The Propensity of a Tech Startup to approach a Financial Source: An Analysis of its Determinants over the Lifecycle.

Shivalik Singh
Senior Research Fellow, Indian Institute of Science, Bangalore, India
Department of Management Studies
shivaliks@iisc.ac.in

M H Bala Subrahmanya
Professor, Indian Institute of Science, Bangalore, India
Department of Management Studies
bala@iisc.ac.in

Abstract

Approaching and accessing appropriate sources of finance are among the significant challenges for a tech startup throughout its lifecycle. However, entrepreneurial finance literature lacks clarity on the factors driving a tech startup to access a particular source of finance. This study contributes to the entrepreneurial finance literature by ascertaining the factors leading a tech startup to approach a financial source and investigating how these factors vary over its lifecycle. Binary logistic regression algorithm was employed to analyse the research objective on the primary and secondary data collected from 93 tech startups in Bangalore. Our results indicate that a tech startup's choice for a financial source varies with its financial requirements. We identified three significant natures of financial requirements: Human Capital (HC), Research Capital (RC), and Social Capital (SC). Of these three, the financial requirement to acquire RC is financed by most investors, including both early stage investors (Business Angel (BA)) and growth stage investors: Corporate Venture Capital (CVC) and Private Equity (PE) firm. However, the requirement to acquire HC and SC predominantly lead a startup to approach a Venture Capital (VC) firm.

Keywords

Entrepreneurial finance; Tech-Startups; Lifecycle stages; Financial requirements; Financial sources.

1 Introduction

The significance of financial capital for emergence, survival and growth of a new entrepreneurial venture has been widely acknowledged by researchers, practitioners and policy makers worldwide (Bala Subrahmanya, 2017; Bellavitis, Filatotchev, Kamuriwo, & Vanacker, 2017; Denis, 2004; Frid, 2014). However, these entrepreneurial ventures, particularly innovative tech startups, are usually financially constrained to meet their various financial requirements throughout their lifecycle (Fraser, Bhaumik, & Wright, 2015; Gilbert, McDougall, & Audretsch, 2006; Ho & Wong, 2007; Manigart & Struyf, 1997). This compels them to approach and access the external sources of finance to meet the resource requirements. The existing literature presents various studies on the individual financiers and investors, including BAs, VCs, PEs, CVCs, Banks, among others (Ding, Sun, & Au, 2014; Gompers, 1995; Gompers, Kaplan, & Mukharlyamov, 2016; Gompers, Kovner, Lerner, & Scharfstein, 2008; Schmidt, 2003; Shane, 2012). Yet, there is a lack of empirical studies that comprehensively studies various financial sources available for a tech startup at different stages in its lifecycle.

Further, these innovative tech startups' financial requirements are heterogeneous and thus, the preference to sources of finance of each startup would be different (Alvarez & Busenitz, 2001; Barney & Alvarez, 2017). However, the extant literature lacks the understanding of how the variations in financial requirements would impact a tech startup's choice to approach a particular external financial source. This study addresses this gap in

the literature and investigates the influence of financial requirements of a tech startup on its choice to approach and access a financial source over its lifecycle.

This paper has been organized to contain five sections. Section 2 presents a literature review on the importance of resources acquisition for a tech startup and the financial sources available to fund these resource requirements and bring out the gaps in the literature. Section 3 includes the research objective, scope, data source, and sampling. Section 4 presents the methodology and results. Section 5 presents the conclusion and implications derived from our study.

1.1 Objective

The research objective of the current is to investigate the factors influencing a tech startup's propensity to access a particular financial source over its lifecycle. Our results indicate that a tech startup's choice for a financial source varies with its financial requirements. These financial requirements primarily include HC, RC and SC.

2 Literature Review

The Resource Based View (RBV) theory interprets a firm as a "bundle of resources" which are heterogeneous and signifies the cruciality of these resources for the firm's performance and sustainable competitive advantage (Alvarez & Busenitz, 2001; Barney & Alvarez, 2017). In order to achieve sustainable competitive advantage a firm has to acquire resources that are not easily imitable and substitutable by those acquired by the competitors (Alvarez & Busenitz, 2001; Barney, 1991; Barney, Wright, & Ketchen, 2001; Ireland, Hitt, & Sirmon, 2003). Thus, a tech startup should possess continuous access to the necessary heterogeneous resources in order to persistently innovate and develop new products and technologies throughout its lifecycle and hence, gain a sustainable competitive advantage (Kor & Mahoney, 2004).

