

The Certification Role of Large Block Shareholders in Initial Public Offerings: The Case of Venture Capitalists

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This paper provides evidence for the certification role of large block shareholders in the initial public offering process. I use an exhaustive set of venture-capital-backed initial public offerings as an example. The presence of venture capital firms in an issuing firm serves to reduce the underpricing and underwriting costs. In addition, lead venture capitalist pre-IPO shareholding is associated negatively with initial return. Consistent with the certification hypothesis, the quality of their reputation is recognized by the capital market through lower underpricing and underwriting spread.

INTRODUCTION

There is considerable theory and evidence that initial public offerings (IPOs), on average, experience positive initial returns and that the market reacts negatively to seasoned equity offerings. This kind of market reaction is a direct implication of Leland and Pyle (1977) and Myers and Majluf (1984). Although Welch (1989), Allen and Faulhaber (1989), and Grinblatt and Hwang (1989) have presented signaling models that predict that intrinsically higher value firms can convey their private information through IPO underpricing to deter mimicking by lower value firms, there are several reasons that make the first party actions suspect. For example, Gale and Stiglitz (1989) show that initial public offering signaling models break down when issuers are allowed to sell equity more than once. If potential investors cannot distinguish among the quality of new equity offerings and place an average value on all issues, the lemons problem described by Akerlof (1970) occurs.

To provide an effective signaling mechanism for an equity offering, an issuer can hire or lease the reputation from a third party specialist. Booth and Smith (1986) model the certification role provided by investment bankers to reduce information asymmetry in new equity offerings. DeAngelo (1981), Beatty (1989), Titman and Trueman (1986), Johnson and Miller (1988), and Carter and Manaster (1990) examine how auditors and underwriters help resolve the asymmetric information inherent in the IPO process. Megginson and Weiss (1991) find that the initial return to venture-capital (VC)-backed IPOs is lower than that of non-VC-backed IPOs. Their evidence suggests that the presence of large block shareholders may provide a complement to underwriter reputation in reducing IPO uncertainty. In addition, Barry, Muscarella, Peavy, and Vetsuypens (1990) show that venture capitalists specialize their investments in firms to provide intense monitoring service. Their monitoring functions are recognized by the market through lower underpricing. Moreover, Gompers (1995a) finds that the monitoring function provided by venture capitalists is valuable both to investors and entrepreneurial companies. I distinguish this study from the earlier works by focusing on VC reputation. Using the equally weighted

value of standardized venture size and age as a proxy for reputation, I find that IPO underwriting costs are associated negatively with VC reputation. The evidence is consistent with Booth and Smith's (1986) certification hypothesis.

Venture capitalists are active investors that are insiders in their portfolio companies. Usually they hold substantial equity positions, perform monitoring functions, and serve on company boards of directors. The success of a VC firm depends not only on the ability to identify and nurture its portfolio companies that are likely to be successful, but also depends on the ability to unwind its equity position so that returns from entrepreneurial effort are maximized. When a portfolio company goes public, VC firms usually play an important role in helping the company choose managing underwriters.¹ Venture capitalists may participate in meetings with representatives of underwriters and discuss the timing and terms of the offering. With equity at stake, venture capitalists have an incentive to take their portfolio companies public when the portfolio companies' equity valuations are high.² Thus, VC-backed IPOs provide a unique opportunity to explore the certification role of large block shareholders in new equity offerings.

Consistent with the findings of Barry *et al.* (1990) and Megginson and Weiss (1991), my results show that VC backing reduces the magnitude of underpricing and that such backing significantly lowers the underwriting spread. In addition, I find that the level of IPO underpricing and underwriter spread are associated negatively with the level of VC reputation. The results are consistent with the implications of the certification hypothesis.

