, and hence, allows less reputable firms to go public. While firms which do RTs are required to provide financial statements within two weeks of the transaction, they sometimes simply file an “inability to file” form instead, citing the difficulties of obtaining a comprehensive set of financial statements so soon after the merger. Indeed, in April of 2004, the SEC voted to increase supervision and regulation of reverse takeovers, and of requiring private firms using RTs to go public to provide more extensive financial information than had been required previously. In doing so, the SEC cited schemes involving insider sales to unsuspecting outside shareholders (Burns, 2004).

Once firms go public using a reverse takeover, the management often transforms the newly public entity through repeated acquisitions, product line modifications, and name changes. Unlike an IPO, firms that use reverse takeovers are, in some ways, able to evade the disclosure requirements and uncertainty of completion inherent in the IPO process. Furthermore, very little information must be provided about the private firm prior to the acquisition; it is up to the public vehicle shareholders to decide if they will vote for the combination. Ritter (1987) ties stock price volatility post-going public to uncertainty about the market value of the firm prior to going public. Thus, there should be greater uncertainty, and post going public volatility, of reverse takeover firms than IPOs whose prospectuses and registration statements require them to provide comprehensive information. In addition, the price stabilization activity that the lead underwriter engages in after an IPO does not occur with a RT.

Only one academic study examines reverse takeovers. In an exploratory study, Gleason et. al. (2005) examine a sample of 121 reverse takeovers listed on the New York Stock Exchange and NASDAQ-AMEX. They find that reverse takeover firms are small, unprofitable, and likely to fail within 2 years of going public, though announcement returns to the acquirer vehicle firm are significantly positive.

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<sup>4</sup> Among the 10 largest RT firms in our sample, Struthers Industries Inc. (now Global Marines, Ltd.) personifies the stereotypical RT firm. “The shareholders of Struthers, Inc. have suffered mightily over the past few years, financially and emotionally, yet somehow still clinging to the dream that there were fortunes to be made; while helplessly watching the share price sink to \$.0001 and the company itself nearly destroyed. On October 28, 2003 all of that changed ... when we decided to take charge of the situation and control our own destiny.” (Company’s Investor Relations website)

<sup>5</sup> Hayes introduced the first PC modem in the late 1970s.

However, they do not examine long run returns from the perspective of the shareholder of the private firm that uses the reverse takeover to go public, nor do they compare the performance or characteristics of reverse takeover firms to IPO firms. In a loosely related study, Brown et. al. (2005) finds that “rollup” IPOs (where several firms in an industry combine into a single entity and go public) underperform as well, and attribute poor performance to agency problems.

### *2.3. Self-underwritten IPOs*

Self-underwritten IPOs (SUs) are initial public offerings (typically best-efforts, though a handful are all-or-none offerings) where the firm doing the issue underwrites its own shares. While typically associated with Small Corporate Offering Registration (SCOR) offerings, which are limited to under \$1 million, or with unregistered Rule 504 offerings, self-underwritten IPOs are registered equity securities that are not limited to qualified institutional buyers for purchase. Like traditional IPO firms, SU companies can list on the Pink Sheets™, the OTCBB, or one of the major exchanges. Although most end up on the Pink Sheets™ or the OTCBB, several have successfully listed their stock on the NASDAQ. Some start off trading on the less liquid platforms, with the hopes of moving up to the NASDAQ.

In a true self-underwritten issue, firms do not have an investment bank manage the new issue; the firm’s management acts as broker-dealer for the IPO itself, and often holds roadshows on the company’s premises. Managers determine the value of the company within limits, and potential investors decide if the price is acceptable. The tradeoffs involved are clear: the firm does not get the benefit of underwriter marketing to institutional investors, aftermarket stabilization, or certification, as described by Gompers and Lerner (1999). However, the firm avoids many of the costs and the uncertainty inherent in obtaining a firm commitment from an investment bank as in a traditional underwritten issue.<sup>6</sup>

The opportunity costs of having management market the issue rather than an investment bank are nontrivial. A tremendous amount of managerial resources must be dedicated to obtaining retail buyer interest (though management may be able to obtain a higher valuation than what would be possible with an issue aggressively marketed to more sophisticated institutional investors). Lipman (2001) describes some SU firms that are able to interest local and regional broker-dealers in providing IPO marketing services to assist managers, but investment banks typically do not provide marketing services unless they handle the entire underwriting process.

SUs are not uncommon in practitioner circles, but have not been addressed in the academic literature, with one exception. Muscarella and Vetsuypens (1989) examine a sample of 38 self-underwritten IPOs in the 1971-1987 period. Their sample is made up entirely of investment banks that participated in their own IPO. They find that underwriters going public underprice their shares just like other issuers. This result is inconsistent with the Baron (1982) agency-based explanation for underpricing, which is based on the assumption that the issuer is less informed relative to its underwriter. While not a study of self-underwritten IPOs per se, Chen and Lin (1996) find similar results, using a sample of investment companies whose underwriters own at least 3% of the firm’s stock at the time of the IPO. The findings suggest that the outside certification involved in the IPO process is important.

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<sup>6</sup> Firms going public through SUs still pay underwriting and registration fees, they simply do not pay them to an investment bank (and often who exactly such fees are paid to is not addressed in the prospectus). Many SU firms report having no underwriting expenses whatsoever.

Despite lacking investment bank/underwriter certification, self-underwritten IPOs are still required to file all necessary documentation that any ordinary IPO would, including a prospectus. Like ordinary IPOs, they are subject to listing and disclosure requirements, lockup period constraints on insider sales, and corporate governance requirements of their respective exchanges. However, asymmetric information is likely to be higher for SUs than IPOs.<sup>7</sup>

In the popular press, SUs are considered speculative. For example, a Wall Street Journal article notes that SUs “stand a good chance of never seeing the light of day” (Hennessey, 2004). They are generally viewed as firms that would not be able to get an investment bank to underwrite the issue (though anecdotal evidence from the 1990’s IPO market suggests that by and large, firms that wanted to go public were able to find underwriters). Indeed, many firms which file prospectuses cannot realistically expect to ever meet the listing and disclosure requirements of even the Bulletin Board. Their prospectuses list risk factors such as: management’s and accountant’s doubts about the firms’ prospects as a going concern, the fact that the CEO may have to resign pending the outcome of an SEC investigation for securities fraud (see Human Biosystem’s 6/25/2003 prospectus), the issue of the firm having no employees, doubts that a product will ever result from R&D, no operating history, and the fact that the executive responsible for sales has no industry experience whatsoever (see Coffee Pacifica’s August 8, 2003 424B2).