Primarily, these essential resources comprise Human Capital (HC), involving the acquisition of a skilled, qualified and experienced team for performing R&D and innovation in a tech startup (Mike, Hmieleski, Siegel, & Michael D. Ensley, 2007; Seghers, Manigart, & Vanacker, 2012). The quality of HC remains one of the most crucial factors for a tech startup in gaining sustainable competitive advantage throughout a tech startup's lifecycle (Florin et al., 2003; Pfeffer, 1994; Unger, Rauch, Frese, & Rosenbusch, 2011). This is attributed to the significance of a quality HC in successfully and persistently developing innovative products and technologies throughout its lifecycle. (Ireland et al., 2003). In addition, the existing literature on entrepreneurship positively associates the performance of a startup with the attributes of its HC (Bosma, Van Praag, Thurik, & De Wit, 2004; Mike et al., 2007; Seghers et al., 2012; Unger et al., 2011).

Besides HC, Research Capital (RC) including the resources essential to perform R&D and innovation, plays a crucial role for a tech startup in achieving sustainable growth and competitive advantage throughout its lifecycle (Baldwin & Gellatly, 2003; McKelvie & Davidsson, 2009; Stam & Wennberg, 2009; WU, SI, & WU, 2016). The extant literature on entrepreneurship indicates a positive association of a startup's RC acquisition to its growth and financial performance due to its contribution to the innovation of products and technologies, further accelerating its growth (Kelley & Nakosteen, 2005; Stam & Wennberg, 2009). Moreover, previous studies imply that innovation and development of new products and technologies are the most appropriate indicator of success for a tech startup (Geroski & Machin, 1992; Ireland et al., 2003; Mike et al., 2007). Hence, the acquisition of RC is inevitable for a tech startup across different stages in its lifecycle.

In addition to HC and RC, Social Capital (SC) of a startup involving its networks or alliances with customers, partners and suppliers, plays a significant role in achieving growth and competitive advantage throughout its lifecycle (Brush, Greene, & Hart, 2002). The existing studies on entrepreneurship assert the importance of a startup's SC in acquiring necessary resources which further leads to sustainable growth and competitive advantage. Therefore, various studies have positively associated a startup's SC with its financial performance at different stages in its lifecycle (Baum, Calabrese, & Silverman, 2000; Bosma et al., 2004; Davidsson & Honig, 2003; Hahn, 2017).

The significance of HC, RC and SC compels a tech startup to acquire them at each stage in its lifecycle for achieving sustainable growth and competitive advantage. However, previous studies suggest that most tech startups lack the financial adequacy for the acquisition of these resources (Fraser et al., 2015; Gilbert et al., 2006; Ho & Wong, 2007). This leads a startup to approach external financiers and investors to fund their resource requirements at each stage in its lifecycle. However, raising external capital is one of the major obstacles for a startup owing to the various uncertainties related to untested product or technology and underdeveloped market (Bala Subrahmanya, 2015; Cassar, 2004; Feeney, Haines, & Riding, 1999; Maxwell, Jeffrey, & Lévesque, 2011). Thus, a tech startup seeks to raise finance from investors whose niche is to make high risk investments in innovative entrepreneurial ventures. Also, each startup's heterogenous financial requirements may drive its choice of external sources at each stage in its life cycle.

At the early stage, attributing to the uncertainties and information asymmetry, the external financial sources available to a tech startup is limited to informal sources, primarily BAs (Cassar, 2004; Denis, 2004). A BA is usually an individual with high net worth with previous entrepreneurial experience and who informally invest financial capital in a startup at its early stage without any intermediation through debt or equity or both (Denis, 2004; Kerr, Lerner, & Schoar, 2014). Extant literature suggests that the basis of BA investment is usually personal relationship with the founders or startup's information which is in close geographical proximity (Duxbury, Haines, & Riding, 1996; Sudek, 2006; Denis, 2004; Nofsinger & Wang, 2011; Prowse, 1998). Besides financial infusion, BAs impact a startup's critical operations and strategies with their expertise, networks and experience as entrepreneurs (Čalopa, Horvat, & Lalic, 2014; Shane, 2012). In addition, the prevalence of a BA in a startup sends positive signals to the other external investors about the future prospects of the company investors (Maxwell et al., 2011). Post BA funding, to gain further growth, a startup has to approach other formal financial sources as BAs usually do not go for follow on funding rounds owing to limited fund size for further growth (Kim and Wagman, 2016).

