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Offer Price, Target Ownership Structure and IPO Performance

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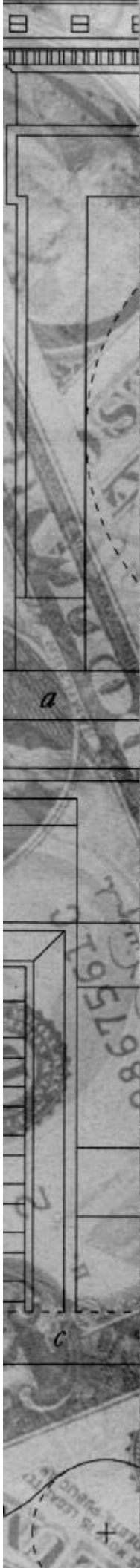

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Abstract

Although the choice of an IPO offer price level would seem to have little economic significance, firms do not decide this arbitrarily. Our findings suggest that firms select their IPO offer prices to target a desired ownership structure, which in turn has implications for underpricing and post-IPO performance. Higher priced IPOs are marketed by more reputed underwriters and attract a relatively larger institutional investment. These IPOs are relatively more underpriced, possibly as compensation for the monitoring and information benefits provided by institutional investors. IPOs whose offer prices are below the median level seem to be targeted towards a retail investor clientele. These IPOs are also relatively more underpriced, possibly as a cost of adverse selection. Our finding that long-run performance increases with offer price confirms that higher priced IPOs are better firms.

1. Introduction

When a company goes public, it must decide, with the advice of its underwriter, the number of shares to offer and the price per share. Given the company's estimate of its total value and the fraction of this value it has decided to sell, the choice to split the total value into a number of shares and a price per share would seem to have little economic significance. However, casual empiricism suggests that companies do not make this choice arbitrarily.[1]

In their recent study of newly listed NASDAQ stocks, Seguin and Smoller (1997) show that the share price contains information about the long-run performance of listed firms. They find that the probability of distress delisting decreases monotonically with the initial price (defined as the closing price at the end of the first listed day) after controlling for market capitalization. They also show that lower priced stocks earn lower risk-adjusted returns than higher priced stocks. They conclude that " …price is an informative predictor of future returns and distress risks."

This study extends the Seguin and Smoller (1997) analysis in two important ways. First, we establish the link between IPO offer price and the post-IPO ownership structure of the firm. Falkenstein (1996) and Gompers and Metrick (1998) show that institutional investors tend to avoid investing in low-priced stocks, a fact relevant for IPO placement. We hypothesize that firms choose an IPO price consistent with the institutional intensity of their preferred ownership structure. Also, since more reputed underwriters are likely to have better access to institutional investors, firms seeking higher institutional ownership would choose more reputed underwriters to market their IPOs.

Second, we relate the post-IPO ownership structure of the firm to IPO underpricing and subsequent firm performance. Firms may seek higher institutional ownership because they anticipate benefits from institutional monitoring (McConnell and Servaes, 1990). As in Stoughton and Zechner (1998), underpricing may represent compensation to institutional investors for their future monitoring services. Benveniste and Spindt (1989) argue that institutional investors provide valuable information during the IPO marketing process and characterize underpricing as compensation to these investors for their information. In either case, the greater the institutional involvement – which is associated with higher IPO prices -- the higher the expected underpricing.

On the other hand, firms may want to discourage institutional investors by choosing a lower offer price. This may be either because managers want to consume private benefits of control (as in Brennan and Franks, 1997), seek a diffuse ownership (as in Booth and Chua, 1996), or want to avoid the possible costs of institutional investor myopia (Bushee, 1998). Underpricing of such lower priced IPOs marketed to non-institutional investors would be higher due to adverse selection, as in Rock (1986). Thus, we expect underpricing to be higher both for higher priced and lower priced IPOs, i.e. we expect a U-shaped relationship between underpricing and offer price.

We present three main results in the paper. Consistent with our first hypothesis, we show that post-IPO institutional ownership is increasing in offer price. We also show that post-IPO institutional ownership is higher for IPOs marketed by more reputed underwriters. This evidence suggests that IPO offer price contains information about post-IPO ownership structure.

Consistent with our second hypothesis, we document a U-shaped relationship between offer price and underpricing. This result is new to the literature. Prior research, e.g. Chalk and Peavy (1987), has documented an inverse relationship between offer price and underpricing. However, our results indicate that underpricing is higher both for low-priced and high-priced IPOs. We verify the robustness of this result by controlling for firm size, offer size and underwriter reputation.

Third, we confirm the Seguin and Smoller (1997) results for our sample of IPOs. We show that long-run performance is increasing in offer price. Whereas low-priced IPOs significantly underperform the market over a 3-year period, high-priced IPOs do not. We also provide evidence that IPO offer prices are negatively related to the probability of distress delisting five years after the IPO. This result is robust to controlling for market capitalization, underwriter reputation and post-IPO institutional ownership.

Taken together, these results support the view that offer price is related to target investor clientele, which in turn is linked to IPO underpricing and long-run performance. Lower offer prices discourage institutional interest, and IPOs with lower offer prices appear to be targeted more to a retail clientele and suffer greater adverse-selection induced underpricing. Higher offer prices encourage institutional attention, and induce higher underpricing as compensation to institutions for their monitoring or information.

The rest of the paper is organized as follows. In the next section, we discuss the implications of theories of IPO underpricing for the relationship among offer price, target investor clientele and IPO performance. Section 3 describes our data. In Section 4, we present our results on the relationship between offer price and institutional ownership, underwriter

reputation and underpricing. We report the long-run performance results in Section 5. Section 6 concludes.

2. Offer price, target ownership structure and IPO underpricing

In this section, we develop our hypotheses linking offer price, target ownership structure and IPO underpricing. Theories of IPO underpricing are based on the information asymmetries or moral hazard problems that prevail between the different constituencies associated with the IPO. One branch of this literature (e.g. Stoughton and Zechner, 1998; Benveniste and Spindt, 1989) predicts that underpricing will result from targeting informed institutional investors, whereas another explains underpricing as the outcome of marketing IPOs to uninformed investors (e.g. Rock, 1986). These theories are not necessarily mutually exclusive. Our hypotheses flow from a fusion of these theories.

There is considerable evidence that the ownership structure of a firm impacts firm value. McConnell and Servaes (1990) document a positive relationship between institutional ownership and Tobin's Q. They interpret this as support for the efficient-monitoring hypothesis, namely that institutional investors have greater expertise and incentive to monitor management and can do so at lower cost than small investors. Stoughton and Zechner (1998) suggest that firms may choose to ration the allocation of IPO shares in favor of large, institutional investors for the monitoring benefits they are expected to provide. Underpricing, which arises in their model from rationing out small investors, represents compensation for expected future monitoring services. The firm benefits as long as the benefit of monitoring is greater than the cost of underpricing. Their model predicts a positive relationship between underpricing and strategic rationing in favor

of large investors.

Large institutional investors may also add value to the firm by providing information during the IPO process. Benveniste and Spindt (1989) have proposed a model in which underwriters rely on a clientele of large informed investors to provide information about the value of the firm being offered. The underwriter uses this information to refine the value of the offering. Underpricing in the Benveniste and Spindt (1989) model represents compensation to these investors for truthfully revealing their information.

