Do VCs Provide More Than Money? Venture Capital Backing & Future Access to Capital

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Abstract

The long-run benefits Venture Capitalists (VCs) provide have been discussed in literature but empirical results based on stock returns have yielded inconclusive results. Brav and Gompers (1997) is one of the few papers, which show moderate outperformance of VC-backed firms in terms of long-run returns. In fact, several papers seem to focus on the long-run benefits VCs provide but few have shown concrete evidence of these benefits. Brav and Gompers (1997) hypothesize several reasons why VCs should improve long-run performance. In this paper we examine if one of the potential benefits VCs provide is better access to capital. The results in this paper show this is the case as IPO firms with venture backing have better access to capital than non-VC backed IPOs.

The role of Venture Capitalists (VCs) remains a heavily contested issue. Many researchers agree VCs provide valuable services to the companies in which they invest, but current research comes up short in providing empirical evidence to the existence of such services. The role of VCs has often been examined at the time of the IPO. If VCs provide benefits to the IPO firm through increased monitoring (Barry, Muscarella, Peavy, and Vetsuypens, 1990) or certification (Megginson and Weiss, 1991), underpricing should be reduced for VC-backed IPOs as investors will recognize the added benefits of a VC-backed IPO. Evidence illustrating a beneficial role of VCs as marked by lower underpricing at the time of the IPO has been mixed at best. In fact, new evidence indicates VC-backed IPOs have higher risk-adjusted underpricing than non-VC-backed IPOs.[1]

This study quantifies the role VCs play in the performance of newly public firms after their IPO. That is, do VCs provide any long-term identifiable benefits to the firms in which they take an equity stake in or do VCs simply provide capital? To date, studies measuring the long-run performance by VC-backed IPOs have yielded vastly different results.[2] In fact, very few papers if any have provided any clear empirical long-term benefits provided by VCs. The goal of the study is to provide some evidence about the long-run benefits of VCs. We hypothesize that VCs would lead to better access to capital

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[1] Early work including Barry, Muscarella, Peavy, and Vetsuypens (1990), Megginson and Weiss (1991), etc. has shown that VC-backing was negatively related to underpricing. In contrast, recent work including Lee and Wahal (2004) and Flagg & Qi (2010) have shown a much different result with VC-backing positively related to underpricing, perhaps due to grandstanding (Lee and Wahal, 2004) and spinning (Flagg and Qi, 2009).

[2] Brav and Gompers (1997) show VC-backed IPOs as having performed marginally better than non-VC backed IPOs. Chan et al. (2005) examine the long-run performance of IPOs and find that for large sized IPOs that VC-backing is positively related to long-run stock performance. Campbell and Fry (2004) show no major difference in stock performance between VC-backed and non-VC-backed IPOs. Dolvin and Pyles (2005) find that VC-backing does not lead to better long-run performance.

after the IPO for the venture-backed firm. The intuition behind this result is VC-backed firms will gain valuable knowledge of capital markets through their VC investors. In other words, before the IPO, VCs provides access to capital by putting hard dollars into the firm. After the IPO, VCs provide their reputation capital leading to newly public firms leading to better access to capital up to three years after the IPO.

Brav and Gompers (1997) illustrate three major reasons why VC-backed IPOs might differ from non-VC-backed IPOs. First, VCs implement management structures helping the firm perform better. VCs are also thought to use their industry expertise to improve the firm's operations also serving on the firm provide valuable information about raising capital, something VCs must do often. Second, VCs might affect who holds the firm's shares after an IPO. More large investors will hold shares of VC-backed IPOs because VCs have contacts with large investment banks. These relationships also lead to future relationships after the IPO. Third, VCs obtain positions on the board of directors of the start-up firms and retain the positions long after the IPO. Having VCs on the board provides board members with experience in raising capital. These three benefits all could help increase future ability to raise capital over time.