At the growth stage of a startup's lifecycle, the quantum of financial requirements to acquire necessary resources increases as it experiences expansion and scaling up (Čalopa et al., 2014; Marmer & Bjoern, 2011). At this stage, a tech startup primarily approaches VCs as they invest in much larger quantum than BAs (Bertoni, Colombo, & Grilli, 2011; Čalopa et al., 2014; Davila, Foster, & Gupta, 2003; Denis, 2004; Gompers et al., 2008). VCs are financial intermediaries between investors (limited partners) and startups and specialise in building an investment portfolio of innovative startups (Davila et al., 2003; De Bettignies & Brander, 2007; Denis, 2004; Gartner, Frid, & Alexander, 2012). Besides financial infusion, VCs acquire certain equity in an investee startup and depending on the size of equity, they seek to be a part of the company's board (De Bettignies & Brander, 2007; Gompers, 1997; Schmidt, 2003). Furthermore, VCs acquire a part of the ownership as equity in the company, apart from capital infusion (De Bettignies & Brander, 2007; Gompers, 1997).

Besides VCs, another category of institutional investors available for tech startups at the growth stage is Corporate Venture Capital (CVC), an investment arm of a large parent corporation that invests in similar business domains. CVC investment's primary purpose is to explore innovative opportunities with new independent tech startups (Benson & Ziedonis, 2009; Elisa & Dushnitsky, 2016; Gompers & Lerner, 2000; J. Y. (Rose) Kim & Park, 2017). Besides financial capital, CVCs offer a startup continuous access to RC in order to stimulate R&D and innovation related activities which act as an impetus for growth (Dushnitsky & Lenox, 2005; Gompers & Lerner, 2000; Maula, Autio, & Murray, 2005; Napp & Minshall, 2011). As a result, previous studies relate the prevalence of CVC in a startup to a higher innovation rate in terms of patents (Elisa & Dushnitsky, 2016; Gompers & Lerner, 2000; J. Y. (Rose) Kim & Park, 2017).

At the growth stage a tech startup has access to debt investors as well, primarily Banks attributing to a certain track record mitigating the uncertainties (Cassar, 2004; Cosh, Cumming, & Hughes, 2009; De Bettignies & Brander, 2007; Gartner et al., 2012). Debt financing through banks allows the founders to maintain full ownership and sends positive signals to other investors for further funding rounds (Cole and Sokolyk, 2017; Cosh et al., 2009; Hechavarría, Matthews, and Reynolds, 2016).

The next step for a startup after it achieves growth and stability in its financial performance is M&A or IPO, which is considered to be a successful exit. VCs usually exit at this stage and as a result, a startup approaches primarily PEs as they invest in already established entrepreneurial ventures with a stable financial performance (Gompers et al., 2016; Kaplan & Schoar, 2005; Wright, Gilligan, & Amess, 2009; Wright, Pruthi, Amess, & Alperovych, 2019).

After reviewing the literature on the significance of resource acquisition on the survival and growth of a tech startup and various financial sources available to fund these resources, it is evident that the extant literature lacks empirical studies on how the financial requirements of a tech startup influence its propensity to approach and access a financial source over its lifecycle. Further, there is a dearth of empirical studies exploring how the nature and quantum of financial requirements of a tech startup influence its choice of financial sources to fund the requirements in the context of an emerging economy. This study addresses these gaps in the context of an emerging economy i.e., India.

Based on the review of the literature and key gaps in the literature, we propose the following hypothesis:

H1:*The propensity of a tech startup to approach and access a financial source varies with its financial requirements.*

3 Methods

The various natures of the financial requirement for a tech startup were captured through a five point Likert scale as each of these variables has certain items presented in Table 1.

Table 1: Types of financial requirements

Variables for types of financial requirements	Nature of variables	Literature
Skill/knowledge of employees	Scale	(Čalopa et al., 2014; Marmer and Bjoern, 2011)
Education of employees	Scale	(Marmer and Bjoern, 2011)
Experience of employees	Scale	(Marmer and Bjoern, 2011)
Patent related expenditure	Scale	(Gartner et al., 2012; Hall & Alastair, 2009)
Networking	Scale	(Baum et al., 2000)
Marketing	Scale	(Baum et al., 2000)
R&D	Scale	(Gartner et al., 2012)

After presenting variables for natures of financial requirement, it is necessary to check the bivariate correlation among the items to avoid multidimensionality. Since, the analysis indicates a significant correlation between certain pairs we performed Exploratory Factor Analysis (EFA) to segregate these variables into different factors for dimensional reduction.

