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Managing Information Asymmetry Risks Using Deal Syndication and Domain Specialization: An Indian Context

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Abstract We review two specific risk management strategies of venture capitalists (VCs): deal syndication and domain specialization with respect to their explicit role in adjudging and managing the overall magnitude of information asymmetry risks. These are analyzed for three distinct categories of VC firms as classified by their funding stage focus (early vs. late), ownership type (foreign vs. domestic) and the human capital composition of the core VC team (entrepreneurial vs. investor). The analysis is based on both secondary data and primary data for active 72 VC firms in India. Syndication is moderately important for entrepreneurial VC firms, but not at all important for early-stage focused and foreign VC firms. This finding is distinctly different from what has been conventionally observed in the literature. Among the various arenas of domain specialization, high-technology focus is important for all segments of VC firms. In the context of investment-stage focus, foreign VC firms exhibit growth-stage specialization, while entrepreneurial VC firms concentrate on earlier investment stages.

Keywords Venture capital, domain specialization, syndication, entrepreneurial VC, foreign VC, early-stage VC

I. Introduction

As financial intermediaries, venture capitalists (VCs) are focused on funding firms in emerging high-technology realms, with nascent technologies, domains, business models and intangible assets (Gompers and Lerner, 2004), being the mainstay of these investments. The resultant information asymmetry warrants the usage of specialized risk assessment and management strategies, with domain specialization and deal syndication being the most prominent (Dimov and De Clercq, 2006). In this paper, we focus on the specialization and syndication strategies pursued by VCs in India and how these vary by distinct VC firm type. In particular, we consider three specific categories of VC firms: first, classified based on their stage-focus i.e. early versus later stage focus;

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second, classified based on their ownership pattern, foreign versus domestic ownership; third, those based on the composition of their Investment Teams, Erstwhile Founders versus Investors.

VCs are rarely generalists; rather they tend to specialize by the funding stage, industry, geography and even the deal size (Ruhnka and Young, 1991; Gupta and Sapienza, 1992). Domain specialization, by facilitating access to networks, information and deal flow, provides a better handle on the magnitude of prevailing risks (Gompers et al., 2009). Syndication implies co-investment in a deal by two or more VCs with the aim of pooling their tangible and non-tangible resources resulting in cherry picking of investee firms (De Clercq and Dimov, 2004; Manigart et al., 2006). To sum up, the value proposition of specialization is access to 'tacit knowledge', a specialized resource in itself, while that of syndication is the augmentation of the pre-existing resource pool - both of which are equally imperative for effective risk management (Barney et al., 2001; Wright and Lockett, 2003).

As investment strategies, specialization and syndication are almost always used in conjunction. Although, domain specialized VCs possess abundant tacit knowledge, they could be relatively less endowed with adequate financial, social or human capital while those with abundant resources could possibly encounter dearth of specialized domain-related skill sets (Jungwirth and Moog, 2004). Thus, assessing the joint role of syndication and specialization - and in particular how these differ for specific VC firm types - becomes an interesting issue to examine in the context of VC investing. The primary research question we address in this paper is: How do the natures of syndication and specialization strategies differ based on the stage-focus, nature of ownership and investment team composition of the concerned VC firms?

We examine this question for the VCs investing in India. VC has emerged as an important conduit of funding new-economy businesses in India over the past decade (Bain Consulting, 2012), which has propelled its position to the top five VC investment destinations worldwide (Ernst and Young, 2014). As of 2013, there were about 309 VCs operating in India (Venture Intelligence, 2014) that have collectively funded more than 5,000 businesses (Bain Consulting, 2012), with an investment growth (CAGR) of about 30% (SEBI, 2013). The Indian VC-entrepreneurial ecosystem has been thriving of late, with various entities such as angel investors, academic incubators, industry accelerators, and technology business incubators contributing to the deal flow of potential VC deals (Joshi and Satyanarayana, 2014; Bala Subrahmanya, 2015). Over the period, Bangalore, Mumbai and Delhi have emerged as important Asian cities in terms of the high concentration of VC-funded companies (Seed Table, 2014) and Bangalore has been identified among the top nine start-up hubs of the world outside the US (Pullen, 2013).

VC funding has been particularly important given the limited development of the domestic bond markets and given the fact that, in addition to funding, they provide mentoring and access to international networks and overseas markets, which are of importance, especially to the first-generation entrepreneurs in India (Bain Consulting, 2012; 2013; 2014). And yet, despite their growing influence, the VCs investing in India encounter remarkable challenges. The presence of a severe trust deficit between VCs and entrepreneurs (Panda and Dash, 2015) results in serious agency risks. The recent examples of turmoil at the VC-funded companies such as Housing.com, Foodpanda.in and, more recently, the replacement of the erstwhile founder-CEO of Flipkart (an Indian e-commerce giant) with a senior executive from Tiger Global (the funding VC entity) only highlight the increasing magnitude of such risks. Previous studies have also revealed the difficulties in contract enforcement given the fact that the legal processes still lag much behind the rapidly evolving VC-entrepreneurial ecosystem (Panda and Dash, 2016). Moreover, VC is still viewed largely as a funding source alone and any other form of intervention by the VCs is strongly resented by entrepreneurs (Bain, 2012; 2013). Another area of concern pertains to the low market depth (Ernst and Young, 2014). The latter inhibits domain specialization, thus hampering the opportunity recognition potential and possibly hindering the process of discovery of viable deals.

Collectively, these factors enhance considerably the risks for VCs in India that need to be tackled by means of appropriate investment strategies. It is in this context that the study of syndication and specialization strategies becomes vital. The rest of the paper is organized as follows. Section 2 presents a survey of literature and Section 3 contains a conceptual framework and the specific objectives based on the same. This is followed in Section 4 by a discussion about the data, variables and the methods of analysis. The results are presented and discussed in Section 5 and Section 6 highlights the managerial implications and the policy conclusions emerging from the study.

II. Survey of Literature

This section provides an overview of the existing literature in the arena of specialization and syndication. Additionally, we discuss how the variation in strategy usage is likely to be influenced by the distinct type of the concerned VC firm.

