What Do Underwriters See? What Do Investors See? An Empirical Investigation of Factors that Impact Underpricing

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ABSTRACT

How do underwriters set up offer prices? How do investors determine trading prices? Two hypotheses – the endorsement hypothesis and the herding hypothesis – are examined in an attempt to identify the factors attributable to the causes of underpricing phenomena. Using data from 1996-2004, my analyses suggest that the underwriter's reputation provides a credible endorsement for the quality of the issuers. Consequently, investors are willing to pay higher trading prices for newly issued stocks. Besides evaluating the firm's financial characteristics, the underwriter also considers its own reputation when setting up the offer price for the issuers. Contrary to prior studies, the empirical tests presented are based on random sampling instead of a complete sampling.

INTRODUCTION

At one point in time, all firms will need to raise capital to finance new projects, expand, or in many cases just to start up their company. For newer and less established companies the best way to raise quick capital is to make a stock offering. When a firm decides they want to sell their initial shares to the public they usually opt to go through an investment banking firm. The investment bank pitches the issuing firm's investment case to different investors to get an idea of the investor's interest and intention to buy the shares. This is called book building and the investment bank can then use this information to negotiate an offer price with the issuing firm. The agreed upon offer price is the price that the underwriter (investment bank) guarantees the issuing firm per share. The underwriter then markets and sells the shares to the public. As one can see, if they agree on a price that is too low, the stock will experience large first-day returns (underpricing) and "the issuer does not get the full advantage of its ability to raise capital" (Ibbotson, Ritter, Sindelar, 1994).

Initial public offerings (IPOs) earn large first-day returns, a phenomenon widely referred to as IPO underpricing (Loughran and Ritter, 2004). What is underpricing? It is the percentage change from a stock's first-day closing market price to its offer price. Following tradition, underpricing and first-day return are used interchangeably in this study. If we were to assume the market price of a stock is dictated by supply and demand and this is representative of the firm's value, then these stocks that earned large first-day returns would seem to have an agreed upon offer price that is below the actual value.

If one can predict which IPO will experience the largest underpricing, they stand to make a lot of money. Thus, it is important for an investor to try and determine the most explanatory factors of underpricing. It is also important for the financial community to understand when

underpricing will occur because if the underwriter underprices too much it will scare away future issuing firms, but if they do not underprice enough they will not attract investors.

Prior studies have documented that IPOs report underpricing of 7.4%, 11.2%, 18.1%, and 65% during the 1980s, early 1990s, mid 1990s, and 1999-2000, respectively (Loughran and Ritter, 2004). Why would an issuing firm accept underpricing and why does it change over time? Excess underpricing suggests an issuing firm leaves significant amounts of money on the table, which is the difference between offer price and the first-day closing market price, multiplied by the number of shares sold. Loughran and Ritter (2004) offer a comprehensive review of the changes in IPOs underpricing from 1980 to 2003. Four most promising hypotheses – changing risk composition hypothesis, realignment of incentive hypothesis, spinning hypothesis, and analyst lust hypothesis– are examined and associated with various empirical models. Most of their empirical evidence leads to agree with the analyst lust explanation, namely, that the issuer is willing to accept more money left on the table in exchange for future bullish analyst coverage on its equity.

I modify Loughran and Ritter (2004) by examining factors attributable to offer price and the first-day closing price, separately. That is, I investigate which factors are adopted by underwriters to determine the offer price and further, which factors are evaluated by investors to trade the newly issued security in a secondary market. In doing so, I attempt to determine whether underwriters and investors use different information sets to evaluate the same security. Consequently, I am able to identify the primary factors leading to underpricing.

The paper is organized as follows. In the Literature Review and Hypotheses section, past literature is reviewed and testable hypotheses are stated. In Methodology, data collection and model structure are explained. The Data Analysis section provides empirical findings along with interpretations, and the final section offers concluding remarks.

LITERATURE REVIEW

I. Determining an Offer Price

Before an underwriter begins the book building process they must determine what they believe to be a company's fair market value. They investigate a firm extensively, focusing on their fundamentals. The fundamental characteristics of each firm that I focus on include: pre-issue book value of assets, trailing annual firm sales, book value of asset per share for the year prior to IPO, sale per share for the year prior to IPO, earning per share for the year prior to IPO, cash flow from operation per share for the year prior to IPO, and capital expenditure over total sales for the year prior to IPO. Underwriters use these figures and ratios along with many others to determine an intrinsic value and determine the offer price for IPOs. Since investors are much more selective during slow economic times, these factors should be more strongly considered during a bear market.

II. Underpricing Due to Market Inefficiencies

Past studies have attempted to offer several explanations on why underpricing occurs and why the degree of underpricing has increased over the last two decades. The changing risk composition hypothesis argues that riskier firms tend to underprice more than their less risky counterparts (Ritter, 1984a). This idea attempts to explain the drastic increase (an increase of 47%) in underpricing during the Internet bubble period, when most were investing in technology and Internet sector firms which are considered very high risk. Loughran and Ritter (2004) cite that their (regression) analyses did not support increased tech and Internet firms issuing IPOs as being the root cause of the increased underpricing. I hypothesize that risk composition was a stronger factor during the 1999-2000 period then the other time periods, that there was a shift away from tech and Internet IPOs in the time period after the Internet bubble, and that they experienced less underpricing.