Next, in order to investigate the influence of a tech startup's financial requirements on its choice of financial sources, binary logistic regression analysis was carried out for each of the five sources. In each of the five models, the dependent variable takes the value 1 if the concerned financial source has funded a startup at the current stage and 0 if not. The independent variables across the models are the factor scores derived from the EFA viz. HC, RC and SC, along with the total quantum of financial requirements and lifecycle stage as a control variable.

Before proceeding further, it is necessary to define a tech startup's lifecycle stages, since we aim to explore a startup's propensity to choose a financial source at each stage in its life cycle. Among the various metrics available for a firm such as revenue, net worth, investments, age, intellectual property, etc., in the context of startups, age and revenue are more relevant (Singh & Bala Subrahmanya, 2020). Thus, as per the distribution of our data based on age and revenue (as of 2019), we segregated the lifecycle stages of a tech startup into three stages. However, we do not make any proposition regarding the stages being sequential in nature for a startup.

Early stage: Age <=4 years and Revenue <= Rs.50million (INR)
Survival stage: Age >4 years and Revenue < Rs.50million (INR)
Growth stage: Age >4 years OR Age <=4 years and Revenue > Rs.50million (INR).

4 Data Collection

4.1 Scope and Sampling

The study is confined to technology intensive startups which are operating in Bangalore. Bangalore was chosen for this study as it is the startup hub of India with the largest cluster of innovative tech startups in India (Startup Genome, 2019). Bangalore has been consistently ranked in the top 20 ecosystems in the world for the last five years. In addition, Bangalore has the largest cluster of investors who invest in tech startups in India (Global Startup Ecosystem Report, 2018; 2017). In Bangalore, our study is restricted to the technology intensive companies which fall under the DPIIT's definition of a startup. This includes a private limited company having age less than 10 years with a turnover not exceeding Rs.1 billion in any financial year since incorporation (DPIIT, 2019).

4.2 Data Collection

In this study, both primary and secondary data were collected. The secondary data source is the private company data audited and filed in the MCA which was followed by the subsequent collection of primary data. Primary data were collected from the sampled startups under study through a semi-structured questionnaire and in-depth interviews with the founders/CEOs of these startups.

5 Results and Discussion

5.1 Numerical Results

5.1.1 Assessment of Multidimensionality using Factor Analysis.

In order to assess the sampling adequacy and the relationship strength among the variables, Kaeser Meyer Olkin (KMO) and Bartlett's sphericity tests were performed. Further, the reliability of scale was analysed using Normed Fit Index (NFI) which assesses the internal consistency of the scale. Table 2 presents the results of these tests and it is evident that they have crossed the threshold and thus, further analysis can be performed.

Table 2: Sampling adequacy and reliability analysis

Kaiser-Meyer-Olkin Measure (KMO)	0.71
Bartlett's Test of Sphericity	p-value = 1.0836e-08; $\chi^2 \sim 91$
Normed Fit Index (NFI)	0.954

Further, we employed Principal Component Analysis (PCA) to obtain a linear combination of variables (principal factors) that are not correlated from the available set of variables based on Eigen values (> 1) and the scree plot presented in Figure 1.

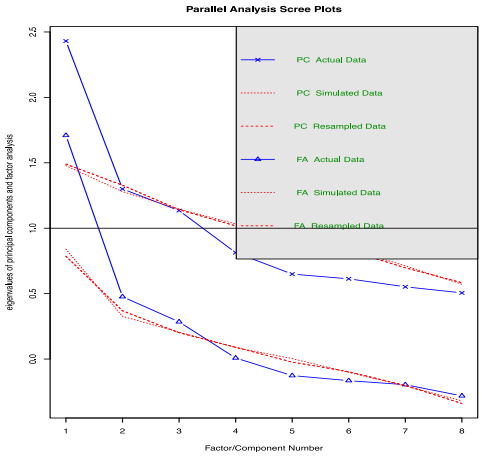

Figure 1: Scree plot

We obtained three factors from the PCA, the variables skill, education and experience of the employees constitute one factor, named as HC, R&D and patent formed one factor as RC and lastly, extent of financial requirement for marketing and networking included as one factor, named as SC. The results are presented in Table 3.

Table 3: Results of EFA

Nature of financial requirements	Factor 1 HC	Factor 2 RC	Factor 3 SC	Communality
Skill	0.509			0.31
Education	0.626			0.46
Experience	0.689			0.53
R&D		0.611		0.38
Patents		0.594		0.45
Marketing			0.433	0.29
Networking			0.601	0.38
SS loadings (Eigen values)	1.245	1.272	1.025	

% cumulative variance	15.7	30.2	38.2	

Lastly, in the factor analysis, we obtained factor scores for each of the factors using the regression method.