1. Specialization as a Risk Management Strategy

Tacit knowledge is a significant source of competitive advantage for firms, especially in domains with relatively large information asymmetries (Teece and Pisano, 1997). As per the resource-based theory, domain specialization is understood to equip the VCs with idiosyncratic or tacit knowledge that aids in addressing the underlying risks (Barney et al., 2001; Newbert, 2007). Domain specialists are more likely to be responsive to signals of viable investment opportunities, thus reducing the magnitude of adverse selection risks (Gompers et al. 2009). In the VC industry, where the information on viable deals is seldom public, the best deals are necessarily the ones that are proactively pursued by the concerned VCs (Hsu, 2007; Joshi, 2015). However, getting a selective access to such deals much before the same are revealed to one's competitors warrants the presence of significant social capital in the form of networks of VC professionals (Sorenson and Stuart, 2008). Access to such networks and, accordingly, to the deals is possible only when the firm is highly specialized in the concerned domain (Norton and Tenenbaum, 1993). For innovation-driven businesses with a strong prevalence of the first-mover advantage (Thornhill, 2006), such networks also serve as significant barriers to entry for newer VCs (Frynas et al., 2006; Hochberg et al., 2010).

The tacit knowledge arising from domain specialization likewise enables them to keep a check on the agency risks as well. By providing a better insight into the specific complexities associated with certain investment stages or industries, it enhances the scope for cross-sectional and serial knowledge spillovers (De Clercq and Arenius, 2006). The specialized VCs also benefit from the learning curve effects that result in an accumulation of superior knowledge over time (Hall and Hofer, 1993). Collectively, these factors enhance the level of control by VCs, thus guarding against the opportunistic behavior of the entrepreneurs (Gupta and Sapienza, 1992).

2. Syndication as a Risk Management Strategy

Syndication is a form of inter-organizational co-operation that serves the purposes of financial intermediation as well as achieves the specific objectives of individual firms (Jääskeläinen, 2012). As such there exist multiple motives of syndication. The finance-based motivation propounds syndication to arise from the need for risk diversification. For VCs with smaller fund sizes, syndication is probably one of the most potent ways to reduce systematic risks by allowing for investment in larger number of diversified companies (Cumming, 2006). Deal-flow motivation is another important motive of syndication. By granting access to a greater quantity and superior quality of

deals (Sorenson and Stuart, 2001), it significantly reduces the magnitude of adverse selection risks.

The value-added motivation views syndication as a means of adding value during both ex-ante and ex-post investment phases (Manigart et al., 2006). During the ex-ante phase, pooling resources across VCs enables them to arrive at a clear-cut judgment of deal quality (Lerner, 1994; Brander et al., 2002; Dimov and Milanov, 2010; Casamatta and Haritchabalet, 2007; Manigart et al., 2006). The pooling of expertise and support during the ex-post investment phases helps in alleviating the magnitude of agency risks and the consequent value-add helps in enhancing the overall valuation of the investee venture (Bruining & Wright, 2002; Sapienza et al., 1996; Meuleman et al., 2009). Above all, syndication with a known VC firm is one of the important ways of achieving 'certification' and 'reputation' for a relatively new VC firm (Gompers and Lerner, 2004). Reputation and certification in turn enable a new VC firm to gain access to better entrepreneurial ventures in the future thus reducing the intensity of the adverse selection problem in upcoming projects too. For foreign VCs spreading their wings to Asian economies, syndication with the local VCs proves to be an important strategy of handling the information asymmetry risks associated with geographic distance and cultural differences (Dai et al., 2012).

However, it must be understood that not all VCs view syndication favorably. In the event of conflicts of interest among co-investing VCs, syndication might actually result in negative synergies (Gompers, 1996; Gompers and Lerner, 2004). After having financed the first round of investment, the VC firm is well aware of the 'true' value of investment. Hence, it may use this information advantage to serve its own interests. Thus, it may have the incentive to misrepresent the true value to the second round of investors (Lerner, 1994). If the VC firm believes that the investee firm's prospects are attractive, the VC may reserve very few shares to outsiders even when having more investors may be advantageous to the investee firm. On the other hand, if the VC firm is troubled by the firm's prospects; it may reduce its stake in the next stage of financing and try to get more capital from outsiders. Either of the outcomes is less efficient from the point of view of the investee firm (Gompers and Lerner, 2004).

3. Determinants of Strategy Choice by VC Firm Type

Typically, the early-stage ventures are regarded to be information opaque (Schertler and Tykvova, 2011). Moreover, this problem is considered to be particularly severe if these ventures belong to high-technology domains (Dai et al., 2012). The team, processes and sometimes even the business model, are

not in place (Ruhnka and Young, 1987). Naturally, the magnitude of information asymmetry risks is distinctly higher for early-stage VCs as compared to their later-stage counterparts. Thus, gaining an insight into early-stage investing decisions has been one of the important underlying themes of the conventional VC literature. Specialization strategies enable the VC firms to gain insights into niche risks within specific domains. At the same time, syndication with other VCs enables in arriving at a consensus regarding the 'true' risk estimate (Sah and Stiglitz, 1986). Syndication is also an effective strategy for VCs intending to diversify into other domains. In general, the inherent risks from early-stage investments are high, which can be to some extent controlled by portfolio diversification. However, the early-stage focused VCs are usually highly resource constrained. Syndication enables them to diversify their portfolio as also support larger deal sizes (Cumming, 2006).

The presence of foreign VC firms in the Asian markets in general, and India and China in particular has grown in leaps and bounds over the past one and a half decade. About 70% of the VC funding in the Asian markets comes from firms of foreign origin (Dai et al., 2012). Given the geographic distance and the cultural differences between the countries of origin and the investment destinations; the magnitude of information asymmetry risks are bound to be particularly severe (Schertler and Tykvova, 2011; Dai et al., 2012). Syndication could be an effective strategy to get over the information asymmetries arising from socio-cultural factors. Domain specialization is also important as over the period, it enables them to build local networks, which they might lack to start with.

One of the emerging streams of literature in the VC domain is regarding the composition of the top management teams (TMTs) of the VC firms, and how it influences their VC portfolio composition. Among these, of particular interest is the past educational and entrepreneurial background of the VC professionals (Patzelt et al., 2009; Zarutskie, 2010). Drawing from the resource-based theory, prior background confers significant tacit knowledge on the fund-managers that enables them to make better VC investing decisions (Barney, 1991; Peteraf, 1993). Usually, VCs with erstwhile entrepreneurs on their TMTs are likely to be highly specialized since they are likely to possess tacit knowledge pertaining to their own domains. Syndication is also an important strategy for enhancing their pre-existing financial resource pool, often owing to their limited fund sizes.