We measure the idea VCs can improve access to capital empirically be looking at the firm level of financial constraint three years after the IPO date. Financial constraint measures the ability of a publicly traded firm to finance their positive NPV projects. If venture backing provides better access to capital than IPO firms with venture backing should be less financially constrained than non-VC backed IPO firms. Our results show VC backing improves the IPO firms' future access to capital as they are less financially constrained. VC-backed IPO firms are found to have lower KZ scores, lower debt ratios,

and have a much greater probability of being financial unconstrained three years after the IPO. These results are consistent with our hypothesis that VC-backed firms have better access to capital after their IPO.

The paper proceeds as follows. Section 2 presents the related literature and implications to the firm with venture backing. Section 3 describes the data used. Section 4 reviews and analyzes the variables used. Section 5 discusses the results. Section 6 concludes the paper.

2. Related Literature and Implications

Firm's access to capital is of extreme importance. The lack of ability to raise funds or reasonably priced funds negatively effects firm value. The recent literature on financial constraints points out financially constrained firms finds it difficult or extremely expensive to raise capital for valuable growth opportunities. Fazzari, et al. (1988), Kaplan and Zingales (1997), Cleary (1999) along with others examine the financing needs of firms. The financial constraints literature has implied information costs and the internal resources of a firm influence the cost of external funds. The challenge is to identify "constrained" and "unconstrained" firms at a particular point in time. Lamont, et al (2001) use the results from Kaplan and Zingales (1997) logit regressions to build a measure that evaluates the firm financial constraint called the KZ index.

Each firm has a KZ index score based on factors, which make it harder or more expensive to raise capital. Higher KZ index scores mean a higher financial constraint. Debt ratio is also shown as a measure of firm level financial constraint in Whited (1992) and Whited and Wu (2006). Higher debt ratios especially as compared to other firms in the industry leads to firms that are more constrained. If VCs improve the ability of firms

to access to capital than VC-backed IPOs should have lower KZ index scores and lower debt-to-asset ratios.

3. Data

The data collection process for this paper includes the following stages: First, all IPOs for the time period 1990–2000 were identified through Securities Data Exchange (SDC). Information taken from SDC include IPO characteristics such as offer date, offer price, closing price, underwriter ranking, net proceeds, net revenues, and a dummy variable illustrating venture backing. The dummy variable representing venture funding has been corrected in a few areas where venture funding existed but was not marked as a venture-backed firm. IPOs with a venture flag but no venture capital firm were detected and eliminated from the sample. This yields a sample of 1,466 IPOs over the eleven year period analyzed. Problems with the SDC venture backing flag have been identified in Ljungqvist and Wilhelm (2003). Information on the founding date of the firms included in the IPO sample was obtained from Jay Ritter's website. This variable is from the Field-Ritter dataset of company founding dates, as used in Field and Karpoff (2002) and Loughran and Ritter (2004). The founding date is used to obtain the age of the firm at the time of its IPO. Firm age is calculated as the IPO date minus the founding date. After finding the stock returns, the next stage is finding the variables from the Compustat database for the first three years of firm's operations for the variables needed to calculate both the KZ Index and debt to income ratios.

4. Variables Used in Regressions

This section will define the variables used in our analysis. A brief definition of the variables is provided in Table 1. Following is a detailed description of the variables along with the motivation for the choice of each variable.

4.1 Access to Capital

It is hypothesized VCs will increase firms' access to capital markets. The first variable utilized to estimate the firms' ability to raise capital is the KZ Index. The KZ Index measures the financial constraint of firms. Higher KZ scores imply higher levels of financially constraint and visa versa.[3] The KZ index has been winzorized at the top and bottom 1% level to eliminate the bias caused by extreme KZ scores, which lowers the total sample to 1,438 total IPOs. The second variable to measure access to capital is a financial constraint dummy variable. This variable classifies a firm as financially constrained based on having KZ scores in the highest one-third of the sample. Using a dummy variable eliminates the need to winzorize the data and increases the sample back to 1,466 as the KZ scores simply take a value of either zero (not financially constrained) or one (financially constrained). Debt ratio is also shown as a measure of firm level financial constraint in Whited (1992). Debt ratio is measured as the total amount of debt divided by total assets.