The lack of a minimum number of shares that must be sold in SU offerings, as opposed to the traditional IPO, makes them risky for investors as well. Managers who potentially have conflicts of interest in marketing the shares can simply offer the shares, take the funds, and obtain personal rents by claiming that sufficient funds were not raised to operationalize the business plan outlined in the prospectus (see Coffee Pacifica’s August 8, 2003 424B2).

In a sense, SUs provide a natural laboratory for investigating whether underwriters make a difference. We examine whether SUs are, in fact, different in terms of operating characteristics from firms whose IPOs are underwritten. We anticipate finding that self-underwritten IPOs face higher volatility and lower performance outcomes than underwritten IPOs.

### **3. Data**

Our data collection efforts were extremely intensive. We obtained a sample of transactions that are neither widely nor accurately covered by traditional data vendors. Our initial sample of reverse takeovers was taken from Securities Data Corporation’s (SDC) International Mergers and Acquisition files. However, in the process of examining the proxy statements of firms reported to be reverse takeover firms, we found that SDC often incorrectly categorizes *rollups* and other forms of industry consolidation as RTs, and improperly categorizes many ordinary IPOs as RTs. Hence, we engaged in an extensive search for other firms that had gone public using reverse takeovers. Our final sample includes 127 confirmed reverse takeovers to go public and which were initially listed on the New York, American, or NASDAQ stock exchanges between 1986 and 2003. However, only 119 have sufficient data available on CRSP to examine post going-public returns (some have Compustat data, but not CRSP data). The names of the participants in the reverse takeover as well as information on the financial advisor and deal value were obtained from firms’ proxy statements. All other information on

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<sup>7</sup> This is made clear in the “Risk Factors” section of Friday Night Entertainment’s 2004 prospectus – “... *potential investors should give careful consideration to all aspects of this offering before any investment is made. In the absence of an underwriter, no due diligence examination has been performed in conjunction with this offering such as would have been performed in an underwritten offering.*”

reverse takeover transactions were confirmed through Lexis-Nexis searches as well as the financial statements of the public and private firms involved in the deals.

Self-underwritten IPOs were even more difficult to track down and verify. Unlike traditional underwritten IPOs, Securities Data Corporation does not cover SUs. Hence, we utilized word searches in EDGAR Online and online news searches to identify self-underwritten IPOs involving public offerings registered with the SEC, which were listed on the New York, American, or NASDAQ stock exchanges. The exchange listing screen removed firms that did Direct Public Offers over the internet (such as Spring Street Brewing Company), Rule 506 offerings only available to qualified institutional buyers, and Regulation A and Public Rule 504/SCOR offerings resulting in a bulletin board listing for which no Compustat data was available.<sup>8</sup> These issues are not covered by traditional data sources, such as SDC, but the SEC and EDGAR's *IPO Express* track them. After obtaining the initial sample, we verified that the IPOs were self-underwritten from their registration statements and from personal contact with the SEC. Our final sample consists of 53 self-underwritten IPOs, which traded on the NASDAQ-AMEX or NYSE between 1986 and 2003; however, we have CRSP data for only 22 firms.

**Table 1**  
**Sample descriptive statistics**

This table shows the sample breakdown by transaction (reverse takeover (RT), self-underwritten IPO (SU) and RTs and SUs together), by year (Panel A), and by SIC code (Panel B).

*Panel A: Sample by year*

Year	Number RT Only	Percent	Number SU only	Percent	Number RT and SU	Percent
1986	0	0.00	1	4.55	1	0.71
1987	1	0.84	1	4.55	2	1.42
1988	0	0.00	1	4.55	1	0.71
1989	2	1.68	0	0.00	2	1.42
1990	4	3.36	0	0.00	4	2.84
1991	2	1.68	0	0.00	2	1.42
1992	6	5.04	1	4.55	7	4.96
1993	13	10.90	1	4.55	14	9.93
1994	8	6.72	1	4.55	9	6.38
1995	7	5.88	0	0.00	7	4.96
1996	14	11.80	3	13.60	17	12.10
1997	13	10.90	0	0.00	13	9.22
1998	12	10.10	0	0.00	12	8.51
1999	19	16.00	2	9.09	21	14.90
2000	11	9.24	4	18.20	15	10.60
2001	6	5.04	1	4.55	7	4.96
2002	1	0.84	2	9.09	3	2.13
2003	0	0.00	3	13.60	3	2.13
Total	119	100.00	22	100.00	141	100.00

<sup>8</sup> Given the size of the issues, it is possible that some of the sample SUs would have preferred to use the Regulation A offering, except that development stage firms with no business plans are prohibited under Reg A, as are felons, under the Rule 262 "bad boy" provision.

*Panel B: Sample by SIC code*

SIC	RT Frequency	Percent	SU Frequency	Percent	RT &SU Frequency	Percent
1000-1999	14	11.76	2	9.09	16	11.35
2000-2999	12	10.08	1	4.55	13	9.22
3000-3999	16	13.45	3	13.64	19	13.48
4000-4999	6	5.04	2	9.09	8	5.67
5000-5999	15	12.61	4	18.18	19	13.48
6000-6999	16	13.45	6	27.27	22	15.62
7000-7999	27	22.69	3	13.64	30	21.28
8000-8999	11	9.24	1	4.55	12	8.51
9000-9999	2	1.68	0	0.00	2	1.42
Total	119	100.00	22	100.00	141	100.00

Finally, we obtained our control sample of traditional underwritten IPOs from Securities Data Corporation’s Global New Issues. We obtained all original IPOs in the 12-month period prior to the reverse takeover or self underwriting, and selected the closest match based on industry at the 3-digit SIC level and assets.

Table 1 shows the breakdown by year and industry. As indicated in Panel A, the most active years for reverse takeovers were 1993, 1996, 1997, 1998, and 1999. The most active years for the sample of self-underwritten offerings are 1996, 1999, 2000 and 2003. Some of these years coincide with the tech/dot-com boom. In Panel B, we report the distribution of our sample by 4-digit SIC code. Four industry groups – SIC 3000, 5000, 6000, and 7000 - accounted for 62.2% of the RT sample, with SIC 7000 (services) being the largest part of the distribution at 22.7%. These same industries were the largest part of the SU distribution, making up 72.7% of the sample.

