

## Venture Capitalist's Stake and Valuation of Privately-held Firms in India

Rishabh Goswami\*, Arun Kumar Gopaldaswamy\*\*, Ravi Teja\*\*\*

**Abstract** This study examines the implications on the valuations of privately held firms when stakes are acquired by venture capitalists in India. In addition, the effect of fund size and revenue multiple is considered as a determinant of firm value. The study is based on a sample of 1229 rounds of funding during the period 2007-2015. The data was obtained from Venture Intelligence. Three major observations emerged based on an OLS regression. Firstly, it is observed that the stake acquired by venture capitalists has a negative effect on firm value. It supports the belief that when a firm reaches its maximum valuation from the promoter's perspective, there is a tendency to liquidate additional stakes. Secondly, a positive association between the revenue multiple and valuation is recognized. Thirdly, the convex relationship (U-shaped) between the fund size and firm valuations as seen in the case of developed economies, appears to be non-existent in India.

**Keywords** Venture capital, Venture Capitalist's equity stake, Firm valuation, Privately-held firms, India

### I. Introduction

Start-ups play a vital role in enhancing market dynamics by introducing innovative products and services. The essence of developing an ecosystem where the start-ups can function smoothly is well recognized by policymakers from India and are evident from the DPIIT initiatives<sup>1</sup>. With over 77,000 DPIIT-recognized start-ups, India has emerged as the third-largest start-up ecosystem

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\* Ph.D. candidate, Department of Management Studies, Indian Institute of Technology Madras, Chennai, Tamil Nadu, India; [mail.rishabgoswami@gmail.com](mailto:mail.rishabgoswami@gmail.com)

\*\* Professor, Department of Management Studies, Indian Institute of Technology Madras, Chennai, Tamil Nadu, India; [garun@iitm.ac.in](mailto:garun@iitm.ac.in)

\*\*\* Lead Data Scientist, PayPal, Chennai, Tamil Nadu, India; [dearravitej@gmail.com](mailto:dearravitej@gmail.com)

1 Department for Promotion of Industry and Internal Trade (DPIIT)

globally<sup>2</sup>. However, the entrepreneurial journey for start-ups is not free from uncertainties and challenges, and sustained long-term funding is a significant constraint. Early-stage start-ups cannot rely entirely on self-financing and face difficulties resorting to equity or debt due to a lack of market confidence and collateral. These funding obstacles have given rise to a third frontier to raise funds - the Venture Capital (VC) industry. The prominence of venture capital as a source of fundraising is well documented in the literature (Mason and Harrison, 1995; Sohl, 2003).

Since start-ups involve high risk and uncertainty regarding future profitability and growth, venture capitalists are compensated with equity stakes in the firm in anticipation of higher future returns (Cochrane, 2005). The venture capitalists plan to exit the firm when its earnings stabilize post the high growth period and when the firm goes for an Initial Public Offering (IPO). Kaplan and Lerner's study (2010) illustrate the importance of the VC as a source of fundraising for new firms and report that 60% of the IPOs during 1999-2009 had VC backing. However, VCs usually do not finance the entire funds required by the firm in a single round and prefer to distribute it over a series of rounds. The venture capitalists mark their presence on the board, scrutinize the performance and growth of the firm, and decide on the disbursement of further funding rounds.

The equilibrium between the VC's funding and stake dilution by entrepreneurs is based upon the negotiation concerning firm valuation (Hsu, 2004; Hochberg et al., 2010; Gompers and Lerner, 2000; Cumming and Dai, 2011). The fraction of equity to be diluted before each round of VC financing is crucial as it impacts the control structure of the firm. It is, therefore, essential to understanding the determinants of firm valuation for privately-held firms. However, challenges such as the valuation of a firm with negative earnings, the absence of comparable firms, and the lack of reliable data have yielded few studies. Further, prior literature primarily focuses on developed countries. It investigates the association of firm value with fund size and funding rounds, and the valuation determinants in the context of emerging economies are yet to be precise. This study attempts to examine the determinants of the valuation of a privately-held firm in India by considering the stake acquired by VC in each round of funding and other firm-specific factors.