4. Research Gaps

Although, the literature pertaining to syndication and specialization strategies of VC firms is fairly comprehensive, there still exist certain apparent

research gaps. To start with, although the importance of syndication strategies for early-stage focused and foreign VCs has been extensively covered in the literature, the relationship been the syndication intensity and the VC investment team composition has not yet been looked into. Next, in the context of specialization, although stage-focus has been extensively covered, technology-focus, funding size focus and geographic focus has not been adequately covered.

For India, empirical studies on VCs are far and few. Some of the earlier studies in this domain have been published as early as 2005 based on the dataset collected in the 1990s (Wright et al., 2005; Lockett et al., 2002; Pruthi et al., 2003). The VC industry has changed a lot since then, especially after the global financial crisis of 2008 (Joshi and Bala Subrahmanya, 2014), thus warranting a need for a more recent study. Some of the other recent studies are mainly qualitative in nature (Panda and Dash, 2015). Hence, there exists a strong need to have a study based on a mixed methods approach to study micro-level issues involved in the process of VC investing in India, primarily based on a quantitative analysis and complemented with relevant qualitative inputs. This study attempts to fill this gap.

III. Conceptual Framework and Research Objectives

Based on the survey of literature and various issues identified therein, we develop the following conceptual framework for the study. Further, we also discuss the specific research objectives of this study.

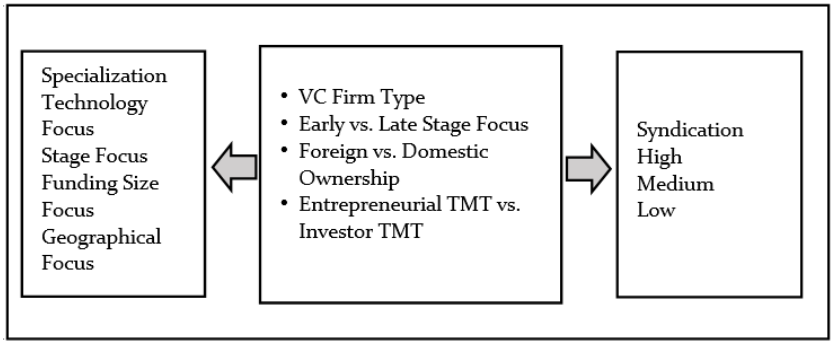

Figure 1 Conceptual framework for the study

*TMT - top management teams

The distinct nature and intensity of usage of the risk management strategies depend on the needs and resources of the concerned VC firm. For the analysis,

we cover three distinct types of VC firms based on their stage focus (early vs. late), ownership type (foreign vs. domestic) and investment team composition (erstwhile entrepreneurs i.e. entrepreneurial TMT vs. erstwhile investors i.e. investor TMT). Depending on the underlying risks and their resource structure the VC firms choose the intensity of syndication (low, medium or high) and also their area of domain specialization. For this analysis, we consider four distinct arenas of specialization - technology focus (high-tech or conventional sectors), stage focus (early, growth or late), funding size focus (specific range of investment amount) and geographical focus (location of VC firms in specific geographies).

Based on the conceptual framework discussed above, we define the broad objectives for this study as follows:

(1) To assess the usage of syndication and specialization as risk management strategies for early-stage vs. late-stage focused VC firms.
(2) To assess the usage of syndication and specialization as risk management strategies for foreign vs. domestic VC firms.
(3) To assess the usage of syndication and specialization as risk management strategies for VC firms with entrepreneurial top management teams vs. investor top management teams.

IV. Scope, Research Methods, Variables and Sample

The research objectives will be analyzed in the context of 72 active VC firms operating in India as of January 2014. This study is based on both secondary and primary data. The secondary data were obtained from Venture Intelligence (a private database on venture capital and private equity deals in India) and the respective VC firm websites. The primary data were obtained from the semi-structured interviews with the senior executives of these VC firms. In this analysis, for each VC firm, we have considered the deals funded by them from 2005 onwards. The unit of analysis is the individual VC firm. The deal level data were further summarized at the VC firm level wherever required. We considered VCs across all Indian cities - Bangalore, Mumbai/Pune, National Capital Region (New Delhi, Gurgaon, Noida and Faridabad), Chennai, Hyderabad, Jaipur and Kolkata. Our sample also consisted of certain other VCs that did not have a physical presence in India, although they invested in deals here. These were located in the United States, United Kingdom and Singapore.

We use logistic regression as the main technique of analysis. This technique is suitable since the dependent variable in each case is binary in nature, while the independent variables are both binary and continuous. In all, we build three

logistic regression models: in the first model, early-stage VC firms are treated as the variable of interest and take the value of 1 (as a dependent variable) while the growth or late-stage focused firms take the value of 0. In the second model, foreign VC firms are the variable of interest and hence take the value of 1 (as a dependent variable) while the domestic VC firms take the value of 0. In the third model, entrepreneurial VC firms take the value of 1 while Investor VC firms take the value of 0. All analysis was performed using SPSS 21.0.0.0 software. In the results, we present the significance levels for each model variable, Pseudo-R^2 (Nagelkerke R^2), Hosmer-Lemeshow Goodness-of-Fit and the percentage of pairs correctly classified. Next, we discuss in detail the variables used in this analysis.

1. Variable Description

1.1 Dependent Variables

There are three dependent variables based on investment stage, ownership pattern and top management team composition. Each of these was created as follows:

Early/late stage VC firms: Since no formal definitions for the investment stages are available yet for India, we defined the same based on the self-reported information obtained from the investment professionals belonging to each VC firm.

Foreign/domestic VC firms: The specific classification for each VC firm into foreign or domestic was obtained from the Venture Intelligence (2014) database.

Entrepreneurial/Investor VC firms: The entrepreneurial VCs are those in which the TMT has some kind of past founding experience while investor VCs are those wherein the TMT possesses financial investing experience alone. In our context, TMT implies senior VC professionals (managing directors, senior partners, principal and so on) with significant investment and portfolio management responsibilities. For the purposes of our definition, even if a single member in the TMT possessed prior entrepreneurial experience, we deemed the VC firm to be Entrepreneurial VC. The information pertaining to the erstwhile background of the TMT members was obtained by reviewing the profile of senior professionals belonging to each VC firm from the respective VC firm websites and the professional networking websites such as Linkedin.com. This was corroborated with those professionals themselves during the course of our discussions.