In either case, IPOs that are marketed towards large, institutional investors are underpriced more. In the context of IPOs, Hanley and Wilhelm (1995) show that the initial allocation to institutions in their sample of IPOs ranges from 6.6% to 88.6% suggesting that institutions invest selectively in IPOs. If a firm wants to target institutional investors, it would have to search for ways to make its stock attractive to institutions. There is evidence that institutions avoid investing in low-priced stocks (as shown by Falkenstein (1996) for mutual funds and Gompers and Metrick (1998) for institutions in general). This may be because higher priced stocks are more liquid and have lower transactions costs. Therefore, a firm could attract institutional interest in its IPO by choosing a higher offer price. In addition, if reputed underwriters are more likely to have a regular clientele of institutional investors, we would expect that institutional allotment is positively related to underwriter reputation. Since one reason firms want to target institutions is that they provide beneficial monitoring services, we also expect that such investors will retain their investment and not trade extensively in the after-market.

However, there are also reasons why firms may choose to avoid institutional investors.

One possibility is that the managers of the firm may want to consume perquisites or other private benefits of control. These entrenched managers would not want to subject themselves to monitoring by large outside shareholders. Since small, dispersed shareholders are less likely or less able to monitor the managers' actions, these firms will target an ownership structure that consists mainly of small investors. It is also possible that some firms may not gain from increased monitoring by institutional investors, but could face a significant cost. If some institutional investors are more interested in short-term price appreciation, they could force the firm to forego potentially valuable long-term investments (such as R&D). A recent article by Bushee (1998) suggests that ownership by institutions that engage in momentum trading significantly increases the probability that managers reduce R&D to reverse an earnings decline. These firms may choose to avoid institutional investors, but not for "value-decreasing" reasons. Since both types of firms want to discourage institutional investment, they are more likely to choose lower offer prices. A low offer price would discourage large investors due to the higher transactions costs associated with low-priced stocks. The resultant pooling equilibrium will lead to a winner's curse problem and higher underpricing (as in Rock, 1986).

The prediction that low-priced IPOs will exhibit higher underpricing is also consistent with other explanations that have been put forth in the literature. For example, Brennan and Franks (1997) show that in order to preserve private benefits of control, firms may choose to underprice their shares and ration the allocation of shares in favor of small, diffuse investors. In a different vein, Booth and Chua (1996) argue that firms may choose a lower offer price to promote diffuse ownership. Since this would be associated with higher total information costs, these issues would be underpriced by larger amounts.

Other researchers have argued that low-priced IPOs are riskier. Chalk and Peavy (1987) and Ibbotson, Sindelar and Ritter (1988) have shown that underpricing is inversely related to offer price. Chalk and Peavy (1987) divide their sample of 649 IPOs during 1975-82 into five portfolios based on offer price. The five portfolios are $0.00 to $1.00, $1.01 to $2.00, $2.01 to $5.00, $5.01 to $10.00, and more than $10.00. Their results indicate that the low-priced IPOs exhibit larger underpricing. One explanation that they advance is that the underpricing represents a premium for above-average risk for stocks priced at $1.00 or less. In a similar fashion, Ibbotson, Sindelar and Ritter (1988) show that IPOs priced at less than $3.00, exhibit much larger underpricing, on average, than higher priced IPOs. They hypothesize that more speculative issues tend to have offering prices below $3.00. Seguin and Smoller (1997) also show that low-priced stocks are associated with higher risk and lower returns.

However, this raises the question of why these riskier firms choose to signal their higher risk by choosing a low offer price. Why not select a higher offer price, mimicking a low-risk firm and thus generating higher proceeds from the IPO? But, as we have noted, institutional ownership can be costly to some firms. Such firms cannot costlessly choose to mimic a low risk firm and will choose lower offer prices to avoid institutional attention.

This discussion suggests that institutional investment in IPOs will be positively related to the offer price. It also implies that more reputed underwriters, who have greater access to institutional clients, will market the higher priced IPOs. Finally, it implies that underpricing will be higher for both higher priced and lower priced IPOs. That is, underpricing should exhibit a U-shaped relationship with offer price.

3. Data and variable definitions

From the Global Financing Database of the Securities Data Company (SDC), we identify all initial public offerings of common stock by domestic (US) firms during the period 1970 to 1993. We require that the stock market data for the firm be available on the Center for Research in Security Prices (CRSP) tapes. This gives us an initial sample of 5536 IPOs. We exclude IPOs of closed-end funds, REITS, and ADRs, retaining only IPOs of corporations (CRSP share code 10 or 11) in our sample (4859 firms). We include IPOs if common stock was the only security that was issued, and exclude a further 731 instances where the issue was for units comprised of common stock and some other security. We also require that the IPO be listed on CRSP NYSE/AMEX/NASDAQ combined tapes not more than two months (42 trading days) after the offer date. This reduces the sample size to 3756 IPOs. As a further check, we exclude an additional 34 issues that were first listed on NASDAQ on December 14, 1972 (the date CRSP started reporting data for NASDAQ firms). The latter two restrictions reduce the possibility that our sample firms have traded elsewhere. Finally, to avoid possible data coding errors, we check that the offer date is on or before the first trading date on CRSP. We also verify that the number of shares outstanding on the CRSP tapes is not less than the number of shares offered in the US. The final sample consists of 3683 IPOs. Almost ninety percent of the IPOs first traded on the NASDAQ, with the remainder being initially listed on NYSE or AMEX.

We collect offering data (offer price, number of shares offered and offer date) and the identity of the lead underwriters from the SDC database. The closing price at the end of the first trading date, number of shares outstanding after the IPO and trading volume are taken from the CRSP tapes. Data on institutional ownership after the IPO comes from various issues of the S&P

Stock Guide. The underwriter reputation ranking is from Carter and Manaster (1990) for IPOs prior to 1985 and from Carter, Dark and Singh (1998) for subsequent IPOs.

For every firm, we calculate underpricing as the raw return from the offer price to the closing price on the first trading day. Firm size is the market value of equity, computed as the product of the *offer price* and the number of shares outstanding on the first trading day. The issue amount is the gross proceeds from the IPO (offer price times number of shares offered), excluding any over-allotments. The offer fraction is the number of shares offered in the IPO as a percentage of the total number of shares outstanding after the IPO. For any given day, we compute the daily volume turnover as a fraction of the number of shares outstanding. Average turnover is defined as the average of the daily turnover over 100 days starting with the second week after listing. The first week (initial) turnover is the average of the daily turnover over the first five days (one day) of trading. The percentage offer price revision is the percentage difference between the final offer price and the mid-point of the original filing range. We measure institutional ownership after the IPO as a percentage of the total number of shares outstanding.[2]

The average firm size for our sample firms is $106 million and the median is $43 million (Table 1). The average (median) issue amount, excluding any over-allotments, is $29 million ($13 million). This is larger than the average gross proceeds of $15 million for a sample of 1526 IPOs during 1975-1984 documented by Ritter (1991). An average of almost 34 percent of the post-issue firm is sold in the IPO. The average (median) offer price is $10.57 ($10.00) per share. The IPOs in our sample exhibit an average underpricing of 11.29 percent, which is similar to what other researchers have documented.[3] However, the median underpricing is much lower at

4.00 percent. The twenty-fifth percentile is zero percent, indicating that at least one quarter of all IPOs do not exhibit underpricing.