One of the most widely accepted theories of underpricing is the Asymmetric Theory. The basis for this theory is that there are three parties involved in the underwriting of IPOs: the issuing firm, the investment bank, and investors. Asymmetric theory states that information is not shared evenly among these three groups. For instance, the issuing firm may have better knowledge on the true value of the company than the underwriter does. Perhaps the best-known asymmetric information model is Rock's (1986) winner's curse, where some investors are more informed than other investors. The informed investors do not bid on overvalued stocks but the uninformed investors do. Since the uninformed investors are the only ones to bid on these stocks, they will get them. This is the Adverse Selection Theory which contends that uniformed investors are said to have experienced "winner's curse" since they "won" all the stock, only because the informed investors did not bid on them and their demand in the attractive offerings is partly crowded out by the informed.

There are a couple of ways that asymmetric theory ties in with underpricing. One belief is that if uninformed investors had an expectation to lose money on IPOs because of always experiencing winner's curse, they would no longer participate in the primary market. The primary market is dependent on the uninformed investor's participation because informed investors' demand alone can not take up all shares being offered even in attractive offerings. As stated by Ljungqvist (2005), this requires that conditional expected returns are non-negative so that the uninformed at least breaks even. In other words, all IPOs must be underpriced in expectation.

The size of the IPO issuance is believed to reveal information about the deal to all parties involved. The larger the IPO issuance, the more information is available; eliminating asymmetric relationships and making the offering more attractive to investors. Also, it is believed the larger the IPO issuance, the more the underwriter will benefit from economies of scale. Benefiting from

economies of scale, the underwriter will not have to underprice each share as much to make their spread. In theory the larger the size of IPO issuance, the less underpricing the issuance should experience.

One way to reduce the informational asymmetry is to hire a prestigious underwriter (Booth and Smith, 1986; Carter and Manaster, 1990). By agreeing to be associated with an offering, prestigious intermediaries "certify" the quality of the issue. Earlier studies, focusing on the time periods of the 1970s and the 1980s have found a negative relation between several measures of reputation and initial return. However, Beatty and Welch (1996) report that starting in the 1990s, the perspective on underpricing has changed and the relationship has flipped such that more prestigious underwriters are now associated with higher underpricing. Ljungqvist and Wilhelm (2003) argue that beginning in the 1990s, underwriters had discretion of allocating IPO shares to "friends and family" of an issuing firm. They also allocated shares to themselves and executives of the issuing firm and this is known as "spinning". With low offer prices, the individuals holding the initial shares stand to make large profits; thus, decision-makers of the issuing firm are less likely to negotiate a higher offer price (known as the realignment incentive hypothesis).

I hypothesize this trend continued through the time periods studied and prestigious underwriters underpriced their IPOs more aggressively. Using Carter and Manaster's (1990) ranking of underwriters, based on the "tombstone" advertisements in the financial press that follow the completion of an IPO, I test if prestigious underwriters underpriced more than less prestigious underwriters.

III. Underwriter's Desire to Underprice IPOs

Underwriters specifically advise issuers on setting the price level and if underwriters are receiving compensation from both issuers and investors, they have more incentive to recommend

a lower issue price. With a higher offer price, the underwriter can reduce the average amount of underpricing and increase the issuer's expected proceeds. I measure the price level as offer price.

After the issuing firm has estimated its total value, it must determine how many shares to represent at this value and how many of shares to sell to the public. Fernando, Krishnamurthy, and Spindt (2002) found that there is a U-shaped relationship between offer price and underpricing, in that IPOs with either of the two extremes, high offer price or low offer price, are more apt to underprice. However, their study only examined the time period of 1981-1998. I hypothesize that the offer price had little effect on underpricing during the Internet bubble period, and high priced IPOs had a negative relationship to underpricing during the bear market of 2001-2004.

IV. The Analyst Lust Explanation of Underpricing

Finally, the most compelling argument for underpricing is that the decision-makers of an issuing firm tend to hire a lead underwriter, whose analyst is willing to offer bullish recommendations on its stock afterward. Bullish analyst coverage generates positive publicity for an issuing firm; hence, an upward demand curve of the stock is created. Consistent with this view, Aggarwal, Krigman, and Womack (2002) show underpricing is positively related to research coverage as well as insider selling at the end of the lockup period. With this bullish analyst coverage, the firm can make secondary offerings at a higher price.

V. First-Day Closing Price

With first-day return being used interchangeably with underpricing it would be important to understand what caused this return. First-day return, which is the difference between offer price and first-day closing price divided by offer price, is more easily understood broken down into two parts. I already presented theories on how the offer price is derived so now we will examine

the first-day closing price. The first-day closing price is no longer in the hands of the issuer or underwriter, but in the hands of the investor.