4.2 Individual IPO characteristics

This section discusses the variables used to identify the characteristics of the different firms at the time of their IPO. VC (the primary variable of interest) will be a dummy variable measuring whether or not the IPO firm had venture funding at the time

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[3] The KZ Index measures constraints based on Kaplan and Zingales (1997) and classify firms according to this measure (known as the KZ Index). Specifically, following Lamont et al. (2001), construct an index of the likelihood that a firm faces financial constraints by applying the following columnarization to the data: KZ Index = *-1.002*CashFlow + 0.283*Q + 3.130*Leverage – 39.368*Dividends – 1.315*CashHoldings*

of the IPO. The next variable used is offer price. Fernando, Krishnamurthy, and Spindt (2002) find a positive relation between offer prices and long-run returns. Log age is the natural log of the age of the firm at the time of the IPO, controlling for the stability and risk of the firm. Log assets are the natural log of the firm's assets at the time of the IPO, controlling for the size of the IPO.

Prestigious underwriter variable is a dummy variable measuring whether or not the firm used a prestigious underwriter for the IPO. Chemmanur and Fulghieri (1994) argue investors use the investment banks' past performance, as measured by the quality of firms in which they previously sold equity, to access their creditability. Underwriters who sell equity in firms with better long-run performance will build their reputation. Carter, Dark, and Singh (1998) examine the theory and find the long-run performance of IPOs is positively affected by the reputation of the underwriter. Houge, et al. (2001) argues flipping affects long-run performance. To control for flipping underpricing will be used as a control variable. Underpricing is measured as the change in price on the first-day of trading (offer date) for the IPO. This variable will identify if underpricing affects long-run performance. The IPO characteristics will be used to control for the differences in the firms at the time of the IPO.

5. Results

5.1 Descriptive Statistics

This section describes the difference in means between venture and non-venture backed IPOs. Table 2 displays the mean and number of observation for the entire sample as well as the sub sample of both venture backed and non-venture backed IPOs. Also shown are the differences between the two groups of IPOs and the significance of those

differences. Panel A examines the means and differences in means between the venture backed and non-venture back samples at the time of the IPO. For the sample of 1,466 IPO firms 46.5% of the IPO firms have venture capital funding. The average characteristics for the entire sample of IPO firms are 109 million in total assets, underpricing of 23.7%, firm age of about 14 years, offer price of $12.21, and underwriter grade of 7.38. As mentioned, panel A also looks at the difference between the two types of IPOs. The difference between the two groups show total assets and firm age are significantly greater for non-venture backed IPOs, while underpricing, offer price, and underwriter grade is significantly greater for venture backed IPOs. The amount of proceeds is insignificantly larger for the venture sample. The significant differences between the IPO characteristics illustrate the major differences between the two types of IPOs.

Panel B of table 2 shows the means for the entire sample and the breakdown of venture backed and non-venture backed IPOs for different measures three years after the IPO. Total assets and sales are significantly larger for the non-venture backed sample, showing the average size is larger for non-VC-backed IPOs. The next three variables examine the operating performance for both IPO groups. The non-venture backed group has operating performance ratios of 2.5%, 2.7%, and 124% for ROA, cash flow per assets, and sales per assets respectively. The venture backed group has performance ratios of -13.6%, -7.8%, and 89.3% for ROA, cash flow per assets, and sales per assets respectively. The difference between all three operating measures of financial performance point out that the sample of non-venture backed IPOs greatly outperforms the venture backed sample. The evidence is intriguing as the result is opposite of Jain and

Kini (1995), and provides evidence against the idea that operating characteristics are better for VC-backed firms during this time period.