The study follows Gompers and Lerner (2000) by implementing a hedonic regression approach<sup>3</sup>. Primarily an OLS regression approach of pre-money valuation of firms against the fund size, a revenue multiple, stake acquired,

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2 <https://www.investindia.gov.in/indian-unicorn-landscape#:~:text=Startup%20Ecosystem%20%20in%20%20India,of%2029th%20August%202022>

3 Hedonic regression approach owing to the different time gaps between financing rounds for the companies

location, stage, and industry is performed. The study shows that there does not exist a convex relationship (U – Shape) between the fund size and firm valuations as in the case of developed economies (Cumming and Dai, 2011). Further, it establishes a negative correlation between the stake acquired by the venture capitalist and the firm valuation.

The remainder of the paper is organized as follows. Section II discusses the literature highlighting the importance of venture capital and the factors affecting the valuation of privately held firms. Section III focuses on the hypothesis development, followed by a discussion of the data and methodology in Section IV. The following section contains the results subdivided into summary statistics and empirical findings. Finally, in section VI, the conclusions from the study are mentioned, followed by the references.

## **II. Literature Review**

This section is divided into two parts. The first part discusses the importance of venture capital as a source of finance and describes the relationship between firm valuation and fund size of a private financing round. The second part discusses the significance of the stake exchanged between the entrepreneur and the venture capitalist.

### **1. Importance of venture capital as a source of finance for early-stage firms**

Mason and Harrison's study (1995) was one of the earliest to document the importance of venture capital as a source of funding for newly established and fast-growing enterprises. The study states that the availability of long-term capital (debt and equity) for investment is one of the primary constraints behind forming small and medium-sized firms. During the early stages, firms usually do not possess adequate collateral capital for securing bank loans. In addition, these firms do not have access to the public stock market owing to higher fixed costs and inadequate profits (Buckland and Davis, 1989). Therefore, firms in their early stages are exposed to the risk of undercapitalization, and eventually they are more likely to fail. Thus, venture capitalists assist these firms in narrowing their capital requirements by providing long-term capital.

Venture capital investments are often associated with high risk and expected return. In this regard, the Cochrane (2005) study investigates whether venture capital investments behave the same way as publicly traded securities regarding risk and return. The study concluded that venture capital investments are similar to the smallest NASDAQ stocks in terms of volatilities and expected returns.

Further, it highlighted that venture capitalists invest in newly started firms associated with high risk owing to the high expected returns.

Kaplan and Lerner's study (2010) captures the growing importance of venture capital for newly established firms in a developed economy. It reports that, in the United States, between 1999 and 2009, 60% of IPOs were backed by venture capitalists, thus emphasizing the growing dependency of the newly started firms on VC for their capital needs. The study also empirically established that the VC industry has invested around 0.15% of the overall value of the US stock market in a span of 30 years.

The study by Damodaran (2000) stresses the need for the valuation of privately held firms. It concluded that the traditional valuation models are not appropriate for newly established firms owing to the unavailability of comparable companies, the importance of short-term growth over long-term growth, and negative bottom-line earnings. By focusing on the valuation of newly established firms from the perspective of venture capitalists, the study by Gompers and Lerner (2000) demonstrated a relationship between firm valuation and the size of the private financing round, the revenue of the firm, and controlling for other firms' characteristics. Their study concluded that the inflow of capital to venture funds increases the valuation of the companies. The research by Cumming and Dai (2011) built on Gompers and Lerner's study (2000) and established a relationship between the private financing fund size and the firm valuation. The study found a convex relationship (U-shaped) between the fund size and firm valuation and a concave relationship (inverse U-shaped) between fund size and venture capitalists' performance.

## **2. The importance of stake exchanged in a venture capital deal**

Hsu (2004) focused on the factors affecting entrepreneurs regarding their choice of venture capitalist. The study found that entrepreneurs often are ready to discount their firm valuation for being affiliated with a reputed VC. Thus, their results confirm the tendency of entrepreneurs to affiliate with reputed VCs for better visibility of their firms.