5.1.2 Binary Logistic Regression analysis to ascertain a startup's propensity towards a financial source.

Table 4 presents the results of Model 1with dependent variable involving funding from a BA. The model statistics indicate that the results are adequately robust.

Table 4: Logistic Regression results for Model 1

Model 1: Dependent variable: BA financing (Financed by BA=1, Not financed by BA=0)					
Column1	**Term**	**Estimate**	**Std. error**	**Statistic**	**P.value**
1	(Intercept)	1.5948	0.4837	3.2965	0.0008***
2	HC	-0.5796	0.2791	-2.07386	0.038**
3	RC	0.51272	0.2850	1.79796	0.072*
4	SC	0.03088	0.2708	0.11269	0.901
5	Quantum	-0.0015	0.00082	-1.7084	0.065*
6	Growth Stage	-2.2674	0.8052	-2.8114	0.0047***
7	Survival Stage	0.0594	0.6184	0.0961	0.924
Model Statistics					
-2 log likelihood			86.5226		
Cox and Snell's R^2			0.3615003		
Nagelkerke R^2			0.4540673		
Model Chi-Square Statistic			41.277 with 6 degrees of freedom		
Hosmer – Lemeshow Goodness of Fit Statistic			0.3674		
% Correctly Classified			78.45%		

***p<0.01; **p<0.05; *p<0.1

The results from Model 1 depict a negative significant relationship between HC and funding from BA. This could be attributed to the fact that a BA's expertise lies in enabling a startup in taking off by infusing seed financial capital at its early stage when the extent of requirement for HC is low (Denis, 2004; J. H. Kim & Wagman, 2016; Shane, 2012; Wong, 2002). However, when a startup achieves growth and expands its operations the financial requirement for HC increases which leads a startup to approach a larger fund. Hence, the HC requirement is negatively related to BA funding.

Moreover, the results suggest a positive significant relationship between RC requirement and BA funding. This is because R&D and innovation of new products or technologies are regarded as one of the major financial requirements right from the emergence of a tech startup in order to gain sustainable competitive advantage. Since the available external source for a tech startup is limited to BA at the early stage, the financial requirement for the acquisition of RC is funded primarily by BA (Deffains-Crapsky & Peter G. Klein, 2016; Parhankangas & Ehrlich, 2014; Wonglimpiyarat, 2009).

Moreover, the quantum of the financial requirement for a tech startup is negative associated with BA funding. This is in line with the extant literature inferring that a startup usually approaches a BA in its early stage when the quantum of financial requirements is relatively low and resorts to formal investors with the larger fund as the requirements increases owing to smaller funding size of BA (Denis, 2004; J. H. Kim & Wagman, 2016; Shane, 2012).

Further, the results from Model 1 indicate that the control variable lifecycle stage significantly influences BA funding. The results show that an early stage startup is more likely to obtain funds from a BA than a growth stage startup. This reaffirms previous studies' findings that BAs are early stage investors who primarily invest seed

capital to facilitate an early stage startup in taking off (Croce, Guerini, & Ughetto, 2018; J. H. Kim & Wagman, 2016).

Next, we draw our attention to the results from Model 2 presented in Table 5 with VC funding as the dependent variable. The model statistics suggest that the results are adequately robust.

Table 5: Logistic Regression results for Model 2

Model 2: Dependent variable: VC financing (Financed by VC=1, Not financed by VC=0)					
Column1	**Term**	**Estimate**	**Std. error**	**Statistic**	**P.value**
1	(Intercept)	-1.097	0.4769	-2.296	0.0216**
2	HC	0.6350	0.2987	2.163	0.0305**
3	RC	-0.3767	0.2421	-1.324	0.1836
4	SC	0.777	0.3497	2.251	0.0243**
5	Quantum	0.00352	0.00121	2.694	0.009***
6	Growth Stage	1.9104	0.9607	1.986	0.0475**
7	Survival Stage	-0.0766	0.5843	-0.131	0.8956
Model Statistics					
-2 log likelihood			81.10162		
Cox and Snell's R^2			0.37811		
Nagelkerke R^2			0.52196		
Model Chi-Square Statistic			46.951 with 6 degrees of freedom		
Hosmer – Lemeshow Goodness of Fit Statistic			0.7439		
% Correctly Classified			82.72043%		

***p<0.01; **p<0.05; *p<0.1

The results signify a positive significant influence of HC requirement on VC funding. This is because the cruciality of HC in innovation leads a tech startup to invest large quantum in attracting and hiring quality HC and as a result it approaches a VC who enable it to identify and acquire quality HC, besides financial infusion (Chemmanur, Krishnan, & Nandy, 2011; Davila et al., 2003; Fraser et al., 2015; Vanacker, Collewaert, & Paeleman, 2013).