THE HYPOTHESIS

In their certification model Booth and Smith (1986) demonstrate conditions under which a nonsalvageable reputation can serve as an effective bond to guarantee the quality of a firm. Outside investors' willingness to pay a premium for the certification provides a stream of quasi-rents that only will continue to be paid as long as the third party does not cheat. The certification can serve as an effective signal if the nonsalvageable quasi-rent is greater than a one time wealth transfer from false certification. Evidence of the reputational capital reasoning to financial markets includes DeAngelo (1981) and Beatty (1989) on the role of auditor reputation in accounting statement certification, Beatty and Ritter (1986) on the underwriter reputation in certifying new equity offerings, and Megginson and Weiss (1991) on the presence of VC firms in reducing IPO underpricing. There are strong *a priori* reasons to believe that VC firms have an incentive to establish/or maintain a trustworthy reputation in order to retain access to the IPO market. Bygrave and Stein (1989) provide evidence that VC firms usually take their portfolio companies to the market on an ongoing basis to unwind their equity holding. Lin and Smith (1995) show that VCs are repeat players in the issuing market and that reputable VCs tend to avoid selling overpriced issues to maintain their reputation. In this study, 66 VC firms had more than

¹ This is because of their close relations with investment banks. Venture Economics (1987) reports that among 76 venture capital firms surveyed, 51 percent are affiliated with financial corporations, including banks, investment banks, and insurance companies.

² Lerner (1994) shows that VC-backed firms go public when equity valuations are high, and employ private financing when values are lower.

six portfolio firms go public from 1979 to 1990. Establishing reputation enables venture capitalists to redeploy their entrepreneurial talent and resources more profitably. Furthermore, as Megginson and Weiss (1991) suggest, a reputation of honesty about the issuers will enable venture capitalists to establish enduring relationships with institutional investors who are vitally important as investors in VC firms and as purchasers of shares in IPOs.

The certification hypothesis described above yields four testable implications. First, because outsiders lack reliable information about an issuer's value and growth opportunities, IPO underpricing is required as a compensation for the uncertainty, as suggested by Rock (1986) and Beatty and Ritter (1986). If the presence of VC firms can provide credible information about the quality of an issue, the compensation to investors will be lower for issues with VC-backing than for issues without VC-backing. Second, because venture capitalists are proficient at taking firms public, their experience in the IPO process may help their portfolio companies choose underwriters that can reduce the issuing costs. Hence, the magnitude of underwriting spread should be lower for VC-backed IPOs than for non-VC-backed IPOs. Third, from the certification hypothesis, the penalty of falsely signaling is more costly for a reputable certifier than for a less reputable one. This implies that reputable VC firms are less likely to cheat because of the bonding mechanism resulting from the penalty. Rational investors are willing to pay more for companies brought to market by reputable VC firms. Accordingly, IPOs backed by reputable VC firms should have less underpricing than IPOs backed by less reputable VC firms. Fourth, James (1992) argues that the greater the uncertainty concerning firm value, the greater the risk borne by underwriters. Therefore, a positive relation is expected between spreads and measures of uncertainty concerning issuing firm value. Turning James's argument around, if VC reputation can reduce an issuer's uncertainty, IPOs backed by reputable VC firms should have lower underwriter spread than IPOs backed by less reputable VC firms.

DATA

To identify IPOs backed by VC firms, I follow the data collection process of Barry, Muscarella, Peavy, and Vetsuypens (1990). Information of VC-backed IPOs is collected from the annual report issues of *Venture Capital Journal*. From 1979 to 1990 *Venture Capital Journal* reported 651 IPOs made by companies that had received VC investment. Information on a VC firm's directorship and shareholding is collected from the "Management" and "Principal and Selling Shareholders" sections of prospectuses, respectively. Descriptive information on the VC firms, including their founding years and size of funds under management, is obtained from *Pratt's Guide to Venture Capital Sources*. Because venture capital firms seldom borrow money for investments, fund size reported by the *Pratt's Guide* typically represents the amount of funds raised from investors and managed by a venture capital firm. To avoid a survivorship bias, both current and older issues of *Pratt's Guide* are used. If an IPO does not have a VC firm listed in the *Pratt's Guide*, the observation is not classified as a VC-backed issue. I obtain 497 VC-backed IPOs. A sample of 2,137 non-VC-backed IPOs of common stock that occurred between 1979 and 1990 is identified using the *Directory of Corporate Financing* and SEC regis-

Table 1—Summary Statistics of VC-Backed and Non-VC-Backed Initial Public Offerings (medians in parentheses)