There are several factors that have an effect on which IPOs investors will buy, which push up prices. Several factors I discussed in prior sections, the most important being the size of issuance. I determined that the size of the issuance is a factor that effects the investor's decision, since the larger issuances eliminate asymmetry of information and is expected to provide more information to the average investor. I also include fundamental characteristics as something investors also consider.

I do however add two new characteristics that reflect market sentiment. Ibbotson, Sindelar, and Ritter (1994) state that if an investor sees that no one else wants to buy, he may decide not to buy even when he has favorable information. It would seem that it would be more beneficial for an issuer to issue at a time when the market is active and performing well. The two factors I include are (1) the average market return of 15 trading days prior to the issue date and (2) the market return difference between the pre-issue date and the issue date. I believe that it is more important to time the issuance of an IPO in slower economic times than it is during booming economic periods.

HYPOTHESES

The primary focus of my study tends to investigate how underwriters set up offer prices and how investors determine their trading prices. In this section, I develop two theories which relate firms' financial ratios, market sentiment proxy, and underwriter prestige to (1) offer price and (2) first-day closing price, respectively. First, the *endorsement hypothesis* (i.e., investor perspective hypothesis), argues that the underwriter uses its reputation as collateral to endorse the quality of its underwriting issuers. Thus, from the investors' perspectives, the more prestigious an underwriter is, the higher trading price is offered by investors in the secondary market.

Conversely, investors do not have the same confidence in issuers who are underwritten by less well known investment bankers. Similar arguments can be found in some prior studies examining the relationship between underpricing and an underwriter's quality (e.g., Betty and Welch, 1996; Cooney, Singh, Carter, and Dark, 2001). The main difference between my hypothesis and previous ones is that I argue that investors offer higher trading prices simply because the issuer is taken to public by a well known and prestigious investment banker, not because the equity is underpriced to be below its intrinsic value.

Second, the *herding hypothesis* (i.e., underwriter perspective hypothesis) argues that underwriters try to match the performance of their peers. In order to gain market share in the IPO business, an underwriter has to demonstrate at least equally good performance as its peers. The underlying reason is two fold – one is to avoid future lawsuits initiated from investors and the other is to successfully compete in the IPO business.

METHODOLOGY

Data Collection and Models

Initial Public Offerings were compiled from ipodata.com, yahoofinance/ipo.com, and New Issues History Database from Disclosure Incorporated. The later database spans only 1996 to early 2001, so for the time period of late 2001 to 2004, ipodata.com and yahoo finance were used as primary data sources. IPOs from the time period 1996-2004 were the only ones gathered, only large issues and common shares. The information collected for each IPO included: company name, ticker symbol, SIC code, cusip number, issue date, number of shares sold, offer price, and lead underwriter.

First, I collected the IPOs with prestigious underwriters. To determine prestigious underwriters, I used Carter and Manaster's (1990) ranking of underwriters' range of 8-9. Twenty-four underwriters were chosen, the ones accounting for the most IPOs issued included:

Bear Stearns, Goldman Sachs, Hambrecht & Quist, Lehman Brothers, Merrill Lynch, Morgan Stanley, Robertson Stephens, Smith Barney, and UBS. I used the lead underwriter as my primary searching criteria and collected all IPOs that were underwritten by these investment banks during 1996-2004, and then separated them by time periods: 1996-1998, 1999-2000, and 2001-2004. There were 615 IPOs issued by these prestigious underwriters. For the lower ranked underwriters (prestige range of 1-5), there was far less IPOs issued per firm. Thus, far more underwriters were used (124) for this group to come up with 324 IPOs issued from 1996-2004. Once again, these IPOs were separated into the same time periods noted above.

I kept the IPOs issued by prestigious underwriters and the IPOs issued by non-prestigious underwriters in separate files. After all the data was collected from both the Disclosure Incorporated database and ipodata.com, all of the issued IPO "doubles" (duplicates) were deleted. Size of IPO issuance was then calculated by multiplying the offer price by the number of shares issued for each IPO. Examining the data I noticed that in the years from 2001-2004 there were very few IPOs issued for both prestigious and non-prestigious underwriters. This is when I used the third source of yahoo finance to gather additional data. That is, I gathered the pre-issue book value of assets, trailing annual firm sales, book value of asset per share for the year prior to IPO, sale per share for the year prior to IPO, earning per share for the year prior to IPO, cash flow from operation per share for the year prior to IPO, and capital expenditure over total sales for the year prior to IPO for each firm that issued IPOs, from the SEC's Electronic Data Gathering and Retrieval (EDGAR) system.