[Insert Table 1 about here]

4. Offer Price, institutional investment, underwriter reputation and underpricing

In this section, we present the main results in the paper by documenting the relationship between offer price, institutional investment and underpricing in our sample of IPOs. The results show that the institutional investment is higher in IPOs with a higher offer price. Consistent with our hypothesis, underpricing is a U-shaped function of offer price. We find that this U-shaped pattern persists, even after controlling for the effect of other explanatory variables.

4.1 Offer price, institutional investment and underwriter reputation

We begin our analysis by exploring whether institutions invest more in the higher priced IPOs and in IPOs marketed by reputed underwriters. If firms choose a higher offer price to attract institutional investors for their monitoring benefits and compensate them via underpricing, we also expect that these firms will retain their holdings in the after market and will provide monitoring services in the future. We thus also investigate whether higher priced IPOs trade less in the after-market.

4.1.1 Offer price, institutional ownership and underwriter reputation

Falkenstein (1996) provides evidence that mutual funds seem to avoid investing in low-priced stocks. Gompers and Metrick (1998) show that this holds true for institutions in general.

This preference could be driven by the higher transactions costs associated with low priced stocks. McInish and Wood (1992) show that the percentage bid-ask spread decreases with price levels. Institutions may prefer to invest in more liquid stocks due to the large positions they hold. A large and liquid market for the stock makes it easier for them to increase or divest their investments without adversely affecting the price. While the evidence relates institutional investment in existing stocks to the price level, it is as yet unknown whether the institutional preference for high priced stocks applies in the case of IPOs. We expect that a firm wanting to target institutional investors would, *ceteris paribus*, set a higher offer price level.

Concern about their reputational capital makes it more likely that reputed underwriters market high quality IPOs. If IPOs marketed by reputed underwriters are viewed as prudent investments, we expect that institutional investors such as pension funds or bank trust funds would be more likely to invest in them. Furthermore, underwriters of higher reputation are more likely to have access to institutional investors due to the other financial services they offer. Hence, firms preferring institutional ownership will be more likely to select a more reputed underwriter and set a higher offer price. We thus expect a positive relationship between underwriter reputation and institutional ownership.

There could be other characteristics that influence the investment decision of institutional investors. There is some evidence that institutions prefer investing in larger stocks. One reason could be the effect of prudent-man laws in biasing institutional investment towards higher quality, large capitalization stocks, as documented in Del Guercio (1996). Another reason could be the higher costs associated with buying or selling a given amount of stock in a smaller firm, since these would be large block transactions for the smaller firms. Falkenstein (1996) shows that

mutual fund demand for stocks increases with monthly volume turnover. If higher trading volume indicates lower transactions costs, we expect the average turnover to be positively related to institutional ownership. Since we observe institutional ownership only after the IPO, it is possible that some institutions flip their shares in the aftermarket, especially for "cold IPOs" which exhibit lesser underpricing, (Hanley, Lee and Seguin, 1996). Hence, we include underpricing as an additional explanatory variable and expect a positive relationship between underpricing and institutional ownership. We also include issue amount as an additional variable, since we expect a larger float to stimulate more institutional investment.

We report the results of various regressions using the percentage institutional ownership after the IPO as the dependent variable and underwriter reputation and offer price (or log of offer price) as our primary explanatory variables. Based on the discussion above, we include log of firm size, average turnover, underpricing and log of issue amount as control variables. The univariate results in the first three columns of Table 2 show that institutional investment is significantly positively related to the IPO offer price and underwriter reputation, as hypothesized. In regression 4, we include all the control variables but exclude offer price. The evidence suggests that institutional investment is higher in IPOs with a larger float. Average turnover and underpricing are unrelated to institutional ownership. When we include offer price and all control variables in regressions 5 and 6, the coefficients on offer price and log of offer price are positive and statistically significant ($t = 2.1$ and 2.4, respectively). However, in these regressions underwriter reputation is not significant. Overall, the evidence is consistent with the hypothesis that the choice of a higher offer price by firms leads to higher institutional ownership.

[Insert Table 2 about here]

4.1.2 Offer price and trading volume

If low priced IPOs are more likely to be held by small, diffuse investors who may be less willing to trade, low priced IPOs would trade less in the aftermarket. Additionally, low priced IPOs may be subject to higher transactions costs, since transactions costs increases with lower price (e.g. McInish and Wood, 1992). This may exacerbate the lower turnover for low priced IPOs.

In the case of higher priced IPOs, if firms target institutional investors for their monitoring benefits, they would not like to see these investors flip their shares in the aftermarket. Hanley and Wilhelm (1995) show that the initial institutional allocation is highly correlated with the post-IPO institutional ownership. This suggests that higher allocation to institutions during the IPO is not undone in the secondary market. In addition, since their shareholdings are large, institutional investors stand to capture a larger fraction of any improvements in firm value that may come about due to their monitoring. This also provides them with an incentive to retain ownership and monitor the firm. Ideally, we would like to identify the institutional investors in high priced IPOs and verify that they do not flip their shares immediately after the issue begins trading. However, we do not know the identity of the institutional investors in the IPO, and cannot directly verify whether they retain their ownership in the firm. As an indirect measure, we use turnover on the first day of listing to shed light on this issue. If institutional trading accounts for a large proportion of the first day turnover, then lower turnover on the first day would be consistent with lower institutional trading, suggesting that the targeted ownership structure is not

overturned in the secondary market. Hence, we expect lower turnover for high priced IPOs.

We use the initial turnover as the dependent variable and estimate its relationship with offer price in a regression framework. Since price and size are related, we include the log of market value as a control variable. If institutional flipping accounts for a large fraction of the initial turnover and flipping is concentrated in IPOs with lower underpricing (Krigman, Shaw and Womack, 1999), we would expect a negative relationship between underpricing and the initial turnover. If institutions in general trade more often than individuals, we expect a positive relationship between institutional ownership and initial turnover. In addition, if high demand for shares in the IPO during the pre-marketing results in rationing the allocation in the IPO, we expect that these IPOs will exhibit high turnover in the immediate aftermarket. Hence, we include the percentage revision in offer price as an additional control variable and expect it to be positively related to the initial turnover.

We find an inverted U-shaped relationship between offer price and trading volume (Table 3). The coefficients on offer price and square of offer price are positive and negative, respectively, and significant at the one-percent level (regression 1). This is robust to the inclusion of log of firm size, underpricing, percentage offer price revision and percentage institutional ownership as control variables (regression 4). As expected, the coefficient on percentage offer price revision is positive and significant. Underpricing is positively related to initial turnover, contrary to our expectation. It is possible that other investors, possibly retail, could be buying shares in IPOs that are underpriced and thus contribute to the higher turnover. However, the percentage institutional ownership is statistically unrelated to the initial turnover. When we estimate the full model using log of offer price and its square (regression 5), the coefficients on

log of offer price and its square are positive and negative respectively. Both are significant at the one-percent level. The signs and significance levels of the other control variables are also unchanged.

[Insert Table 3 about here]

The results in this subsection suggest that the initial turnover is lower both for high priced and low priced IPOs. This indicates that low-priced IPOs trade less, possibly due to higher transactions costs associated with these stocks. However, even high-priced shares seem to trade less. We now analyze whether the offer price is related to underpricing as predicted in Section 2.