1.2 Independent Variables

The independent variables for the study were of two types. First, those related directly to Syndication and Specialization and, second, the control variables that are likely to affect the association between the intensity of syndication/specialization and the VC firm type.

Syndication: To assess the magnitude of syndication, we compute the proportion of syndicated deals for each VC firm. For this, deal-level data were aggregated at the VC firm level.

Early-stage focus: The VC was categorized to be an early-stage focused one based on self-reporting by the VC professionals of that firm. This was corroborated with the data from Venture Intelligence database.

High-technology focus: If the proportion of deals in high-technology sectors was above 50 per cent, the VC firm was categorized as having a high-technology focus. The high-technology sectors were defined as those belonging to IT, ITeS and biotechnology. The sector-specific information pertaining to each deal was obtained from the Venture Intelligence database.

Funding size focus: A VC firm was classified as having funding size focus if its investment size was restricted to certain specific range. Since the investment amounts are sparsely populated in the Venture Intelligence database, we defined this variable based on the self-reporting by the VC professionals of that firm.

Geographic focus: In India (as is the case with other parts of the world), VC firms tend to invest in locations geographically close to themselves. For ensuring the same, many VCs have offices across multiple locations in India. Thus, the location of the VC firm itself can be treated as a proxy for its geographic focus.

1.3 Control Variables

Historically funded deals: The number of deals previously funded enhances experience and networks of the VC firm and is thus likely to influence its strategy usage. Hence, it is important to include the erstwhile deals funded as a control variable. Aggregating the deal-level data at the VC firm level from the Venture Intelligence database created this variable.

Successful exits: The number of successful exits potentially enhances the future fund-raising potential of the VC firm. This in turn could impact the strategy usage. This variable was created based on the exits related data obtained from the Venture Intelligence database. Exits via mergers/ acquisitions or IPOs were regarded as ‘successful’ exits for this analysis.

SEBI registration: The Securities and Exchange Board of India (SEBI) is the nodal regulation agency for all equity investments in India. While it is mandatory for all domestic VCs with secondary sources of funds to register with SEBI, the same does not apply to the foreign VCs. They can invest via the

automatic approval route from the RBI as long as they adhere by the Foreign Direct Investment guidelines (SEBI, 2014). SEBI registration brings with it stringent regulations with respect to investments and portfolio diversification for the concerned VC firms. These can have important implications for the nature of strategies pursued by them. The information about SEBI registration status for each VC firm was obtained from the SEBI website.

Corporate VC firms: Corporate VC firms are offshoots of their larger corporate entities. Their investments are often strategic in nature and which possibly meet the technology need to the parent firm. This in turn can have a bearing on the nature of strategies pursued by them. This information was obtained from both Venture Intelligence and the respective VC firm websites.

2. Sample Description

The composition of the broad segments in our sample is as follows: by funding stage-focus-about 37% of the VC firms in our sample have an early-stage focus, 29% have a growth-stage focus and 34% have a late-stage focus. For the purpose of analysis and sharper results, we have grouped together VC firms with growth and later stage focus. Thus, in aggregate about 63% of the VC firms have a growth and late stage focus. By ownership type, about 60% of the VC firms in our sample are of domestic origin whereas the rest 40% are of foreign origin i.e. they are offshoots of larger foreign VC firms or other foreign corporate entities. By VC firm TMT composition, about 26% of the VC firms have entrepreneurial TMTs whereas the rest 74% have investor TMTs (these are typically finance professionals from business schools (in India or overseas) with prior investment or portfolio management experience).

About 40% of the VC firms belong to Mumbai/Pune, 33% to Bangalore, 16% to National Capital Region and rest to other parts of India or overseas. About 28% are focused on high-tech domains and about the same proportion is also registered with the SEBI. They have each funded about 18 deals on an average (between 2005 and 2013) and witnessed six successful exits for the period under study (successful exits have been defined as those via mergers/ acquisitions and IPOs). About 45% of their funded deals are syndicated on an average.

V. Results and Discussion of Findings

To start with, we present the descriptive statistics for each segment of VC firms in our sample. Further, we present the results from each separate logistic regression model. The descriptive statistics for each of the VC firm segments

have been presented in Table 1.

Table 1 Descriptive statistics for diverse VC firm segments

Variable Name	Stage Specialization		Ownership Structure		VC TMT Composition	
	Early	Late	Foreign	Domestic	Entre -preneurial	Investor
Historically Funded Deals (Average no. of deals)	16	19	18	18	14	19
Successful Exits (Average no. of M&As/IPOs)	1	7	4	5	1	6
Age of the VC firm (in years)	4	7	7	6	4	7
SEBI Registered	27%	46%	18%	52%	0%	46%
Foreign VC firms	27%	48%	100%	0%	33%	42%
Entrepreneurial Background	42%	16%	21%	29%	100%	0%
Proportion of Syndicated Deals	58%	51%	56%	52%	56%	53%
High-Tech Focus (proportion of VC firms)	65%	23%	47%	33%	56%	33%
Early-Stage Focus (proportion of VC firms)	100%	0%	25%	45%	61%	29%
Investment Size Focus (proportion of VC firms)	94%	80%	86%	85%	89%	84%
Location - Bangalore (proportion of VC firms)	35%	32%	43%	26%	44%	29%
Location - Mumbai (proportion of VC firms)	19%	52%	25%	50%	33%	42%
Location - NCR (proportion of VC firms)	19%	15%	14%	17%	5%	19%

* TMT - top management team

The number of historically funded deals does not vary much across the VC firm segments; although it is the highest (19 funded deals) for late-stage VC firms and the least (14 funded deals) for the entrepreneurial VC firms. The former category of VCs has also experienced the most number of successful exits while the latter as also the early-stage focused VCs have experienced the least number of exits (just one successful exit). The early-stage focused and the entrepreneurial VCs are also the youngest in terms of their years of operations in India (four years). Since the complete investment cycle for a VC firm (from entry to exit), is typically greater than five years; it could possibly be a reason for the lower number of exits experienced by them.

Given the regulatory requirements, the VC firms of domestic origin are most likely to be registered with SEBI. The least likely to do so are the entrepreneurial VCs where none of them are SEBI registered. This could be possibly owing to the fact that they are more likely to operate with their own

sources of pooled funds (Joshi, 2015); whereas SEBI registration is mandatory only if the funds are raised from other secondary investors (such as foundations, pension funds and so on) (SEBI, 2006).