The four regression models are defined as follows:

Model 1 -

$$\text{Offering Price}_i = \alpha_0 + \alpha_1 \text{ASSET} + \alpha_2 \text{SALE} + \alpha_3 \text{BVPS} + \alpha_4 \text{EPS} + \alpha_5 \text{SPS} + \alpha_6 \text{CFPS} + \alpha_7 \text{CAP} + \alpha_8 \text{TECH} + \varepsilon_i$$

Model 2 -

$$\text{Offering Price}_i = \alpha_0 + \alpha_1 \text{ASSET} + \alpha_2 \text{SALE} + \alpha_3 \text{BVPS} + \alpha_4 \text{EPS} + \alpha_5 \text{SPS} + \alpha_6 \text{CFPS} + \alpha_7 \text{CAP} + \alpha_8 \text{TECH} + \alpha_9 \text{RANK} + \varepsilon_i$$

Model 3 -

$$\text{First-Day Closing Price}_i = \beta_0 + \beta_1 \varepsilon_i + \beta_2 \text{SIZE} + \beta_3 \text{MA15} + \beta_4 \text{MR1} + \beta_5 \text{ASSET} + \beta_6 \text{SALE} + \beta_7 \text{BVPS} + \beta_8 \text{EPS} + \beta_9 \text{SPS} + \beta_{10} \text{CFPS} + \beta_{11} \text{CAP} + \beta_{12} \text{TECH} + \beta_{13} \text{OFFER} + \beta_{14} \text{INTEGER} + \xi_i$$

Model 4 -

$$\text{First-Day Closing Price}_i = \beta_0 + \beta_1 \varepsilon_i + \beta_2 \text{SIZE} + \beta_3 \text{MA15} + \beta_4 \text{MR1} + \beta_5 \text{ASSET} + \beta_6 \text{SALE} + \beta_7 \text{BVPS} + \beta_8 \text{EPS} + \beta_9 \text{SPS} + \beta_{10} \text{CFPS} + \beta_{11} \text{CAP} + \beta_{12} \text{TECH} + \beta_{13} \text{OFFER} + \beta_{14} \text{INTEGER} + \beta_{15} \text{RANK} + \xi_i$$

Models 1 and 2 test information sets used by the underwriters to set up offer prices. The only difference is that model 2 adds a rank dummy. Models 3 and 4 investigate the factors that determine trading prices of investors. Like the differences between models 1 and 2, model 4 incorporates rank, but model 3 does not. Model 2 is the subsequent test after model 1, and model 4 is the subsequent one after model 3.

RESULTS

Looking at the various data averages presented on Table 1, the data are broken down yearly, being fairly distributed throughout all time periods. All the columns are averages of the total number of IPOs selected. One interesting thing to notice is that the first-day return is drastically better than the market return during the same day as the issue. Also notice that during the Internet bubble period of 1999 and 2000, the average first-day returns were 61.56% and 47.9%, respectively. Interestingly enough, the average market return for the same days as IPO issues was the lowest during 2000, coming in at -.15%. The next subsection of Table 1 presents the data broken down into the three time periods addressed previously: i.e., 1996-1998, 1999-2000, and

2001-2004. The Internet bubble period has the highest first-day return of 56.11% and the lowest average market return of -.4%. One last thing to note from this table is how in the period of 2001-2004, the IPO issuance had the highest market value and the lowest first-day return. This may shed light on two plausible explanations: (1) that the larger the issuance, the less underpricing there is or (2) that market timing has a large effect on the size of the first-day return.

In Table 2, I break down the data into four time periods of roughly two years each and the data averages are presented. The first thing to note is that during the Internet bubble period there is the fewest number of IPOs issued (only 223). The reason for this is that the primary source of data, ipodata.com, only had information available for stocks that were still trading and as well-known, many companies went out of business shortly after their IPO issuance. The most interesting story that the data suggest in this Table is that during the Internet bubble period, the fundamentals of the companies had little impact on IPOs' performance. Every fundamental measurement used was the worst during this time period except for earnings per share for the prior year. It was likely the IPOs issued in 2003 that caused that time period to have the lower earnings per share since the market had been performing poorly after the Internet bubble burst. The fact that majority of the companies issuing IPOs during the Internet bubble period were technology-focused start-up companies is an obvious reason why the Internet bubble period would have the poorest fundamentals. One very interesting statistic however, is that the market return for the day prior to the issuance of the IPO was the worst during the Internet bubble period.

Table 3 contracts the data into three time periods: prior to the Internet bubble period (1996-1998, P1), the Internet bubble period (1999-2000, P2), and the post Internet bubble period (2001-2004, P3) (beta coefficients presented). The data is then separated into sub-categories of low

rank versus high rank underwriters. I examined whether there was a significant difference between the important factors for IPOs underwritten by low ranked underwriters versus IPOs underwritten by high ranked underwriters. Size of assets (=13.03 vs. 11.51, 12.70 vs. 11.91, and 12.61 vs. 14.50 for P1, P2, and P3, respectively) and sales of the year prior (=13.00 vs. 11.59, 12.14 vs. 11.39, and 14.02 vs. 1.97 for P1, P2, and P3, respectively) were significantly higher for the high ranked underwriters for all periods compared to low ranked underwriters ($p<.05$). Size of issuance was significant at the 1% level for all periods (=13.39 vs. 11.97, 13.66 vs. 12.25, 14.01 vs. 12.74 for P1, P2, P3, respectively for high versus low ranked underwriters). During the Internet bubble period, the dummy variable for technology firms was the highest, meaning there were more technology firms underwritten by high ranked underwriters during that time period ($p<.01$). Not very surprisingly, after the Internet bubble burst, there was a dramatic drop-off of IPOs issued by technology firms. However, the averages provided in Table 3 may be inconclusive since there are proportionately more IPOs underwritten by high ranked underwriters than by IPOs issued by low ranked underwriters.