We obtained stock price, returns, and volume data from CRSP, accounting data from Standard and Poor’s Compustat Research Insights, and institutional ownership data for all firms from CDA/Spectrum. Finally, we determined the characteristics of the transactions from the proxy statements for the reverse takeovers, the registration statements for the self-underwritten IPOs, and SDC Global New Issues database for the underwritten IPO control sample.

## **4. Methodology**

### *4.1. Univariate analysis*

We first examine whether RT and SU firms differ from their matched control firms in terms of their financial and operating characteristics the year prior to and the year of their going public transactions, using t-tests and Wilcoxon Signed Rank tests for differences in means and medians.

### *4.2. Multivariate Logit Analysis*

We examine the characteristics of firms selecting into either an RT or SU (=1), or a traditional underwritten IPO (=0) using a logit regression analysis:

$$p(\text{RT or SU}) = \alpha + \beta_1\text{SIZE} + \beta_2\text{Z} + \beta_3\text{CASH} + \beta_4\text{PROFIT} + \beta_5\text{LEVERAGE} + \varepsilon_i, \quad (1)$$

where SIZE is measured using the log of either assets or sales (in different model specifications) at the time of the going public transaction, Altman's Z is a distress proxy, CASH (a proxy for balance sheet liquidity) is the ratio of cash and equivalents to total assets, PROFIT profitability is measured by ROA or ROE (in different specifications), and LEVERAGE is the ratio of debt to total assets.

#### *4.3. Performance of RT and SU firms*

A great deal of evidence exists demonstrating that firms underperform following an IPO, using a variety of measurement techniques (see, e.g., Ritter, 1991; Loughran and Ritter, 1995; Gompers and Lerner, 2003; Levis, 1993; Lee, Taylor, and Walter, 1999; Keloharju, 1993). Ritter (1991) finds that IPO firms significantly underperform non-IPO firms post IPO, and studies of internet IPOs (see, e.g., Ljungqvist and Wilhelm, 2003) provide even greater evidence of negative long horizon performance in the late 1990s.

However, whether poor post-IPO performance is merely an artifact of the broader issue of low returns to small, low book to market firms, the use of buy and hold rather than calendar time returns, or a function of the particular returns generating process used in the analysis, is a matter of ongoing empirical debate (see, e.g., Brav and Gompers, 1997; Brav, Geczy, and Gompers, 2000). Furthermore, Purnanandam and Swaminathan (2004) argue that the evidence from analysis of multiples indicates that high offer price-to-value IPOs experience greater price declines than peers. It seems that the market seems to get carried away with overly optimistic growth forecasts, and engages in systematic misvaluation.

If IPO firms do underperform post-IPO, then sentiment and market timing models are able to explain the performance (see, e.g., Ritter, 1991; Loughran and Ritter, 2000; Hirshleifer, 2001; Baker and Wurgler, 2000; Ljungqvist, Nanda, and Singh, 2002; Loughran, Ritter, and Rydqvist, 1994). Carter et. al. (1998) indicates that underwriter reputation is a significant determinant of long run performance post IPO. Furthermore, investors time their purchases to coincide with periods of optimism, which bids up the price of the newly public firms, but which results in sell-offs when the investor sentiment becomes negative. Ben Dor (2004) argues that institutional investor involvement in new IPOs is a leading indicator of market sentiment. Since institutional investors have better information than uninformed individual investors, the former should anticipate investor sentiment and capitalize on it. Consistent with this hypothesis, he shows that higher institutional investor ownership shortly after the IPO is associated with higher subsequent returns.

If traditional underwritten IPOs underperform, despite efforts by underwriters to properly price and market the security issue (for which they are usually paid approximately 7% of the proceeds), then what might one expect from the performance of firms using alternative techniques to go public? At first glance, it might appear that it would be more difficult for reverse takeovers and self-underwritten IPOs to obtain institutional support or analyst coverage given that there is no underwriter to promote the issue. It may be the case that such firms are poor performers that could not get an investment bank to risk reputational capital by underwriting their offerings. Anecdotally, it appears to be the case that the scrutiny of the IPO process is more extensive than for corporate combinations. If so, one would expect the popular conception of reverse takeovers to be true – they may turn out to be shareholder rip-offs. Self-underwritten IPOs may save the 7% required for underwriting, but they also would be expected to suffer from the consequences of not having the due diligence backup provided by the underwriter, and from the overextension of managerial resources involved in marketing the stock to retail buyers. As mentioned before, both self-underwritten IPOs and RTs face the disadvantage of not

obtaining the publicity and visibility inherent in underwritten IPOs. RTs also differ from SUs and traditional IPOs in that if the shares are determined to be marginable, they can be shorted without lockup period constraints, while the shares of SUs and traditional underwritten IPOs cannot be.

To examine long run market value performance, we calculate buy-and-hold returns (BHRs) for the sample RT and SU firms and for the matched IPO firms using daily returns. The returns start the day after the RT or SU event date until the end of the holding period (which is 6, 12, 18, 24, or 36 months) or the delisting date, whichever is earlier. The buy-and-hold abnormal return (BHAR) is calculated as the difference between the buy-and-hold return of the RT or SU firm and the buy-and-hold return of the matched IPO firm.

We use both equal-weighted and value-weighted (the firms' market capitalization at the time of the RT or SU event are used as weights) average holding period buy and hold returns to compare the long-run performance of the RT and SU sample relative to the control sample of IPOs. The average holding period buy and hold return across a sample of N firms is calculated as:

$$BHR = \sum_{i=1}^N \omega_i \left[ \prod_{t=2}^{T_i} (1 + R_{it}) - 1 \right] \times 100 \quad (2)$$

where

$\omega_i$  = stock i's weight in forming the average holding period return

$R_{it}$  = the return to stock i over day t

$T_i$  = end of the holding period for stock i or the delisting date, whichever is earlier

Following Field and Lowry (2004) and Ben Dor (2004), we examine whether institutional investor participation predicts returns after controlling for important firm characteristics:

$$\begin{aligned} \text{Log}(1 + \text{BHAR}_{12}) = & \alpha + \beta_1 \text{INSTOWN} + \beta_2 \text{SIZE} + \beta_3 \text{NOUW} + \beta_4 \text{CASH} \\ & + \beta_5 \text{LEVERAGE} + \beta_6 \text{HOT} + \varepsilon_i \end{aligned} \quad (3)$$

The log transformation is used to deal with the skewness in the distribution of 12-month BHARs. INSTOWN is the percent of shares owned by institutions at the end of the first quarter following the going-public transaction. SIZE is the log of market value at the time of the IPO. NOUW is a dummy = 1 if the firm went public through a self-underwritten IPO or an RT where the firm reported having no investment advisor. CASH is measured by the ratio of cash to assets at the firm's first reporting period. LEVERAGE is the ratio of debt to total assets. HOT is a dummy = 1 if the IPO took place during the internet bubble (defined, by Ljungqvist and Wilhelm, 2003, as the period between January 1, 1999 to December 31, 2000).<sup>9</sup> All specifications incorporate White's correction for heteroscedasticity.

