Did Venture Capital Promote Innovation in India?

Seema Bushra, Javaid Akhter

Abstract*: The study exhorts to ascertain the general perception that Venture Capitalists fund innovative technology projects in the Indian context using primary and secondary data. A structured questionnaire was used to elicit response from 101 (sample) out of 134 (Population) SEBI registered and active Venture Capital firms in the recent past. The study analyses the mode of funding by Venture Capital firms and their geographical dispersion. The study ascertains whether Venture Capital firms have enabled innovation in the Indian context during the recent past or not. Finally, the study concludes that Venture Capital Investments have not been very enabling for innovative technologies in the Indian context, which is contrary to the relevant literature available in the context of USA and other developed nations.

Keywords: Innovation, Investments, Start-up, Technology, Venture Capital.

I. INTRODUCTION

The firms that are financed by Venture Capital are supposed to be more innovative than the others (Samuel and Josh, 2000). Venture Capital is a promising mechanism for innovation and growth one on hand and Venture Capital is the appropriate to the equity needs of firms based on innovation on other hand. However, over the years, Venture Capital became more formalized and more appropriate generic term of 'private equity' was coined.

The "equity gap" that exists due to the strict regulations of conventional finance of tangible asset requirement and previous track record of enterprise faced by the innovative and nascent enterprises is filled by venture capital firms. VCFs provide finance to innovative ventures during the first stage of innovation (Florida et. al Kenney, 1988). Large corporate houses invest in corporate ventures to develop their innovative capabilities (Engel, 2011; Birkinshaw et al., 2002). It is also a means for public policy to foster technological or environmental concerns such as, Cleantech (Hargadon et Kenney, 2012).

However, recent research (Mason and Harrison, 2002) indicates that the profitability of venture capital funds is rather low and that their impact on innovation is uncertain than expected, thus putting the model of venture capital itself into question. Hence, it is an opportunity to review the model of venture capital as presented by the economic and management literature, to examine whether these assumptions are valid in the Indian context. As a mechanism to foster innovation for young firms in highly technological and capital-intensive sectors, authors also question whether this model takes recent advances in innovation management into account, or whether it is a mostly finance-based model.

India, the second most populated country in the world with more than 1.24 billion people (Census, 2011), has emerged as one of the fastest growing economies in the recent years. With the projected compounded annual growth rate of 9%, India's GDP is likely to be US$3.26 trillion by 2020 (Statista, Source: Statista, https://www.statista.com/statistics/263771/gross-domestic-product-gdp-in-india/).

The availability of technically skilled and linguistically adept manpower, large size of market, sustainable high growth rate, low domestic penetration and improving regulatory conditions make India a very attractive destination for venture capital investment. India has been doing well in IT/ITES industry; it is still a low-cost developer and service provider. As India continues its rapid growth path, several sectors of the economy such as telecom, FMCG, infrastructure and education are growing rapidly and offer significant opportunities for venture capital.

For the purpose of this study, innovation/innovative technology is defined as a new technology for commercial use or an existing technology with some modifications/ improvements resulting in new products/new services/new applications for commercial use. The study attempts to ascertain whether the recent (during the last three years, 2016-18) venture capital investments had supported innovation in the Indian context as per the "innovation" or not? The reason for choosing this time frame is because of surge in venture capital financing and IT/ITES sector, which accounted for 45% of the venture capital financing during the year 2018. Also, India has introduced Make in India and Start up India campaigns in the years 2014 and 2016 respectively. The Make in India campaign is an attempt to make India a global manufacturing hub, while the Start-up India campaign is designed to encourage entrepreneurial talent.

II. LITERATURE REVIEW

Richard & Martin (1988) find that venture capital transformed the innovation process in the USA. Venture capital financed innovation is a new model of innovation catalyzing technological change.

Paul & Josh (2001) find that the manners in which venture capital funds are raised and structured, the capital is invested in young firms, and these investments are concluded are now much better managed.