Further, the results imply a positive significant relationship between SC requirement and VC funding. This is because, besides investing financial capital, VCs impart value adding services including access to their social ties and networks with suppliers, partners and target customer in the market (Chemmanur et al., 2011; Cyr, Johnson, & Welbourne, 2000; Fraser et al., 2015; Gorman & Sahlman, 1989; Vanacker et al., 2013). This leads a startup to approach VC as the extent of financial requirement to acquire SC increases.

In addition, the quantum of financial requirement is significantly related to VC funding positively. This is because VCs are institutional investors with a large pool of financial capital raised from high net worth individuals, and thus, as a startup requires a large quantum of finance it is more likely to approach a VC (Bertoni et al., 2011; Čalopa et al., 2014; Denis, 2004)

The control variable lifecycle stage of a startup has a significant influence on whether it obtains finance from a VC. A growth stage startup is more likely to access VC funding as compared to an early stage startup. This is in line with the extant literature on entrepreneurial finance as VCs are growth stage investors (Denis, 2004; Nofsinger & Wang, 2011).

Drawing attention to the results from Model 3 presented in Table 6 with the dependent variable as CVC funding, it is evident from the model statistics that that model results are adequately robust.

Table 6: Logistic Regression results for Model 3

Model 3: Dependent variable: CVC funding (Financed by CVC =1, Not financed by CVC =0)

Column1	Term	Estimate	Std. error	Statistic	P.value
1	(Intercept)	-0.9788	0.409	-2.389	0.0168**
2	HC	0.055967	0.23652	0.2232	0.8189
3	RC	0.49946	0.2483	2.0345	0.0423**
4	SC	0.07823	0.2448	0.3216	0.7481
5	Quantum	-0.00019	0.00041	-0.386	0.6967
6	Growth Stage	1.09837	0.6469	1.6158	0.0899*
7	Survival Stage	0.1957	0.5528	0.3527	0.7231
Model Statistics					
-2 log likelihood			110.28246		
Cox and Snell's R^2			0.1758		
Nagelkerke R^2			0.3269		
Model Chi-Square Statistic			10.951 with 6 degrees of freedom		
Hosmer – Lemeshow Goodness of Fit Statistic			0.8214		
% Correctly Classified			66.6914%		

***p<0.01; **p<0.05; *p<0.1

The results signify that the financial requirement to acquire RC is positively related to CVC funding. This is because the main objective of a CVC is to outsource R&D and innovation of new technologies through independent tech entrepreneurial ventures by providing them access to complimentary resources and infrastructure besides financial investment. This way both parties get benefitted and hence, an increase in RC requirements leads a tech startup to approach and access CVC funding (Elisa & Dushnitsky, 2016; J. Y. (Rose) Kim & Park, 2017; Maula et al., 2005).

The results from Model 3 further imply that a growth stage startup is more likely to obtain CVC funding than one in the early stage. This is because, CVC usually invests in growth stage startups with a strategic overlap with its parent corporation with a possibility of acquisition (Dushnitsky & Lenox, 2005; Gompers & Lerner, 2000; J. Y. (Rose) Kim & Park, 2017).

Next, in the analysis, we investigate how the financial requirements influence a tech startup's propensity to approach and access bank financing. The results from Model 4 are presented in Table 7. The model statistics imply that the results are robust.

Table 7: Logistic Regression results for Model 4

Model 4: Dependent variable: Bank financing (Financed by Bank=1, Not financed by Bank=0)					
Column1	**Term**	**Estimate**	**Std. error**	**Statistic**	**P.value**
1	(Intercept)	-2.41846	0.7612	-3.1769	0.0014***
2	HC	-0.08248	0.4139	-0.2064	0.8366
3	RC	0.28144	0.3872	0.7227	0.4659
4	SC	0.08072	0.4361	0.1823	0.8529
5	Quantum	-0.00218	0.00129	-1.973	0.0498**
6	Growth Stage	3.56808	1.089	3.2754	0.0013***
7	Survival Stage	-0.65852	1.2600	-0.5232	0.60712
Model Statistics					

-2 log likelihood	47.41446
Cox and Snell's R^2	0.1951773
Nagelkerke R^2	0.3777917
Model Chi-Square Statistic	20.194 with 6 degrees of freedom
Hosmer – Lemeshow Goodness of Fit Statistic	0.8314
% Correctly Classified	89.24731%

***p<0.01; **p<0.05; *p<0.1

The results signify a negative relationship of bank financing with the quantum of financial requirements. This is because, to meet a large quantum of financial requirement through debt from a bank might impart financial pressure on the founders regarding the timely repayment of the debt (Levin et al. 2004; Oranburg, 2016; Gartner et al., 2012; de Bettignies & Brander, 2007). Moreover, repayment of the debt would lead to a reduction in retained earnings which could be crucial for a startup's growth (Manigart & Struyf, 1997).