## 5. Results

### 5.1. Do firms using alternatives to IPOs differ from IPO firms? Univariate statistics

We first examine whether the characteristics of RT, SU, and matched IPO firms differ significantly in the year prior to going public, and in the year of the going public transaction. Anecdotal evidence suggests that firms that use alternatives to the traditional underwritten IPO do so because they are so

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<sup>9</sup> Alternative model specifications defining different periods for the hot market yielded similar results.

small, or that their operating characteristics are so poor that either the firm cannot afford to have an investment bank underwrite the issue, or the firm cannot find an investment bank to underwrite the issue at all. The results of univariate tests are shown in Table 2. Panel A provides mean and median values for the operating characteristics of RT, SU, and IPO firms, for the year prior to going public.<sup>10</sup> Panel B provides mean and median values for the year of the going public transaction. All three sets of firms are small, with mean (median) assets of \$359.4 (\$16.0) million for RTs and SUs, and \$283.8 (\$22.3) million for IPOs. The tests of differences in means and medians, indicates that firms using RTs or SUs to go public do not differ significantly from their IPO matches the year prior to going public.<sup>11</sup> This is not surprising since the IPOs were size matched to RTs and SUs for the year prior to the transaction. RT and SU firms do not, by and large, appear to differ from matched IPO firms in terms of profitability, as measured by ROA (the means for all categories are negative), in the year prior to going public. On the other hand, RTs and SUs have negative ROEs vs. positive ROEs for IPO firms in the year before they become public. As a result, RTs alone and with SUs have significantly ROE (mostly at the 1% level) in terms of mean and median ROE than their control IPOs in the year prior to going public.

Table 2 (Panel A) also provides information on balance sheet liquidity (cash and equivalents/total assets), distress (Altman's Z), and leverage (debt/total assets) in the year prior to going public. In terms of liquidity and distress, RTs and SUs are comparable to their IPO matches in the year prior to going public. RTs are modestly more leveraged (significant at the 10% level) in the same period

As shown in Panel B, RTs and SUs exhibit mean and median negative profitability in the year of going public, and the matched IPOs do so as well in terms of mean ROA and ROE. However, only mean and median ROA is significantly less (at the 1% level) for RT and SU firms in this period. Firms using alternative going public transactions are also significantly less liquid (mostly at the 1% level), and are significantly more distressed (at the 1% level) than their control IPOs. Finally, RT and SU firms have significantly more leverage (at the 1% level) than traditional IPOs in the year they go public.<sup>12</sup>

Table 2, Panel B also provides information on the market value and relative valuation of the firms in the year of the going public transaction. We find that at the time they go public, RT and SU firms have significantly lower mean and median market capitalizations than control firms (at the 10% and 1% levels, respectively). However, their price to book and price to sales multiples are generally comparable to control IPOs.

## *5.2. Logit analysis*

We next examine differences in characteristics of firms using SUs and RTs in a multivariate framework. Specifically, we test if firms using alternatives to IPOs differ from traditional IPOs in terms of leverage, balance sheet liquidity, profitability, and size (log of assets or sales). Table 3 provides the results of logit regressions, where the dependent variable is equal to 1 if the firm utilized a RT or SU to go public, and is equal to 0 if the firm utilized a traditional underwritten IPO to go public.

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<sup>10</sup> For RT firms, the year prior data is provided for the private firm that goes public via a reverse takeover.

<sup>11</sup> Nonparametric Kolmogorov-Smirnov tests indicate that assets, ROA, ROE, Cash to Assets, Debt to Assets, and Altman's Z are not normally distributed. Hence, we provide nonparametric as well as parametric tests throughout the paper. In most cases, the results of the nonparametric tests support the results of the parametric tests.

<sup>12</sup> For five observations, firms had debt to asset ratios that exceeded 100%. We report results where these five debt to asset ratios have been set at 100%. This removes the impact of outliers to some extent, but biases our tests against observing that RT and SU firms have significantly higher leverage.

**Table 2**

**Firm characteristics in the year prior to going public and year of going public**

Univariate tests on the characteristics of RT, SU and matched IPO firms during the year prior to going public and the year of going public. Panel A shows firm characteristics in the year prior to going public. Panel B shows firm characteristics in the year of going public.

*Panel A: Mean (median) descriptive statistics, year prior to going public*

	RT & SU	RT Only	IPOs matched to RT & SU	IPOS Matched only to RT	RT & SU vs. IPO	RT vs. IPO
	Mean Median	Mean Median	Mean Median	Mean Median	T-statistic Wilcoxon Z	T-statistic Wilcoxon Z
Assets	359.39	376.98	283.77	319.04	0.32	0.30
(\$ millions)	15.97	16.29	22.33	52.50	-0.37	-1.04
ROA (%)	-22.83	-22.18	-24.31	-7.71	-0.70	-0.57
	-8.77	-10.53	0.31	0.63	-1.02	-1.08
ROE (%)	-13.49	-13.55	16.63	6.68	-2.80**	-3.76***
	-1.03	-2.77	19.08	3.34	-2.77***	-3.56***
Cash/total assets	20.80	22.96	24.88	21.57	-0.32	-0.90
	8.83	10.30	12.10	10.22	-0.03	-1.09
Z	2.49	3.92	0.27	0.42	1.14	1.14
	1.92	2.38	2.01	2.15	-0.89	1.51
Debt/total assets	24.26	20.85	30.80	30.76	-1.27	-1.82*
	17.64	13.80	20.35	20.15	-1.24	-1.83*