Using all of the collected data, I tried to create a model that could explain how these variables contribute to the determination of the offer price. My first model includes the variables listed in Table 4 (Model 1) which presents beta coefficients and *t*-values. The adjusted R^2 for the pre and post Internet bubble period models both came in at 43%, while the R^2 during the Internet bubble period was only 22%. This goes along with my above rationale that during the Internet bubble period fundamentals had little effect on the determination of the offer price. Since this model is mostly comprised of fundamental variables, it should come as no surprise that the adjusted R^2 for the Internet bubble period came in at a dismal 22%. Another interesting thing that this model shows is that sales for the year prior were actually negatively related to the offer

price. This may also be explained by the fact that many of the companies issuing IPOs during this time either did not have sales the year before or had very low sales the year before.

Panel B shows the results for Model 2 which contains all of the same variables as Model 1 and includes an additional dummy variable for high ranked IPOs. Adding the dummy variable for high ranked underwriters increases the adjusted R^2 for all of the time period models, most drastically for the pre Internet bubble period (56%). The high rank dummy variable is positive and significant for all time periods (beta coefficients= 4.81, 3.38, and 2.96, *t*-values = 9.1, 3.43, and 3.89; $p<.01$).

A model was then developed to explain why the market decided on what it deemed a fair price (first-day closing price), always higher than the offer price. Model 3 includes all variables from Model 1, the residuals from Model 1, and three new variables that were believed would influence the investor. The three new variables were: size of IPO issuance, the average market return of the prior fifteen days, and the market return of the prior day, calculated as trading day market close less prior day market close divided by prior day market close. The residuals include other variables underwriters may consider that Model 1 could not capture. These could include but are not limited to: seeking positive analyst coverage (Objective Function), spinning and other forms of share disbursements (Incentive Alignment), and Risk Composition Theory.

Table 5 (Panel A) depicts the regression results by providing the betas and *t*-values. The adjusted R^2 for all three time period models (1996-1998, 1999-2000, and 2001-2004) were all strong and came in at 65%, 54%, and 80% respectively. Surprisingly, size of IPO issuance and average market return were only significant at the 1% and 5% levels respectively, during the pre Internet bubble period. Once again, fundamentals were of little importance on the buyer's side during the Internet bubble period where only Earnings per Share had a significant negative relation to the trading price (beta coefficient = -209.9, $t = -3.05$, $p<.01$). I believe this is due to

the fact that many of the firms during this period were either non-existent the year before or had extremely low earnings. Another very surprising result was that the technology firm variable was only positively significant during the pre Internet bubble period, with a *t*-value of 1.7 ($p<.05$).

My final model, Model 4, was constructed in the same fashion as Model 3. All the variables included in Model 2 (which included a dummy variable for high ranked underwriters), added the residuals from Model 2, and added the three market sentiment variables. As expected, the fundamentals factors were only significant during the pre and post Internet bubble periods and not during the Internet bubble period. Size of issuance had a negative relationship to first-day closing price in the Internet bubble period with a beta coefficient of -4.41(t = -1.82, $p<.10$), which I believe is due to the fact that many of the firms going public at this time were smaller firms. The fifteen day market average return was (marginally) positively related to first-day closing price for both the pre and post Internet bubble periods (beta coefficients = 2.6 and 1.62, *t*-values = 1.85 and 1.89, $p<.10$), but showed an insignificant negative relationship during the Internet bubble period. This also supports that when the overall market is on an upswing and other IPOs during that time are having success, underwriters are not too concerned with the timing of the issuance. The high offer price of greater than $15 had a significant positive relationship to the first-day closing price in both the pre Internet period (beta coefficient = 1.65, t = 1.68, $p<.10$) and post Internet bubble period (beta coefficient = 1.83, t = 2.92, $p<.05$). Conceivably, high offer price was not significant during the Internet bubble period because people were buying pretty much any IPO issued at that time. The adjusted R^2 increased for all three time periods to 70%, 57%, and 80%, in sequential order.

CONCLUDING REMARKS

How do underwriters determine offer prices? The endorsement hypothesis argues that investors are willing to pay higher trading price for the issues underwritten by high caliber investment bankers. Thus, rank of the underwriter is a vital factor used by investors to determine the trading prices of the newly issued stocks. Multiple regressions with either offer price or the first-day closing price as the dependent variable provide evidence in support of the endorsement hypothesis. The effect is more obvious when the coefficient of the underwriter reputation (i.e., rank) during the Internet bubble period is almost five times or two times of those in some other sub-periods. The herding hypothesis states that an underwriter tries to perform at least as good as other underwriters. By doing so, the underwriter can reduce any potential frivolous litigation. Thus, the underwriter is presumed to use the firm's financial ratios to set up offer prices.