Foreign VC firms are more likely to be focused on late stage deals and have their TMTs comprising erstwhile investors rather than entrepreneurs. Likewise, the entrepreneurial VC firms are more likely to be early-stage focused and primarily exhibit a domestic ownership pattern. The largest proportion of foreign-owned VC firms and the Entrepreneurial VC firms is located in Bangalore possibly to take advantage of the thriving start-up ecosystem prevalent there (Bala Subrahmanya, 2017). On the contrary, the late stage VCs and the domestic VCs are more likely to be based in Mumbai, possibly to take advantage of the 'financial ecosystem' therein; given that Mumbai is the financial hub of India. Likewise, the National Capital region exhibits the least concentration of entrepreneurial VCs.

Foreign VCs, early-stage focused and entrepreneurial VCs display the greatest syndication intensity with about 57% of their deals being syndicated. The same categories of firms also exhibit the greatest high-technology focus in their investments. This ranges from as high as 65% for the early-stage VCs to 56% for the entrepreneurial VCs and 47% for the foreign VCs. The entrepreneurial VCs and the ones with domestic ownership pattern are more likely to be focused on early investment stages. The investment size focus is the highest for early-stage focused and entrepreneurial VCs.

Having described the preliminary statistics, we now present the results from the three logistic regression models.

1. Early-Stage versus Later-Stage Focused VC Firms

The dependent variable is defined as 1 if the concerned VC firm is early stage focused; 0 otherwise. It is then modeled as a function of other independent variables - those related to their specialization, syndication and other control variables. The regression equation for this logistic regression model is:

$$\text{Logit } i = \ln(\text{Prob event} / 1 - \text{Prob event})$$
$$= \beta 0 + \beta 1 (\text{Domain Specialization Focus}) + \beta 2 (\text{Deal Syndication Intensity}) + \beta 3 (\text{Control Variables})$$

In the above equation; event refers to the VC firm having an early-stage focus. Each of the variable categories viz. domain specialization focus, deal syndication intensity and control variables constitute multiple other attributes.

From the P-value corresponding to the model Chi-Square statistic given in Table 2, the model pertaining to the stage of funding is highly significant. The

Nagelkerke R^2 value is 0.76, while the Cox and Snell R^2 value is 0.56. The Hosmer-Lemeshow goodness of - fit is also high for all models indicating the proximity of the actual and predicted values. The proportion of observations correctly classified is 91%. These metrics point to the robustness of the logistic regression model.

Specialization emerged as one of the most significant variables. This finding seems more or less in tandem with what is suggested by the resource-based view (Barney et al., 2001) wherein the specialization in itself is a tacit resource. The early-stage VCs in India seemed to specialize by both funding size and sector/domain. Thus, these were found to fund deals only within a certain range of funding requirements and rarely go beyond the same. This could be mainly attributed to smaller fund sizes of early-stage focused VCs. The average fund size of early-stage VCs was USD 79 MN as compared to that of late stage VCs for which it was USD 215 MN.

The early-stage focused VCs were also found to specialize in high-technology domains. This is possibly to capitalize on the first mover advantage wherein they take a stake when the valuations are low and sell their stakes as the valuations rise. The first-mover advantage is particularly important in case of high-technology domains that exhibit a 'winner-takes-all' kind of market structure (Eisenmann, 2006). Being among the first few VCs to get a stake at earlier stages of the firm enables the VC firm to capture a significant portion of the pie. For example, in India, equity investments by Saama Capital and SAP Ventures in Paytm (a prominent electronic payments processing firm) and that by Accel Partners in Flipkart.com (a prominent e-commerce retailer) are a reflection of the same. It has been estimated that Saama Capital and SAP ventures made a return of about 50x on the sale of their initial stake (of 4%) in Paytm to Alibaba.com (Livemint, 2017).

Syndication too emerged as an important signal of investment for early-stage VCs. However, syndication seemed to have an opposite sign (negative) than expected. Our analysis showed that early-stage VCs seemed to have a higher proportion of non-Syndicated deals (consequently, a lower proportion of Syndicated deals) as compared to their growth and late stage counterparts. Although, this finding seemed counter-intuitive initially, it has been well supported by the recent literature in this domain (Hopp and Rider, 2006; Nitani and Riding, 2013). If syndication is viewed as detrimental and is associated with agency risks, the investors would possibly refrain from the same. The sale of 10% stake in Subhiksha, a prominent grocery chain by ICICI Ventures to Azim Premji ventures is a clear reflection of the fact that it is possible for an initial investor to keep the late-stage co-investor in the dark regarding critical corporate governance issues in the investee venture (Livemint, 2010).

Table 2 Regression model results for early-stage VC firms

Dependent Variable: Early-stage VC firm = 1; Later Stage VC firm =0				
Number of Observations = 70				
	B Coefficient	Wald X^2 Statistic	P-Value	Exp(β)
Constant	-13.741	8.818	0.003	0.000
Specialization Focus Related Variables				
High-Tech Focus	3.546	7.61	0.006	34.67
Specialization Amount	2.647	5.534	0.009	14.109
Syndication Related Variables				
Percent Non-Syndicated Deals (Indicator variable for > 75% non-syndicated deals	3.230	6.221	0.013	25.279
Control Variables				
Historically Funded Deals	0.113	5.534	0.019	1.120
Successful Exits	-1.042	9.083	0.003	0.353
SEBI Registration	-2.901	5.305	0.021	0.055
Model Statistics				
Nagelkerke R^2	0.760			
Cox and Snell R^2	0.557			
-2 Log-Likelihood	35.364			
Model Chi-Square Statistic	56.996 with 6 d.f., p-value 0.000			
Hosmer-Lemeshow Goodness of Fit	Chi-Square 4.190, p-value 0.840			
Percent pairs correctly classified	91.40%			

Moreover, our qualitative study revealed that in India, co-investment is primarily used as a mechanism to augment the deal size (i.e. when the funding requirements are too large for an individual VC to fund on its own) and not so much to alleviate the information asymmetry risks (Joshi, 2015). Furthermore, the average deal size for early stage VC deals itself is much lower in India as compared to other developed world such as United States - the average size of an early-stage deal is about USD 0.8 Million in India as compared to USD 1.5 Million in the United States (Ernst and Young, 2012). A low deal size reduces the need for syndication. Above all, syndication as a tool of alleviating information asymmetry becomes more relevant when VCs tend to be highly specialized by sectors (Gompers and Lerner, 2004; Barry, 1994). In this context, syndicating with a VC that was specialized in another domain enabled a VC to get access to idiosyncratic knowledge relevant to the new sector. However, the Indian VC funds did not practice sector-specific specialization to start with (since the market for deals lacked the requisite depth). Thus, the lack of sector-specific specialization could probably explain why syndication might not have been very important to early-stage VCs in general. In fact, many

Indian VC firms also believe in strong negative synergies associated with syndication if practiced indiscriminately (Lerner, 1994).