*Panel B: Mean (median) descriptive statistics, year of going public*

	RT & SU	RT Only	IPOs matched to RT & SU	IPOS Matched only to RT	RT & SU vs. IPO	RT vs. IPO
	Mean Median	Mean Median	Mean Median	Mean Median	T-statistic Wilcoxon Z	T-statistic Wilcoxon Z
Assets(\$ millions)	516.08	652.37	393.64	444.56	0.41	0.46
	17.72	24.69	71.07	69.27	-2.98 ***	-3.00 ***
ROA (%)	-32.19	-26.86	-8.57	-8.48	-4.17***	-3.15***
	-4.27	-3.85	1.86	3.71	-4.19	-3.53
ROE (%)	-9.96	-14.06	8.89	-7.40	-0.21	-0.85
	-1.24	-2.35	4.06	6.13	-0.45	-1.10
Cash/total assets	22.19	22.90	34.90	36.16	-4.54***	-2.65***
(%)	10.09	11.30	24.80	34.70	-3.90***	-2.43**
Z	1.10	2.11	10.25	10.05	-4.86***	-4.86***
	2.12	2.27	5.99	5.57	-5.03***	-5.03***
Debt/total assets	27.03	24.83	14.90	14.27	3.78***	3.78***
	19.74	17.38	4.78	3.86	3.35***	3.35***
Market cap.	75.96	58.67	487.30	638.88	-1.82*	-1.88*
(\$ millions)	19.60	16.53	110.86	140.72	-7.32***	-7.68***
Price/book	5.80	7.59	5.24	5.03	0.33	0.90
	1.96	2.28	3.00	3.23	-1.99**	-1.29
Price/sales	9.57	7.14	6.13	6.58	0.98	0.92
	0.23	0.21	0.25	0.23	-1.22	-1.08

\*\*\*Indicates statistical significance at the .01 level.

\*\*Indicates statistical significance at the .05 level.

\*Indicates statistical significance at the .10 level.

Table 3 confirms the results shown in Table 2 in a multivariate framework. Firms that use RTs or SUs rather than IPOs tend to be significantly smaller (at the 1% level) as indicated by the negative coefficient on log of assets or sales. RT and SU firms have significant negative liquidity coefficients (at the 1% level). Thus, it is not surprising that they also tend to exhibit significantly higher distress (at the 1 and 5% level), as indicated by Altman's Z. Firms with higher Zs experience lower levels of distress, and the negative coefficient on Altman's Z indicates that firms with lower levels of distress are less likely to do reverse takeovers or self underwritten deals than IPOs. While ROA and ROE have negative coefficients, ROA is only moderately significant (at the 10% level). Finally, RTs and SUs are associated with significantly higher levels of debt (at the 5% level).

5.3. Do firms using alternatives to traditional IPOs underperform traditional IPOs?

Table 4 provides buy and hold returns (BHRs) for sample and control firms for the 6, 12, 18, 24, and 36 month periods following their going public transactions.

**Table 3**  
**Logit regression**

The dependent variable is RT or SU = 1, IPO = 0. The models show factors affecting the probability of firm using an alternative to an IPO (such as a RT or SU) versus and IPO. SIZE is measured by log of assets (or sales) at the time of the going public transaction, Altman's (Z) is used to measure distress, CASH, a proxy for balance sheet liquidity, is the ratio of cash and equivalents to total assets, PROFIT, a profitability measure is return on assets (ROA) or return on equity (ROE), and LEVERAGE is the ratio of debt to total assets. All variables are as of the year of going-public transaction. Wald statistics are shown below parameter estimates.

	Model 1	Model 2	Model 3	Model 4
Intercept	2.588*** (26.62)	2.741*** (26.98)	2.385*** (18.85)	1.795*** (15.51)
Log assets	-0.512*** (22.71)			-0.462*** (27.73)
Log sales		-0.512*** (23.54)	0.436*** (15.71)	
Z	0.071*** ( 8.14)	-0.069** ( 6.36)	-0.063*** ( 5.85)	
Cash	-1.816*** ( 9.20)	-3.352*** (18.56)	-3.351*** (20.07)	-2.098*** (15.23)
ROA			-0.009* ( 1.78)	
ROE	-0.001 ( 0.00)	0.001 ( 0.11)		-0.001 ( 0.21)
Leverage				0.017*** ( 6.42)
Likelihood ratio	80.72***	79.13***	83.49***	68.81***
Wald chi-square	41.92***	42.48***	41.99***	45.74***
N	253	253	253	253

\*\*\*Indicates statistical significance at the .01 level.

\*\*Indicates statistical significance at the .05 level.

\*Indicates statistical significance at the .10 level.

**Table 4**  
**Post-going public performance**

Reported are mean and median equal-weighted and value-weighted 6, 12, 18, 24 and 36 month buy and hold returns (BHARs) for all RT and SU firms vs. matched IPO firms (Panel A), and for RT only firms vs. matched IPO firms (Panel B). The market capitalization of a firm on the RT or SU date is used as a weight to calculate the value-weighted results.

*Panel A: All RT and SU firms*

Period (in months)	N	Equal-weighted mean (median) BHRs			Value-weighted mean (median) BHRs		
		RT & SU	Matched IPO	t-test for diff. (Wilcoxon Z)	RT & SU	Matched IPO	t-test for diff. (Wilcoxon Z)
6	141	17.45	- 3.40	2.06**	- 0.15	0.05	1.43
		(- 9.09)	(-13.93)	( 1.74)*	(- 0.01)	(- 0.01)	(- 0.90)
12	119	4.56	- 7.29	1.09	- 0.32	0.19	-1.57
		(-14.67)	(-23.97)	( 0.91)	(- 0.02)	(-0.02)	(- 0.78)
18	108	- 0.52	- 4.62	0.30	- 0.41	0.72	-1.35
		(-30.51)	(-23.24)	( 0.66)	(- 0.05)	(- 0.02)	(- 1.17)
24	100	4.35	- 0.73	0.33	- 0.54	0.86	- 1.40
		(-40.98)	(-24.42)	(- 0.70)	(- 0.06)	(- 0.01)	(- 2.30)**
36	90	41.63	26.54	0.56	- 0.26	1.88	- 1.10
		(-18.31)	(-22.72)	( 0.49)	(- .002)	(- 0.01)	(- 1.22)

*Panel B: RT firms only*

Period (in months)	N	Equal weighted mean (median) BHRs			Value-weighted mean (median) BHRs		
		RT	Matched IPO	t-test for diff. (Wilcoxon Z)	RT	Matched IPO	t-test for diff. (Wilcoxon Z)
6	119	22.81	- 0.18	1.97*	- 0.09	0.10	- 1.42
		(- 6.00)	(-12.45)	( 1.66)*	(- 0.01)	(- 0.01)	(- 0.25)
12	98	7.22	- 4.85	0.96	- 0.23	0.31	- 1.29
		( 13.79)	(-23.19)	( 0.75)	(- 0.02)	(- 0.02)	(- 0.05)
18	90	3.52	- 1.55	0.32	- 0.11	1.04	- 1.02
		(-30.51)	(-18.31)	( 0.55)	(- 0.05)	(- 0.02)	(- 0.46)
24	85	11.17	3.93	0.49	-0.29	1.22	- 1.15
		(-37.50)	(-21.74)	(-0.51)	(- 0.05)	(- 0.02)	(- 1.39)
36	76	46.09	37.62	0.27	0.02	2.60	- 0.98
		(-18.31)	(-16.04)	( 0.13)	(- 0.02)	(- 0.01)	(- 1.10)

\*\*\*Indicates statistical significance at the .01 level.