The research by Hochberg et al. (2010) highlighted the bargaining power of venture capitalists over entrepreneurs in a market where the entry barriers are high for a new entrant. Their study concluded that the percentage stake acquired by the venture capitalist acts as a critical determinant during the negotiation between the venture capitalist and the entrepreneur. However, the relationship between the percentage stake acquired, and the firm's value remains largely unexplored.

Most of the studies on venture capital pertain to developed economies, and studies in the context of developing economies are scarce. The underlying

reasons could be that the venture capital industry in these economies is relatively new and faces the issue of data scarcity or data authenticity. Thus, a need arises to examine the factors affecting the valuation of privately held firms from the developing economy perspective and establish the effect of the percentage stake acquired by the venture capitalist on the firm value.

### **III. Hypothesis Formulation**

The value of a firm is directly proportional to its potential profitability and inversely related to the cost of capital, as investors seek to maximize returns while minimizing risk. It is well established in finance theory that the value of a firm is derived as a discounted value of its future expected cash flows. However, in the case of newly established firms that venture capitalists fund, the traditional valuation techniques do not represent accurate estimates because of initial negative earnings, lack of comparable firms, and uncertainty of future earnings, amongst other reasons.

Based on the studies by Gompers and Lerner (2000) and Cumming and Dai (2011), as discussed in Section II, it is known that there exists a convex relationship between fund size and the valuation of the firm. However, these studies were undertaken based on data from the United States (US), and their findings cannot be extended to a developing country like India. Therefore, this study aims to investigate the same in the Indian context by formulating the following hypothesis.

*H1. There is a convex relationship between fund size and firm valuation.*

Further, the relationship between the percentage stakes acquired by a venture capitalist and firm valuation remains underexplored in an Indian setting. Therefore, the second hypothesis is framed as indicated below.

*H2. The percentage stake acquired by the venture capitalist does not affect the firm's valuation.*

### **IV. Data and Methodology**

The primary information about the venture funding, including the number of rounds, fund size, stage, industry, and location, is collected from Venture Intelligence Database. It provides data on the PE-VC deals in India from 1998. However, the information on revenues and the revenue multiples are available

from the year 2006. Hence the initial dataset starts from 2007 (as revenue multiples from the previous year are used for pre-money valuation) and comprises 4486 rounds of funding of several firms spanning across industries.

From the data sample of 4486 rounds of funding, the rounds of funding meeting the following criteria are filtered for the final analysis-

- a) Rounds of funding with valuation data
- b) Rounds of funding with a percentage of stake acquired by the venture capitalist
- c) Rounds of funding with revenue multiples

Of the 2071 rounds of funding meeting the above criteria, finally, the list of companies with more than 1 round of funding are shortlisted to capture the value of more stable companies. Therefore, the final data sample comprises 1229 rounds of investments containing the details of pre-money valuation, the percentage stake acquired, and the revenue multiple data.

The pre-money valuation<sup>4</sup> of the firm captures the effect of each funding round on the company's existing value before the round of funding.

Pre Money Valuation (PMV) = Post Money Valuation<sup>5</sup> – Fund size

Previous studies (Armstrong et al., 2006, Hand 2005) have shown that the valuation of a company is significantly affected by company characteristics. Therefore, company-wise standard z scores are calculated for the dependent and independent variables to mitigate the company-specific effect and provide normalized data for the analysis.

$$Z = ((x - \mu) / \sigma)$$

Where,

$\mu$  is the mean of the population of each company's variables (Pre-money valuation, stake, revenue multiple, fund size)

$\sigma$  is the standard deviation of the population of each company's variables (Pre-money valuation, stake, revenue multiple, fund size)

After the normalization of the data, an OLS regression with the pre-money valuation as the dependent variable against percentage stake, fund size, and revenue multiple is carried out in addition to the control variables representing the stage, industry, and region in a step-wise manner.