Variable	VC-Backed IPOs	Non-VC- Backed IPOs	t-statistic in Mean	Mann-Whitney Z test
Number of Issues	497	2137		
Offer Size ^a	\$22.9 (17.3)	\$26.6 (7.3)	1.74*	13.49***
Offer Price	\$11.2 (10.0)	\$8.6 (8.0)	11.02***	10.88***
Firm Value ^a	\$87.3 (60.0)	\$65.0 (20.3)	3.79	15.98***
Issuer age	7.5 (5.0)	15.0 (5.0)	10.97***	1.35
Earning per Share	\$1.34 (0.58)	\$1.72 (0.67)	0.84	1.37
Earning per Share Over Offer Price	10.6% (4.8%)	17% (6.5%)	1.92*	3.21***
Underwriting Spread Over Offer Size	7.4% (7.0%)	8.3% (8.0%)	14.93***	13.44***
Underwriter Ranking ^b	7.0 (7.5)	5.5 (5.5)	14.93***	11.61***

^aIn millions of dollars

^b Defined as the Carter and Manaster (1990) ranking of underwriters, where 9 indicates the highest level of prestige and 0 represents the lowest level

* Significant at the 10 percent level

** Significant at the 5 percent level

*** Significant at the 1 percent level

tered offering statistics tape.³ The closing stock price of the first trading date is obtained from the Center for Research in Security Prices data tape. VC backing represents about 18.8 percent of all IPOs. Consistent with Barry *et al.*, the number of IPOs varies widely across time. The years of exceptionally high IPO activity are 1983, 1986, and 1987.

Table 1 compares characteristics between VC and non-VC-backed IPOs using a standard t-test and Mann-Whitney median test. Summary measures of offer size and offer price are presented in rows 2 and 3, respectively. Consistent with the findings of Megginson and Weiss (1991), VC-backed IPOs have a larger median offer size than that of non-VC-backing, although the presence of several large non-VC-backed IPOs leads to a smaller mean size for VC-backed offers. In addition, VC-backed IPOs have a higher offer price and firm value, defined as the offer price times shares outstanding, than non-VC-backed firms. Rows 5 through 7 present summary statistics of issuer characteristics before going public. Consistent with the findings of Barry *et al.* (1990), IPO with VC-backing has shorter years before going public than non-VC-backing. While earnings per share between VC-backed and non-VC-backed IPOs are not significantly different, the latter group has a higher earning/offer price ratio than the former group. Summary measures of underwriting costs and underwriter prestige are presented in rows 8 and 9. The results reveal that VC-backed firms have lower underwriting spreads, defined as gross spread over offer price, and employ more reputable underwriters, where the underwriter reputation is defined as the

³ The registered offering statistics tape was discontinued by the SEC at the end of 1988.

Table 2—Weighted Least Squares Regressions of Initial Return and Underwriting Spread Against the Log of Offer Size, Age of the Issuing Firm, Underwriter Ranking, and Whether an Issue is VC-Backed. Dummy Equals 1 if an Issue Is Backed by VC Firms, 0 Otherwise

Panel A: Correlation Matrix of the Explanatory Variable (p-value in parentheses).

	Log of Offer Size	Issuer's Age	Underwriter Ranking	Dummy
Log of Offer Size	1.000 (0.000)			
Issuer's Age	-0.022 (0.266)	1.000 (0.000)		
Underwriter Ranking	0.671 (0.001)	0.005 (0.817)	1.000 (0.000)	
Dummy	0.203 (0.001)	-0.133 (0.001)	0.253 (0.001)	1.000 (0.000)

Panel B: Regression Results (t-statistics in parentheses).

Independent Variable	Dependent Variable	
	Initial Return (%)	Underwriting Spread Over Offer Price (%)
Intercept	18.20 (3.49***)	14.67 (48.02***)
Log of Offer Size	-0.35 (-0.53)	-0.58 (-13.86***)
Issuer's Age	-5.82E-2 (-2.83***)	-2.37E-3 (-1.57)
Underwriter Ranking ^a	-1.05 (-2.86***)	-0.22 (-12.25***)
Dummy	-1.13 (-1.27)	-0.15 (-3.59***)
Adjusted R ²	0.06	0.59
N	2,180	2,158

^a Defined as the Carter and Manaster (1990) ranking of underwriters, where 9 indicates the highest level of prestige and 0 represents the lowest level

*** Significant at the 1 percent level

Carter and Manaster (1990) ranking.⁴ The finding is consistent with Megginson and Weiss's (1991) report that venture capitalists are capable of helping entrepreneurs in attracting quality underwriters.