Among the control variables related to the VC firm profile, number of historical Deals and exits turned out to be significant attributes. While the former has a positive coefficient; the latter has a negative one. Typically, the average deal size for the early-stage deals is much smaller thus permitting the VC firms to fund a larger number of small deals. This explains the positive sign on the number of historical deals. However, it must be pointed out that the early-stage VCs have also witnessed a much smaller number of successful exits so far. This could be due to two possible explanations. Firstly, most of the early-stage deals have been executed post 2008 and therefore, the complete investment-to-exit cycle is not yet complete. Secondly, in general, the early-stage businesses have a higher failure rate and thus the number of successful exits is expected to be lower.

Further we also found that the early-stage focused VCs are less likely to be registered with SEBI. It could be possible that given their small fund sizes, they have been started by the pooled funds from promoters themselves. This negates the mandatory requirement of SEBI approval, which primarily applies to the VCs raising funds from outside entities.

2. Foreign versus Domestic VC Firms

The dependent variable is defined as 1 if the ownership type of concerned VC firm is foreign; 0 if it is domestic. It is then modeled as a function of other independent variables - those related to their specialization, syndication and other control variables. The regression equation for this logistic regression model is:

$$\text{Logit } i = \ln(\text{Prob event} / 1 - \text{Prob event}) = \beta 0 + \beta 1 (\text{Domain Specialization Focus}) + \beta 2 (\text{Deal Syndication Intensity}) + \beta 3 (\text{Control Variables})$$

From the P-value corresponding to the model Chi-Square statistic given in Table 3, it can be seen that the model pertaining to the foreign VC firms is highly significant. The Nagelkerke R^2 value is 0.39, while the Cox and Snell R^2 value is 0.28. The Hosmer-Lemeshow goodness of fit is also high for all models indicating the proximity of the actual and predicted values. The proportion of observations correctly classified is 72%. These metrics point to the robustness of the logistic regression model.

Interestingly, Syndication did not emerge as an important strategy used by foreign VC firms operating in India. This is quite contrary to what has been discussed in the literature so far. Previous studies have shown that partnering

with local VCs is a prominently used strategy by the foreign VCs to invest in information opaque early-stage ventures. Typically, domestic and foreign VCs possess different type of skill-sets. While the domestic companies have well-developed regional networks with potential vendors, customers and other significant stakeholders in general; the foreign VCs possess the financial muscle and networks to scale up and grow internationally (Devigne et al., 2013). However, in India the above does not seem to hold true.

Table 3 Regression model results for foreign VC firms

Dependent Variable: Foreign VC firm = 1; Domestic VC firm =0				
Number of Observations = 72				
	B Coefficient	Wald X^2 Statistic	P-Value	Exp(β)
Constant	-2.604	2.225	.136	.074
Specialization Focus Related Variables				
High-Tech Focus	1.310	3.301	.069	3.705
Specialization Amount	.725	2.916	.088	2.065
Early-Stage Focus	-2.524	9.456	0.002	.080
Syndication Related Variables				
Proportion Syndicated Deals	1.149	1.927	.165	3.156
Control Variables				
Historically Funded Deals	.005	.089	.765	1.005
SEBI Registration	-2.245	9.538	.002	.106
Model Statistics				
Nagelkerke R^2	0.391			
Cox and Snell R^2	0.289			
-2 Log-Likelihood	70.343			
Model Chi-Square Statistic	23.879 with 6 d.f., p-value 0.000			
Hosmer-Lemeshow Goodness of Fit	Chi-Square 8.583, p-value 0.379			
Percent pairs correctly classified	72%			

Hence, it becomes important to answer the question regarding how the foreign VCs cope with the information asymmetry issues in the presence of low syndication. This is possible in two ways. First, they hire professionals of Indian origin who have a better connect with the local culture and have a better understanding of the socio-political structures. Such professionals are either transferred to India from their US offices or hired from other competitor VCs in India. In fact, the foreign VCs in India have long been known to hire their senior professionals from their Indian counterparts (Dossani and Kenney, 2002). One of the first foreign VCs to invest in India viz. Draper International hired a top executive (Kiran Nadkarni) from ICICI Ventures (the first VC firm in India) to head its India operations. Hiring experienced local VC professionals from competitors enables foreign VCs to piggy back on the

networks of the former. Secondly, the foreign VCs are known to establish offices at multiple locations in India. India being a large country, there exists a significant diversity among the local cultures itself. The foreign VCs tend to absorb professionals that are local to each of these destinations. Establishing multiple offices also enables them to be geographically close to the investee, which facilitates monitoring and reduces the impact of agency risks.

Among the specialization related variables, we find that the foreign VCs tend to specialize by funding amounts and high-technology focus, but not necessarily by stage. Historically, foreign VCs have invested in technology-focused firms in their parent countries. The learning-curve effects arising from the same can directly be applied to the new geography by just slightly tweaking the delivery models. E.g. Flipkart, one of the top VC funded e-commerce company in India introduced the 'cash-on-delivery' model to suit the local situation, wherein a majority of people either do not possess electronic cards or the ones possessing the same are hesitant to use them for online payments. Thus, it should not be surprising if the foreign VCs are focused on investing in high-tech ventures. Although, they have relatively larger fund-sizes as compared to their local counterparts, there exists a strong need for them to diversify in order to reduce the element of systematic risks. This could possibly be the reason for the foreign VCs to specialize by funding amounts.