How do investors determine trading prices? As demonstrated, underwriters and investors alike are concerned with fundamental factors of an issuing firm during normal and poor market time periods. During unsustainable or "bubble periods", underwriters and investors alike appear to be guilty of a herd mentality and do not have much rationale behind their actions. The size of IPO issuance does not seem to be a driving factor for the first-day closing price, but market sentiment is important to investors in normal or poor market periods. Taken together, the underwriter reputation is the most influential and essential factor evaluated by both underwriters and investors to determine offer price and trading price, respectively.

This research has its limitations in that using only 939 IPOs during a span of nine years is somewhat constrictive and could provide non-proportionate results. Further research on other factors not measured here (e.g., executive retention of shares or how soon after a secondary offering was issued and at what price) is encouraged.

TABLE 1

Data Description Averages of Sampled IPOs

The sample firms first-day return, average market return of the first trading day, offer value, market value and money on table are reported. All dollar values are in dollars of 2000 purchasing power adjusted using the Consumer Price Index.

The first-day return is defined as the percentage change from the offer price to the closing price on the first trading day. Money on the table is defined as the price difference between offer price and the first-day closed trading price times the number of shares issued.

Year	Number of Selected IPOs	First-Day Return	Market Return	Offer Value ($)	Market Value	Money on the Table
1996	132	24.95%	0.14%	775402.97	905800.83	121560.01
1997	132	24.67%	0.05%	842366.52	891998.35	141974.09
1998	133	23.17%	-0.001%	1029987.5	1173817.47	136415.84
1999	134	61.56%	0.03%	1307606.80	2034955.47	631993.69
2000	89	47.90%	-0.15%	2063755.94	2708734.37	646611.25
2001	71	6.67%	-0.14%	3302903.30	3487612.08	203149.29
2002	68	9.56%	-0.08%	1927435.91	2061873.14	159655.30
2003	65	15.69%	0.10%	1637557.23	1862897.83	215461.37
2004	115	10.40%	-0.006%	1347010.34	1484029.40	177534.35
1996-1998	397	24.26%	0.06%	882956.94	1020924.98	13324.45
1999-2000	223	56.11%	-0.04%	1609388.30	2303862.74	637827.60
2001-2004	319	10.47%	-0.03%	1965563.90	2130343.48	187152.35
Total	**939**	**27.14%**	**0.006%**	**1423159.40**	**1702500.72**	**271423.81**

TABLE 2

Market and Financial Characteristic Averages of Sampled IPOs

The average of market and financial characteristics of selected IPO samples are reported.

The sample firms' offering price (OFFER), the first trading day closed price (PC), first-day return (IPO), pre-issue book value of assets (ASSET0), trailing annual firm sales (SALE0), book value of asset per share for the year prior to IPO (BVPS), sale per share for the year prior to IPO (SPS), earning per share for the year prior to IPO (EPS), cash flow from operation per share for the year prior to IPO (CFPS), capital expenditure over total sales for the year prior to IPO (CAP), average market return of 15 trading days prior to IPO (MA15), the market return difference between the pre-issue date and issue date (MR1). Dummy variable is assigned 1 if the offer price is an integer (INTEGER). Dummy variable is assigned 1 if the offer price is greater than $15 (OFFER15). The offer size is 2000 purchasing power adjusted using the Consumer Price Index (SIZE).

	1996-1998	**1999-2000**	**2001-2002**	**2003-2004**
OFFER	$12.23	$13.66	$14.41	$13.31
PC	$15.05	$23.74	$16.06	$17.46
IPO	24.26%	56.11%	10.47%	27.14%
ASSET0	12.50	12.48	14.02	13.04
SALE0	12.52	11.94	13.47	12.70
BVPS	0.25	0.25	0.63	0.39
SPS	0.25	0.14	0.34	0.26
EPS	0.002	-0.009	0.004	-0.0003
CFPS	0.007	0.002	0.02	0.01
CAP	0.16	1.55	0.23	0.54
MA15	0.10%	0.04%	0.01%	0.06%
MR1	0.78%	-5.33%	0.91%	-0.63%
INTEGER	0.81	0.94	0.84	0.85
OFFER15	0.30	0.37	0.42	0.35
SIZE	12.76	13.24	13.68	13.19
SAMPLE	**397**	**223**	**319**	**939**

TABLE 3

Market and Financial Characteristics of Sampled IPOs Grouped by Underwriters Reputation[a]

The sample firms' offering price (OFFER), the first-day closed trading price (PC), first-day return (IPO), pre-issue book value of assets (ASSET0), trailing annual firm sales (SALE0), book value of asset per share fore the year prior to IPO (BVPS), sale per share for the year prior to IPO (SPS), earning per share for the year prior to IPO (EPS), cash flow from operation per share for the year prior to IPO (CFPS), capital expenditure over total sales for the year prior to IPO (CAP), average market return of 15 trading days prior to IPO Dummy variable is assigned 1 if the firm is in technology sector. (MA15), the market return difference between the pre-issue date and issue date (MR1). Dummy variable is assigned 1 if the offer price is an integer (INTEGER). Dummy variable is assigned 1 if the offer price is greater than $15 (OFFER15). The offer size is 2000 purchasing power adjusted using the Consumer Price Index (SIZE). High ranking underwriters are those with Carter and Manaster (1990) with ranks at least 8 or higher point.