In addition, the results suggest that the growth stage tech startups are more likely to obtain bank financing as compared to the early stage startups. This is attributed to the fact that growth stage startups are likely to possess a positive track record and tangible/intangible assets to pledge as collateral and hence are more likely to obtain bank financing as compared to early stage startups (Cassar, 2004; Cosh et al., 2009; De Bettignies & Brander, 2007; Gartner et al., 2012).

Lastly, we analyse the propensity of a startup to approach and access a PE fund in Model 5. The Model 5 are robust, indicated by the model statistics and presented in Table 8.

Table 8: Logistic Regression results for Model 5

Model 5: Dependent variable: PE financing (Financed by PE=1, Not financed by PE=0)					
Column1	**Term**	**Estimate**	**Std. error**	**Statistic**	**P.value**
1	(Intercept)	-4.2883	1.1263	-3.807	0.00014***
2	HC	-0.6358	0.4693	-1.3513	0.174
3	RC	0.80873	0.4695	1.7224	0.0853*
4	SC	0.4368	0.604	0.7223	0.469
5	Quantum	0.00157	0.000670	2.3482	0.0183**
6	Growth Stage	2.5837	1.2143	2.1281	0.033**
7	Survival Stage	-0.6682	1.6807	-0.3976	0.696
Model Statistics					
-2 log likelihood			39.482		
Cox and Snell's R^2			0.351		
Nagelkerke R^2			0.6281		
Model Chi-Square Statistic			40.316 with 6 degrees of freedom		
Hosmer – Lemeshow Goodness of Fit Statistic			0.221		
% Correctly Classified			94.68%		

***p<0.01; **p<0.05; *p<0.1

The results signify a positive relationship between PE financing and requirement for RC. This suggests that an increase in financial requirement for the acquisition of RC for a tech startup is likely to be funded by a PE firm. Further, the results suggest a positive significant relationship between the quantum of funds required and PE

funding. This is because, PE being a formal institutional investor possess a large pool of funds and thus invest large quantum of financial capital in entrepreneurial ventures and hence, with an increase in the quantum of financial requirements, a tech startup is more likely to approach and access PE funding (Gompers et al., 2016; Kaplan & Schoar, 2005; Wright et al., 2009, 2019). Moreover, results suggest that growth startups are more likely to obtain PE financing than early stage startups. This reaffirms the previous studies inferring that PE firms mostly invest in startups in its growth stage with a certain level of stability and financial performance (Block, Fisch, Vismara, & Andres, 2019; Čalopa et al., 2014; Gompers et al., 2016).

To summarise the results from the EFA and the five Logistic regression models, we draw out certain conjectures. Firstly, our analysis brought out three major categories of a tech startup's financial requirements namely, HC, RC, and SC. The logistic regression analysis supported our hypothesis that a tech startup's financial requirements drive its propensity to approach and access a particular financial source over its lifecycle. While the financial requirement to acquire HC and SC limits a startup's choice and accessibility to certain investors, predominantly VCs, it is the financial requirement of RC that assumes dominance across the diverse financial sources and is met by early as well as growth stage investors. Further, the results depict that a startups growth in its lifecycle plays a vital role in accessing a financial source. A startup is in its growth stage is much more decisive in selecting an appropriate financial source given the financial requirements than the one in early and survival stage.