\*\*Indicates statistical significance at the .05 level.

\*Indicates statistical significance at the .10 level.

The results in Panel A (for all RT and SU firms) and Panel B (for RT firms only) show that firms utilizing alternative going public mechanisms outperform their matched traditional IPO counterparts in the short term (using equal-weighted mean BHRs), and generally exhibit comparable performance in the three years following going public (as indicated by both mean equal-weighted and value-weighted BHRs). We also compare median BHRs of the two samples because the distribution of BHRs for both the RT and SU firms and the matched IPOs is characterized by skewness. The results suggest that firms employing alternative techniques to IPOs do not underperform a matched sample in terms of

market value performance three years post-going public. This is contrary to what might be expected given that bankers did not vet firms using alternative financing methods as they would in an IPO. On the other hand, this may not be surprising given that so many RTs and SUs were done during the tech/dot-com bubble when many IPOs were subjected to inadequate due diligence.

**Table 5**  
**Volatility post going-public**

Reported are mean (median) standard deviation of returns for 6, 12, 18, 24 and 36 month periods for all RT and SU firms and matched IPOs (Panel A), and for RTs only and matched IPOs (Panel B).

*Panel A: All RT and SU firms*

Period (in months)	N	RT & SU	Matched IPO	t-test for diff. (Wilcoxon Z)
6	141	0.07 (0.06)	0.49 (0.04)	5.66*** (5.24)***
12	119	0.07 (0.06)	0.05 (0.05)	4.05*** (3.63)***
18	108	0.07 (0.06)	0.05 (0.05)	3.20*** (2.52)**
24	100	0.07 (0.06)	0.05 (0.05)	3.54*** (2.95)***
36	90	0.06 (0.06)	0.05 (0.05)	2.42*** (1.87)*

*Panel B: RT firms only*

Period (in months)	N	RT & SU	Matched IPO	t-test for diff. (Wilcoxon Z)
6	118	0.08 (0.07)	0.05 (0.04)	6.33*** (6.00)***
12	98	0.07 (0.07)	0.05 (0.05)	4.78*** (4.21)***
18	91	0.07 (0.06)	0.05 (0.05)	3.62*** (2.90)***
24	84	0.07 (0.06)	0.05 (0.05)	3.72*** (3.09)***
36	76	0.07 (0.06)	0.05 (0.05)	2.70** (2.16)**

\*\*\*Indicates significance at the .01 level.

\*\*Indicates significance at the .05 level.

\*Indicates significance at the .10 level.

*5.4. Volatility and trading liquidity*

We investigate volatility and trading liquidity of sample and control firms following the inception of trading. The popular perception of RTs and SUs is that they are generally riskier (more volatile) than

IPOs and less liquid. Table 5 provides data on volatility, as measured by mean and median standard deviation of returns, over the 6, 12, 18, 24, and 36 months following the going-public transaction.

Table 5, Panel A shows that the stocks of RT and SU firms are significantly more volatile, in terms of standard deviation of returns (generally at the 1% level), than those of matched IPO firms over each time interval. Similar results are obtained if the comparison is done for the sample of RT firms only and their matched IPO firms (see Panel B).

Table 6 provides the results of an analysis of liquidity of RT and SU firms over the first, second, and third year following their going-public transactions. We measure liquidity by turnover, i.e., trading volume divided by number of shares outstanding. Liquidity is measured beginning from the second month after the event date (i.e. date of reverse takeover or self-underwritten offering), and is measured as daily averages for each of the first three years. In each year, a RT and SU firm is included in the sample if it and its matched IPO (in the case of Panels A and B) have a minimum of 200 observations for which daily turnover can be calculated.

Panel A documents that the RT and SU firms are significantly less liquid (at the 1 and 5% levels) than their IPO counterparts in each of the three years following the RT or SU event date. Similar results are obtained when the comparison is done for the sample of RT firms only and their IPO counterparts (see Panel B). These results complement the findings in Eckbo and Norli (2001), which finds that IPOs are more liquid than size-matched seasoned firms.

Unlike SUs and IPOs, RTs involve a previously existing and publicly traded firm. So in Panel C we examine if the liquidity of the public firm is affected by the reverse takeover. We find that there is no statistically significant change in the liquidity of the public firm because of the reverse takeover. The liquidity of the pre-existing public firm in the year prior to the reverse takeover is not statistically different from the liquidity in the year after the reverse takeover.

### *5.5. Ability to attract institutional ownership*

In Table 7, we compare the institutional ownership of the combined RT and SU sample and the RT only sample with the institutional ownership of the matched IPO sample during the quarter of the event (i.e. reverse takeover or self-underwritten offering) and the following quarter (see Panel A). We also do this comparison for the period corresponding to the matched firm's IPO (see Panel B). Finally, we examine if there is a change in the institutional ownership for sample and control firms in the quarter after they go public.

To illustrate the contents of Table 7, we provide the following example. Hayes Corp went public through an RT on 7/30/1997. Its control firm, Ciena Corp, did an IPO on 2/7/1997. Table 7 column A1, shows the percent institutional ownership for RT firms at the end of the quarter in which they went public (i.e., for Hayes, the quarter including 7/30/1997) and the quarter after. Column A3 provides the same information for the combined RT and SU sample. Column A2 (A4) shows the institutional ownership of the matched IPO firm at the time the RT (RTSU) firm went public (i.e., institutional ownership is reported for Ciena for the quarter including 7/30/1997, which is the quarter that the sample firm Hayes went public, and the quarter after). Columns A5 and A6 provide t-statistics and Wilcoxon Z statistics for difference in mean and medians between the RT sample and control IPO firms and between the full RTSU sample and matched control firms, respectively.