	1996-1998[a]		**1999-2000[a]**		**2001-2004[a]**	
	L Rank	***H Rank***	***L Rank***	***H Rank***	***L Rank***	***H Rank***
OFFER	8.95	14.84***	9.79	15.25***	10.51	15.79***
PC	11.35	17.99***	11.91	28.06***	11.29	17.73***
IPO	26.81	22.24	19.88	71.02***	5.31	12.29**
ASSET0	11.51	13.03***	11.91	12.70**	12.61	14.50***
SALE0	11.59	13.00***	11.39	12.14**	1.97	14.02***
BVPS	0.21	0.27	0.42	0.18**	0.50	0.67
SPS	0.17	0.29*	0.10	0.16	0.19	0.40**
EPS	0.002	0.001	-0.0012	-0.01**	0.003	0.005
CFPS	-0.0014	0.011	0.003	0.002	-0.03	0.04
CAP	0.10	0.20**	2.36	1.34	0.09	0.28**
TECK	0.20	0.37***	0.28	0.63***	0.13	0.17
MA15	0.08	0.11	0.11	0.02**	0.002	0.02
MR1	-7.34	0.7.34	-21.12	1.25	8.34	-1.72
INTEGER	0.78	0.84	0.89	0.96**	0.76	0.87**
OFFER15	0.07	0.48***	0.08	0.49***	0.17	0.51***
SIZE	11.97	13.39***	12.25	13.66***	12.74	14.01***
SAMPLE	**176**	**221**	**65**	**158**	**83**	**236**

[a] beta coefficients are reported.

* p<.10

** p<.05

*** p<.01

TABLE 4
Proposed Regression Models / First -Stage[a]

Offer price is used as dependent variable. Independent variables are defined as follows.

ASSET0	pre-issue book value of assets
SALE0	trailing annual firm sales
BVPS	book value of asset per share for the year prior to IPO
SPS	sale per share for the year prior to IPO
EPS	earning per share for the year prior to IPO
CFPS	cash flow from operation per share for the year prior to IPO
CAP	capital expenditure over total sales for the year prior to IPO
TECK	the firm is in tech sector
RANK	ranks at least 8 or higher point – based on Carter and Manaster (1990)

Panel A Model 1

[***Offer Price is a function of: ASSET0, SALE0, BVPS, SPS, EPS, CFPS, CAP.***]

Period	1996-1998[a]	1999-2000[a]	2001-2004[a]
Intercept	-15.99 (-7.69)***	-1.22 (-0.38)	-7.64 (-2.94)**
ASSET0	1.97 (7.02)***	1.81 (5.02)***	1.01 (2.97)**
SALE0	0.31 (1.14)	-0.63 (-1.94)*	0.56 (1.71)*
BVPS	-0.82 (-1.62)	1.42 (0.98)	0.21 (0.60)
EPS	-3.84 (-0.41)	21.66 (-1.52)	25.42 (3.84)***
SPS	-1.32 (-2.30)**	-0.48 (-0.33)	-0.35 (-0.73)
CFPS	11.20 (1.93)**	-12.91 (-1.99)**	4.99 (2.98)**
CAP	1.06 (1.93)**	-0.15 (-3.27)***	0.01 (0.02)
TECH	0.92 (1.70)*	0.32 (0.41)	0.60 (0.78)
ADJUSTED R^2	0.43	0.22	0.43

[a] beta coefficients (*t* values in parentheses)
* p<.10
** p<.05
*** p<.01

Panel B Model 2

[*Offer Price is a function of: ASSET0, SALE0, BVPS, SPS, EPS, CFPS, CAP, Rank.*]

Period	1996-1998[a]	1999-2000[a]	2001-2004[a]
Intercept	-9.86 (-5.05)***	1.19 (0.37)	-3.71 (-1.37)
ASSET0	1.38 (5.40)***	1.322 (3.49)***	0.78 (2.32)**
SALE0	0.17 (0.70)	-0.51 (-1.61)	0.35 (1.08)
BVPS	-0.43 (-0.97)	1.75 (1.23)	0.32 (0.95)
EPS	5.13 (0.61)	-14.77 (-1.05)	27.82 (4.30)***
SPS	-0.84 (-1.64)	-0.36 (-0.25)	-0.19 (-0.41)
CFPS	5.94 (1.16)	-10.9 (-1.73)*	4016 (2.53)**
CAP	0.65 (1.34)	-0.12 (-2.68)**	-0.36 (-0.87)
TECH	0.04 (0.308)	-0.41 (-0.52)	-0.13 (-0.16)
RANK	4.81 (9.10)***	3.38 (3.43)***	2.96 (3.89)***
ADJUSTED R^2	0.56	0.26	0.46

[a] beta coefficients (*t* values in parentheses)

* p<.10

** p<.05

*** p<.01

TABLE 5
Proposed Regression Models / Second Stage[a]

Offer price is used as dependent variable. Independent variables are defined as follows.