4.2 The relationship between offer price and underpricing – univariate tests

We first examine the univariate relationship between offer price and underpricing. We divide the sample into decile portfolios based on offer price. Decile portfolio 1 consists of the 10 percent of IPOs with the lowest offer prices and so on. We calculate the average underpricing for each of these decile portfolios. The results in Table 4 show a pronounced U-shaped pattern in underpricing as a function of offer price. The average underpricing in decile portfolio 1 is 30.7 percent. It declines monotonically through decile portfolio 4, which averages 5.3 percent. The average underpricing then starts increasing and is 15.4 percent in decile portfolio 10. A similar pattern emerges when we look at the medians. The evidence also indicates that a similar pattern exists in the percentage of underpriced IPOs. Relatively fewer IPOs are underpriced in the middle four decile portfolios (average of about 73 percent) than in the extreme decile portfolios (almost 80 percent in the bottom three decile portfolios and over 82 percent in the top three decile portfolios). This indicates that a few outliers do not generate the observed U-shaped pattern.

[Insert Table 4 about here]

The clustering of a large number of IPOs with offer prices around $10.00 suggests that the spread in offer price between adjacent decile portfolios may not be large enough to enable us to draw meaningful inferences. We address this issue in two ways. First, we examine the mean offer prices and underpricing in pairs of adjacent decile portfolios and find that they are statistically different from each other (not reported).[4] Second, we form portfolios at equal intervals of $3.00 based on offer price and repeat the above analysis.[5] Table 5 exhibits a clear U-shaped pattern in the mean and median underpricing, and in the percentage of underpriced issues. The mean (median) underpricing declines from 40.2 percent (21.9 percent) in interval portfolio 1 to 6.5 percent (1.9 percent) in interval portfolio 4, and increases to 12.8 percent (8.9 percent) in interval portfolio 8.

[Insert Table 5 about here]

4.3 The relationship between underpricing and offer price – multivariate tests

The evidence above indicates that IPO underpricing varies unconditionally in a U-shaped fashion with offer price. However, Stoll and Whaley (1983) document a positive association between market value of equity and price per share for common stocks. There is some evidence in column 2 of Tables 4 and 5 that a similar positive relationship between offer price and firm size exists in our sample also. The Pearson correlation between IPO offer price and log of firm size computed at the close of the first trading day is 0.75 (Table 6). Thus, it is not clear if the variation in underpricing is due to firm size rather than price. In addition, there are many other theories that attempt to explain what factors affect IPO underpricing. We turn our attention to

these issues below.

[Insert Table 6 about here]

4.3.1 Control variables

Carter and Manaster (1990) develop a model in which more reputed underwriters market lower-risk and higher quality IPOs. Confirmatory evidence that underwriter reputation is negatively related to underpricing is presented in Carter and Manaster (1990) and Carter, Dark and Singh (1998). Various signaling theories (e.g. Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989) hypothesize that underpricing is a positive signal of firm value, since only "good firms" will be able to recoup the signaling costs in the form of a higher price at a subsequent equity issue. But the available empirical evidence (Jegadeesh, Weinstein and Welch, 1993; Michaely and Shaw, 1994) does not support the implications of the signaling models. To the extent that underwriter reputation acts as a substitute signal of firm quality, we would expect IPOs marketed by more reputed underwriters to be underpriced by a smaller amount.

The winners curse hypothesis put forth by Rock (1986) argues that underpricing is used to compensate uninformed investors for adverse selection. We expect this to be more of an issue if the ex-ante information asymmetry is higher. Benveniste and Spindt (1989) also argue that underwriters use underpricing (along with preferential allocation) to induce informed investors to reveal their private information. Therefore, *ceteris paribus*, IPOs that are more likely to be subject to depressed valuation due to information asymmetry will exhibit higher underpricing. Smaller issues are more likely to be speculative issues by start-up firms, as argued by Beatty and Ritter (1986) and Tinic (1988). Furthermore, in the presence of fixed information costs, the

relative cost of information may be large even for larger firms when a small fraction of their equity is offered to the public. Hence, we use offer fraction (number of shares offered as a percentage of total shares outstanding after the IPO) and log of the issue amount ($ million) as alternative proxies for ex-ante uncertainty of the IPO. We expect a negative relationship between underpricing and both offer fraction and log of issue amount. On the other hand, an investment banker could use underpricing as a way to reduce marketing effort, which will be greater for larger issues (Baron, 1982). This would imply a positive relationship between both offer fraction and log of issue amount and underpricing.

Benveniste and Spindt (1989) argue that if favorable information is revealed in the pre-market, the underwriter responds by increasing the offer price upwards to partially reflect this information. These IPOs would be priced in the upper part of the initial offer price range. Their allocation is rationed and they would also be underpriced more. It is likely that the rationing of shares would imply higher trading volume in the after-market. Under this scenario, we would expect to see a positive relationship between underpricing and initial turnover and the percentage offer price revision.[6] Additionally, we include log of firm size as a control variable to verify if offer price is related to underpricing, independent of firm size.

4.3.2 Results

We first regress underpricing separately on each of the variables identified above --offer price, average underwriter reputation rank, offer fraction, log of issue amount, initial turnover, percentage offer price revision and log of firm size. The results in Table 7 indicate that the offer price, log of firm size, log of issue amount and average underwriter reputation rank are all

negatively associated with the level of underpricing, and are significant at better than the one-percent level. The percentage offer price revision and initial turnover are significantly positively related to underpricing. The offer fraction is not statistically related to underpricing. Overall, this evidence is consistent with the underwriter reputation hypothesis, and also the hypotheses put forth by Benveniste and Spindt (1989) and Rock (1986). The data does not support the hypothesis in Baron (1982).

[Insert Table 7 about here]

Since our focus here is on the relationship between offer price and underpricing, we estimate multivariate regressions after including the control variables. The results of OLS regressions of underpricing on offer price and the square of offer price (Table 8) strongly support the U-shaped pattern that we have documented earlier. The coefficient on offer price is negative and that on the squared term is positive. The coefficients in regression 1 are highly statistically significant. The explanatory power for this regression is over six percent. Alternatively, we use the log of offer price and its square (regression 2). Again, the coefficients are signed as expected, highly significant and confirm the U-shaped relationship between underpricing and offer price. In regression 3, we include all the control variables. The results show that underwriter reputation and log of issue amount are negatively related to underpricing, whereas percentage offer price revision and log of firm size are positively related to underpricing. When we add the offer price and the squared term to the control variables in regression 4, we observe that the coefficients on offer price and the squared term are of the expected sign, and statistically significant (t-values of –11.4 and 9.0 respectively). The explanatory power of the regression is increased from 18.6 percent to 22 percent, indicating that the U-shaped pattern provides a better fit for the cross-

sectional variation in underpricing. In regression 5, we use the log of offer price and its square and observe the same pattern. The coefficients on log of offer price and the squared term are still negative and positive, respectively, and statistically significant at better than the one percent level of significance. However, the coefficient on underwriter reputation is insignificant in regressions 4 and 5, suggesting that its effect is subsumed by offer price.

[Insert Table 8 about here]

The data in Table 6 indicates that many of our control variables are strongly correlated. For example, the correlation between underwriter reputation and offer price is a very significant 0.53, and that between offer price and log of firm size is 0.75. However, the U-shaped relationship between underpricing and offer price is statistically significant at the one-percent level or better in all regression specifications in Table 8. In addition, the statistical significance of the other control variables also does not change much across the various regressions. To provide additional robustness checks, we use many alternative specifications and verify that our inferences are unchanged.