Samuel & Josh (2002) examine the influence of venture capital on patented inventions in the United States across twenty industries over three decades and address concerns of causality in several ways.

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Colin & Richard (2002) analyse the returns of venture capital investment, and find that the distribution of returns is skewed, with 34% of exits with negative returns, 13% at a partial loss or break even, but with 23% showing an IRR of 50% and above.

Bowonder & Mani (2004) trace the evolution of venture capital support for innovation in India, particularly the government supported schemes and suggest that Venture Capital has strong linkages with innovation-based Clusters.

Masayuki & Masaka (2008) conclude that venture capital investments stimulate innovation.

Roberta & Nina (2010) study the impact of venture capital on innovation as evident by the number of patents filed at the industry level. Further, they argue that a dollar of venture capital appears to stimulate innovation, three to four times than a dollar of traditional corporate research finance.

Eduards (2011) brings to light that revenues of venture-backed companies accounted for 21 percent of U.S. GDP and in 2008 employed more than 12 million people. Job and revenue growth within this private equity market significantly outperformed the overall economy for years.

Andrew & Martin (2012) argue that three key conditions are necessary for venture capital to successfully open new economic spaces and the study concludes that large loan guarantees are unlikely to be effective.

Juanita (2013) delves into the relation between venture capital and innovation by comparing the number of paten filings, and the quality of innovations, before and after companies are financed by venture capital investor.

Kevin, Blanche and Armand (2014) find venture capital to be a key link in the complex chain of financing for young innovative firms. By helping them at critical stages of innovation development, it helps an economy to leverage its public research and sustain growth.

Cheng et. al (2019) estimate the impact of venture capital on innovation, employment, and payroll in Chinese metropolitan area. Results show that VC is significantly contributing to the metropolitan economy as a whole by supporting innovation, creating jobs, and generating wealth in local cities.

III. OBJECTIVES OF STUDY

(i) To analyze the geographical dispersion of venture capital funding for innovation in India.

(ii) To analyze the mode of venture capital financing by venture capital organizations (Seed funding/Angel funding/Debt funding/Private Equity).

(iii) To study the perception of Venture Capital Organizations towards financing of innovative technologies in the Indian context.

(iv) To ascertain whether venture capital investments have supported (enabled) innovation in India during the period of study.

IV. RESEARCH METHODOLOGY

In order to achieve the four objectives as detailed above, the following methodology has been adopted:

Objective (i): To analyse geographical dispersion of venture capital funding (VCF) projects in India.

Analysis of Secondary data of their geographical dispersion of VCF (available at: https://trak.in)

Objective (ii): To analyse the mode of venture capital funding (VCF) by venture capital organizations (Seed funding/Angel funding/Debt funding/Private Equity).

Analysis of Secondary data of their mode of VCF (available at: https://trak.in)

Objective (iii): A structured Questionnaire consisting of 10 questions was developed.

The study is based on primary data based on a structured Questionnaire as per the details given below:

Population: There are 191 SEBI (Securities Exchange Board of India) registered Venture Capital Organizations (VCO) in India, out of which 134 are active which is considered as population for this study.

A pilot testing of questionnaire was made from the point of comprehensibility, logical sequencing etc. and appropriate amendments were made to make the questionnaire understandable.

Questionnaire had been sent to 134 VCOs through e-mails and follow up was done through calling and messaging. 109 responses were received, out of which 101 responses were found complete in all respect.

The sample size is 101 (at 95% Confidence level and the Margin of Error (MOE) is 5%). Qualitative analysis of the responses (question wise) has been presented, (Source: https://trak.in)

Objective (iv): To ascertain whether venture capital investments have supported (enabled) innovation in India during the period of study or not.