RESULTS AND INTERPRETATIONS

To examine the certification role of VC firms, initial return and underwriting spread are regressed against log of offer size, age of the issuing firm, underwriter ranking, and whether the issue is VC-backed. The dummy equals one if an issue is backed by VC firms, zero otherwise.

Cross-sectional tests of the certification hypothesis are reported in Tables 2 and 3. Significance levels are computed using the White (1980) correction for heteroskedasticity. Panel A of Table 2 reports the correlation matrix of the independent variables. Offer size is correlated positively with underwriter ranking and the presence of venture capital. Most importantly, the presence of venture capitalists is associated with more prestige underwriters. Column 1 of Panel B in Table 2 reports the weighted least squares results when

⁴ In the sample 2,181 (82.8 percent of the total) IPOs' lead underwriters are in the Carter and Manaster's (1990) listing. If the lead underwriter is not listed in the Carter and Manaster's listing, I use the ranking of the comanaging underwriter as the proxy for underwriter prestige.

Table 3—Weighted Least Squares Regressions of Initial Return and Underwriting Spread Against the Log of Offer Size, Age of the Issuing Firm, Lead VC Pre-IPO Shareholding, Underwriter Ranking, and VC Reputation Indicator

Panel A: Correlation Matrix of the Explanatory Variables (p-value in parentheses).

	Log of Offer Size	Issuer's Age	VC Pre-IPO Shareholding	Underwriter Ranking	VC Reputation Indicator
Log of Offer Size	1.000 (0.000)				
Issuer's Age	0.082 (0.067)	1.000 (0.000)			
VC Pre-IPO Shareholding	-0.029 (0.510)	0.657 (0.144)	1.000 (0.000)		
Underwriter Ranking	0.588 (0.001)	0.101 (0.025)	-0.862 (0.055)	1.000 (0.000)	
VC Reputation Indicator	0.165 (0.001)	0.011 (0.799)	0.114 (0.011)	0.169 (0.001)	1.000 (0.000)

Panel B: Regression Results (t-statistics in parentheses)

Independent Variable	Dependent Variable		
	Initial Return (%)	Underwriting Spread Over Offer Price (%)	Issuing Cost ^c (%)
Intercept	-17.57 (-1.84*)	13.29 (34.43***)	-4.20 (-0.44)
Log of Offer Size	3.77 (3.54***)	-0.46 (-9.63***)	3.30 (3.03***)
Years From Incorporation to Offering Date	-3.02E-2 (-0.67)	-2.35E-3 (-1.35)	-0.034 (-0.49)
Lead VC Pre-IPO Shareholding	-0.12 (-2.94***)	-2.37E-3 (-0.84)	-0.117 (-2.25**)
Underwriter Ranking ^a	-1.29 (-3.36***)	-0.20 (-5.44***)	-1.48 (-3.91***)
VC Reputation Indicator ^b	-1.61 (-1.97**)	-7.78E-2 (-2.09**)	-1.71 (-1.99**)
Adjusted R ²	0.08	0.45	0.08
N	496	492	492

^a Defined as the Carter and Manaster (1990) ranking of underwriters, where 9 indicates the highest level of prestige and 0 represents the lowest level

^b The VC reputation indicator is defined as the equally-weighted measures of VC firm's age and portfolio size. The indicator can be expressed as:

$$VCi \text{ reputation indicator} = \frac{1}{2} \left(\frac{SIZE_i - \overline{SIZE}}{STD_{size}} + \frac{AGE_i - \overline{AGE}}{STD_{AGE}} \right),$$

where:

$\overline{SIZE}_i$	=	Portfolio size of VC firm i;
$\overline{SIZE}$	=	Mean of VC firms' portfolio sizes;
STD_{size}	=	Cross-sectional standard deviation of VC portfolio size;
AGE_i	=	Age of VC firm i
$\overline{AGE}$	=	Mean of VC firms' ages; and
STD_{age}	=	Cross-sectional standard deviation of VC age.