4.3.3 Robustness checks

We have re-estimated all the regressions in Table 8 using the log of the issue amount instead of offer fraction, but our basic result remains unchanged.[7] Our inferences about the U-shaped pattern are not affected, when we include the initial turnover instead of the percentage offer price revision. Finally, underwriters may support stock prices in the after-market by posting a stabilizing bid at or just below the offer price. The underpricing could thus be left-censored at zero percent.[8] Ruud (1993) and Schultz and Zaman (1994) present evidence of such stabilization

activities. Consequently, we estimate all the regressions using a Tobit model instead of the OLS specification. Our main result that underpricing exhibits a U-shaped pattern in offer price remains unchanged.

We also recognize that the stock exchanges (NYSE/AMEX/NASDAQ) have initial listing requirements that firms must comply with. One common requirement is that the firms have a minimum number of shares that are publicly held. For example, the NASDAQ required firms to have a public float of at least 100,000 shares during 1983 to 1993.[9] The NASDAQ NMS, NYSE and AMEX place similar restrictions, which are changed only infrequently. Assuming that all the shares in the IPO represent public float, this minimum number of shares restriction would create an upper bound on the offer price for a given issue amount. In some cases, stock market regulators also impose lower bounds on the bid price. To ensure that firms in our analysis have some latitude in choosing their offer price, we re-estimate the regressions in Table 8 using only those IPOs where the offer price is at least $2.00 less than (more than) the upper bound (the lower bound) on offer price. We lose 236 firms in this process, thus retaining more than ninety percent of the original sample. Our finding that underpricing is U-shaped in offer price is unchanged.

Although we allow our sample firms to be initially listed up to 42 trading days subsequent to the offer date, more than ninety-five (ninety-nine) percent of our sample firms list within three days (ten days) of the offer date. Thus, it is possible that a small portion of our sample could have traded elsewhere and that the closing price on the first trading day is stale. We repeat the analysis in Table 8 using a sub-sample of IPOs for which the initial listing date is at most three days after the offering. Our inferences are not affected.

The evidence we have presented thus far indicates that (i) there is a positive relationship between IPO offer prices and the percentage institutional ownership, and (ii) the relationship between underpricing and offer price is characterized by a U-shaped pattern. This pattern is robust to a variety of alternative specifications. These findings support our hypothesis that firms choose a higher offer price and more reputed underwriters to attract institutional investors. The firm could benefit from increased institutional ownership if these investors retain their shares and provide monitoring services in the future.

If institutional investors are successful in reducing agency problems through their monitoring activities, then these firms should perform better in the after-market, all else held equal. Seguin and Smoller (1997) show that high priced firms perform better in the aftermarket. In the following section, we analyze the long-run performance for our sample of IPOs.

5. Offer price and long-run performance

Ritter (1991) and Loughran and Ritter (1995) document that IPOs underperform in the three to five years following the offering. However, a recent paper by Brav and Gompers (1997) provides evidence that most of the underperformance is concentrated in the small, non-venture backed IPOs. Furthermore, Seguin and Smoller (1997) show that low-priced stocks are more likely to end up in financial distress. Our findings hitherto also suggest the possibility that there may be systematic differences in long-run performance between high-priced and low-priced IPOs. This could be because of the higher level of institutional monitoring associated with high-priced IPOs. Additionally, Seguin and Smoller (1997) and Carter, Dark and Singh (1998) show that IPOs marketed by more reputed underwriters perform better in the long run than those sold

by less reputed underwriters. We investigate whether offer price helps explain long-run performance after controlling for other factors such as firm size, institutional ownership and underwriter reputation in a multivariate regression framework.

In order to investigate whether offer price helps explain the cross-sectional variation in long-run performance, we calculate the market-adjusted excess return for each stock. As in Section 4, we first divide the IPOs into decile portfolios on the basis of offer price. For each firm, we calculate the excess return as the difference between the firm's holding period return over 12 months from the month after listing (or 24 months or 36 months) and the contemporaneous market return. We use both the equally weighted and value weighted monthly return series from CRSP as proxies for the market return. We include firms only if they existed for the entire period under consideration. Our results in Table 9 indicate that the IPOs in the lowest two deciles underperform the market, irrespective of the market index used. For example, in the 24 months after the IPO, they underperform by more than 25 percent. The excess return generally increases with offer price. In particular, IPOs in the highest two deciles do not underperform the market over any of the holding periods.

[Insert Table 9 about here]

In order to provide additional evidence, we analyze whether IPO offer price can help explain the likelihood that a firm would experience financial distress. As in Seguin and Smoller (1997), we consider a firm to be viable if at the end of five years after the offering, it still trades on the NYSE/AMEX/NASDAQ or has been delisted due to a merger or an exchange offer. Since we identify the delisting status from the CRSP NYSE/AMEX/NASDAQ combined 1996 tapes, the period is less than five years for IPOs in 1992 and 1993. We use a dummy variable that takes

the value '1' if the firm is viable at the end of five years after the IPO and '0' otherwise, as our dependant variable. In logistic regressions (Table 10), our main explanatory variable is the offer price. We use log of firm size, underwriter reputation and percentage institutional ownership after the IPO as control variables. The results in regression 1 (regression 2) show that the offer price (log of offer price) is significantly positively related to the likelihood that the firm remains viable after five years. These results are consistent with Seguin and Smoller (1997). This inference is unchanged even when we include the control variables in regressions 4 and 5. It seems to be that controlling for other variables, high priced IPOs are less likely to be delisted for distress related reasons.

[Insert Table 10 about here]

6. Concluding remarks

Casual empiricism, supported by evidence from the actual distribution of IPO offer prices, suggests that companies do not choose their IPO prices arbitrarily. In this paper, we have investigated whether IPO offer prices are related to ownership structure, IPO underpricing and firm performance, and found strong evidence that they are. We find that institutional ownership increases with offer price. Controlling for firm size, offer fraction, underwriter reputation and other variables thought to influence IPO underpricing, we find that underpricing is a U-shaped function of offer price.

Our findings are consistent with the characterization of high-priced IPOs as targeted towards institutions in which case underpricing compensates the institutions for information and future monitoring services. Firms could choose a low offer price and discourage institutional investment to either preserve private control benefits or to avoid potentially costly investor

myopia. The resulting pooling equilibrium could lead to higher underpricing. Our results also suggest that the offer price is positively related to the likelihood that the firm will remain viable after five years.

This paper contributes to the growing literature showing that price levels matter. While there is no comprehensive economic theory linking firm characteristics and investor decisions to stock price levels, the evidence from stock and mutual fund share splits indicates that some investors may have preferences with regard to share price levels. Our findings suggest that in IPOs, companies and their underwriters make explicit choices regarding price level, and that price level contains information about firm ownership and future performance.