The following equation represents the final regression:

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4 Pre money valuation of a firm is defined as the product of price paid per share in the financing round and the shares outstanding prior to the financing round

5 Post money valuation of a firm is the value of the firm, after each round of funding

$$PMV = \alpha_0 + \beta_1 \times S + \beta_2 \times FS + \beta_3 \times RM + \sum_{i=1}^6 \lambda_i \times d_i + \sum_{i=1}^4 e_i \times f_i + \sum_{i=1}^8 g_i \times h_i + \varepsilon_t$$

Where,

*PMV* represents the pre-money valuation of a firm measured as the product of the price paid per share in the financing round and the shares outstanding prior to the financing round

*S* represents the percentage stake acquired by the Venture Capitalist in the particular financing round

*FS* represents the amount invested in each round of professional financing

*RM* represents the revenue multiple<sup>6</sup>, measured based on the previous year's revenues

*d* represents the dummy variable representing the stage of the firm (1 represents Early, 2 represents Growth, 3 represents Late, 4 represents Pre- IPO, 5 represents Pipe, and 6 represents Buyout).

*f* represents the dummy variable representing the region where the firm is located (1 represents East, 2 represents West, 3 represents North, and 4 represents South).

*h* represents the dummy variable representing the industry to which the firm belongs (1 indicates Banking & Financial Services, 2 illustrates Engineering & Construction, 3 represents Healthcare and Life Sciences, 4 denotes IT & ITES, 5 indicates Manufacturing, 6 represents Non-Financial Services, 7 specifies Telecom & Media, 8 refers to Transportation & Logistics).

The variables  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  and the vector of variables  $\lambda$ ,  $e$ , and  $g$  are unknown parameters to be estimated using the OLS regression with the addition of dummy variables one by one (Step-wise regression).  $\varepsilon$  represents the error term which is expected to follow an i.i.d distribution with zero means.

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6 The rationale behind using revenue multiples is to capture the growth of the firm's revenues in situations where the bottom line reports no profits.

## V. Results

### 1. Descriptive Statistics

Table 1 lists the number of financing rounds by year and the number of rounds for which valuation information is available. Additionally, among the rounds with valuation data, the information available on sales, revenue multiples, and percentage of stake acquired are also portrayed in the table.

**Table 1 Number of year-wise professional financing rounds**

Year	No. of financing rounds	Rounds with valuation data	% with Valuation	Of the rounds with valuation data					
				Rounds with sales data	Rounds with sales data (%)	Rounds with revenue multiple data	Rounds with revenue multiple (%)	Rounds with stake acquired data	Rounds with stake acquired (%)
2007	536	407	75.93%	52	12.78%	272	66.83%	379	93.12%
2008	500	383	76.60%	97	25.33%	258	67.36%	349	91.12%
2009	313	225	71.88%	77	34.22%	155	68.89%	211	93.78%
2010	427	350	81.97%	159	45.43%	218	62.29%	324	92.57%
2011	564	440	78.01%	199	45.23%	325	73.86%	411	93.41%
2012	554	407	73.47%	184	45.21%	290	71.25%	382	93.86%
2013	495	383	77.37%	167	43.60%	263	68.67%	373	97.39%
2014	569	355	62.39%	128	36.06%	227	63.94%	337	94.93%
2015	528	236	44.70%	66	27.97%	120	50.85%	226	95.76%
<b>Total</b>	<b>4486</b>	<b>3186</b>	<b>71.02%</b>	<b>1129</b>	<b>35.44%</b>	<b>2128</b>	<b>66.79%</b>	<b>2992</b>	<b>93.91%</b>