**Table 6**  
**Trading liquidity**

Reported are mean (median) liquidity during the first, second and third years for the combined RT and SU sample and matched IPOs (Panel A) and for RTs only (Panel B). The table also shows mean (median) liquidity of the public firm in the year before and after the reverse takeover (Panel C). Liquidity is measured by turnover, which is volume divided by number of shares outstanding. It is measured beginning from the second months after the event date (date of reverse takeover or self-underwritten offering), and as daily averages for each year (source: CRSP). In each year, a RT or SU firm is included in the sample if it and its matched IPO (Panels A and B) have a minimum of 200 observations of daily turnover.

*Panel A: All RT and SU firms*

Period (in months)	N	RT & SU	Matched IPO	t-test for diff. (Wilcoxon Z)
0-1	111	0.01 ( 0.00)	0.01 ( 0.00)	-1.12 (-3.29)***
1-2	94	0.00 ( 0.00)	0.01 ( 0.00)	-2.22** (-3.73)***
2-3	64	0.00 ( 0.00)	0.01 ( 0.00)	-2.36** (-2.45)**

*Panel B: RT firms only*

Period (in months)	N	RT & SU	Matched IPO	t-test for diff. (Wilcoxon Z)
0-1	92	0.01 ( 0.00)	0.01 ( 0.01)	-0.53 (-2.39)**
1-2	77	0.00 ( 0.00)	0.01 ( 0.01)	-1.88* (-3.35)***
2-3	53	0.01 ( 0.00)	0.01 ( 0.01)	-2.54** (-2.65)***

*Panel C: Mean (median) turnover of RT firms pre-RT and post RT*

N	Mean (median) daily turnover		t-test for diff. (Wilcoxon Z)
	Year -1	Year 1	
84	0.01 ( 0.00)	0.01 ( 0.00)	-0.33 (-0.18)

\*\*\*Indicates significance at the .01 level.

\*\*Indicates significance at the .05 level.

\*Indicates significance at the .10 level.

**Table 7**

**Mean (median) institutional investor participation in RTs and SUs post going public**

Comparisons of institutional ownership of the combined RT and SU sample and RT only sample with the institutional ownership of the matched IPO sample during the quarter of the event. Panel A reports the institutional ownership of RT and SU firms and the comparison with the matched IPO firms in the quarter (T) the RT or SU firm went public and the next quarter (T+1). Panel B reports on institutional ownership for the matched IPOs in comparison with the RT and SU firms in the quarter each firm went public and the next quarter.

*Panel A: Comparison of institutional ownership (in %) with the matched IPO firms in the period corresponding to the RT/SU event*

	(A1) RT N=100	(A2) Matched IPO time since RT	(A3) RT and SU N=117	(A4) Matched IPO time since RT/SU	(A5) t-test for RT – IPO = 0 (Wilcoxon Z)	(A6) t-test for RT & SU – IPO = 0 (Wilcoxon Z)
Inst. ownership (T)	11.16	24.18	11.81	23.80	-5.31***	-5.14***
	-5.62	-20.7	-5.42	-20.13	(-5.01)***	(-5.02)***
Inst. ownership (T+1)	10.21	24.97	10.85	24.34	-6.03***	-5.23***
	( 6.67)	(21.00)	(5.04)	(20.73)	(- 5.47)***	(- 5.26)***
t-test for (T+1) - T = 0	-0.71	1.87*	-0.8	2.02**	-1.24	-1.44
(Wilcoxon Z)	(-0.75)	(1.80)*	(-0.90)	(1.68)*	(-1.71)*	(-1.82)*

*Panel B: Comparison of institutional ownership (in %) with the matched IPO firm in the period each firm went public*

	(B1) RT N=100	(B2) Matched IPO time since RT	(B3) RT and SU N=117	(B4) Matched IPO time since RT/SU	(B5) t-test for RT – IPO = 0 (Wilcoxon Z)	(B6) t-test for RT & SU – IPO = 0 (Wilcoxon Z)
Inst. ownership (T)	11.16	17.87	11.81	17.83	-2.99***	-2.56***
	( 5.62)	(16.07)	( 5.42)	(15.63)	(-5.47)***	(-3.24)***
Inst. ownership (T+1)	10.21	24.97	10.85	24.34	-6.03***	-5.23***
	( 6 .67)	(16.86)	(5.04)	(16.82)	(- 4.97)***	(- 5.01)***
t-test for (T+1) - T = 0	-0.71	1.87*	-0.80	2.02**	-1.24	-1.44
(Wilcoxon Z)	(-0.75)	(4.62)***	(-0.90)	(5.31)*	(-3.53)*	(-3.84)***

\*\*\*Indicates significance at the .01 level.

\*\*Indicates significance at the .05 level.

\*Indicates significance at the .10 level.

The information for the RT sample and the combined RT & SU sample remains the same in Panel B. What differs in Panel B is the time measurement for control sample comparison purposes. Column B2 (B4) provides the percent institutional ownership for the IPO control firms for the RT (RT & SU) sample for the quarter during which the control firm went public and the quarter after (i.e., Ciena's institutional ownership the quarter of 2/7/1997, when Ciena went public, and the quarter after). In using both time measurements, we take into account market conditions that might affect institutional ownership decisions as well as the decisions of institutions to hold stock involving the "trading age" of the firm, or the time since the firm went public.

Table 7 shows that at the end of the first reporting quarter, RTs and the combined RT and SU sample exhibit significantly lower levels of institutional ownership (at the 1% level) relative to the control IPO sample. The mean institutional ownership is 11.16% for RTs and 11.81% for the combined RT and SU sample, vs. 23.80% for matched IPO firms in the same period, and 17.83% for IPO firms in the period when the IPO firm went public. Similarly, in the quarter following the going public transaction, institutional ownership is significantly lower (at the 1% level) for RT firms and for RT and SU firms than for the matched sample IPOs.

The last row in Table 7, Panel A indicates that institutional ownership for the RT sample and the combined RT and SU sample *declined* (not significant) in the quarter they went public and the following quarter when there was no control match. Institutional ownership *rose* significantly (at the 5 and 10% levels) for control IPO firms. When compared to the matching sample, the decline in institutional ownership for RT and SU firms is moderately significant (at the 10% level). Turning to Panel B, we see a similar pattern, but the magnitudes and significance is much greater (at the 1% level).