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Table 1
Descriptive Statistics

We identify the sample of 3683 IPOs of common stock in the United States over the period 1970-93 from the Securities Data Company database (SDC). We include IPOs of domestic firms (CRSP share code 10 or 11) comprised only of common stock; IPOs of units comprised of common stock and other securities are excluded. Offer price is the price at which shares in the IPO were offered and are taken from the SDC database. Market value of equity (MVE) is calculated as the product of offer price and the number of shares outstanding (from CRSP). For each firm, average turnover (TURNOVER) is calculated as the average of the daily turnover (as a fraction of shares outstanding) over 100 trading days, starting with the second week after listing. TURNOVER5 (TURNOVER1) is computed similarly for the first five days (one day) of listing. Underwriter reputation (AVGUW) is the average of the underwriter reputation ranking for the lead managers (from Carter and Manaster, 1990, and Carter, Dark and Singh, 1998). The percentage offer price revision (PCTPRCDF) is the percentage change in final offer price from the mid-point of the initial filing range. Offer fraction (OFFRAC) is the number of shares offered in the United States as a percentage of the total number of shares outstanding, excluding over-allotments. The gross proceeds of the IPO (ISSAMT) is the product of offer price and the number of shares offered in the IPO, excluding over-allotments. INSTT is the precentage institutional ownership after the IPO, from the S&P stock guide. Underpricing is the percentage return from the offer price to the closing price on the first trading day.

	Mean	Median	N
Offer price ($)	10.57	10.00	3683
Market value of equity (MVE, $ mil)	106.26	42.99	3683
Average turnover (TURNOVER, %)	0.52	0.40	3175
First Week Turnover (TURNOVER5, %)	4.65	3.53	3123
Initial Turnover (TURNOVER1, %)	13.86	9.63	3113
Percentage offer price revision	-2.84	0.00	3382
Average underwriter reputation ranking	6.91	7.50	3210
Offer fraction (OFFRAC, %)	33.91	31.15	3683
Issue amount (ISSAMT, $mil)	28.64	12.83	3683
Institutional Ownership (INSTT, %)	7.14	4.51	1501
Underpricing (%)	11.29	4.00	3683

Table 2
Results of OLS Regressions of Percent Institutional Ownership on Offer Price, Firm Size, Issue Amount, Underwriter Reputation and Trading Volume

The left hand side variable is the institutional ownership after the IPO (as a percentage of total shares outstanding) for our sample of 3683 IPOs of US firms. The data on institutional ownership is from various issues of the S&P Stock Guide. The percent institutional ownership is regressed on various firm-specific variables. OFRPRC (LNOFRPRC) is the final offer price of the IPO (natural log of). LNISSAMT is the natural log of total gross proceeds of the IPO, excluding over-allotments ($ millions). LNMVE is the natural log of the market value of equity, computed using the offer price ($ millions). AVGUW is the average of the underwriter reputation ranking for the lead managers (from Carter and Manaster (1990) and Carter, Dark and Singh (1997). For each firm, TURNOVER is the average of the daily turnover (as a fraction of total shares outstanding) over 100 trading days starting from the second week after listing. UNDPCT is the raw return from the offering price to the closing price on the first trading day. The table lists the parameter estimates from OLS regressions, t-values are in parentheses.

	Sign	1	2	3	4	5	6
INTERCEPT		0.0605 (9.4)***	0.0411 (2.8)***	0.0459 (4.4)***	0.1184 (9.8)***	0.1105 (7.2)***	0.0743 (3.3)***
OFRPRC	+	0.0008 (1.8)*				0.0016 (2.1)**	
LNOFRPRC	+		0.0120 (2.1)**				0.0238 (2.4)**
AVGUW	+			0.0035 (2.6)**		0.0006 (0.3)	0.0004 (0.2)
LNMVE	+				-0.0385 (-6.8)***	-0.0403 (-7.0)***	-0.0403 (-7.0)***
LNISSAMT	+				0.0414 (6.8)***	0.0391 (5.9)***	0.0386 (5.9)***
TURNOVER	+				-0.8417 (-1.2)	-1.2315 (-1.7)*	-1.2391 (-1.8)*
UNDPCT	?				-0.0128 (-0.8)	-0.0110 (-0.6)	-0.0121 (-0.7)
Adj. R^2 (%)		0.14	0.23	0.38	4.1	4.4	4.5
F-value		3.2	4.5	6.5	14.5	10.4	10.7
(p)		(0.08)	(0.04)	(0.02)	(0.00)	(0.0)	(0.00)
# Obs		1501	1501	1449	1266	1225	1225

Table 3
Results of OLS Regressions of Volume Turnover on Offer Price, Institutional Ownership, Issue Size and Firm Size

The left-hand side variable is the trading volume turnover on the first listing day and is calculated as the ratio of trading volume to number of shares outstanding. OFRPRC (LNOFRPRC) is the final offer price in the IPO (natural log of). INSTT is the percentage institutional ownership after the IPO. The percentage offer price revision (PCTPRCDF) is the percentage change in final offer price from the mid-point of the initial filing range. LNISSAMT is the natural log of total gross proceeds of the IPO, excluding over-allotments ($ millions). LNMVE is the natural log of the market value of equity, computed using the offer price ($ millions). The table lists the estimates (t-values) from OLS regressions.

	Sign	1	2	3	4	5
Intercept		0.0120 (1.6)	0.0280 (3.8)***	0.2126 (12.0)***	0.0978 (3.4)***	-0.4787 (-3.7)***
OFRPRC	+	0.0167 (14.5)***			0.0192 (5.2)***	
$(OFRPRC)^2$	__	-0.0004 (-8.9)***			-0.0005 (-4.8)***	
LNOFRPRC	+		0.0137 (2.9)***			0.5408 (5.2)**
$(LNOFRPRC)^2$	__		0.0149 (10.1)***			-0.0980 (-4.7)***
INSTT	+			0.0493 (1.2)	0.0299 (0.7)	0.0314 (0.7)
PCTPRCDF	+			0.2696 (10.1)***	0.2197 (7.3)***	0.2245 (7.5)***
LNMVE	?			-0.0147 (-4.1)***	-0.0226 (-4.9)***	-0.0232 (-5.1)***
UNDPCT1	__			0.1335 (4.8)***	0.1442 (5.2)***	0.1495 (5.4)***
Adj. R^2 (%)		10.4	9.7	17.1	18.8	19.5
F-value (p)		181.2 (0.00)	167.3 (0.00)	63.8 (0.00)	47.9 (0.00)	50.0 (0.00)
# Obs		3113	3113	1219	1219	1219

Table 4
Underpricing Across Offer Price Decile Portfolios for IPOs During 1970-1993

Underpricing is calculated as the return from the offer price to the closing price on the first trading day. We create ten portfolios, each having an equal number of firms, on the basis of offer price. Portfolio 1 contains the ten-percent of IPOs with the lowest offer price. The market value of equity is the product of the offering price and number of shares outstanding, as at the end of the first trading day. The table lists the mean and median underpricing, and the percentage of IPOs that are underpriced for each portfolio. The t-values (z-values computed using the normal approximation to the binomial distribution for the sign test) test the null hypothesis that the mean (median) underpricing is zero.