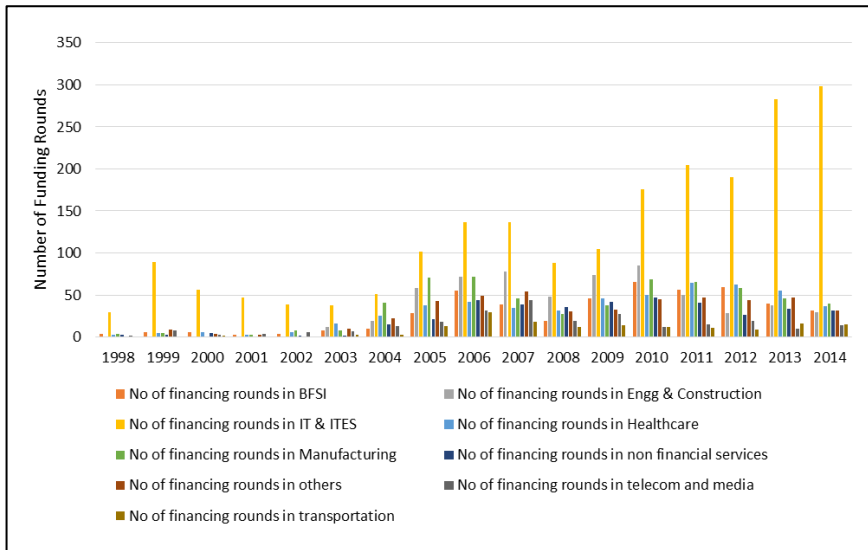
Source: Author's compilation

It can be observed from Table 1 that the highest information on valuation data is available for the year 2010, and the lowest is from the year 2015. In addition, the table portrays that the data on the percentage of stake acquired, which is of primary interest in this study, have consistently reported the highest rate of information.

Figure 1 shows the total number of financing rounds across various industry types. Information technology and related industries consistently have more financing rounds than other sectors. There are several reasons behind it, and the higher proportion of long-term projects is one of them. Long-term projects have the potential to generate more revenue than medium or short-term projects is



one of the reasons they are done more frequently. Additionally, its life cycle tends to lengthen when a project goes through several iterations based on the client's needs. As a result, the need arises for further rounds of fundraising.



**Figure 1** Number of financing rounds across industries

Source: Author’s compilation

Table 2 shows the number of financing rounds in terms of various characteristics, such as the stage of the firm, industry, location, and type of investor. It indicates that the highest number of observations are for firms in their early stage, from the IT and allied industry, located mainly towards the Southern region and funded by Indian investors.

**Table 2** Number of observations based on characteristics of the firm

Panel A: Stage-wise					
Stage	Total rounds	Rounds with valuation data	% of total rounds	Rounds without valuation data	% of total rounds
Early	1438	817	25.64%	621	47.77%
Growth	969	666	20.90%	303	23.31%
Late	1058	855	26.84%	203	15.62%
Pre IPO	67	61	1.91%	6	0.46%
Pipe stage	673	599	18.80%	74	5.69%
Buyout	176	127	3.99%	49	3.77%

Other	105	61	1.91%	44	3.38%
<b>Total</b>	<b>4486</b>	<b>3186</b>	<b>100%</b>	<b>1300</b>	<b>100%</b>

**Panel B: Industry-wise**

Industry	Total rounds	Rounds with valuation data	% of total rounds	Rounds without valuation data	% of total rounds
Banking & Financial Services	426	367	11.52%	59	4.54%
Engineering & Construction	508	375	11.77%	133	10.23%
Healthcare & Life Sciences	423	325	10.20%	98	7.54%
IT & ITES	1619	944	29.63%	675	51.92%
Manufacturing	461	374	11.74%	87	6.69%
Non-financial services	340	258	8.10%	82	6.31%
Telecom & Media	192	142	4.46%	50	3.85%
Transportation and logistics	136	111	3.48%	25	1.92%
Others	381	290	9.10%	91	7.00%
<b>Total</b>	<b>4486</b>	<b>3186</b>	<b>100%</b>	<b>1300</b>	<b>100%</b>