Data Variables (Dependent):

(a) No. of Venture Capital financed deals

(b) Total amount of Venture Capital financing (US Dollars)

(c) No. of Venture Capital financed deals (Innovative technologies)

(d) Total amount of Venture Capital financing of Innovative technologies (in US Dollars)

V. ANALYSIS

(a) Objective (i)

Table 1: Geographical dispersion of Venture Capital Funding

Cities	No. of Deals			Total
	2016	2017	2018	
Ahmedabad	18	8	6	32
Bengaluru	294	226	100	620
Chennai	31	24	16	71
Delhi NCR	335	198	82	615
Mumbai	188	141	61	390
Other Areas	152	90	43	285
Total	1018	687	204	1909

It is seen from Table 1, that Bengaluru and Delhi NCR have emerged as the major venture capital financing cities in India.

(b) Objective (ii)

Table 2: Mode of VCF for Innovative Technologies

Year	Mode of Funding				Total funding (US$ billion)
	Seed	PE	Angel	Debt	
2016	3.08%	96.92%	Nil	Nil	3.90
2017	0.07%	98.85%	0.04%	1.04%	10.42
2018	5.00%	79.60%	15.00%	Nil	3.70

From Table 2, it is seen that the preferred mode of Venture Capital Financing for innovative technologies is PE (Private Equity).

(c) Analysis of the Questionnaire (Objective (iii))

1. As a Venture Capital Firm (VCF), what is the risk-return preference of your firm in case of innovative project?

Table 3: Risk-Return preference for innovative projects

Risk-Return Preferences	%
a. Low risk-low return	0
b. High risk-high return	48
c. Moderate risk-moderate return	10
d. Depends on the innovativeness of the project	42

48% of the VCOs (VCOs) prefer High Risk-High Return while 42% of the VCOs indicated that their Risk-Return profile depends on the innovativeness of the project.

2. As a VCO, what kind of return you are seeking in general?

Table 4: Return requirement of VCFs

Return range	%
a. 10 to 15%	1
b. 15 to 20%	4
c. 20 to 25%	46
d. 25 to 30% and above	49

Most (95%) of the VCOs indicate that their expected rate of return is 20% and above, while 57% prefer a return of 25 to 30 percentage and above.

3. As a VCO, what kind of return would you seek while investing in an innovative technologies/innovative use of existing technologies?

Table 5: Return requirement for innovative projects

Return	%
a. Initially low but gradually increasing return	9
b. Initially high but gradually stabilizing around the market return	14
c. Consistently higher than the market return	62
d. A return that can stabilize our portfolio of investment	15

62% of the VCOs prefer considerably higher rate of return than the prevalent market rate for innovative technologies, while 14% of the VCOs prefer initially high return but gradually stabilizing around market return in the later years.

4. As a VCO, how do you assess the innovativeness of the project?

Table 6: Assessment of innovativeness of technologies

Innovativeness	%
a. New product/service that currently does not exist in the market	14
b. A product/ service based on ground breaking technology	48
c. A complete game changer in the industry	33
d. Number of patents/copyrights held by the firm seeking funding	5

48% of the VCOs perceive a technology to be innovative, if it is ground breaking technology, while 33% perceive an innovative technology to be of a game changer in the industry.

5. As a VCO, your objective to promote innovative technologies/innovative use of existing technologies for.

Table 7: Objectives for promoting innovative technologies

Objectives	%
a. Diversifying the portfolio of investment	33
b. Encouraging first generation techno-preneurs	12
c. Enhancing the corporate branding strategy	22
d. A belief that such technological innovations create greater value for the asset portfolio	33

33% of the VCOs state their objective to promote innovative technologies is for diversifying their portfolio of investment, while 33% indicate their objective for such investments is for creating greater value for their asset portfolio.

6. As a VCO, what mode of financing is preferred for funding the projects based on innovative technologies/innovative use of existing technologies?

Table 8: Preferred mode of financing for innovative technologies

Mode of Financing	%
a. Angel/seed funding	67
b. Debt funding	1
c. Private equity	33
d. Term loan	0

A majority (67%) of the VCOs prefer Angel/Seed financing mode for innovative technology-based firms, while 33% of the VCOs prefer private equity mode.

7. As a VCO, what kind of risk profile would you prefer for projects based on innovative technologies/innovative use of existing technologies?