RESIDUAL	from Models 1 and 2
SIZE	offer size is 2000 purchasing power adjusted using the CPI
ASSET0	pre-issue book value of assets
SALE0	trailing annual firm sales
BVPS	book value of asset per share for the year prior to IPO
SPS	sale per share for the year prior to IPO
EPS	earning per share for the year prior to IPO
CFPS	cash flow from operation per share for the year prior to IPO
CAP	capital expenditure over total sales for the year prior to IPO
TECK	the firm is in tech sector
OFFER	Dummy variable is assigned 1 if the offer price is greater than $15
INTERGER	Dummy variable is assigned 1 if the offer price is an integer
RANK	ranks at least 8 or higher point – based on Carter and Manaster (1990)

Panel A Model 3

[*The First Trading Closed Price is a function of: ASSET0, SALE0, BVPS, SPS, EPS, CFPS, CAP, RESIDUALS FROM MODEL 1.*]

Period	1996-1998[a]	1999-2000[a]	2001-2004[a]
Intercept	-28.06 (-6.05)***	-4.28 (-0.18)	-10.07 (-3.12)***
RESIDUAL	0.71 (5.89)***	3.77 (9.32)***	0.95 (13.3)***
SIZE	3.35 (6.71)***	0.07 (0.03)	0.08 (0.27)
MA15	3.86 (2.55)**	-2.21 (-0.44)	1.40 (1.52)
MR 1	0.001 (0.49)	-0.00002 (-0.003)	-0.001 (-0.63)
ASSET0	-2.34 (-4.31)***	1.30 (0.78)	0.76 (2.45)**
SALE0	2.07 (5.62)***	-0.15 (-0.12)	0.97 (3.91)***
BVPS	3.76 (1.74)*	4.87 (0.90)	-0.37 (-2.06)***
EPS	14.25 (1.19)	-209.90 (-3.05)***	23.40 (4.45)***
SPS	-1.60 (-1.59)	-7.25 (-1.18)	-0.48 (-1.26)

CFPS	-17.10 (-2.00)**	13.25 (0.22)	4.50 (3.38)***
CAP	4.84 (6.53)**	-0.23 (-1.31)	0.28 (0.90)
TECH	2.40 (3.67)***	-0.77 (-0.28)	0.96 (1.61)
OFFER	3.38 (3.26)**	3.04 (0.73)	3.03 (4.68)***
INTEGER	0.27 (0.40)	12.40 (2.19)**	0.08 (0.13)
ADJUSTED R^2	0.65	0.54	0.80

[a] beta coefficients (*t* values in parentheses)
* p<.10
** p<.05
*** p<.01

Panel B Model 4

[*The First Trading Closed Price is a function of: ASSET0, SALE0, BVPS, SPS, EPS, CFPS, CAP, Rank, RESIDUALS FROM MODEL 2.*]

Period	1996-1998[a]	1999-2000[a]	2001-2004[a]
Intercept	-7.26 (-1.39)*	46.28 (1.75)*	-2.11 (-0.65)
RESIDUAL	1.12 (8.94)***	4.23 (10.35)***	1.07 (15.56)***
SIZE	0.91 (1.58)	-4.41 (-1.82)*	-0.44 (-1.24)
MA15	2.60 (1.85)*	-0.10 (-0.02)	1.62 (1.89)*
MR 1	0.001 (0.49)	0.0001 (0.012)	-0.24 (-0.80)
ASSET0	-1.32 (-2.50)**	1.55 (0.97)	0.75 (2.61)**
SALE0	1.63 (4.74)***	-0.29 (-0.25)	0.80 (3.43)***
BVPS	3.76 (1.89)*	5.58 (1.07)	-0.51 (-1.98)**
EPS	27.38 (2.45)**	-193.85 (-2.92)**	27.91 (5.67)***
SPS	-1.98 (-2.13)**	-6.02 (-1.02)	-0.32 (-0.89)
CFPS	-11.90 (-1.50)**	12.55 (0.21)	4.11 (3.33)***

CAP	4.33 (6.31)***	-0.22 (-1.27)	-0.15 (-0.51)
TECH	1.79 (2.93)**	-3.03 (-1.10)	0.05 (0.09)
OFFER	1.65 (1.68)*	0.19 (0.05)	1.83 (2.92)**
INTEGER	0.27 (0.40)	9.69 (1.77)*	-0.35 (-0.63)
RANK	6.37 (6.93)***	15.98 (3.72)***	3.75 (6.41)***
ADJUSTED R^2	0.70	0.57	0.82

[a] beta coefficients (*t* values in parentheses)

* p<.10

** p<.05

*** p<.01

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