The next three variables measure access to capital. First, the KZ index is shown and the sample is slightly lower with a total sample of 1,438 IPOs as it has been winzorized at the top and bottom 1% level. The comparison of the KZ index shows venture backed IPOs have significantly lower KZ scores than non-venture backed IPOs. This leads to a lower financial constraint for VC-backed IPO firms and thus better access to capital. The second variable to measure access to capital is the financial constraint dummy, which classifies a firm as financially constrained based on having KZ scores in the highest third (higher KZ scores equal more constrained firms). Using a dummy variable eliminates the need to winzorize the data and increases the sample back to 1,466. Venture backed IPOs have a 17.2% less probability of being considered financially constrained using this dummy variable for financial constraint as compared to non-venture backed firms. The third measure examined is the firm's debt-to-asset ratio. Venture backed IPOs have a significantly lower debt ratio. All three measures indicate that venture backed IPOs have significantly less financially constrained than non-venture backed IPOs. The result is consistent with the fact VCs increase the firm's ability to access capital markets.

5.2 Regression Results

This section will explain the various regression results of the paper to examine access to capital. The first dependent variable used to measure firms' access to capital is the KZ-index, which measures the constraint a firm. Table 7 illustrates VC's influence on the access to capital for IPO firms. The smaller sample size of this first regression is due

to the fact the KZ-index variable was winzorized at the 98% level, eliminating the lowest and highest 1% because of extreme values on these sides. The results for the KZ index are shown in column (1) of table 3. The coefficient for the VC dummy variable is negative and significant showing the presence of a VCs reduces the constraint of a firm and thus providing a better future access to capital for VC-backed IPOs. The coefficient for the prestigious underwriter dummy variable is also negatively significant to the KZ-index. Having a prestigious underwriter reduces the financial constraint level in firms. Log proceeds are also significant, but have a positive coefficient as firms that raise more proceeds at the time of the IPO are more financially constrained as measured by the KZ index. Firm age, offer price, and underpricing are insignificant to the KZ-index. The adjusted R-squared for the regression is 10.4%.

To avoid the loss of observations with extreme upper and lower values of the KZ index, a dummy variable was created for financial constraint. The dependent variable in column (2) is a dummy variable measuring financial constraint firms (based on the KZ index). Since a dummy variable is used as the dependent variable a probit model is used for column (2). The coefficient for the VC dummy variable is negative and significant showing venture funding at the time of the IPO reduces the probability a firm will be financially constrained. The result agrees with the results from column (1) using the raw KZ index. One major difference from the results from column (1) is the prestigious underwriters regression coefficient. Now the coefficient for prestigious underwriters is insignificant. Column (3) takes the other side of the picture and constructs a dummy variable for the firms that are the least financially constrained. A Probit model is used for this regression. The coefficient for the VC dummy variable has a positive and significant

coefficient, showing that venture funding increases the likelihood that the firm will be financially unconstrained or the firm will have less fictions in accessing the capital markets. The major difference in the regression is now the coefficient for prestigious underwriters is positive and significant. This confirms the results from column (1) using the KZ index and shows that although prestigious underwriters do not decrease the likelihood of an IPO being financially constrained, they do increase the likelihood of the firm being financially unconstrained.

Column (4) uses a different variable to measure IPO firms' access to capital, the ratio of debt to assets. As with the other measures for access to capital, the VC dummy variable has a negative and significant coefficient. The variable shows VC-backed IPOs have significantly lower debt to asset ratios as compared to non-VC-backed IPOs after controlling for risk and industry which is consistent with the results from the KZ measure. Offer price, prestigious underwriters, and underpricing reduce the debt to asset ratio of IPO firms. The other variables used in the regression are insignificant.

6. Conclusion

It seems to be widely accepted VCs improve the long-run performance of IPOs they take an equity stake in, but the empirical results have been lacking. This paper examines the role of VCs in the long-run performance of IPOs, and provides empirical evidence to the role of VCs. VCs improve IPO firms' access to capital. The paper shows this result using a couple of different measures for financial constraint, including KZ-Index and Debt/Ratio. Interestingly enough, VCs ended up providing the exact thing firms are looking for when they first seek out VC-funding, better access to capital.