It was further observed that foreign VCs consciously stayed away from early-stage deals; rather they tend to specialize in growth/late stage deals. The proportion of VC firms with an early-stage focus was just 25% among the foreign VCs whereas the same was about 45% among the domestic VCs. It is well understood that foreign VCs prefer investing in information transparent ventures (Dai et al., 2012; Joshi and Bala Subrahmanya, 2015). Early stage ventures particularly in the technology domains have a huge level of information asymmetry associated with them, consequently adding an additional layer of risks. Handling these risks warrants a deep understanding of local conditions. Since such abilities of the foreign VCs are likely to be quite limited they stay away from such ventures. Also, the early-stage companies require a much higher level of involvement on the part of VCs (Gupta and Sapienza, 1992). The domestic VCs are better positioned to assist the early-stage businesses by providing contacts to relevant external parties for soliciting feedback on critical processes and critically reassessing initial ideas based on this feedback (Devigne et al., 2013). Thus, in general, the local VCs are more likely to possess the skill sets required for investing in and managing the early-stage ventures; and therefore, investments in such ventures are usually considered a prerogative of the domestic VCs. To sum up, the foreign VCs seem to be focused on investing in high technology ventures during the scaling -up phase. Our qualitative interviews supported well this fact wherein the

foreign VCs were unwilling to incur the risks of being a 'first-mover' in any domain. They preferred to enter much later, and dominate the market by the induction of capital. A senior executive at one of the foreign VCs that has funded a prominent e-commerce grocery chain in India, clearly mentioned that their forte lied in the scale-up stage and they would wait for the relevant businesses to move up to this phase and then push out the competitors by pumping in large amounts of capital in these chosen companies.

Among the control variables, we find that the foreign VCs are unlikely to be registered with SEBI. They are often seen to bypass this route and invest in India via the automatic approval route of the Reserve Bank of India subject to foreign Direct Investment regulations. Bypassing SEBI registration possibly confers on them greater flexibility in terms of the diversification of their investments. SEBI has laid down strict rules regarding the proportion of funds to be invested by the registered VCs in businesses that belong to the same parent entity and so on (SEBI, 2006).

3. 'Entrepreneurial' versus 'Investor' Dominated Top Management Teams of VC Firms

The dependent variable is defined as 1 if the VC firms' top management team has an erstwhile entrepreneur on board; the VC firm with TMT professionals' possessing only investment but no entrepreneurial experience is defined as 0. It is then modeled as a function of other independent variables – those related to their specialization, syndication and other control variables. The regression equation for this logistic regression model is:

$$\text{Logit } i = \ln(\text{Prob event} / 1 - \text{Prob event})$$
$$= \beta 0 + \beta 1 (\text{Domain Specialization Focus}) + \beta 2 (\text{Deal Syndication Intensity}) + \beta 3 (\text{Control Variables})$$

We built two separate models here. Owing to multicollinearity, all variables could not be accommodated within the same model. From the P-value corresponding to the model Chi-Square statistic given in Table 4, it can be seen that the model pertaining to the entrepreneurial VC firms is highly significant. The Nagelkerke R^2 values are 0.56 and 0.31, while the Cox and Snell R^2 value are 0.38 and 0.21. The Hosmer-Lemeshow goodness of fit is also high for both models indicating the proximity of the actual and predicted values. The proportions of observations correctly classified are 87% and 80%. These metrics point to the robustness of the logistic regression models.

Table 4 Regression model results for entrepreneurial VC firms

Dependent Variable: Entrepreneurial VC firm = 1; Investor VC firm =0								
Number of Observations = 72								
Model Variables	Model 1				Model 2			
	β Coeff	Wald X^2 Statistic	P-Value	Exp (β)	β Coeff	Wald X^2 Statistic	P-Value	Exp (β)
Constant	0.796	.949	.330	2.217	-2.358	6.251	.012	.095
Specialization Focus Related Variables								
Early-Stage Focus					1.707	5.438	.020	5.510
High-Tech Focus	.895	1.236	.266	2.447				
Geographic Location Bangalore	1.678	3.288	.070	5.355	1.799	4.171	.041	6.042
Geographic Location Mumbai					1.140	1.601	.206	3.127
Syndication Related Variables								
Proportion Syndicated Deals*	3.348	4.988	.026	28.434				
Control Variables								
Age of the VC firm	-.442	7.618	.006	.643				
Foreign VC firm					-.288	.176	.675	.750
Corporate VC firm	-3.131	4.547	.033	.044	-2.675	5.169	.023	.069
SEBI Registered	-2.240	5.389	.020	.088				
Model Statistics								
Nagelkerke R^2	0.556				0.312			
Cox and Snell R^2	0.378				0.213			
-2 Log-Likelihood	46.528				63.079			
Model Chi-Square Statistic	33.279 with 6 d.f., p-value 0.000				16.728 with 6 d.f., p-value 0.005			
Hosmer-Lemeshow Goodness of Fit	Chi-Square 29.893, p-value 0.000				Chi-Square 7.023, p-value 0.534			
Percent pairs correctly classified	87%				80%			

* To assess the impact of syndication, we created an indicator variable for percentage of sole deals between 30% and 45%. This corresponds to percent syndicated deals between 55% and 71%

Coming to the discussion pertaining to the model variables in particular, it can be seen that Specialization emerges as an important signal for the VCs with prior founding background. The VCs in this category are seen to specialize through funding stage, domain and geography. The variables high-technology focus and early-stage focus both have positive signs. Although, the variable on high-technology focus is not significant in the model per se, from the statistics presented in Table 1, it may be seen that this is an important differentiator between 'entrepreneurial' and 'investor' VCs. While the proportion of deals with high-technology focus is 56% for the former, it is just 33% for the latter. Our primary data study revealed that in fact a large proportion of these VC firms have been founded by erstwhile technology entrepreneurs, who have also been successful angel investors in the past (Joshi,

2015). This possibly could be the reason for the high-technology focus in their investments. Investing in early-stage ventures is an attractive proposition since it is possible to buy a large equity of these businesses at that stage at substantially lower rates and consequently make substantial profits on exit (Patzelt et al., 2009). Of course, the uncertainties associated with early-stage ventures are also quite high owing to the presence of agency problems and technology risks (Wright and Robbie, 1998). However, the past founding experience of these VCs better equips them to handle such risks as compared to the other VCs with no such commensurate experience (Zarutskie, 2010).

The entrepreneurial VC firms are also highly focused on Bangalore. Also, almost 95% of their deals are located in Bangalore itself. Bangalore being the start-up hub of India and co-location with the other components of the ecosystem possibly facilitates their access to resources. Since the quantum of their own resources is often much smaller (owing to smaller fund sizes and team sizes), geographic specialization becomes critical. This can also help them alleviate the quantum of agency risks, by facilitating closer monitoring.