^c Issuing cost is defined as the summation of underpricing and underwriter spread

* Significant at the 10 percent level

** Significant at the 5 percent level

*** Significant at the 1 percent level

initial return is the dependent variable. While Ritter (1984) shows a negative relation between initial return and offer size, the results in this study reveal no significant relation between them. The coefficient on the issuing firm's age is negative and statistically significant. The evidence is consistent with Ritter's (1991) argument that old firms are less risky which results in lower underpricing. Consistent with Booth and Smith's (1986) certification hypothesis, the initial return is associated negatively with underwriter ranking. In addition, while the coefficient on the dummy variable is negative, we are unable to make a strong attribution from the dummy because of its high collinearity with the underwriter prestige.

The second regression, shown in column 2, replaces the initial return with the underwriting spread. Consistent with the findings of Bhagat and Frost (1986), James (1992), and others, a negative relation exists between the underwriter spread and the offer size. While the coefficient on the issuer's age is negative, the t-value is not significant at conventional levels. I also find that the coefficient on the underwriter ranking is related inversely with the underwriter spread. Moreover, the coefficient on the dummy variable is negative and significant at the 1 percent level. The evidence implies that the existence of VC firms can reduce issuing costs. The estimates presented in Table 2 suggest that underwriter prestige is the most important determinant of initial return and underwriting spread. The presence of VC firms provides a complement of underwriter reputation in lower underpricing and underwriting costs, controlling for the effects of offer size and issuer age.

The regression results in Table 3 highlight the relation between VC reputation and underpricing. To reflect the VC reputation, a lead VC firm's age, which is defined as the offering date minus the founding year of the VC firm, and the amount of fund under management are chosen as proxies.⁵ The rationale is as follows. First, the longer a VC firm has been in business, the less uncertainty the market faces about whether the VC firm is likely to cheat about an issuer's value. A longer operating history also may provide market participants with information concerning VC managerial investment-unwinding decisions. This additional information may allow investors to marginally reduce their estimate of *ex ante* uncertainty. Hence, the longer a VC firm's age, the more credible the information it conveys about the issuer. Second, venture capitalists must convince investors (individuals, corporations, fund managers, financial institutions, etc.) of their expertise and their ability to nurture new growing companies to attract resources. Accordingly, the amount of fund may serve as a proxy for VC expertise in the industry. In addition, managing a large portfolio implies that a venture capital firm is involved in many emerging companies and may need IPOs to exit those companies. Frequency in involving IPOs increases the incentive for venture capitalists to protect their reputation and preserves their option to sell shares in future IPOs. The amount of fund also represents a proxy for the penalty of cheating. The larger the size of the fund, the more there is to lose

⁵ Appendix A summarizes lead VC firms' ownerships, portfolio sizes, and ages. If two or more VC firms are in the same IPO firm, I choose the VC firm that has the largest shareholding as the lead. If two or more VC firms have the same amount of shareholding in the same IPO firm, the one with directorship of the issuer is chosen. Our classification of lead venture capitalist follows Barry *et al.* (1990), but differs from Gompers (1995b). Gompers defines the lead venture capitalist as the firm that has been on the board the longest as the lead venture capitalist.

if venture capitalists convey falsely information about an issuer.⁶ I therefore construct the VC reputation indicator using the equally weighted measures of VC firm age and portfolio size. The reputation indicator is calculated as:

$$\text{VC}_i \text{ reputation indicator} = \frac{1}{2} \left(\frac{\text{SIZE}_i - \overline{\text{SIZE}}}{\text{STD}_{\text{size}}} + \frac{\text{AGE}_i - \overline{\text{AGE}}}{\text{STD}_{\text{AGE}}} \right),$$

where:

- SIZE_i = Portfolio size of VC firm i ;
- $\overline{\text{SIZE}}$ = Mean of VC firms' portfolio sizes;
- STD_{size} = Cross-sectional standard deviation of VC portfolio size;
- AGE_i = Age of VC firm i
- $\overline{\text{AGE}}$ = Mean of VC firms' ages; and
- STD_{age} = Cross-sectional standard deviation of VC age.