**Panel C: Location wise**

Location	Total rounds	Rounds with valuation data	% of total rounds	Rounds without valuation data	% of total rounds
East	110	97	3.04%	13	1.00%
West	1479	1122	35.22%	357	27.46%
North	952	667	20.94%	285	21.92%
South	1621	1161	36.44%	460	35.38%
Others	324	139	4.36%	185	14.23%
<b>Total</b>	<b>4486</b>	<b>3186</b>	<b>100%</b>	<b>1300</b>	<b>100%</b>

**Panel D: Type of investor**

Location	Total rounds	Rounds with valuation data	% of total rounds	Rounds without valuation data	% of total rounds
Foreign	1426	1023	32.11%	403	31.00%
Indian	3060	2163	67.89%	897	69.00%
<b>Total</b>	<b>4486</b>	<b>3186</b>	<b>100%</b>	<b>1300</b>	<b>100%</b>

Source: Author's compilation

Table 3 summarizes the descriptive statistics of variables, including the dummy variables of all the 1229 rounds of funding.

**Table 3 Descriptive Statistics of the variables included in the regression analysis**

	Mean	Std. Deviation	N
Pre Money Valuation	.000000	1.0004071	1229
Stake	.000000	1.0004071	1229
Fund Size	.000000	1.0004071	1229
Revenue Multiple	.000000	1.0004071	1229
<i>Stage</i>			
Buyout	.0334	.17965	1229
Early	.1603	.36703	1229
Growth	.2164	.41198	1229
Late	.2571	.43722	1229
Pre - IPO	.0203	.14122	1229
PIPE	.3084	.46201	1229
<i>Industry</i>			
Banking & Financial Services	.1782	.38283	1229
Engineering & Construction	.0968	.29584	1229
Healthcare & Life Sciences	.1204	.32559	1229
IT & ITES	.2872	.45265	1229
Manufacturing	.1164	.32078	1229
Non - Financial Services	.0700	.25521	1229
Telecom & Media	.0334	.17965	1229
Transportation & Logistics	.0260	.15931	1229
<i>Region</i>			
East	.0195	.13843	1229
West	.3515	.47763	1229
North	.1928	.39469	1229
South	.3865	.48714	1229

Source: Author's computation

Note: The descriptive statistics representing the variables pre-money valuation, stake, fund size, and the revenue multiple are calculated post-normalization using the z-score.

## 2. Empirical Findings

Table 4 summarizes the OLS regression results with the step-wise addition of each dummy variable. The first model (Model 1) comprises stake, revenue multiple, and fund size as independent variables. In addition, the subsequent models (Models 2, 3, and 4) incorporate the control variables - the stage of the firm, the industry to which the firm belongs, and the region in which the firm operates, respectively.

**Table 4 Regression Results**

	Dependent Variable: Pre-Money Valuation			
	(1)	(2)	(3)	(4)
Intercept	0.000 [0.000]	-0.606 [-1.713]	-0.610 [-1.650]	-0.594 [-1.544]
<i>Variables of key interest</i>				
Stake	-0.598 [-23.038]***	-0.589 [-22.419]***	-0.588 [-22.277]***	-0.588 [-22.241]***
Fund Size	0.562 [20.770]***	0.549 [19.995]***	0.548 [19.862]***	0.548 [19.831]***
Revenue Multiple	0.118 [4.953]***	0.122 [5.109]***	0.122 [5.116]***	0.122 [5.109]***
<i>Stage dummies</i>				
Buyout		0.627 [1.672]*	0.618 [1.625]	0.621 [1.624]
Early		0.474 [1.322]	0.449 [1.220]	0.450 [1.227]
Growth		0.635 [1.779]*	0.622 [1.715]*	0.622 [1.709]*
Late		0.644 [1.808]*	0.642 [1.777]*	0.644 [1.776]*
PIPE		0.636 [1.788]*	0.647 [1.788]*	0.650 [1.791]*
Pre - IPO		0.464 [1.197]	0.471 [1.199]	0.471 [1.194]
<i>Industry dummies</i>				
Banking & Financial Services			-0.017 [-0.170]	-0.017 [-0.162]
Engineering & Construction			-0.005 [-0.047]	-0.006 [-0.051]
Healthcare & Life Sciences			-0.003 [-0.032]	-0.005 [-0.042]
IT & ITES			0.044 [0.458]	0.044 [0.456]