The relationship with respect to Syndication is quite interesting. The VCs with prior entrepreneurial experience engage in only moderate syndication i.e. not too high or too low. About, 29% to 43% of their deals are non-syndicated (implying that about 57% to 71% of their deals are of syndicated nature). The reason for the same is two-fold. The fund size of most of such VCs is likely to be quite small as these are mainly early-stage investors and also a large section of such funds may be non-pooled in nature. Thus, there exists a need to co-invest with other VCs in order to augment the deal size. However, they consciously avoid over-syndication since that can potentially reduce their control over the investee companies. Since, the niche investing and portfolio management skills of such founder-backed VCs are quite important to the overall success of the venture, they consciously avoid over-syndication for the purpose of maintaining their control over the investee firm.

Among the VC profile-related variables, age of the VC firm is significant and has a negative sign. This implies that the VCs in this category are much younger in terms of their years of operations in India as compared to their other counterparts. This again is an intuitive finding as it is a well-known fact that such VC professionals with prior founding background are essentially the ones who have been successful entrepreneurs in the US and have migrated back from there during the latter part of the last decade (Madhavan and Iriyama, 2009; Saxenian, 2010). Since, this is a relatively recent phenomenon, most entrepreneurial VCs are much younger in terms of their years of operations. Given that most of these VCs operate with their own pool of funds, they are less likely to be SEBI-registered and much less likely to be offshoots of other larger corporate entities.

VI. Summary, Conclusions and Policy Implications

This paper examines in detail the usage of two principal risk management strategies viz. syndication and domain specialization for diverse categories of VCs in India. In particular, we evaluate the usage of these strategies for three distinct VC segments - one, based on their investment stage focus viz. early vs. late stage focused VCs; two, based on their ownership type viz. foreign vs. domestic VCs and three, based on the composition of their top management teams viz. with erstwhile entrepreneurs vs. those with erstwhile investors. Our findings reveal significant variations in the deployment of these investment strategies across VC segments. To start with, as a sharp contrast to what has been noted in the conventional literature, we find that early-stage focused and foreign VCs do not rely on syndication as their principal risk management strategy. Only the entrepreneurial VCs use syndication but that too in moderation. On the contrary, despite the low market depth for viable deals in India, domain specialization is intensely pursued as a risk management strategy. The main areas of specialization are high-tech domain focus and funding size focus. The foreign VCs exhibit a growth-stage focus, while the entrepreneurial VCs exhibit an early-stage focus. Additionally, the latter also exhibit a strong geographical focus with over 90% of their funded deals concentrated in and around Bangalore.

Our study makes important contributions to the existing literature in the VC investment strategy domains of syndication and specialization. To start with, the issue of how the same set of strategies is used diversely by the distinct VC firm segments operating in the same geography and over the same time-period has not been studied previously. Such a study makes mutual comparisons among the same relevant and possible. Moreover, the relationship between the top management team composition and syndication intensity has not been studied so far. This study throws some light on the same. The fact regarding negative synergies associated with syndication has been explored only to a limited extent earlier. This study delves into the same. While there have been several studies that consider specific aspects of specialization, this is among the first studies to review the same in its entirety. Finally, this is the first mixed methods-based study to jointly investigate the risk management strategies of syndication and domain specialization in the Indian context in recent times.

This study has several important policy implications. We find that across all segments, VCs exhibit a high-tech focus in their investments. Facilitating the establishment of technology business incubators (TBIs) with appropriate arenas of specialization could be the first viable step for promoting high-tech investments. It is well known that although multiple TBIs are present in India, only a handful of them are truly functional (Centre for Internet and Society,

2017). Moreover, the companies incubated from highly successful TBIs, face significant hurdles on graduation, especially in terms of follow-up mentorship, bureaucratic red tape, and follow-on funding. This can have a detrimental impact on the start-up success rate and thus requires urgent attention.

We also find that a majority of foreign VCs do not come under the purview of SEBI, which is the central regulatory authority of the VC industry in India. In fact, most of the foreign VC funds bypass the SEBI registration route and invest in India via the foreign direct investment route (with approvals from foreign investment promotion board and reserve bank of India) and the Mauritius Registry route (by routing their funds via registering their business entity in Mauritius to take advantage of the Double Taxation Avoidance Treaty). This becomes particularly important since more than 90% of the VC funds invested in India are raised overseas. Although, SEBI registration confers several advantages (in the form of tax pass-through, share pricing and lock-in period of IPO), the foreign funds still see distinct advantages in circumventing this route (Agarwal, 2011). It is important to probe the underlying reasons for this, since given the growing influence of foreign funds it is not desirable that a majority of them fall outside the ambit of the regulatory authority.

Further, we found that despite their high-tech focus, the majority of foreign VCs were not really interested in investing in innovative domains or being the 'first-movers' in the technology space. They were rather more inclined to implement tried and tested business models from overseas (such as e-commerce or cab aggregators) by adapting them to Indian markets. The investigations based on qualitative data revealed that the foreign VCs find the Indian IP system difficult to maneuver and there is a perception that getting licenses for anything innovative necessarily involves encountering significant red-tape and bureaucracy. On the contrary, the entrepreneurial VCs are found to be inclined in addressing the local problems via innovative technology solutions. However, these VCs are often fund-constrained. It is here that having a seed-fund based on the 'fund-of-funds' approach will be viable. While a start has been made in this regard under the aegis of the 'start-up India' campaign of the government of India, a lot of ground still needs to be covered.

There could be many possible extensions of this study. The unit of analysis for this study is the individual VC fund. However, using funded deals as the analysis unit is likely to add further granularity to this investigation. Interesting dynamics about each deal can be unraveled if we could sequentially study the multiple funding stages for each deal. Although, we have studied the investment strategies of VCs, we have not linked the same to their financial performance at large. Studying the impact of syndication and specialization on the financial returns for VCs could be an interesting proposition. In this study, we have probed three principal segments of VCs - early vs. late stage focus,

foreign vs. domestic VC firms and entrepreneurial vs. investor VCs. However, there is a great scope to expand the coverage to include more segments such as corporate VC firms or those focused on investment in social sectors in particular. Given the thrust provided by SEBI to impact investment, under its Alternative Investment Guidelines in 2013, it can be an important area for future study.

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