Taken together, these results suggest that the IPO process provides benefits to IPO firms in terms of obtaining institutional support for those firms. While these firms pay for these services, they appear more difficult to achieve without the help of underwriter involvement in the IPO process, from the roadshow to aftermarket stabilization. The marketing function performed by the lead manager appears to be more effective than that of the merger advisor, in the case of the RT, or the management of the company, in the case of the SU, in attracting institutional support.

#### *5.6. Post going-public return predictability*

We next examine the factors that influence the one year performance of firms using RTs and SUs to go public. Table 8 provides the results of regressions for three model specifications where the dependent variable is 12 month buy and hold abnormal returns (BHARs) of RT and SU firms.

**Table 8**  
**Predicting returns using institutional holdings**

The dependent variable is log of [1+12 month post going public buy and hold abnormal returns (BHARS)] for sample RT and SU firms. Log transformation is used to account for the skewness of the distribution of 12 month BHARS. INSTOWN is the percent of shares owned by institutions at the end of the first quarter following the going-public transaction. SIZE is the log of market value at going-public. NOW is dummy = 1 if the firm engaged in a RT or SU and reported having no investment advisor. CASH is a proxy for balance sheet liquidity and is the ratio of cash and cash equivalents to assets at the firm's first reporting period. LEVERAGE is the ratio of debt to total assets. HOT is a dummy = 1 if the IPO took place during the internet bubble – between January 1, 1999 to December 31, 2000 (see Ljungqvist and Wilhelm(2003)).

	(1)	(2)	(3)
Intercept	0.347 (1.47)	0.421* (1.77)	0.258 (1.12)
INSTOWN	0.027** (1.99)	0.029** (2.07)	0.012* (1.69)
SIZE	-0.009* (-1.67)	-0.008 (-1.55)	-0.006 (-1.56)
NOUW	-0.413* (-1.73)	-0.387* (1.68)	-0.497** (-2.18)
CASH			0.677* (1.78)
LEVERAGE	-0.013** (-2.25)	-0.013** (-2.02)	
HOT		-0.410 (-1.61)	-0.496* (-1.94)
Adj. R <sup>2</sup>	18.95	20.02	22.23
F	3.85***	4.06***	4.71***
N	89	89	97

\*\*\*Indicates significance at the .01 level.

\*\*Indicates significance at the .05 level.

\*Indicates significance at the .10 level.

All three model specifications indicate that institutional ownership at the end of the first quarter is a significant (at the 5 and 10% levels) determinant of superior post going-public performance. This is consistent with the results found by Field and Lowry (2004) and the notion that institutional owners mitigate agency conflicts and provide monitoring for newly public firms. The market capitalization of

the RT or SU firms is negatively related to 12-month BHARs but its coefficient is significant (at the 10% level) in only one specification. The coefficient on the HOT dummy is negative but not significant in Model 2 and is negative and moderately significant (at the 10% level) in Model 3. This provides weak support for the idea that RT and SU firms, which went public during the hot IPO period between January 1999 and December 2000, perform poorly. This result is consistent with the findings of IPO studies.<sup>13</sup> Models 1 and 2 indicate that higher leverage (as measured by the ratio of debt to total assets) is significantly detrimental (at the 5% level) to long term returns of RT and SU firms. Model 3 indicates that higher balance sheet liquidity is positively and moderately significant (at the 10% level) related to stock market performance.

We also investigate whether having outside valuation assistance facilitates better post-valuation performance. We include NOUW, a dummy variable, which is equal to 1 if the firm is either an SU (with no underwriter) or an RT with no investment advisor.<sup>14</sup> Having no investment advisor or underwriter (i.e., truly a “do it yourself” deal) predicts significantly negative 12 month stock market performance (at the 10% level in Models 1 and 2 and at the 5% level in Model 3). This is consistent with comments made by Capital West Securities banker Bob Rader, in explaining why self-managed going public transactions often fail: “As a manager, you need to dedicate your time to running the firm, rather than going out and trying to find people interested in your stock.”<sup>15</sup> While not necessarily a strong indicator of the role performed by the underwriter in a traditional IPO, this result is consistent with the conjecture that managerial resources can become overextended if the firm does not seek outside assistance with the going public transaction, and with the idea that an outside financial valuation group provides certification of value.

## **6. Conclusions**

In this paper, we examine the characteristics of firms using reverse takeovers and self-underwritten IPOs as an alternative to the traditional underwritten IPO. A reverse takeover occurs when a private firm is acquired by a public firm in order for the former to become a publicly traded company. In a self-underwritten IPO, a firm goes public without the use of underwriters. We also look at the performance implications for these alternative methods of going public compared to a matched sample of firms doing initial public offerings.

Using univariate statistics, we find that reverse takeover and self-underwritten firms have a significantly lower ROA in the year of going public, but show no difference in ROE than a matched sample of 3-digit SIC firms that used an IPO to go public in the same year. In addition, firms employing reverse takeovers and self-underwritten IPOs to go public exhibit significantly lower balance sheet liquidity, greater likelihood of financial distress and greater financial leverage than a control sample in the year of going public.

We also examine post going public stock market performance, volatility, liquidity and institutional ownership. We find evidence that firms utilizing alternative going public mechanisms outperform their matched traditional IPO counterparts in the short term, and exhibit comparable performance in the three years following going public using equal-weighted buy and hold returns. We also find that these

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<sup>13</sup> Ofek and Richardson (2003) use the 1998 to 2000 time period to represent the “internet bubble”. Our results are robust to this definition of hot market as well.

<sup>14</sup> Some reverse takeover firms report hiring a financial advisor to assist with the deal. However, about a third report “no investment advisor” in their pre-merger financial statements.

<sup>15</sup> Personal interview with Bob Rader of Capital West Securities, 7/30/2004.

firms are characterized by significantly higher volatility, as measured by the standard deviation of returns in every 6 month period up to three years after going public. Liquidity also declines significantly in every period except the first six months after going public. Firms choosing alternative going public approaches have significantly lower institutional ownership in the first quarter of being public and comparable institutional ownership in the next quarter post going public to their control IPO firms.

Our results have important implications for managers – namely, that the traditional underwritten IPO is not the only game in town, and that firms can avoid the costs of the traditional IPO without experiencing substantially lower performance by some measures. However, investors should consider that firms employing reverse takeovers and self-underwritten IPOs to go public have lower liquidity, higher volatility and lower institutional participation.

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