5.2 Graphical Result

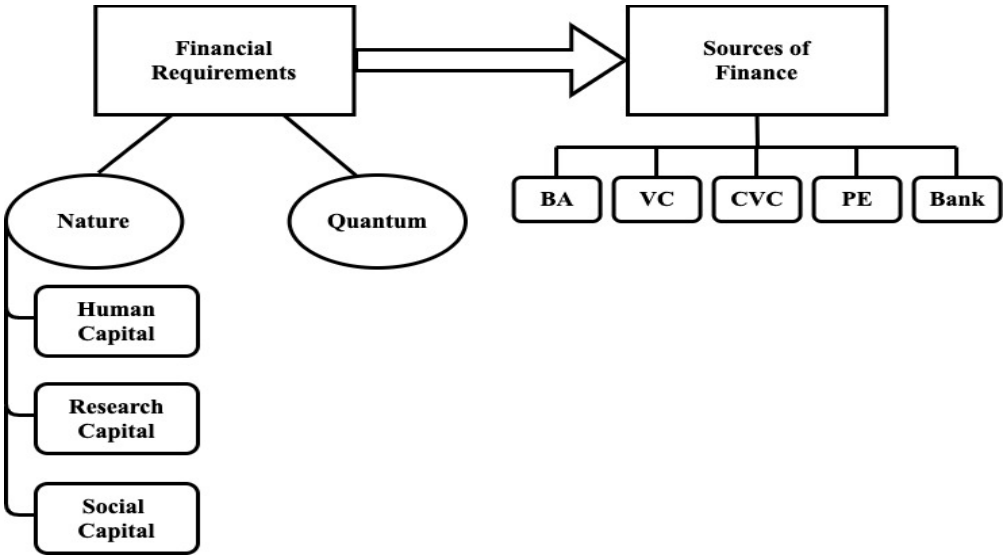

Figure 2: Framework derived from the results

Figure 2 pictorially depicts the inference drawn from the EFA and the five binary logistic regression models. It indicates that a tech startup's decision to approach and access a financial source at a particular lifecycle stage is influenced by its nature and quantum of financial requirements. The nature of financial requirements driving a startup's decision include HC, RC and SC.

6 Conclusions

A tech startup's survival and growth are crucially dependent on the timely acquisition of essential resources throughout its lifecycle (Alvarez & Busenitz, 2001; Barney & Alvarez, 2017). Yet, most tech startups are financially constrained to meet these resource requirements (Bala Subrahmanya, 2017; Čalopa et al., 2014; Ho & Wong, 2007; Hsu, 2007). This leads these startups to approach external sources of finance to fund the financial requirements. However, the extent of financial requirements for each of the necessary resources viz. HC, RC and SC would vary across startups. The extant literature lacks empirical studies on how the various natures and quantum of financial requirements would drive a tech startup's propensity to approach and access a particular financial source. This study contributed the existing literature on entrepreneurial finance by investigating how the financial requirement of a startup influences its decision to access a source of finance.

We segregated the various natures of financial requirements into three broad categories: HC, RC, and SC. These financial requirements at each lifecycle stage influence a tech startup's propensity to approach and access a particular financial source. Furthermore, our findings affirm the significance of RC for a tech startup as it is funded by early (BA) as well as growth stage investors (CVC and PE). This is because the external sources of finance realise that for their investee startups to achieve accelerated growth and competitive advantage, continuous R&D and innovation of new products and technologies are essential and hence, they facilitate the acquisition of RC at

each stage in a tech startup's lifecycle (Baldwin & Gellatly, 2003; Hottenrott & Peters, 2012). Unlike RC, the financial requirements for HC and SC lead a startup to approach large institutional investors, particularly VCs.

The decisive role of RC in a tech startup's sustainable economic growth and competitive advantage, the policymakers as well the financing community for startups are required to give necessary attention to the meet the financial requirements for the acquisition of RC, in order to support the emergence and growth of innovative tech startups in India.

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Biography

1. Shivalik Singh is a Senior Research Scholar in the Department of Management Studies at Indian Institute of Science (IISc), Bengaluru, India. His Entrepreneurial Finance research work involves the study of financial requirements of a tech startup, sources of finance available, accessibility to financial sources and its effect on the performance of a tech startup over its lifecycle. He received his bachelor's in mechanical engineering from Bhilai Institute of Technology (BIT), Durg in 2015. He was also an International Exchange Student, in 2018 at Toyohashi University of Technology, Aichi, Japan.

2. M H Bala Subrahmanya is a Senior Professor of Economics in the Department of Management Studies at the Indian Institute of Science (IISc), Bengaluru, India. He joined Indian Institute of Science, Bengaluru as an Assistant Professor in 1996, was promoted to Associate Professor in 2002, and further to a Professor in 2008. He has more than 27 years of professional experience, of which more than 21 years are at the IISc. During his professional career, he received a Commonwealth Fellowship (1999–2000), a Japan Foundation Fellowship (2004/2005), and a Fulbright-Nehru Senior Research Fellowship (2009/2010). He holds a PhD

in Economics from the Institute for Social & Economic Change (ISEC) in Bengaluru, and his field of specialization is Industrial Economics.