Initial return is regressed against the VC reputation indicator and four control variables: the log of offer size, the age of the issuing firm, the pre-IPO shareholding of the lead VC firm, and the underwriter ranking. Panel A of Table 3 reports the correlation matrix of the independent variables. Offer size is associated positively with both underwriter and venture capital reputations. In addition, the higher the venture capital reputation is, the more prestige the underwriter has. Panel B of Table 3 reports the regression results. Column 1 indicates that the underpricing is related positively to the offer size, consistent with the findings of Barry, Muscarella, Peavy, and Vetsuypens (1990). Although the coefficient on the issuer's age is negative, the computed t-statistic is not significant at conventional levels. In addition, the initial return is related negatively with the lead VC firm's pre-IPO shareholding. This evidence suggests that high VC shareholding conveys a positive signal about an issuer's firm value. The results imply that, *ceteris paribus*, increasing a lead VC firm's pre-IPO shareholding by 1 percent, on average, results in an additional reduction in 0.12 percent of IPO underpricing. Moreover, consistent with the certification hypothesis, the initial return is associated inversely with the underwriter ranking at the 1 percent significant level. Last, the underpricing is related negatively with the VC reputation indicator. The evidence is consistent with Barry, Muscarella, Peavy, and Vetsuypens's (1990) argument that quality VC firms can reduce IPO underpricing.

In column 2 initial return is replaced with underwriting spread. The results show that most of the explanatory variables to predict the underwriting spread are negative. Consistent with the reported results of James (1992), the underwriter spread is associated negatively with offer size. Although the coefficients on the issuer's age and the lead VC firm's pre-IPO shareholding are negative, their computed t-statistics are not significant at con-

⁶ I thank an anonymous referee for pointing this out.

ventional levels. While the investment bank prestige and the VC reputation indicator are highly correlated, the coefficients on both regressors are negative and statistically significant at the 5 percent level.

In column 3 issuing cost, defined as the summation of underpricing and underwriter spread, is used as the dependent variable. Consistent with the prediction, VC reputation and pre-IPO shareholdings are related negatively with issuing cost. The results suggest that, *ceteris paribus*, increasing a lead VC firm's pre-IPO shareholding by 1 percent, on average, results in an additional reduction in \$420,650 in issuing costs.⁷

The evidence presented in Tables 2 and 3 reveals that new equity issues with VC investments are met with a lower underpricing and underwriting spread. This evidence is consistent with the findings of Barry *et al.* (1990) and Megginson and Weiss (1991). The results are also consistent with the notion of the certification hypothesis discussed by Booth and Smith (1986).

CONCLUSION

This paper investigates IPO underpricing for firms with and without VC backing. This paper also examines the relation between VC reputation and underwriter spread. There are two contributions of this study. First, this paper documents that VC backing reduces the mean and median degree of IPO underpricing and that such backing significantly lowers underwriting spread charged by investment banks. Support is found in both the bivariate t-test and the cross-sectional regressions. This is consistent with the notions that the presence of a VC firm can be a partial substitute for and a complement to the certification provided by investment bankers. Second, venture capitalists, as large block shareholders, play an important role in certifying the value of a new equity offering. The quality of their reputation provides incremental information not signaled by the underwriter alone. Consistent with the certification hypothesis, VC reputation is able to reduce IPO underpricing and underwriting costs.

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⁷ The average issuing cost of VC-backed IPOs is 15.7 percent of the offer size. That is, the average issuing cost is equivalent to \$3,595,300.

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**APPENDIX A—SUMMARY STATISTICS OF LEAD VC PRE-IPO
SHARE HOLDING AND PROXY FOR VC REPUTATION**

Variables	Mean	Standard Deviation
Lead VC Firm's Pre-IPO Shareholding	17.3%	13.4%
Amount of Fund Under Management by the Lead VC Firm ^a	168.73	215.18
Age of the Lead VC Firm Before IPOs	12.82	9.03

^a In millions of dollars.