Manufacturing			-0.019 [-0.173]	-0.018 [-0.157]
Non – Financial Services			0.0148 [0.123]	0.018 [0.148]
Telecom & Media			0.006 [0.043]	0.008 [0.054]
Transportation & Logistics			0.0318 [0.192]	0.032 [0.195]
<i>Region dummies</i>				
East				-0.044 [-0.225]
West				-0.023 [-0.208]
North				-0.016 [-0.142]
South				-0.015 [-0.132]
Adjusted R square	37.4	37.6	37.2	37.0
F- statistic	245.248	83.258	43.878	35.409
p-value	0.000	0.000	0.000	0.000
Number of observations	1229	1229	1229	1229

Source: Author's computation

Note:

- (a) Model (1) comprises the regression consisting of 1229 rounds of investment and the relationship between the firm's pre-money valuation with stake, fund size, and revenue multiple. Models (2) – (4) are built upon Model (1) with the addition of dummy variables representing the stage of the firm, the industry to which the firm belongs, and the region successively
- (b) \*\*\* and \* represent significance at 1% level and 10% level, respectively

In contrast to the evidence presented by Cummings and Dai (2011), the findings from this study (reported in Table 4) highlight no convex relationship between fund size and firm valuation in India. Thus, the first hypothesis is rejected.

Further, the inclusion of control variables – Stage dummies, Industry dummies, and Region dummies - does not significantly alter the primary findings from the regression. Except the stage of the firm, none of the other control variables showed any significance. It is because the VC industry in India is not mature enough compared to developed countries. For instance, in India, the investments raised by Alternative Investment Funds (AIFs) were around USD 23.5 billion in 2019 as against USD 10.3 trillion in the US.

Although the roots of the Indian VC industry date back to the early 1960s, the industry started growing at a rapid pace only after the economic reforms of 1991. Prior to the economic reforms, most of the financing was from public sector financial institutions. The year 1995 marked the entry of foreign VC in India, which further boosted the start-up ecosystem in India.

The coefficients of the percentage of stake acquired are observed to be consistently negative and significant. It indicates that the percentage stake and valuation of the firm are negatively correlated, thus rejecting the second hypothesis. The negative association does not imply that the stake acquired by venture capitalists has a detrimental effect on firm valuation. Instead, one possible reason is that when a company reaches its maximum value from the founder's perspective, they tend to liquidate more stake. As a result, the value of the company does not grow substantially.

## **VI. Conclusions and Implications**

India's venture capital industry is growing, and the accessibility of finance for privately-held firms is becoming easier. As a result, the valuations of firms are observed to rise rapidly. However, prior experiences, such as the dot com bubble, have reiterated the importance of valuing a company based on fundamentals.

This study has documented the association of the firm's pre-money valuation with the stake acquired by the VC, fund size, and revenue multiple in the context of Indian privately-held firms. It addresses the implications of stakes acquired by venture capitalists on firm valuation and highlights that the promoters tend to liquidate additional stakes once the firm reaches its maximum valuation from their perspective.

The implications of this study are twofold. Firstly, it aims to attract the attention of venture capitalists by presenting the impact of the equity stake acquired by them and the fund size on the firm's valuation. It, therefore, aids the venture capitalists in deciding on the optimum proportion of fund size and equity stake in such a way that the valuation of the firm can be maximized. A higher firm value implies a higher future payoff for the venture capitalists during the time of exit. Secondly, the findings are of interest to managers of firms with VC backing as each round of funding leads to equity dilution of promoters. The equity dilution by promoters changes the firm's control structure and decision-making abilities and influences the firm's future valuation. Generally, a higher proportion of equity dilution by promoters sends a negative signal about the firm's prospects and leads to a decline in firm value. Therefore, the number of funding rounds and proportion of equity dilution, being strategic decisions, must be planned carefully.

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