Portfolio	Average Offer Price ($)	Average Market Value of Equity ($ mil)	Percentage Underpricing				N
			Mean	t-value	Median	%>0 (z)	
1	2.50	9.90	30.7	13.4	15.6	86.4 (13.9)	367
2	5.31	16.72	11.8	11.3	5.0	77.0 (10.3)	368
3	6.65	30.50	9.2	10.3	3.6	76.2 (10.0)	368
4	8.17	39.53	5.3	8.5	1.6	71.7 (8.3)	368
5	9.64	66.96	6.7	9.6	1.4	73.6 (9.0)	368
6	10.73	71.88	6.6	9.4	2.4	73.9 (9.1)	368
7	12.30	84.84	6.9	10.2	2.1	74.5 (9.3)	368
8	13.80	131.15	8.9	13.2	4.1	80.2 (11.5)	368
9	15.76	173.14	11.3	13.1	5.0	81.3 (11.9)	368
10	20.74	434.19	15.4	13.9	8.7	85.8 (13.7)	372

Table 5
Underpricing Across Offer Price Interval Portfolios for IPOs During 1970-1993

Underpricing is calculated as the return from the offer price to the closing price on the first trading day. We create eight portfolios based on offer price at intervals of $3. Portfolio 1 consists of all IPOs with offer price less than $3.00, portfolio 2 consists of all IPOs with offer price greater than or equal to $3.00 but less than $6.00, and so on. Portfolio 8 includes all IPOs where the offer price is greater than or equal to $21.00. The market value of equity is the product of the offering price and number of shares outstanding, as at the end of the first trading day. The table lists the mean and median underpricing for each portfolio. The t-values (z-values computed using the normal approximation to the binomial distribution for the sign test) test the null hypothesis that the mean (median) underpricing is zero.

Portfolio	Offer Price Range ($)	Mean Equity Market Value ($ mil)	Underpricing (%)				N
			Mean	t-value	Median	%>0 (z)	
1	< 3.00	8.92	40.2	10.4	21.9	89.1 (10.8)	193
2	≥ 3.00 , < 6.00	14.36	14.8	14.0	6.3	79.0 (12.5)	462
3	≥ 6.00 , < 9.00	32.48	8.0	13.8	2.8	75.2 (13.9)	769
4	≥ 9.00 , < 12.00	68.46	6.5	14.1	1.9	73.4 (13.3)	811
5	≥ 12.00 , < 15.00	109.55	8.0	16.0	3.1	77.3 (14.4)	697
6	≥ 15.00 , < 18.00	178.10	11.6	14.3	5.4	82.2 (13.2)	423
7	≥ 18.00 , < 21.00	266.88	17.4	10.1	8.6	85.5 (10.0)	200
8	≥ 21.00	761.27	12.8	8.6	8.9	84.0 (7.6)	128

Table 6
Correlation between Firm Characteristics and Offering Characteristics

We report various Pearson correlations among various firm and offering characteristics for a sample of 3683 IPOs during 1970-93 (p-values in parentheses). Offer price is the price per share as indicated in the SDC database. LNMVE is the natural log of the market value of equity computed using the offer price. Offer fraction is the number of shares offered in the IPO as a percentage of the total number of shares outstanding after the IPO. Institutional ownership is computed as a percentage of shares outstanding, and is taken from the S&P Stock Guide. Average turnover is the daily volume turnover, averaged over 100 days starting with the second week after listing. The underwriter reputation is the average of the underwriter ranks for the lead underwriters. Underwriters are assigned ranks as per Carter and Manaster (1990) for all IPOs offered prior to January 01, 1985, and as per Carter, Dark and Singh (1997) for all subsequent IPOs.

	LNMVE	Offer Price	Offer Fraction	Institutional ownership	Average turnover	Underwriter Reputation
LNMVE	1.00	0.75	-0.31	-0.01	-0.06	0.65
	(0.00)	(0.00)	(0.00)	(0.61)	(0.00)	(0.00)
Offer Price		1.00	-0.09	0.05	0.01	0.53
		(0.00)	(0.00)	(0.08)	(0.76)	(0.00)
Offer Fraction (%)			1.00	0.19	0.40	-0.06
			(0.00)	(0.00)	(0.00)	(0.00)
Institutional ownership				1.00	0.05	0.07
				(0.00)	(0.07)	(0.02)
Average turnover					1.00	0.06
					(0.00)	(0.00)
Underwriter Reputation						1.00
						(0.00)

Table 7
Results of Univariate OLS Regressions of IPO Underpricing

The left hand side variable in all the regressions is the IPO underpricing for our sample of 3683 IPOs of US firms during 1970-93, and is calculated as the raw return from the offer price to the closing price on the first day of trading. The underpricing is regressed on various firm-specific variables. OFRPRC is the final offer price in dollars of the IPO. LNMVE is the natural log of the market value of equity, computed using the offer price ($ mil). AVGUW is the average of the underwriter reputation ranking for the lead managers (from Carter and Manaster (1990) for IPOs prior to 1985 and from Carter, Dark and Singh (1997) for all subsequent IPOs). OFFRAC is the total number of shares issued in the IPO in the domestic market (excluding any over-allotments), as a percentage of the total number of shares outstanding after the IPO. LNISSAMT is the natural log of the total amount of the IPO (gross proceeds in $ million), excluding over-allotments. PCTPRCDF is the percentage revision in the final offer price from the mid-point of the initial filing range. For each firm, initial volume (TURNOVER1) is calculated as the turnover (as a fraction of shares outstanding) on the first listing day. The table lists the parameter estimates from OLS regressions, t-values are in parentheses.

Variable	Intercept	t-value	Slope	t-value	Adj. R^2 (%)	N
Offer price (OFRPRC)	0.1634	20.6	-0.0048	-7.1	1.33	3683
Firm size (LNMVE)	0.1878	16.6	-0.0199	-7.0	1.27	3683
Underwriter reputation (AVGUW)	0.2002	16.4	-0.0142	-8.4	2.10	3210
Offer fraction (OFFFRAC)	0.1207	14.8	-0.0230	-1.1	0.00	3683
Issue amount (LNISSAMT)	0.1733	19.9	-0.0235	-7.6	1.52	3683
Percentage offer price revision (PCTPRCDF)	0.1199	38.2	0.4598	22.8	13.27	3382
Initial turnover (TURNOVER1)	0.0752	15.5	0.2398	9.4	2.72	3113

Table 8
Results of OLS Regressions of IPO Underpricing on Offer Price, Offer fraction, Firm Size, Average Trading Volume and Underwriter Reputation

For our sample of 3683 IPOs of US firms during 1970-93, the underpricing calculated as the return from the offer price to the closing price on the first day of trading, is regressed on various firm-specific variables. OFRPRC (LNOFRPRC) is the final offer price (natural log of) in dollars of the IPO. AVGUW is the average of the underwriter reputation ranking for the lead managers (from Carter and Manaster (1990) for IPOs prior to 1985 and from Carter, Dark and Singh (1997) for all subsequent IPOs). PCTPRCDF is the percentage revision in the final offer price from the mid-point of the initial filing range. LNISSAMT is the natural log of the total amount of the IPO (gross proceeds in $ million), excluding over-allotments. LNMVE is the natural log of the market value of equity, computed using the offer price ($ mil). The table lists the parameter estimates from OLS regressions, t-values are in parentheses.