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Table 1

Variables Used in Regressions

Variables	Definitions
ACCESS TO AND COST OF CAPITAL	
1. KZ Index	Index measures the financial constraint of firms. Based on the work of Kaplan and Zanglas (1997) and Lamont, Polk and Saa-Requejo (2001).
2. Financial Constraint	A dummy variable representing the lowest third or the most constraint firms in the sample based upon the KZ Index.
3. Debt-to-Asset Ratio	The ratio of a firms debt to assets.
IPO CHARACTERISTICS	
1. VC	A dummy variable signifying venture funding. A value of 1 represents venture funding.
2. Offer Price	The offer price of the IPO.
3. Log Age	The natural log of the firm's age at the time of the IPO. Firm age is measured as IPO date – founding date.
4. Log Assets	The natural log of total assets for the IPO firm.
5. Prestigious UW	Dummy variable given if the lead underwriter firm for the IPO has a rank of 8 or above.
6. Underpricing	The initial (first-day) return for the IPO. Underpricing is calculated as the percentage change in price from the offer price to the closing price of the stock on the first day of trading.

Table 2

Descriptive Statistics for the Sample of 1,466 IPOs (1990-2000)

The table looks at the descriptive statistics for the whole sample, IPOs with no venture backing, and IPOs with venture backing.   Table 1 defines all of the variables shown in the descriptive statistics. Difference is defined as the sample of non-venture backed IPOs subtracted by venture backed IPOs. Tests were run on the difference between the two samples to test if they were different from each other. P-values from these tests are shown in the last column.

Panel A: Time of the IPO

Variable	Full Sample	No Venture	Venture	Difference	P-value
Number of IPOs	1466	769	697	72	
Total Assets	109.01	116.33	100.93	15.40	0.02
Underpricing	0.237	0.160	0.321	-0.161	0.00
Proceeds	42.27	40.90	43.78	-2.88	0.20
Age	14.20	17.43	10.64	6.79	0.00
Offer Price	12.21	11.75	12.71	-0.952	0.00
Underwriter Grade	7.38	6.86	7.95	-1.09	0.00

Panel B: Three Years After the IPO

Variable	Full Sample	No Venture	Venture	Difference	P-value
Total Assets	160.82	178.55	141.25	37.31	0.00
Sales	150.80	179.48	119.16	60.32	0.00
ROA	-0.078	-0.025	-0.136	0.111	0.00
Cash Flow / Assets	-0.023	0.027	-0.078	0.105	0.00
Sales / Assets	1.08	1.24	0.893	0.352	0.00
KZ Index	-5.49	-3.47	-7.71	4.24	0.00
Financial Constraint	0.323	0.404	0.232	0.172	0.00
Debt / Asset	0.173	0.225	0.114	0.111	0.00

Table 3

Determinants of Access to Capital

The table examines the access to capital for the sample of 1,466 IPOs. Table 1 defines all of the variables used in the regressions. This table examines different variables measuring firm level of access to capital to determine how venture funding impacts future firm access to capital. The time horizon used is three years measuring the level of firm financial constraint or access to capital three years after the IPO. The P-values are shown in parentheses. Columns (2) and (3) are probit regressions since the dependent variable is a dummy variable.

Dependant Variable	KZ Index	Financially Constrained	Financially Unconstrained	Debt Ratio
	(1)	(2)	(3)	(4)
VC Dummy	-1.665	-0.173	0.516	-0.035
	(0.02)	(0.04)	(0.00)	(0.00)
Log Age	0.475	-0.016	-0.130	-0.008
	(0.19)	(0.70)	(0.01)	(0.18)
Offer Price	-0.129	-0.030	0.029	-0.009
	(0.30)	(0.06)	(0.04)	(0.00)
Prestigious UW	-1.590	-0.021	0.199	-0.053
	(0.05)	(0.83)	(0.03)	(0.00)
Log Proceeds	1.424	0.089	-0.221	-0.010
	(0.05)	(0.31)	(0.01)	(0.46)
Underpricing	-1.143	-0.231	0.134	-0.026
	(0.18)	(0.10)	(0.15)	(0.05)
Industry Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Constant	-2.697	-0.256	-0.376	0.117
	(0.36)	(0.72)	(0.20)	(0.01)
Adj. R-squared	0.104	0.148	0.152	0.282
Observations	1438	1466	1466	1466