Table 9: Preferred risk profile for innovative projects

Risk Profile	%
a. Initially high but gradually diminishing risk	14
b. Initially high but gradually stabilizing around market risk	57
c. Consistently lower than the average market risk	2
d. A risk that would balance overall portfolio risk	17

57% of the VCOs prefer initial high risk but gradually would like the risk to stabilize around market risk for innovative technology firms.

8. As a VCO, what technologies do you perceive to have potential of generating better return in near future?

Table 10: Potential technologies for higher returns

Potential Technologies	%
a. Quantum Computing & Machine Learning	33
b. Use of Artificial Intelligence for automated work & 3D printing	33
c. Augmented reality & Block Chain Technology	16
d. Space & Defense Technology and Optimized Communication	18

33% of the VCOs perceive innovative technologies to be of Quantum Computing and Machine Learning that would have potential of generating better return in future, while another 33% of the VCOs perceive Artificial Intelligence and 3-D printing to be innovative

technologies and have the potential for better returns in near future.

9. As a VCO, what other factors motivate you to invest in projects based on innovative technologies/innovative use of existing technologies.

Table 11: Motivation factors for investing in innovative projects

Motivation Factors	%
a. Excitement of breaking the new technological frontier	52
b. An expectation of very high return and corporate branding	43
c. Social benefit	3
d. To provide impetus to government projects	2

52% of the VCOs fund the innovative technology firms due to the excitement of breaking into new Technological frontiers, while 43% of the VCOs fund the innovative technologies for very high return and corporate branding.

10. As a VCO, if a project based on innovative technologies/innovative use of existing technologies is not performing as per expectations, which of the following courses of action would you initiate?

Table 12: Action options of VCFs for poorly performing innovative projects

Action Options	%
a. Immediate exit	12
b. Revisit the plan and inject additional funds for short term	2
c. Revisit the plan and inject additional funds for medium term and get involved in monitoring	43
d. Revisit the plan and inject additional funds for long term and get involved in strategic and operational matters	43

43% of the VCOs indicate that if innovative projects do not perform as expected, they would review the project plans and invest more funds in the medium term with better monitoring, while 43% of the VCOs indicate that they will invest more funds on a long term basis and get involved more actively in strategic and operational matters.

(d) Objective (iv) To ascertain whether venture capital investments have supported (enabled) innovation in India during the period of study.

Data Variables (Dependent):

(a) No. of Venture Capital financed deals.

(b) Total amount of Venture Capital financing (US Dollars).

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Table 13: Financing of Innovative Technologies

Variable	2016	2017	2018
No. of Venture Capital financed deals	1018	687	308
Total amount of Venture Capital financing (US Dollars Billion):	3.9050	10.4290	3.6971
No. of Venture Capital financed deals (Innovative technologies)	77	66	34
Total amount of Venture Capital financing of Innovative technologies (in US Dollars billion)	0.4567	0.2618	0.1428
Innovative Deals to Total Deals (percentage)	7.56	9.61	11.04
Innovative Financing to Total Venture Capital Financing (percentage)	11.70	2.51	3.86

From Table 13, it is seen that the percentage of Innovative financing to Total Venture Capital Financing is quite low over the past three years pointing towards low support for innovative technologies in the Indian context.

VI. CONCLUSION

The study researches the general perceptions and beliefs about funding of innovative technologies by Venture Capital Organizations (VCOs) in the Indian context based on primary and secondary sources of information over the past three years. The responses through the questionnaire highlight that VCOs are more inclined to fund innovative technologies if the returns are high and commensurate with the high risk involved with such projects and the expected returns are above 25% plus Return on Investment (ROI). The VCOs consider technologies to be innovative if they are Ground breaking/Game changer technology in the industry. The other important findings of the study have been that VCOs prefer Private Equity (PE) mode of financing and only a small percentage of the total funding goes towards financing innovative technologies. The Survey results are in contrast to the evidence available in the literature particularly in the context of US and other developed countries.

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