	1	2	3	4	5
INTERCEPT	0.2763 (24.5)***	0.3048 (29.4)***	0.1755 (14.0)***	0.2314 (16.9)***	0.3131 (24.0)***
OFRPRC	-0.0273 (-15.5)***			-0.0226 (-11.4)***	
$(OFRPRC)^2$	0.0009 (13.8)***			0.0005 (9.0)***	
LNOFRPRC		-0.1614 (-23.3)***			-0.1704 (-22.6)***
$(LNOFRPRC)^2$		0.0302 (13.6)***			0.0266 (10.1)***
AVGUW			-0.0049 (-2.5)**	0.0004 (0.2)	-0.0003 (-0.1)
PCTPRCDF			0.4806 (25.0)***	0.5467 (26.9)***	0.4859 (25.5)***
LNISSAMT			-0.0353 (-5.0)***	-0.0190 (-2.7)***	-0.0277 (-4.1)**
LNMVE			0.0172 (2.7)***	0.0267 (4.2)***	0.0295 (5.0)***
Adj. R^2 (%)	6.2	13.7	18.6	22.0	30.7
F-value (p)	121.7 (0.00)	292.4 (0.00)	170.5 (0.00)	141.1 (0.00)	220.4 (0.00)
# Obs	3683	3683	2977	2977	2977

Table 9
Long-Run Market Adjusted Excess Returns Across Offer Price Decile Portfolios for IPOs During 1970-1993

We create decile portfolios, each having an equal number of firms, on the basis of offer price. Portfolio 1 contains the ten percent of IPOs with the lowest offer price. Long-run returns for the IPO firm are calculated as the holding period returns for 12 (24 or 36) calendar months starting after the listing month. Excess returns are calculated by subtracting the contemporaneous returns on a proxy for the market index (CRSP equally weighted and value weighted index). We include firms only when they have data for the complete period. The table lists the mean percentage excess return for each portfolio. The t-values (in parentheses) test the null hypothesis that the mean excess return is zero.

Portfolio	Excess Returns using CRSP Equally Weighted Index			Excess Returns using CRSP Value Weighted Index		
	+1 to +12	+1 to +24	+1 to +36	+1 to +12	+1 to +24	+1 to +36
1	-8.17	-25.93	-40.41	-9.99	-25.95	-43.37
	(-1.92) *	(-4.28) ***	(-4.70) ***	(-2.34) **	(-4.19) ***	(-4.97) ***
2	-4.31	-23.81	-30.61	-7.61	-30.33	-44.85
	(-1.09)	(-5.32) ***	(-4.58) ***	(-1.89) *	(-6.75) ***	(-6.69) ***
3	-3.94	-12.86	-0.19	-4.34	-14.97	-6.49
	(-1.01)	(-2.03) **	(-0.02)	(-1.11)	(-2.37) **	(-0.54)
4	-7.29	-5.16	-5.86	-10.34	-8.99	-15.19
	(-2.50) **	(-0.87)	(-0.67)	(-3.55) ***	(-1.53)	(-1.76) *
5	-3.85	-10.88	-22.69	-5.28	-10.00	-25.29
	(-0.91)	(-1.93) *	(-3.19) ***	(-1.21)	(-1.77) *	(-3.55) ***
6	-2.41	-8.43	-11.20	-2.80	-9.42	-17.09
	(-0.79)	(-1.62)	(-1.50)	(-0.90)	(-1.82) *	(-2.25) **
7	-5.80	-5.09	-5.13	-7.36	-6.57	-10.89
	(-2.07) **	(-0.74)	(-0.57)	(-2.57) **	(-0.94)	(-1.21)
8	-3.32	-7.49	-7.67	-1.79	-4.77	-6.87
	(-1.02)	(-1.42)	(-1.02)	(-0.54)	(-0.88)	(-0.89)
9	0.97	-0.19	0.64	1.78	2.58	-0.57
	(0.35)	(-0.04)	(0.09)	(0.62)	(0.53)	(-0.08)
10	-3.44	-3.46	2.79	-3.33	-3.21	0.35
	(-1.33)	(-0.72)	(0.35)	(-1.30)	(-0.65)	(0.04)

Table 10
Results of Logistic Regressions to Explain Distress Delisting of IPOs

The dependant variable is a dummy variable that takes the value '0' if the firm delisted for reasons of financial distress within five years after the IPO and '1' if the firm is viable. The firm is considered to be viable if at the end of five years after the offering it is still traded on the NYSE/AMEX/NASDAQ, or if the delisting was the result of a merger or an exchange offer. The logistic regression models the likelihood of the firm remaining viable. The main explanatory variable is the IPO offer price, OFRPRC. The additional control variables include: LNMVE, the natural log of market value of equity computed using the offer price ($ mil); AVGUW, the average of the underwriter reputation ranking for the lead managers (from Carter and Manaster, 1990, and Carter, Dark and Singh, 1997), and PCTINSTT, the percentage institutional ownership after the IPO. The table lists the parameter estimates from various logistic regressions with p-values in parentheses.

	1	2	3	4	5
Intercept	-0.203 (0.06)	-0.541 (0.00)	0.439 (0.34)	-0.867 (0.00)	-0.539 (0.37)
OFRPRC	0.231 (0.00)			0.087 (0.01)	
LNOFRPRC		1.163 (0.00)			0.749 (0.02)
LNMVE			0.278 (0.04)	0.093 (0.53)	0.147 (0.30)
AVGUW			0.142 (0.04)	0.115 (0.10)	0.101 (0.15)
PCTINSTT			0.048 (0.97)	-0.245 (0.86)	-0.169 (0.90)
Model χ^2 p-value	0.00	0.00	0.00	0.00	0.00
Percent concordant	74.8	74.8	62.2	64.4	64.1
# Obs	3683	3683	1449	1449	1449

[1] For example, practitioner manuals by Ernst and Whinney (1984) and Deloitte, Haskins and Sells (1983) suggest an acceptable price range to be between $10 and $20 per share. Listing regulations also limit companies' pricing choices. Inspection of the distribution of offering prices shows that it is not uniform as would be expected if the choice were purely arbitrary.

[2] Since initial IPO allotments are not available to us, we measure the institutional ownership after the IPO using various issues of the S&P Stock Guide. If the data is available in the S&P Stock Guide that is issued three months after the offer date, we use that as our measure of institutional ownership. If the data is not available in that issue, we use the Stock Guide issued six months after the offer date. If the data is still unavailable, we set it as missing.

[3] Ibbotson, Sindelar and Ritter (1988) document an average underpricing of 16.37 percent for a sample of 8668 IPOs during 1960-87. Ibbotson (1975), Ritter (1987,1991), Carter and Manaster (1990), Jegadeesh, Weinstein and Welch (1993) and Booth and Chua (1996) have also documented similar results.

[4] The significance levels are similar whether we use the t-test assuming equal variances or unequal variances. Note that this test is not a test of the overall pattern in the relationship between offer price and underpricing.

[5] The inferences are unchanged if we use ten $2.00 interval portfolios instead. These results are not reported, but are available upon request.

[6] Hanley (1993) shows that underpricing is positively related to the percentage change in offer price from the original filing price. She also shows that initial day trading volume is higher for these IPOs, and this relationship holds for up to two years into the future. We run all our underpricing tests using both percentage initial day volume and the average of the daily percentage volume over the first 100 trading days (average trading volume). The inferences are unchanged, but we report the latter results since the sample size is slightly larger.

[7] Since none of our inferences are significantly altered, these results are not reported, but are available upon request.

[8] Strictly speaking, the data is not left-censored at zero percent since we also observe that some IPOs are overpriced (negative underpricing). However, the Tobit specification has been used in the literature (see Ruud, 1993).

[9] The NASDAQ Fact Book (1988) describes public float as those shares not held directly or indirectly by any officer or director of the issuer and by any person who is the beneficial owner of more than 10 percent of the total shares outstanding.